Andhra Pradesh Capital Region Development Authority
Amaravati, Andhra Pradesh
File No: CRDA-14023(41)/1/2019-AEO2-LSE-APCRDA

From
Sri. K. Kanna Babu, I.A.S
Commissioner, APCRDA
Amaravati
AndhraPradesh.

To
The Member Secretary
SEIAA,
3rd floor, AP Markfed building,
Autonagar, Vijayawada, AP – 520007.

Sir,

Sub: APCRDA – Greenfield capital city works- Submission of 2nd half yearly compliance report 2025.

Ref:
1) EC Order No.SEIAA/AP/GTN/151/2015, dt. 09.10.2015
2) Judgement of Hon'ble NGT dt: 17.11.2017.
3) EC amended order SEIAA/AP/GNT/151/2015-515 dt:11.06.2018

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1. Vide ref 1st cited, the Amaravati greenfield capital city project has been issued Environment clearance and vide ref 2nd cited, Hon'ble NGT has issued directions and the SEIAA complying to the directions, vide ref 3rd cited has issued EC amendment.

2. It is to inform that, as per the general condition (vii) of the EC, 2nd half yearly compliance 2025 including conditions of the Amended EC in compliance to the direction of Hon'ble NGT is herewith submitted. The copy of the compliance report is uploaded on the Parivesh portal of MoEF & CC.

Note: Soft copy of the Compliance report – conditions of EC and amended EC with annexures is communicated through mail.

Commissioner
APCRDA

Copy to
The Regional Office, MoEF & CC
The Zonal Office, CPCB
The ZO and RO office, APPCB
The Implementation Committee
The Supervisory Committee

Digitally signed by
KUNNAPAREDDY KANNABABU
Date: 08-01-2026 14:28:10

Amaravati Greenfield Capital City Project

2nd Half Yearly Compliance Report-2025

Condition wise compliance to

Order No: SEIAA/AP/GTN-151/2015, Dated: 09.10.2015

Amendment to Environment Clearance No. SEIAA/AP/GTN/151/09/2015-515 dt 11.06.2018

Submitted to

The MS, SEIAA, AP

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

WATER ENVIRONMENT

S. NO.	EC CONDITION	COMPLIANCE STATUS
1	The Krishna river be protected from all types of harmful discharges from all developmental activities before, during and after Capital Region Development.	All adequate measures have been taken to prevent entry of harmful discharges such as Raw/Treated Sewage/Wastewater into River Krishna. The city is divided into 13 LPS (Land Pooling Scheme) zones and each zone is planned with STP, UG sewer lines and reuse lines. LPS works were commenced prior to 2019 and were halted from June 2019 till 2024. In 2025 works are being revived and Tenders for the LPS zone works are concluded (except one zone). Tenders for 12 STPs are concluded. STPs are planned with tertiary treatment systems. The development of Avenues, reuse lines for the supply of treated waste water from the zonal STP for various reuse applications are part of the BoQ. **Abstract of a LPS zone work is enclosed in Annexure 1**. Large scale Buildings: STPs are included in BoQs in Amaravati Government Complex buildings (Interlinked building projects). **BoQ of an interlinked project showing STP provision is enclosed in Annexure 2 (See pg 93 of 184).** STPs are established in Existing Government complexes and Private Universities.
2	The proponent shall utilize only surface water from Krishna River and Kondaveetivagu to the tune of 1067 MLD, after obtaining the approvals from the concerned statutory bodies and after proper treatment in the proposed Water Treatment Plants. Proponent shall ensure supply of water round the clock	WTP with Water supply lines works have commenced and source of water is from te Krishna river. The IS 10500 will be ensured during operational stage. During construction stage, the condition is being complied. Water for all the interlinked projects, labour camps including existing Interim Government Complex and

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	i.e., 24×7, meeting the drinking water quality standards as per IS 10500.	Judicial complex and Universities in the capital city is being drawn from Krishna River from existing lift irrigation schemes and supplied through water supply lines laid by APCRDA. . The functional government buildings and the Universities have WTPs within their premises. At city level for the supply of treated water, a WTP of 190 MLD capacity with ZLD has been awarded prior to 2019and around 30% of the work has been completed. Works were halted from June 2019. Now in 2025, works have been recommenced. For the immediate drinking water requirements of the interlinked building projects in the Amaravati Government complex, a WTP of 10 MLD near Rayapudi is completed. The Treatment standards to IS 10500 for the during construction stage in the labour campsis being ensured..
3	The proponent shall construct nine internal detention ponds and two reservoirs within the Capital City in addition to two external detention ponds of adequate capacity to overcome the flood menace posed by the Kondaveetivagu and its tributaries. The proponent shall carry detailed hydrological study of the Kondaveetivagu and its tributaries and plan location of detention ponds and reservoirs to achieve twin objectives – combat of inundation and utilization of water. The proponent shall consider factor of increase in intensity of the flow and volume due to pavement of the City and area inundated for 1 hour or	The Hydrological studies of the Kondaveeti Vagu and its catchment has been done by Tata consulting Engineers Ltd. and Arcadis(Netherlands based firm). **The flood management report is enclosed in Annexure 3**. Detention ponds, improvement to the storm water drains, construction of Gravity canal and pumping stations are designed as per the recommendations of the said studies. The hydrological study of the Kondaveeti vagu and its tributaries has considered the expected paved areas and its factor contributing to flooding conditions and options were suggested for the flood management infrastructure

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	more and having water depth more than 6 inches may be considered as affected by water logging for designing of Storm Water Drainage System. The proponent shall take into account climate change considerations and design storm water drains for 20% more capacity than the calculated discharge. The proponent shall protect and improve the existing natural drains and construct modern storm water drainage system to avoid flooding and water logging problems. The proponent shall ensure that sewage shall not enter into storm water drainage system under any circumstances. Proponent shall construct adequate detention ponds and reservoirs at appropriate locations to collect entire storm water. Proponent shall also take measures to strengthen the Krishna River Bund to minimize flood related issues.	in the studies. Climate change aspects are also considered in the design. The design considered the effects of paved area and the storm sewers are designed considering the 1 in 5year storm frequency and canals, detention ponds and flood pumping stations are designed considering the 1 in 100year 24 hr return rainfall. Separate underground systems for the Sewage and Storm water network are planned along all roads and works have been commenced. The storm water system for the city includes the network of existing natural streams, city storm sewers, detention ponds, canals. It is planned to achieve twin objectives to combat inundation and utilization of water. The Reservoirs (Detention ponds) near Krishnayapalem & Neerukonda and Shakamuru are part of the flood mitigation and they are interconnected to the Storm water network. Flood mitigation works were commenced prior to 2019 and later halted during 2019-2024. Works have been re commenced in June 2025. Krishna River bund strengthening will be taken up after prior studies.
4	Detailed studies on the flood management of the Storm water drains, mainly Kondaveetivagu and its branches and a detailed plan to avoid inundation of the areas be developed taking in to account of the impact of the increased built up area in different development zones of the project.	The Blue Master Plan has been prepared in consultation with the Expert Committee constituted by Government of Andhra Pradesh for flood management works in Amaravati. Further, the DPRs have been reviewed by the KWD, the World Bank & CLC Singapore. The WRD Department, GoAP has vetted all

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

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		the designs and DPRs. The design considered the effects of paved area and the storm sewers are designed considering the 1 in 5year storm frequency and canals, detention ponds and flood pumping stations are designed considering the 1 in 100year 24 hr return rainfall. To avoid inundation, as per the studies, the existing natural streams are proposed for improvement in terms of its widening and deepening without altering its course, a new canal called gravity canal is proposed to divert the Kondaveeti vagu upper catchment runoffs from entering the city. Two pumping stations are proposed one at Vykuntapuram which receives runoff waters from the Gravity canal and other pumping station at Undavalli which receives the storm water runoffs from the city catchment area. Further, 3 reservoirs of capacity 0.53 TMC are planned in the city which act as detention ponds. The flood mitigation works (3 detention ponds, improvement to Pala vagu, Kondaveeti vagu, construction of Gravity canal are awarded and works are commenced during June 2025) Further, as part of the flood mitigation, separate under ground storm water network is planned along all streets with final outlets into vagus with outlet levels above the HFL of the vagu. Kondaveeti vaagu pump station with a capacity of ~5250 cusecs is commissioned. All the pumps at Pumping station were operated during the 2024 heavy storm event (1 in 100 year).

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
5	The proponent shall ensure cleaning of storm water drains at least three times a year. (i) First, the process must start by 31 March each year. (ii) The drains should also be thoroughly cleaned after first heavy shower (iii) subsequently, after retreating of rain i.e., in the post monsoon.	The cleaning of the storm water drains will ensured and compliance will be submitted at appropriate stage of the project.
6	Proponent shall ensure construction of rain water harvesting structures and also promote rain water storage and use system by considering heavy rains in the area. Proponent shall make these as mandatory by incorporating in the Bye-laws of APCRDA & CA.	The interlinked projects have been planned with the rain water harvesting system and storage tanks. The details of the execution will be submitted post execution. The construction of RWH structure is made mandatory as per the Amaravati zoning regulations. **Refer Annexure 4 – See sec 606 of Amaravati Zoning regulations.**
7	Water pumping system and sewage conveyance and treatment systems are energy intensive and as such the proponent shall follow Bureau of Energy Efficiency Norms.	The Condition of EC is complied and provisions are made in the tender documents. LT pumps selected for clear water pumping and distribution system are of IE3-rated, in compliance with the norms set by the Bureau of Energy Efficiency (BEE). The HT pumps used for clear water pumping, as well as the raw water pumps installed at the intake well and WTP are based on the 3D (Demand Driven Discharge) concept. These pumps operate according to the actual demand, ensuring optimized performance. Their operation is regulated by energy-efficient devices such as Variable Frequency Drives (VFDs), which help in controlling the pump speed and reducing energy consumption. VFD systems are used in Sewerage infrastructure. **The BoQ for the STP is enclosed in**

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
		Annexure 5 (see pg 8,12) and the reply from the ADCL on the Water supply systems is enclosed in the Annexure 6 (see pg 2). Appropriate O&M will ensure minimum electrical energy usage in pumping of raw water from the Intake Well, raw water transmission main, various treatment processes in WTP, clear water pumping station, clear water transmission main and in water distribution system through WDCs to the users.
8	Proponent shall encourage low flow plumbing efficient fixtures, sensors, auto valves, pressures reducing devices including for toilets, faucet aerators and shower heads to conserve the water. Proponent shall incorporate these guidelines in the Bye-laws.	Amendment of Amaravati Zoning Regulations by incorporating of EC conditions and NGT conditions is completed.. see Annexure 7.
9	The proponent shall ensure 100% collection of sewage by covering entire area of the city with modern underground sewerage network. The proponent shall treat entire (100%) waste water of 877 MLD (year 2050) in the proposed Five Sewage Treatment Plants and one dedicated Industrial Waste Water Treatment Plant to the International Municipal Sewage reuse standards of BOD ≤ 10 mg/l, COD ≤ 10 mg/l, Total Suspended Solids (TSS) ≤ 10 mg/l, Residual Chlorine ≤ 1MG/l and Faecal Coli /100 ML – No detectable levels as committed in EIA report. The proponent shall recycle 100% of treated sewage for non potable applications like flushing, gardening, road and vehicle cleaning, HVAC, fire protection, construction activities, industrial applications by laying dedicated pipeline for supply of treated grey water as committed in the EIA report. The	The total wastewater generation for the year 2050 is projected to be 681 MLD, and land for treatment plants of sufficient capacity has been allocated in the capital city. The STPs will be developed on modular basis to treat this quantity. Sewage collection system has been planned for the entire Capital City area, the city is divided into thirteen sewerage zones, each serviced by 1 sewage treatment plant. In the tender documents, the recommended norms of treated sewage quality by MoHUA dtd 18.12.2023 or CPHEEO (Revised table 7.19 of the Manual on Sewerage and Sewage treatment) are included for treatment of Sewage. Tertiary treatment systems included in the BoQ with BoD <5 mg/l. **See pg 11-13 of 30 in Annexure 5.**

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	proponent shall construct treated sewage storage ponds of adequate capacity with HDPE liner to store treated sewage during rainy season as committed. The proponent shall lay dual piping at street level shall be laid out in service ducts with 24 ×7 water supply provision by ensuring pressure in the main water supply network is always maintained at least twice of the pressure in dual pipe carrying treated waste water to avoid contamination of the fresh water.	It is planned to reuse the treated waste water for various applications like flushing, greenery, District cooling systems and other applications as required. Dedicated Underground water supply and reuse lines are laid and it will be ensured that sufficient pressure is maintained in the main water supply network.
10	The proponent shall construct Sewage Treatment Plant of capacity 216 MLD in the 1st phase and reuse 114 MLD for green belt development and Horticulture and 102 MLD for flushing, construction activities, HVAC requirements, road washings, emergency fire fighting, industrial applications etc., as committed. The proponent shall also construct 3500 MLD treated sewage storage pond for storage of treated sewage in the rainy season as committed. The proponent shall undertake construction of Sewage Treatment Plant simultaneously with the construction of the city.	The tenders for the construction of the STPs catering the sewage demand from 12 LPS zones (of total 13 zones) for a capacity of 282 MLD are finalized . It is planned to construct STPs with a capacity of ~330 MLD and with increase in population the STPs capacity will be increased for the ultimate design population. It is proposed to reuse the treated waste water for various applications in the capital city. Reuse lines along the roads for distribution of the treated waste water to the greenery areas and other applications are part of the BoQs.
11	The proponent shall provide continuous online water quality monitoring facilities for WTPs, STPs and upstream of drinking water source at Krishna River. Results of monitoring shall be linked to SPCB / CPCB website.	Online River Water Quality System is commissioned on upstream of River Krishna and is connected to APPCB and CPCB server. The city level STPs and WTPs will be monitored using SCADA system and it is included in the BoQs. **see pg 12 of 30 in Annexure 5 and pg 2 of 9 in Annexure 6**. The Scada systems will be connected to the SPCB/CPCB website. The compliance will be submitted post

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
		execution.
12	All roads should have rain water drains connected separately (from the sewage network) to the treatment facility of the zone.	All the roads have been planned with separate UG storm water network and the storm water is proposed to be released into the proposed reservoirs or the existing natural drains. For efficient drainage from the city the outlets are above the HFL of the canals.
13	Appropriate sites be identified and selected for establishing the STPs for different zones, and the proponent shall reserve the area within 200 m from the STPs, as no habitation vegetation zone and may use for establishing waste recycling or processing or handling facilities for the respective zone.	Sites for the STPs are identified and the area around the STPs for handling waste recycling or processing will be examined case to case basis and compliance will be submitted.
14	Water quality of all the surface water bodies, including the storm water drains be monitored during pre-monsoon and post-monsoon seasons, for their management purposes and the report is submitted as compliance.	During construction stage, Water quality monitoring of surface water is included in the tender documents of all works on quarterly basis. Monitoring includes pre construction and construction stage. **Refer Annexure 9 pg 126 of Standard bid document.** Post completion of the capital city works, the monitoring of the water bodies will be done and reported. Online River monitoring station upstream of Prakasam Barrage is connected to APPCB website and CPCB website.
15	The proponent shall prepare water footprint and carry auditing every year.	Water footprint will be prepared and Water Audit will be carried out as part of the Operation and Maintenance measures proposed for the system. The compliance will be submitted.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

AIR ENVIRONMENT

S. NO.	EC CONDITION	COMPLIANCE STATUS
1	The proponent shall give priority for walking, cycling and integrated public transport system for laying of the roads and usage of cleaner fuels and plying of fuel efficient vehicles on the road.	1. The elements of walking, cycling, public transport were well planned and spread over in the city as per notified Master Plan. 2. Walking, Cycling: Dedicated space is part of the design of all Trunk(Arterial, Sub arterial) and LPS roads (Collector streets). 3. Public Transportation(PT): Sub-Arterial roads are provided with dedicated PT corridor and ordinary PT system will ply on Arterial Roads. Preference will be given for Electric vehicles in the public transportation system in the capital city. Consultant has been engaged to prepare a typical plan and sections with the details of necessary EV charging infrastructure along with Bill of Quantities, Cost estimate to accommodate minimum 2 to 3 EV charging stations at one location. With reference to Arterial Roads, EV charging infrastructure will be installed on either side of the carriageway by creating a lay bye to the main carriageway with facilitation for EV charging infrastructure for various vehicles such as Bus, Car and Two Wheelers etc. In the interlinked building projects of the Capital city – i.e., Interim Government Complex (IGC), battery operated vehicles are being used within the premises. It is proposed to install EV charging provisions in the building project complex taken up by APCRDA.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
2	Proponent shall construct a continuous unobstructed foot path on each side of all streets with ROW wider than 12 mtrs. Minimum width of footpath shall be 2 mtrs. In addition to space for trees/greenery/vending spaces and surface utilities. Width of footpath shall be determined based on pedestrian volume and have to be wider than 2m wherever required. Intermittent buffers, bollards and other physical elements should be used to protect foot paths from encroachment by motor vehicle parking. At least 125 trees per kilometre length of footpath on the streets shall be ensured. Spacing of trees at no place should be greater than 12 m except at intersections. On streets with ROW of 18 m or less, if pedestrian traffic is greater than 8000 per hour in both directions together, the entire ROW should be notified for pedestrianization. Footpath Elevation over the carriage way at all times should be less than 150 mm. All pedestrian facilities should be barrier free for universal access by all persons with reduced mobility including those with hearing and visual impairments. At least 5 safe street-level crossing opportunities per kilometre of street with 250m being maximum spacing between two crossings shall be ensured. Depending on context, these crossings may be signalized and / or traffic calmed (through raising crosswalk over street level by 150 mm) to reduce vehicular speed. Limiting speed on urban arterial roads and sub-arterial streets to 50 kmph and on collector	The details of roads as per design and tenders are as follows- The minimum ROW of 12 m with foot path, cycling tracks and avenues on both sides are designed and spread all over the city. Footpaths: Proposed on all the Trunk and LPS roads with width ranging between 1.8m on both sides of 12 m road to 3 m on both sides of 50 m road. **See pg 12-15 of Annexure 8 for cross sections in LPS roads** **See pg 8 of Annexure 6** Trees per Km.: Spacing of the trees will be as per the standards for different road widths. Speeds on roads: The city roads were planned by following the Urban road hierarchy system and designed by adopting the best national, International standards/practices. Road safety elements are included will be developed under the street furniture item. **See Annexure 1**. Few of the Arterial, Sub Arterial, Collector and Local road construction works are awarded and reached some progress till 2019 and later during 2019 June to 2014 works were halted. Now, in 2025 the works have re-commenced. Roads with the footpaths, cycle tracks, street poles, street furniture, avenues, UG ducts for electrical, Sewer lines, reuse lines, ICT, Water supply, Gas lines are part of the tenders.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	and local streets to 30 kmph shall be ensured. Traffic calming of all streets with ROW of 12m or less through narrowing of driveway and meandering path with use of trees, islands and street furniture should be done and speed should be limited to 20 km/hr by design. Highways within urban areas should be avoided since they disrupt pedestrian activity and disconnect neighbourhoods. Vending spaces should be marked in addition and adjacent to the walking path, especially along high pedestrian volume areas to activate the street and make it safe. Space to be planned for utilities including drinking water kiosks and toilets so that the walking space is enhanced but not compromised.	Total Collector roads length is ~1280 Km and Total Arterial and Sub Arterial roads length is ~320 km. The major road classes of Master Plan were designed with recommended speed limits along with proper safety measures. All other conditions will be considered **see Design basis report of a LPS zone is enclosed in Annexure 8.**
3	Proponent shall - Construct dedicated and physically segregated bicycle tracks with width of 2m or more, one in each direction on all streets with total motor vehicle carriageway larger than 10 m (not ROW) after providing adequately sized footpaths in each direction based on pedestrian traffic. - Develop at least 5 safe street crossings per km for bicycles with spacing between two crossings not more than 250m. - Provide secure parking for cycles at transit stations, all public places and commercial and institutional buildings.	1. With a vision and objective to encourage Non-Motorized Transport (NMT) in the city, required infrastructure is planned in the notified Master Plan. A dedicated NMT corridor all along the trunk and LPS roads were proposed in the master plan. The Right of Way (RoW) created for NMT will encourage and generate awareness among citizens about the bicycle activity. In context of maintaining the safety of cyclists and create environment friendly transport system these segregated bicycle tracks were planned. 2. Based on the IRC and other international standards, road and street crossing designs such as Table Tops, Pelican signals, zebra crossings, etc. and bollards restricting the vehicles entering into Pedestrian and Cycle tracks are included in the BoQs.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	- Promote and implement public sharing schemes.	3. APCRDA has taken up developing the pre-feasibility analysis study for Public Bike Sharing (PBS) system in Amaravati along with Vijayawada and Guntur with World Research Institute (WRI). 4. Bike sharing System size, Bike Station location Plan, infrastructure requirement, implementation plan, awareness & advocacy training programs, etc. will be taken up as per the recommendations at appropriate stage of the city development and will be reported.
4	Proponent shall design streets with emphasis on Pedestrian and cyclist safety, comfort and convenience. Proponent shall establish a dedicated unit for planning and auditing of Non-Motorized Transport (NMT) facility. Area of blocks surrounded by public access pedestrian / cyclist streets or pathways shall not exceed 2 Ha. No development shall be permitted until local street grid is put in the place which subdivides land into blocks of no more than 2 Ha.	All the streets are designed considering safety, comfort and convenience for the pedestrians and cyclists. Area of blocks surrounded by public access pedestrian / cyclist streets or pathways shall not exceeded 2 Ha.
5	Proponent shall develop high quality and high frequency rapid public transport system with dedicated lines for bus rapid transit system. All public facilities (institutional / educational / cultural etc.) should be accessible by public transport within 400m walking distance.	1. Grid pattern network of roads is planned in the city. The distance between any two major roads (Arterial/Sub-Arterial) in the city is 1km. All the sub-arterial roads were provided with dedicated PT corridor and ordinary PT system will ply on arterial roads. The Arterial and Sub-Arterial roads were planned one adjacent to another. This will create an access to citizen for Public Transportation system within 400m walking distance. 2. Each Community Centre is within 5

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
		minute walking distance for any resident, and public transport node is within 10 minute walking distance.
6	The proponent shall encourage battery operated vehicles by providing separate lane with a provision for recharging.	Battery operated vehicles will be encouraged and details of provision of lay bye and recharging facilities will be submitted..
7	On making available of cleaner fuels like LPG/CNG, the proponent shall ensure plying of only CNG/LPG fuelled public transport vehicles like buses, taxis, autos on the road. Proponent shall also ensure that vehicle beyond 15 years of age shall not ply in the city. Proponent shall also encourage usage of low sulphur diesel and unleaded petrol by vehicles. Proponent shall ensure plying of latest emission compliant vehicles only on road.	Measures will be taken to comply with the condition. Necessary controls will be brought to ensure that Low sulphur diesel and unleaded petrol are used by the vehicles. The compliance details will be submitted.
8	The proponent shall encourage environmental friendly modes of transport like public transport and non motorized transport and discourage usage of personal cars by devising disincentives for private car use, in the form of both spatial (like parking control) and physical (like levies on car, fuels, congesting charges).	The design of the city roads considered public transport system and about 150 km of dedicated corridor for public transportation network is identified. Designated commercial areas are connected with public transportation in the master plan. Policy for discouraging the use of personal vehicles and promotion of public transport at appropriate stage of the city development will be submitted.
9	The proponent shall provide adequate parking facilities by giving priority to public vehicles and non-motorized transport vehicles.	For all the projects it is ensured that parking spaces are provided as per the NBC norms/ZR norms.
10	The proponent shall ensure that all utility lines (electricity, telephone, cable, water supply, sewerage,	With an objective to make Amaravati as a dig free city, the Infrastructure Master plan has recommended to develop Utility

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

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S. NO.	EC CONDITION	COMPLIANCE STATUS
	drainage etc.) shall be laid below the ground. Duct shall be provided along and across the roads to lay the utility lines. Major trunk (water/sewerage) lines are to be laid along the utility corridor.	Corridor all along Trunk and LPS roads placed on either sides of the carriageway below the ground. **See pg 12-15 of Annexure 8 for cross sections in LPS roads** **See pg 8 of Annexure 6**
11	The proponent shall ensure that DG sets shall comply with noise and emission norms prescribed by MoEF& CC in Environment (Protection) Rules.	The DG sets approved by authorised agencies will be installed and monitoring results of the Noise and Air emissions of the DG sets will be submitted. During construction stage, Monitoring of Noise and Air emissions is included in the tender documents. **See pg 127 standard bid document enclosed in Annexure 9**. In the tender documents, it is recommended to use CNG genset, Solar based sources in all practicable cases and to use DG sets as a last option. It will be ensured that stack of minimum height is installed to prevent the ground level emissions. **See pg 129 of standard bid document enclosed in Annexure 9** A condition is incorporated in the Amaravati zoning Regulations stating that only Approved DG sets shall be installed. **See Annexure 7**
12	The proponent shall ensure development and meeting of not less than 10% of energy needs from the renewable energy sources like Solar, Wind, WTE, Bio mass etc. To meet the demands of the Capital City, at least 120 MW of solar power with investment to the tune of RS.500 Crores and wind power with investment of Rs.100 Crores in the 1st phase shall be taken up as	Roof top solar is included in BoQs of all Housing and Office building in AGC area. Roof top solar is mandated in the Amaravati Zoning Regulations for all buildings except for residential buildings less than 300 sqm plot area. **See Annexure 7.** The enforcement of the roof top solar at plot level will significantly contribute to achieve the 10% of total city energy needs from

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	committed.	renewable. The decision on the establishment of the Large scale renewable energy based parks/plants will be submitted.
13	The proponent shall ensure installation of solar panels by all buildings by allocating at least 1/3 of roof top for this purpose. This is in addition to installation of solar heaters. The proponent shall incorporate these guidelines in Bye-laws.	The condition related to solar water heating and solar lighting is already mandated in Amaravati zoning regulations. **see Annexure 7**. All the proposed interlinked projects are planned to develop with Roof top solar plants. Roof top solar is included in the BoQs of the building projects. **See pg 167 of 184 of a BoQ of interlinked building projects in AGC area, enclosed in Annexure 2.** Solar water heaters are also included in the building projects. **See pg 129 of 184 of a BoQ of interlinked building projects in AGC area, enclosed in Annexure 2.** In the Interim Government Complex two solar trees of total capacity 20.8 KW are installed. Installation of the Roof top solar plant on all the buildings in the IGC is also completed with a total capacity of 842.5 Kw. 60 Kw Roof top solar plant is under operation in High court. Further, a 22 kw capacity plant is installed and to be brought into operation. Roof top solar has been installed by the Universities in Amaravati.
14	The proponent shall incorporate energy efficiency guidelines (Energy Conservation Building Code) and Green Building Concepts (GRIHA/IGBC/LEED) in the Bye-laws. Buildings shall utilize natural lighting and ventilation to the maximum extent.	Green building norms, ECBC are mandated for the buildings in the capital city. The condition is incorporated in the Amravati Zoning regulations. **See Annexure 7**. The condition is included in the building permission process **see pg 5 of a**

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	All point light sources shall be CFL or LEDs or equivalent. All linear light sources shall be T-5 or at least 4* BEE rated TFLs or equivalent. The distributed cooling system shall be at least BEE 3* rated products. All the major buildings having connected load of more than 100 KW shall maintain power factor of above 0.95. All multi story residential apartment / complexes shall meet at least 15% of total external lighting load through renewable energy sources and all commercial, institutional, industrial and mixed use buildings shall meet at least 5% of the total lighting loads through the renewable energy sources. All residential buildings having plot area of more than 500 Sq.mtrs, multi story residential apartments / complexes, hotels and banquette halls, hospitals, all government buildings, residential schools, educational institutes, hostels and industries requiring hot water shall install solar water heating systems to meet at least 20% of hot water requirement. 24 hours use buildings like hospitals, hotels, call centers, shall ensure that thermal performance of external walls and roof shall conform to ECBC 2007 requirements i.e., maximum U-factor (W/m^2K) of 0.44 and 0.261 respectively and for day time use buildings U-factor of 0.44 and 0.409 respectively. U-factor for windows shall not be more than 3.30. All major buildings land complexes shall meet Energy Performance Index of less than 150kWh/Sq.m per year. All commercial buildings with	**building permit order in capital city enclosed in Annexure 10.** The interlinked building projects designs have included the green building and ECBC norms in the BoQs and is targeted for Green certification. BEE minimum 3 star rated to 5 star rated products, Roof top solar and its connectivity to the external lighting load, water heaters, LEDs and other green building norms, power factor are considered in the designs and BoQs.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	connected load of 100kW and above shall invariably comply with energy conservation building code. All the Capital complexes, Commercial, institutional and major residential complexes should be constructed following Green Building concepts and ensure – energy efficiency, low carbon foot-print, resources conservation etc. The proponent shall ensure that all the bulk consumers of the energy, shall meet a greater part of their demand through renewable energies and avoid use of fossil fuels; The proponent shall incorporate these in Bye-laws.	
15	The proponent shall establish minimum 3 online continuous Ambient Air Quality Stations in three zones i.e., residential, commercial and business zones and connect the results to CPCB / SPCB website in the 1st phase. Permanent Online Air Monitoring Stations for Air Quality be established, one for every 25 km2 of area, located strategically considering the wind rose of the area and terrain conditions.	One station is installed by APPCB at Interim Govt. Complex, Velagapudi, and connected to CPCB. 3 manual stations will be installed with the support from the APPCB and CPCB under the NAMP. The proposed locations in the capital city are at Thullur PHC, Yerrabalem Sub center and SRM University.
16	The project proponent should develop mechanism for monitoring Carbon sequestration from the plantations made and should achieve a Mean Annual Increment of the Carbon stock of at least 5 tons/Ha/annum. The proponent should monitor the carbon stock of each area, at least once in two years and submit reports.	Carbon stock and sequestration calculations have been completed till 2025 February. Further, a planned program for greening will be adopted as per the suggestions ofclimate action plan for city and accordingly carbon stock and sequestration will be monitored and reported. Climate action plan final report is submitted. ICLEI (International council for local

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
		environment Initiatives) engaged for preparation of climate action plan and carbon sequestration through plantation is part of the final report. **See Action points in Annexure 11.**
17	The proponent shall prepare carbon footprint for the city and strive for carbon neutrality.	Earlier, M/s TERI has been entrusted with the task of preparing climate change action plan for the Amaravati capital city and the carbon sequestration is part of the Action plan. The work was halted during 2019 -2024. ICLEI has been engaged for preparation of climate action plan.The final report is submitted. Strategies for carbon neutrality is part of the Report. The final report was prepared after consulting with stakeholders and is now aligned with the State Action Plan on Climate Change, as advised by the Member-cum-Nodal Officer. It has been submitted for IC and SC members for review. It was shared on 18 Nov 2025. **See Annexure 11.** Necessary actions in this regard are yet to be initiated and the details will be submitted.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

SOLID WASTE MANAGEMENT

S. NO.	EC CONDITION	COMPLIANCE STATUS
1	The proponent shall ensure that occupiers of all premises to keep two receptacles, one for the storage of food / organic / biodegradable waste and another for non biodegradable / recyclable and other types of solid waste generated. Hazardous waste generated by households shall be kept separately in suitable container as and when such a waste is generated.	The Households in the Existing settlements have been distributed with two bins for the wet and dry waste. Households are supplied with 2 dustbins and Bins have also been distributed to the commercial establishments in all the villages. HHs are segregating waste at the source level and awareness is being done regarding source level segregation of the wet and dry waste separately.
2	The project proponent shall ensure that all the newly developed areas shall not have any open waste disposal sites on the road sides and develop efficient waste collection mechanism that ensures segregation at the origin level only.	Suitable no. of the collection vehicles and manpower for Door-to-Door waste collection are engaged to prevent open waste disposal. Further, dumper bins are placed in the major streets to temporarily store the door to door collected wastes and later for collection by compactors for transportation to the waste to energy plant.
3	Proponent shall arrange for door-to-door collection and / or community bin collection of domestic waste; trade and institutional waste stored by the waste generators in segregated manner.	Door to Door collection in all the villages is already in practice. Cube bio energy pvt ltd has been engaged.
4	Proponent shall identity and allocate suitable pieces of land in the jurisdiction of the city to facilitate sorting of various components of recyclable material collected by waste collectors and prevent such activities being carried out on the foot paths / road side etc.	The condition will be complied at appropriate stage with city growth and actions taken in this regard will be submitted.
5	The proponent shall identify and allocate adequate land for Multiple Transfer Stations with mechanical Material Recovery Facility for secondary segregation and storage	The condition will be complied at appropriate stage with city growth and actions taken in this regard will be submitted. Currently, the waste is being transported to the waste to energy plant

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	of dry waste as committed. Transfer Stations shall be properly covered and hygienically maintained to minimize Environmental and Health Hazards.	in Naidupet, Guntur. **See Annexure 18.** The condition will be complied and actions taken in this regard will be submitted.
6	The proponent shall ensure daily sweeping of all public streets and periodical cleaning of all public places.	The street sweeping is being done in the settlements and the condition is complied.
7	The proponent shall make arrangements for separate collection of construction and demolition waste and shall be transferred to Construction and Demolition Waste Recycling Facility. Proponent shall allocate adequate and suitable land for establishment of Construction and Demolition Waste Recycling Facilities.	The condition will be complied. As per the C & D waste management guidelines, portions of the C & D waste will be used in filling the low lying areas of the city and levelling of the land. Conditions are included in the ESMP/SoP of the tender documents of the capital city contract works i.e. - In the construction phase, all the contractors shall store the C & D wastes in the segregated forms within the project sites and shall be disposed to the C & D plant as directed by the APCRDA. **See pg 47 of SoP enclosed in Annexure 12.** The APCRDA will notify Request for proposal to engage a firm for establishment of C & D plant for the management of the Construction stage C & D wastes. Actions taken will be submitted.
8	The proponent shall ensure that a separate adequate space for segregation / storage and decentralized processing of solid waste is demarcated in the plan for group housing or commercial/ institutional or any non-residential complex exceeding 200 dwellings or having a plot area of more than 10000 Sq.mtrs.	Adequate space for onsite waste management is considered in the interlinked building projects and compliance will be submitted post execution. The condition is incorporated in Amaravati zoning regulations and buildings permission orders. **See pg 5 of the building permit order issued for a**

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
		development in capital city enclosed in Annexure 10. **See Annexure 7 for the Amaravati zoning regulations amendment.**
9	The proponent shall ensure collection of waste from vegetable, fruit, meat and fish markets on daily basis and promote setting up of de-centralized compost plant or bio methanisation plant at suitable location in the market.	The establishment of the decentralized compost plant/ bio-methanation plants in the market locations will be promoted and dealt case to case basis. The compliance details will be submitted.
10	The proponent shall ensure establishment of modern abattoirs (slaughter houses) with appropriate waste management facilities. The proponent shall also take measures for establishment of Rendering Plant for disposal of carcass or parts of any dead animal in scientific manner.	The existing abattoir located in the adjacent and contiguous area to the capital city they are Mangalgiri or Vijayawada will be utilised. Decision on the identification of Land for Modern abattoir will be reported.
11	The proponent shall allocate suitable and adequate site for setting up of Common Bio Medical Waste Treatment and Disposal Facility within the city limits.	As per the biomedical waste management guidelines, the facilities within 75 km shall be utilised and CBMWT facility in the Chinnakakani will be used for the disposal of the bio medical wastes. The plant is not operated to its full capacity. If the existing plant reaches its full capacity and, in the future, major hospitals that come up in Amaravati will be asked to develop suitable biomedical waste management facilities within their premises. Handing over of the biomedical wastes by the waste generator to the authorised dealer is incorporated in the building permit procedures. **See pg 5 of the building permit order issued for a development in capital city enclosed in Annexure 10**

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
12	Proponent shall make arrangement for setting up of Waste Collection Centers for plastic waste in association with plastic manufacturers. The Proponent shall also ensure safe collection, storage, segregation and transportation, processing and disposal of plastic waste in environmentally sound manner. The proponent shall allocate suitable and adequate site for setting up of plastic recycling, processing and disposal facilities.	It will be complied. The actions taken will be submitted.
13	The proponent shall facilitate setting up of E-waste Collection Centers by the producers and channelize e-waste to recyclers or dismantlers. The proponent shall allocate suitable and adequate site for setting up of e-waste recycling / dismantling facilities.	Waste collection centers will be established at appropriate locations. It will be complied. The actions taken will be submitted.
14	The proponent shall identify and allocate suitable site for establishment of common Hazardous Waste Treatment and Disposal Facility.	It is proposed to develop only non-polluting industries and therefore the facility establishment will be considered on the need basis. The domestic waste collected from the city is transported to the waste to energy plant in Naidupet, Guntur. The technology at WTE, Naidupet accepts the mixed type of wastes.
15	The proponent shall facilitate establishment of used battery Collection Centers by manufactures / importers / assemblers / reconditioners and canalize the used batteries to registered recyclers. Proponent shall allocate suitable site for setting up of used battery recycling facilities.	In the interlinked building projects under operation buy back arrangements are done. Used batteries are classified as hazardous waste and shall be handled as per rules. The actions taken will be submitted.
16	Proponent shall ensure proper collection and scientific disposal of	Co treatment facilities for the sludge are included in the STP works.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	sludge from the water treatment plants, sewage treatment plants, water seal latrines and septic tanks.	As an interim measures for the septage from the existing settlements – the sludge collected will be transported to the 20 MLD STP located in Ramalingeswar nagar STP.
17	Proponent shall take measures for proper collection and scientific disposal of bulky waste like discarded tables, chairs, cots, cub boards, mattresses, gas cookers, microwave ovens, washing machines etc.	Transfer Station will be suitably designed with special arrangements to handle bulky objects. Actions taken will be submitted.
18	Proponent shall take measures for establishment of state of art modern Integrated Solid Waste Management Facility for the city as committed consisting of Sorting / Material Recovery Plant, Compost Plant / Anaerobic Digesters, Waste to Energy Plant, Construction and Demolition Waste Recycling Plant, Bio medical Waste Facility, Plastic Waste Processing and Recycling Facility and Engineered Landfill Facility. Proponent shall allocate suitable and adequate space for ISWMF in the city limits and ensure establishment of ISWMF simultaneously with the construction of the city in the first phase itself.	Currently, the waste from the existing settlements is being collected and transported to the waste to energy plant located in Naidupet, Guntur which was constructed a regional facility to cater to the waste management from few ULBs in erstwhile Guntur and Krishna districts. **See Annexure 18.** Suitable site has been allocated within the capital city and the development of the ISWMF will be done at appropriate stage of city development. During the construction stage, conditions for the management of waste by the contractors are included in the standard bid document and the SoP. **See pg 127 of Standard bid document enclosed in Annexure 9 and pg 47 of SoP enclosed in Annexure 12**
19	The proponent shall maintain adequate green buffer around Integrated Solid Waste Management Facility and Common Hazardous Waste Treatment and Disposal facility By carrying proper assessment, but not less than 100 m width.	Compliance will be submitted during design and execution of the ISWMF.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
20	The proponent shall ensure usage of fly ash for levelling / reclamation of low lying areas, road embankments, for raising platforms in inundated areas, and usage of fly ash based products for construction purpose including fly ash bricks, PPC cement, Concrete etc., in compliance with Fly Ash Notification issued by the MoEF under Environment (Protection) Act. The proponent shall incorporate usage of fly ash by construction agencies in the Bye-laws.	Incorporated in Zonal Regulations, **See Annexure 7**. The usage of fly ash and its products in the constructions activities of interlinked projects is already under practice. AAC blocks are considered in the building project. **See pg 23-25 of 184 in BoQ of a building project in AGC area enclosed in Annexure 2**.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

ECOLOGY

S. NO.	EC CONDITION	COMPLIANCE STATUS
1	A list of all existing water bodies (including ponds, tanks, drains, irrigating channels) falling in the proposed area, shall be prepared village wise with survey no., extent, use and other details duly certified by a competent authority and a certified map of these water bodies as on project commencement date should be kept as base map with the APCRDA & CA, and should be displayed on its web site;	A Notified Master plan depicting the water bodies is displayed in the APCRDA website.
2	All construction activities by the proponent should ensure that the activities do not alter or do not adversely affect the water bodies and their ecology;	Condition is already included in Bid document. **See pg 104, 117, 149 of the standard bid document enclosed in Annexure 9**
3	Improvement or rehabilitation of existing natural streams, channels / nallas shall be carried out without disturbing the ecological habitat.	The existing channels are being improved to make the city a flood resilient city. All the streams will be developed with 30 m green buffer on both sides and 20 m green buffer both sides of gravity canal. The green buffer will be developed with nature based solutions and this will enhance the biodiversity and ecological functions in the area. The compliance will be submitted.
4	No untreated or treated wastewater shall be discharged in any of the water bodies including Krishna River under any circumstances.	All waste water will be treated and reused for various applications in the capital city. Zonal level STPs are planned to treat the entire city sewage and tenders will be notified. Building level STPs are functional in the exiting operation al buildings. In the interlinked projects under construction STPs are included. Suitable nature based solution will be developed for the in-situ treatment of the

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
		drainage released from the existing villages before draining it into the water bodies. Compliance will be submitted. Budget for the infrastructure upgradation in the existing villages has been sanctioned by the government and the works include water supply, storm water drains, sewerage, roads and street lighting. The infrastructure will be integrated with the city infrastructure.
5	The proponent shall create primary green spaces of 7200 Ha. Consisting of city parks, lake parks, town parks, neighbourhood parks as committed. The proponent shall create primary green space of 3924.57 Ha in the 1st phase as committed.	As per the master plan ~30% of the area is under Blue and Green spaces Some of the water bodies such as Thullur tank, Venkatapalem tank have already been developed with greenery and converted into public spaces. Development of water tanks in other villages will be taken up in phased manner. The ADCL which is an implementing agency of few capital city works is looking after greenery development in the capital city. **Proposed Greenery development details are enclosed in the Annexure 6**.
6	The proponent shall create and maintain secondary green space of 1910 Ha. Weave through the townships connecting the various town and neighbourhood parks acting as a passive recreation places, interactive jogging trails and Non Motorized Transport corridors across the city. The proponent shall create secondary green space of 510.04 Ha in the 1st phase as committed.	Secondary green spaces are provided in the LPS layouts and will be developed as part of LPS development works. The Avenue plantation are planned along LPS streets and arterial roads. **See pg 8 of LPS -BoQ enclosed in Annexure 17**. **See Annexure 6 for tree plantation proposed along trunk roads.** Further, buffer plantation along the canals will be developed. The total tree length will be 4000 km with varying widths of the roads and

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
		canals. Tree plantation during construction stage will be developed in the labour camps, in the existing villages. It is included in the ESMP/SoP as condition for the prevention of impacts due to construction works.
7	The proponent shall protect and conserve the existing water bodies of 4815 Ha. In addition to creating new water bodies integrated with green spaces as committed.	Existing Water bodies have been protected. 3 more reservoirs at Krishnayapalem, Neerukonda and Sakhamuru are being developed to store up to 0.53TMC of flood water. The areas around the water bodies will be developed with green spaces. Compliance will be submitted.
8	A buffer of 30m on either side of canals and streams; 50m around water bodies and 100m along the Krishna River Front shall be reserved as greenbelt without allowing any development. Plantation along the side of the roads and in the open spaces shall be developed to act as sinks of air pollutants.	It is proposed to develop the greenery all along the natural drains of Kondaveeti vaagu, Pala vaagu and gravity canal. All the streams will be developed with 30 m green buffer on both sides and 20 m green buffer both sides of gravity canal. The tenders of the works are being notified. Suitable species will be selected.
9	The proponent shall encourage urban agriculture to meet the city food requirements and reserve high value agriculture land wherever possible for this purpose as committed.	As per City Zoning Regulations, urban agriculture is not allowed. However, few of the Secondary green spaces/green spaces in the Universities/ Housing complex will be used for encouraging urban agriculture.
10	The proponent shall utilize natural features such as forest and hills to create regional green network as committed.	Actions taken in this regard will be submitted.
11	The proponent shall utilize reserve forest land of 251.814 hectares, after obtaining approval for diversion from competent authorities for development of green belt / eco	The 251 hectares of the forest land will be preserved as green lungs and will not be diverted for non-forestry uses or even for uses like parks or recreational activities to preserve its natural

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	friendly activities only.	characteristics. The reserve forest is designated as P3 protected zone in the capital city master plan. (See sec 404.3 of Amaravati zoning regulations enclosed in Annexure 4) and the definition of P3 is given below. "P3 zoning districts have been established to conserve and protect the environmentally sensitive areas such as steep slopes and rivers which are rich in nature and biodiversity. These areas are non-developable for other strategic purposes. In the case of highly sensitive areas like forests and rivers the zoning for the protected areas shall supersede."
12	The proponent shall utilize treated sewage water for irrigation of primary and secondary green areas by laying pipeline network.	Dedicated reuse lines from the STP to the Avenues are part of the designs under the LPS works. The compliance will be submitted post execution of the works.
13	All archaeological, cultural and ecologically-sensitive areas (i.e. estuaries, mangroves, rocky shores, caves etc.) in and around the Amaravati capital city be adequately protected and conserved. The proponent shall take appropriate measures for protection of Undavalli caves. The proponent has to declare no development activity Zone of 100 to 300 mtrs around Undavalli caves as per ASI regulations.	100 m zone around the ASI site is protected. Further, the condition is incorporated in the Zoning Regulations.
14	A comprehensive PRIMARY BASELINE DATA on the productivity of the Krishna River in the CRDA area (primary, secondary and tertiary productions), before and after Capital region development shall essentially be collected and processed in systematic and scientific way.	The work has been awarded to the firm VVN technologies. **See Annexure 13**. The inception report has been finalized, and the first round of seasonal data (July to September 2025) has been collected and report is submitted to APCRDA for review.
15	Development of the green belts, green corridors, avenue plantations	Greenery will be developed by selecting native species suitable to agro climatic

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	etc., be made only with the native species with multiple uses, and the plantation should not affect the native species diversity and shall help enhance carbon stocks.	zone of Guntur and Krishna district.
16	The proponent shall reserve most of the waterfront along the Krishna River for public use as committed.	The details of the Riverfront spaces reserved for public use will be submitted.
17	The proponent shall create 780 Ha recreational landscapes including Theme Parks, Golf Courts, Sports and Recreational Spaces.	The details will be submitted as and when planned and executed.
18	The proponent shall create green and blue network interconnecting all reservoirs, water bodies and green spines as committed.	Canals with green buffers, greenery around water bodies will be connected to the avenues on the street and the greenery on the hills and hillocks. Compliance will be submitted.
19	The proponent shall create network of water ways as committed to connect various eco tourism attractions on the cluster of islands in the river Krishna. These water ways have to inter connect Islands and mainland within the city.	The details will be submitted as and when planned and executed.
20	A major part of the development of the water bodies and green areas be completed before the end of the construction phase;	Actions are being initiated to develop water bodies and green areas. For details see **Annexure 6**.
21	All construction activities by the proponent should ensure that the activities do not adversely affect the water bodies and their ecology.	Conditions relevant to the protection of the water bodies are included in the bid document. **See pg 104, 117, 149 of the standard bid document enclosed in Annexure 9**
22	No natural water body shall be lined or no embankment shall be cemented except for protection and safety of the people in the surrounding area. The water bodies shall be kept in natural conditions without disturbing the ecological habitat.	The condition will be complied and if required only nature based solutions will be adopted and compliance will be submitted.
23	Improvement or rehabilitation of existing natural streams, channels /	Improvement of existing natural streams are being taken up only from flood

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	nallas shall be carried out without disturbing the ecological habitat.	management perspective and will be carried out without disturbing the ecological habitat.
24	Mitigation measures like providing adequate drainage, embankment consolidation and slope stabilization shall be taken on the built up areas and along the city roads to avoid soil erosion. Top soils (30 cm) of the borrow pit sites shall be conserved and restored after completion of excavation. All the topsoil excavated during construction activities shall be stored for use in horticulture / landscape development within the project site. Proper erosion control and sediment control measures shall be adopted.	The details of embankment consolidation and slope stabilization are given **Annexure 14.** Top soil upto 30 cm depth and its preservation is mandated. **See pg 104 and 115 of the Standard bid document enclosed in Annexure 9**. **See pg 1 of LPS BoQ enclosed in Annexure 17.** Compliance will be submitted.
25	Recognizing the fact that the Capital City project is being proposed on the Green & Blue Concepts, as such to protect the environment, the 24.29% of the land allocation for greening and open spaces, be achieved at the Development zone wise as far as possible.	~ 30% of master plan area is dedicated for green and blue spaces.
26	Deep rooted large foliage plantation along the side of the roads and in the open spaces shall be developed to act as sinks of air pollutants.	It is proposed to develop plantation on road sides and open spaces with the deep rooted, large foliage sapling of trees. Native species will be planted to absorb air pollutants.

RESETTLEMENT AND REHABILITATION

S. NO.	EC CONDITION	COMPLIANCE STATUS
1	The APCRDA & CA shall submit the specific plans for the inclusion of the existing habitations in the capital area development and submit the details of the Project Affected Families and the RR Plans to address the PAFs. As far as possible, Least Dislocation Principle be adopted;	The existing settlements are not disturbed. Negotiated settlement policy is being adopted and successfully implemented. Very few HHs will be affected due to road alignment passing near to the settlement and those affected will be provided land site and fund for house construction within the village periphery. **See chapter 2 of the resettlement policy framework**

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

		document of APCRDA enclosed in Annexure 15.
2	The proponent shall develop a peripheral area development plan and provide plans for the compensation of the loss of rural productivity like loss of grazing areas for the livestock dependent communities; vegetable growing farmers and sellers etc.	The landless labourers are being provided with an initial pension of Rs 2500 per month per family for a period 10 years and now (from 2024 onwards) it is increased to Rs 5000 and extended by another 5 years. Skill training programs are planned and actions taken will be reported. Further, it is envisaged to developed greenery in village peripheral areas with tree species and grasses required for the livestock. The actions taken will be reported.

DISASTER MANAGEMENT

S. NO.	EC CONDITION	COMPLIANCE STATUS
1	The proponent shall prepare and implement proper flood management plan to overcome threats posed by the KondaveetiVagu and its tributaries, Krishna River, heavy rains (more than 1000 mm) and cyclones.	Flood management works are being taken up as per the flood management DPR prepared by the TCE and the Arcadis. One in 100year 24 hr return rainfall is considered and further climate change aspects are also considered in the design of the flood mitigation works. Flood forecasting and monitoring center and infrastructure will be developed as per the city level disaster management and resilience plan. Tender process completed and LoA will be issued to the firms Tarutium Global consulting in JV with Geoclimate risk solutions Pvt.Ltd.
2	The proponent shall prepare earthquake response management plan by considering the location of the city in the class III seismic zone. The proponent shall incorporate structural design requirements of buildings for Seismic Zone – III in the Bye-Laws.	Necessary provisions are incorporated in the Amaravati city bye laws (AZR) Se Annexure 7. Further, it is submitted that Government complex buildings design have considered the seismic zone requirements.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
3	The proponent shall create adequate infrastructure for emergency fire fighting.	
4	The proponent shall prepare emergency Health Management Plan.	

ENVIRONMENT MANAGEMENT DURING CONSTRUCTION PHASE

S. NO.	EC CONDITION	COMPLIANCE STATUS
1	The proponent shall ensure safe and secure accommodation, clean drinking water, hygienic sanitation facilities like mobile toilets, community level gas supply, rest areas for female workers, nutrition development programme for workers at all construction sites for the projected work force of 5000 – 10000 spread in about 40 labour camps as committed in EIA report.	1. Contractors have been mandated to have onsite facilities/amenities as part of their contract. 2. Prior to 2019, the contractors have constructed labour camps for labours with adequate welfare and sanitary facilities and other basic amenities for safe working conditions on site, safe and secure accommodation required for the social development of the workers and such facilities are within the reach of the workers camp. It is assessed by the authority and evaluated by PMC. It is ensured that the same conditions with regard to the provision of basic facilities to the labour at the construction sites are incorporated in the tender documents.
2	The proponent shall ensure following mitigation measures as committed, to minimize pollution problems during construction stage. • All the loose material either stacked or transported shall be provided with suitable covering such as tarpaulins etc. • Water sprinkling shall be done at the location where	All these conditions are incorporated in the tender document. **See Annexure pg 101 to 130 in Standard bid document enclosed in Annexure 9**. The contractors of all the Amaravati Capital City Projects have been mandated to follow the conditions. The contractors will be monitored by project management consultant(PMC) with dedicated personnel for environment,

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	dust generation is anticipated. • Construction equipment be maintained and serviced regularly such that the gaseous emissions from these equipment are maintained within the design specifications. • Provision for insulating caps and aids at the exit of noise source on the machinery. • The use of dampening materials such as thin rubber/ lead sheet for wrapping the work places like compressors, generator, etc. • Inlet and outlet mufflers shall be provided. • Earmuffs shall be provided to workers and enforced to be used by the workers. • Noise prone activities shall be restricted to the extent possible during the night time, in order to have minimum environmental impact on the workers as well as on the neighbourhood.	safety. The contractors and PMCs are monitored by Program Management consultant (PgMC). PMCs and PgMC will ensure the compliance and report to the Environment Social Management Unit in APCRDA. Compliance will be submitted.
3	Groundwater should not be used for any activities during the construction phase also; and a policy for the use of water by different users in the project area be developed for their sustainable use and submitted.	Ground water usage for the construction activities is not allowed in the tender document. **See Annexure pg 104 & 117 in Standard bid document enclosed in Annexure 9**. Surface water from River Krishna will be supplied from the existing water supply lines laid by the APCRDA. Actions taken in this regard will be submitted.

ENVIRONMENT MANAGEMENT MONITORING SYSTEM

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
1	The responsibility of implementation of environmental safeguards rests fully on the project proponent. Project proponent shall establish an Environmental Management Regulatory Authority to carryout functions relating to environmental management under the supervision of a senior executive, directly reporting to the Project Proponent. It should have separate wings for (a) Greenery and Ecological Management; (b) Sewage Management; (c) Solid Waste Management; (d) Fly Ash Utilisation and (e) Pollution Control, staffed by Scientists / Engineers and supported by established laboratories and adequate supporting staff.	As per the requirements of this condition Environment Management Regulatory Authority has been constituted under the chairmanship of Additional commissioner, APCRDA to carry out functions relating to environmental management. Now, ESMU has been constituted vide G.O MS NO 112 of MA & UD (CRDA.2) dtd 29.10.2024. All the functions of the EMRA are under the purview of the ESMU. **See Annexure 16.** ESMU convenes on regular basis.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

GENERAL CONDITIONS

S. NO.	EC CONDITION	COMPLIANCE STATUS
1	Any change(s) in the scope of the project, shall require a fresh appraisal by the SEIAA. As the details of the Inter Linked Projects for the Government Complexes, Housing Complexes, Cultural Centers, Industrial / IT Park, Commercial Complexes, Education Institutions etc. have not been submitted with-respect to built-up area, excavation, water consumption, sewage generation, solid wastes generation, power requirement, pollution control arrangements, environmental safeguards, construction material etc. for construction and operation phases, the respective project proponents shall obtain separate Environmental Clearances for all the projects which falls under the schedule of Environment Impact Assessment Notification, 2006 from State Level Environmental Impact Assessment Authority, as per provisions of Environment Impact Assessment Notification 2006.	As per the EC condition, as per the provisions of EIA notification 2006 the APCRDA has obtained Separate environmental clearance for the following projects 1. Interim Government Complex vide Order no: SEIAA/AP/GNT/CON/01/2016/18 dt: 09.02.2016. 2. Group-D Staff Housing project vide Order no: SEIAA/AP/GNT/CON/09/2017/417 dt:12.10.2017. 3. Legislative Assembly Building Project SEIAA/AP/GNT/CON/09/2017/418 dt: 12.10.2017. 4. MLA/MLC Housing Project SEIAA/AP/GNT/CON/09/2017/419 dt: 12.10.2017. 5. Gazetted Officers Housing Project SEIAA/AP/GNT/CON/09/2017/422 dt: 12.10.2017. 6. Secretariat Staff Housing Project SEIAA/AP/GNT/CON/09/2017/423 dt: 12.10.2017. 7. AIS Officers Housing Project SEIAA/AP/GNT/CON/09/2017/444 dt: 12.10.2017. 8. High Court Building Project SEIAA//AP/GNT/CON/09/2017/420 – 322 dt: 17.05.2018. 9.HOD staff housing Project SEIAA//AP/GNT/CON/09/2017/422 – 321 dt: 17.05.2018. 10. Infrastructure Sector Office Complex SEIAA//AP/GNT/CON/05/2018/591 – 751 dt: 14-08-2018 11. Industry Sector Office complex SEIAA//AP/GNT/CON/05/2018/592 –

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
		752 dt: 14-08-2018 12. Service Sector Office Complex SEIAA//AP/GNT/CON/05/2018/593 – 750 dt: 14-08-2018 13. Hon'ble CM office complex vide SEIAA/AP/GNT/CON/05/2018/590 - 1393 dt: 27.11.2018 14. Amaravati Happy Nest Project SEIAA//AP/GNT/CON/10/2018/700 - 338 dt 31.05.2019 15. Bungalows SEIAA/AP/INFRA2/EC/GU/ 04/2025/1334/261.19 & 261.13 dt 12.5.2025 16.Project office and Judicial complex SEIAA/AP/INFRA2/EC/GU/ 04/2025/1335/261.20 & 261.14 dt 12.5.2025
2	The proponent shall incorporate penal provision in the byelaws/regulations for any violation of environmental issues. The proponent shall also create proper intuitional mechanism to ensure continual environmental awareness among all stakeholders.	Compliance will be submitted.
3	The proponent shall obtain consent from Andhra Pradesh Pollution Control Board.	Obtained CFE from APPCB vide Order no: 373/APPCB/CFE/RO-GNT/HO/2015 dt: 19.10.2015. CFE validity extension is issued with validity till 8.10.2026
4	The proponent shall strictly comply with Municipal solid waste (Management & Handling) Rules, the plastic manufacturer, sales & usage Rules, the Hazardous Waste (Management, Handling & Transboundary movement) Rules, Bio Medical Waste (Management and Handling) Rules, E-waste (Management & handling) Rules, the noise pollution (Regulation and Control) Rules, the Manufacture,	Noted and actions taken will be reported.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	Storage and Import of Hazardous Chemical Rules, Fly ash notification and standards notified by MoEF under Environment (Protection) Act, wherever applicable.	
5	The project proponent shall inform the public that the project has been accorded Environmental Clearance by SEIAA, AP and copies of clearance letters are available with the APPCB and may also be seen at website of SEIAA, AP at www.seiaa.ap.nic.in and at website of Ministry of Environment and Forest at http://envfor.nic.in. This shall be advertised within 7 days from the date of issue of clearance letter, at least in 2 local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned and a copy of the same forwarded to SEIAA AP and Regional Office, MoEF& CC, Chennai.	Published in two local Newspapers one of which is vernacular languages dt: 16.10.2015 and forwarded the same to SEIAA, AP and MoEF & CC, Regional Office, Chennai.
6	The proponent shall obtain all other mandatory clearances from respective departments.	Noted and it will be complied.
7	The project proponent shall submit / upload half yearly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the MoEF& CC, its Regional Office, Chennai, SEIAA, AP, Zonal Office of Central Pollution Control Board, Bangalore and A.P. Pollution Control Board. The Regional Office of MoEF / APPCB / CPCB / SEIAA, AP shall monitor the stipulated conditions. The proponent shall upload the status of compliance of the environmental clearance, conditions including results of monitored data on their websites and shall update the	Submitting and uploading half yearly reports on the status of compliance of the stipulated environmental clearance conditions. From 2016 onwards and till date, 5 compliance reports were submitted and uploaded the same in APCRDA website. During 2019 to 2024 as the works were halted, it was submitted to the MoEF, SEIAA, APPCB, CPCB that the next compliance will be submitted after 6 months from the commencement of the works. Works have commenced during June

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	same periodically.	2025. 1st half yearly compliance report 2025 is submitted.
8	The environmental statement for each financial year ending 31st march in Form-V as mandated is to be submitted by the project proponent to the A.P. Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the Proponent along with the status of compliance of environmental clearance conditions and shall also be sent to the Regional office of the MoEF& CC, Chennai by e-mail.	Reports are submitted.
9	Concealing the factual data or submission of false / fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Noted.
10	The SEIAA may revoke or suspend the order, if implementation of any of the above conditions is not satisfactory. The SEIAA reserves the right to alter/modify the above conditions or stipulate any further condition in the interest of environment protection.	Noted.
11	Any appeal against this Environmental Clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	Noted.
12	The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the	Noted.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

S. NO.	EC CONDITION	COMPLIANCE STATUS
	Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules.	

Amended EC conditions and compliance

AMENDED EC CONDITION		COMPLIANCE STATUS
1	The project proponent shall conduct or cause to be conducted a comprehensive study on hydro geomorphology of the area with a view to effectively plan water retention ponds/reservoirs, storm water drains and their interconnectivity, so as to optimize water conservation, both surface and sub surface.	**The condition is complied.** Tender Process completed and the firm Blue Energy Build Pvt. Ltd, Hyderabad is the Lowest bidder and agreement was entered vide Agreement no. 1 /LSE/ENV/APCRDA/2025-26, dt 15.4.2025 with 3 months time for completion of studies. The study was commenced during April 2025 and final draft has been submitted by the consultant. (**see Annexure 19**) The final report of the Hydrogeomorphology, Aquifer geometry and Palaeoflood analysis study is submitted to the APPCB for circulation to the committees constituted by the Hon'ble NGT for review. **Water conservation measures in compliance to this direction have already been considered by APCRDA as per the EC condition:** In compliance to the directions, the measures that are already considered by the APCRDA area as follows: Hydrological studies were conducted by M/s Tata

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

AMENDED EC CONDITION		COMPLIANCE STATUS
		Consulting Engineers and M/s Arcadis for the flood management in Amaravati. The Flood management studies integrated water retention ponds/ reservoirs with a capacity of 0.53 TMC, improvement of existing natural drains and creation of new canal – called gravity canal with a total length of 48 km etc The water in the Canals and Reservoirs will be retained using locks to serve the recreational needs except during the high flood discharge from the upper catchment, where the excess water is let into River Krishna or into Krishna Western delta Canal. Water retention in the canals and reservoirs of total capacity 0.53 TMC and in a length of 48 km of drains would substantially conserve water and enhance the groundwater recharge. Further, 30 m green buffer on both sides of the natural drains and with 20 m green buffer on both sides of gravity canal designated in the master plan will be developed. These Green buffers will reduce the sediment load in the natural drains, enhance the infiltration and recharge ground water. Treated wastewater reuse lines from the STPs are proposed along all the roads, for reuse applications. The treatment standards considered for BoD is 5mg/l to ensure reuse applications like for flushing, horticulture and other purposes. With the reuse lines, there will be a reduction of raw water intake from the surface water body i.e. River Krishna. **See pg 10-13 which indicates the BoD included in BoQ, Bid Document enclosed in Annexure 5.** Further, it is to mention that the outcomes of studies hydrogeomorphology will be in

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

AMENDED EC CONDITION		COMPLIANCE STATUS
		GIS layers indicating potential water recharge zones, which will be superimposed with the master plan to regulate development and simultaneously plan for suitable recharge structures at plot level and zone level. Provision for Sustainable urban drainage systems(SUDS) are considered is included in the city development works which include the integration of the existing water bodies with the storm water network. ***Details of abstract estimate of one project work (land pooling scheme) works of zone 7 are enclosed in Annexure 1. The abstract indicates the STP including tertiary treatment, reuse lines, SUDS.***
2	Any alteration of the flood plains by construction of storm water drains, retention ponds and related development within the capital city should be done only after conducting a study	**The Condition is complied.** In the NGT directions 17.11.2017, it is mentioned that the city area on the northern side of the bund is in the active flood plains and the southern side of the River Krishna is mentioned as passive flood plains where the city development is proposed. It is already submitted to the Hon'ble NGT in the O.A. no. 171 of 2015, Appeal no. 148/2015 and other appeals, no development works will be done in the active flood plain. No alternations have been proposed in the active flood plains of the River Krishna. In the passive flood plains, i.e. southern side of the river bund in which city development is proposed, as per the Environment Clearance conditions, hydrological studies for the Kondaveeti vagu and its tributaries must be completed to plan location of detention ponds and reservoirs to achieve twin objectives – combat of inundation and utilization of water.

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

AMENDED EC CONDITION		COMPLIANCE STATUS
		In compliance to the Environment Clearance condition, hydrological studies were done by M/s Tata Consulting Engineers and M/s Arcadis and Flood management plan was prepared with detention ponds, improvement and strengthening of the existing Vagus/Canals, construction of additional gravity canal and pumping stations to discharge the flood waters into river to protect the city from the Kondaveeti vagu floods.
3	No alteration of the river or natural storm water morphology, flow pattern and location by way of straightening shall be permitted, as such alteration may result in increase of soil erosion, sediment transport due to raised velocity and decrease in ground water recharge which may reduce base flow during the dry season.	No alternations have been proposed either to the River Krishna or its natural storm water morphology, flow pattern and location. All the flood management works proposed are as per the flood management studies which is mandated as per the EC condition and the details of the flood management works, the flood studies report were explained to both committees of the Hon'ble NGT. Copies of the studies undertaken were also submitted.
4	No alteration to the pre-existing embankments if any should be permitted except as may be required for its strengthening for flood protection of the proposed Capital City. Even such exercise should be undertaken after detailed study of the flood pattern and hydraulics of the river or the storm water drains.	No alterations are proposed to existing River bund. As per the Environment clearance conditions measures shall be taken to strengthen the Krishna River Bund to minimize flood related issues. A detailed study on the flood pattern and hydraulics of the river will be undertaken and submitted prior to embankment strengthening works for flood protection.
5	All bulk generators of municipal solid waste in the proposed constructions, both residential and non-residential, must necessarily segregate waste at the source and process entire biodegradable waste by composting or biomethanation within the premises.	It is submitted that the condition is incorporated in the Zoning Regulations. **See Annexure 7.** The conditions are already included in the building permit orders. A sample order is attached along with the proceeding of the commissioner. (**Refer Annexure 10 – see conditions 21-29 in the sample permit**

COMPLIANCE STATUS ON EC CONDITIONS OF GREENFIELD CAPITAL CITY AMARAVATI

EC order No: SEIAA/AP/GTN-151/2015, Dtd: 09.10.2015 & Amendment order No. SEIAA/AP/GTN/151/09/2015-515 Dtd: 11.06.2018

AMENDED EC CONDITION		COMPLIANCE STATUS
		order) The Consent for Establishment has permitted the APCRDA to utilise the existing facilities in the region until permanent facilities are established in the City. Currently, the entire city waste from the existing settlements (including waste from High court and Secretariat) is being to the Waste to Energy plant in Guntur. **See Annexure 18.** For all the interlinked building projects, onsite space for waste management is allocated and organic waste processing systems are proposed. Compliance will be submitted post execution of the projects. **See pg 163- 164 of BoQ of an interlinked building project in Amaravati government complex area enclosed in Annexure 2.**

Commissioner
APCRDA, Vijayawada, AP

Annexures 1-19 are enclosed.

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KUNNAPAREDDY KANNABABU
Date: 08-01-2026 14:28:27

GENERAL ABSTRACT

NAME OF THE WORK : APCRDA - "Construction of Roads, Drains, Water Supply, Sewerage, Utility Ducts for Power & ICT, Reuse waterline, Avenue Plantation, compatible with trunk infrastructure in Layouts for Land Pooling Schemes for kondamarajupalem(P), Lingayapalem(P), Uddandarayunipalem(P), Velagapudi(P) and Mandadam(P) Villages in Zone-7 Area in Amaravati Capital City, Andhra Pradesh on Lump sum Contract (% Percentage Tender) including DLP of 2 Years"

SL.No	Description of Items	Amount in Crores
Part A - Basic Infrastructure Cost (Capex)		
1	Roads	416.36
2	Storm Water Drains	144.85
3	Water Supply	30.10
4	Waste Water	55.31
5	Power & ICT	100.02
6	Reuse Water	10.75
7	Retrofitting Works	10.04
8	Cost towards Investigation,Designs and Drawings at 0.532%	4.08
9	Cost towards Implementation of Environment and Social Management Plan (ESMP) at 1%	7.68
	Sub Total part - A	**779.19**
Part B - Provisions		
1	Seignorage Charges of all works	10.84
2	Extra @ 100% on Seignorage Charges towards consideration amount	10.84
3	Extra @ 2% on Seignorage Charges towards MERIT	0.22
4	Extra @ 30% on Seignorage Charges towards DMF	3.25
5	NAC @ 0.1% on Part A & B (1+2+3+4)	0.80
6	GST @18% on Part A & B (1+2+3+4+5)	144.93
7	Provision for STP including Raw Sewage Pumping Station & Tertiary Treatment including O&M for 7 Years.	170.94
8	Administrative Charges @2% on (A)	15.58
9	Provision for Street furniture and implementation of street design guidelines, provisions for Sustainable Urban drainage systems and other sustainable features, Price Adjustment, Contingences, AMR for property connections and unforeseen items etc...	98.93
	Sub Total part - B	**456.33**
	GRAND TOTAL Part (A + B)	**1235.52**

AEE 14/2/25 DFE C./- 14/2/25 EE 14/2/25 SE

Administrative Sanction accorded for Rs. 1235.52 crores vide G.O.Ms No. 6 MA & UD(CRDA) dept., Dt:- 17.01.2025. Technical Sanction accorded for Rs. 1235.52 crores vide CER No. 19/CE(Infra-I)/2024-25 Dt: 14/02/25.

14/2/2025

Chief Engineer
APCRDA, VIJAYAWADA.

To

Name of the work:WORLD BANK & ADB financed Amaravati Capital City Development Program related to "Completion of balance works viz., Architectural Finishes, Internal & External Electrical, Plumbing & Sanitary Fixtures, Fire Fighting Provisions, Lifts, DG, HVAC, Security Systems, External Development & Land Scaping etc., for Multi-Storeyed Quarters of 432 Apartment units in 18 towers of (S+12) Floors Pattern Buildings for Hon'ble MLAs & Hon'ble MLCs and All India Services Officers near Nelapadu, Amaravati, Andhra Pradesh" on Lumpsum Contract (% Percentage Tender) System with the DLP of 2 Years

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1	3,049.96	Earth work excavation for building foundations and depositing on bank for all lifts and with conveyance the excavated earth up to 1 Km including all operational, incidental, labour charges such as shoring ,sheeting, planking, strutting, etc. complete for finished item of work excluding seigniorage etc complete as per SS 20B in Ordinary Soils-Mechanial Means for following, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities. - Upto 3M depth	176.94	5,39,660.00
2	15,237.57	Filling with Gravel including cost and conveyance of all materials and all labour charges and spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at once and compacting with 80-100 kN Vibratory roller to achieve the desired density complete as per Technical Specification of MORTH.	629.32	95,89,308.00
3	9,318.43	Providing and Laying Sand filling as bedding layer to receive PCC (measured separately) and wherever necessary to required layers including watering and consolidating each layer by mechanical ramming. Consolidated quantity shall be measured and valued, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	375.48	34,98,884.00
4	19,999.71	Pre construction Anti termite is a process in which chemical toxic to subterrean tremites is apply/ inject into soil during early stage of building Construction 2. Treatement of soil Beneath the building and around the foundations conduct and chemical use as per BIS - IS 6313 (Part -2) 2013 code specification & CIB RC registered termiticide which creates a continuous chemical barrier beneath the building which kills or repels terminates & impervious to tremite entry 3. Imidacloprid 30.5% SC (IS 63131) dissolve 2.1 Ml/1 liter of water and apply emulsion/solution @ 7.5 Litres/Square meter (Sqm) of internal, external vertical surface of the colums , plinth beams (Back filling) walls and floor junction, external perimeters, along reatining wall @ 5.0 Liters/Sqm of the horizontal surface of basement top surface of the basement filling below flooring bed (Plinth) & @ 2.0 Litres/ Line meter at expansion joints. The substructure of a depth of 500mm around coulmns & 300mm deep around plinth beams, basements & floor filling area including excavation channel along the wall & rodding etc. cost & Conveyance of all materials to the site, cost of labour for sparying, rodding etc. complete for furnished item of work as per the approval of the Engineer-in-charge	203.37	40,67,341.00
5	400.00	Bailing out water from the pipe line trenches with oil engine driven pump sets, including hire charges, fuel charges and wages for Driver and Helper upto 5HP capacity pumps.	420.64	1,68,256.00
6	3,091.48	Plain Cement Concrete (1:3:6) with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	5,728.24	1,77,08,739.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
7	344.89	Concrete for Raft - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge. (Actual payment will be made based on the Design mix Concrete)	8,061.66	27,80,386.00
8	259.22	Wall (160mm thick) - Ground Floor - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge. (Actual payment will be made based on the Design mix Concrete)	16,936.83	43,90,365.00
9	44.32	Wall (200mm thick) - Ground Floor - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge. (Actual payment will be made based on the Design mix Concrete)	15,287.21	6,77,529.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
10	1.00	Plinth Beam - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge. (Actual payment will be made based on the Design mix Concrete)	10,826.77	10,827.00
11	136.84	Stilt,Sump& Parapet wall on podium - 200mm thk - Ground Floor - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge. (Actual payment will be made based on the Design mix Concrete)	15,287.21	20,91,902.00
12	135.00	UG Sump Slabs - 225mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge. (Actual payment will be made based on the Design mix Concrete)	8,374.33	11,30,535.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
13	694.89	Podium Pile Cap - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge. (Actual payment will be made based on the Design mix Concrete)	8,061.66	56,01,967.00
14	256.28	Podium Grade Beams - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	10,826.77	27,74,685.00
15	41.00	Staircase - Stilt - 175mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge. (Actual payment will be made based on the Design mix Concrete)	9,224.55	3,78,207.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
16	181.66	Columns - Upto Ground Floor level - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	12,820.02	23,28,885.00
17	147.50	Columns - 1st Floor - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	12,996.18	19,16,937.00
18	92.00	Columns - 2nd Floor - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	13,544.08	12,46,055.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
19	92.00	Columns - 3rd Floor - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge. (Actual payment will be made based on the Design mix Concrete)	14,090.44	12,96,320.00
20	2.00	Columns - Terrace - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	14,638.34	29,276.00
21	769.50	Beam - Upto Ground Floor level - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	10,988.01	84,55,274.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
22	193.00	Beam - 1st Floor - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	11,037.77	21,30,290.00
23	163.00	Beam - 2nd Floor - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	11,399.37	18,58,097.00
24	156.00	Beam - 3rd Floor - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	11,759.44	18,34,473.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
25	110.00	Beam - Terrace - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	12,121.04	13,33,314.00
26	1.00	Slabs - Upto Ground Floor level - 125mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	10,605.29	10,605.00
27	1.00	Slabs - 1st Floor - 125mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	10,655.05	10,655.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
28	1.00	Slabs - 2nd Floor - 125mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	10,999.76	11,000.00
29	1.00	Slabs - 3rd Floor - 125mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	11,344.46	11,344.00
30	1.00	Slabs - Terrace - 125mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	11,689.16	11,689.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
31	1,012.58	Slabs - Upto Ground Floor level - 150mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	9,737.50	98,59,998.00
32	201.50	Slabs - 1st Floor - 150mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	9,787.27	19,72,135.00
33	181.10	Slabs - 2nd Floor - 150mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	10,082.81	18,25,997.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
34	142.00	Slabs - 3rd Floor - 150mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	10,378.36	14,73,727.00
35	130.70	Slabs - Terrace - 150mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	10,673.91	13,95,080.00
36	1.00	Slabs - Upto Ground Floor level - 175mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	9,224.55	9,225.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
37	1.00	Slabs - 1st Floor - 175mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	9,274.31	9,274.00
38	1.00	Slabs - 2nd Floor - 175mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	9,543.52	9,544.00
39	1.00	Slabs - 3rd Floor - 175mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	9,812.73	9,813.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
40	1.00	Slabs - Terrace - 175mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	10,073.17	10,073.00
41	1.00	Slabs - Upto Ground Floor level - 200mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,746.30	8,746.00
42	1.00	Slabs - 1st Floor - 200mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,796.06	8,796.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
43	1.00	Slabs - 2nd Floor - 200mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	9,037.84	9,038.00
44	1.00	Slabs - 3rd Floor - 200mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	9,279.62	9,280.00
45	1.00	Slabs - Terrace - 200mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	9,513.72	9,514.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
46	1.00	Slabs - Upto Ground Floor level - 225mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,374.33	8,374.00
47	1.00	Slabs - 1st Floor - 225mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,424.09	8,424.00
48	1.00	Slabs - 2nd Floor - 225mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,644.54	8,645.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
49	1.00	Slabs - 3rd Floor - 225mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,864.98	8,865.00
50	1.00	Slabs - Terrace - 225mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	9,078.60	9,079.00
51	1.00	Slabs - Upto Ground Floor level - 250mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,076.75	8,077.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
52	1.00	Slabs - 1st Floor - 250mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,126.51	8,127.00
53	1.00	Slabs - 2nd Floor - 250mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,329.89	8,330.00
54	1.00	Slabs - 3rd Floor - 250mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,533.27	8,533.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
55	1.00	Slabs - Terrace - 250mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,730.50	8,731.00
56	1.00	Slabs - Upto Ground Floor level - 275mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	7,833.28	7,833.00
57	1.00	Slabs - 1st Floor - 275mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	7,883.04	7,883.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
58	1.00	Slabs - 2nd Floor - 275mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,072.45	8,072.00
59	1.00	Slabs - 3rd Floor - 275mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,261.87	8,262.00
60	1.00	Slabs - Terrace - 275mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,445.69	8,446.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
61	1.00	Slabs - Upto Ground Floor level - 300mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	7,630.39	7,630.00
62	1.00	Slabs - 1st Floor - 300mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	7,680.15	7,680.00
63	1.00	Slabs - 2nd Floor - 300mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	7,857.92	7,858.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
64	1.00	Slabs - 3rd Floor - 300mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,035.70	8,036.00
65	1.00	Slabs - Terrace - 300mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	8,208.35	8,208.00
66	366.76	UG Sump Walls - 275mm thk - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	13,487.62	49,46,720.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
67	164.34	Ug Sump Beams - Supply and placing of Design Mix Concrete M 30 grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using Batching Plant of capacity 15 cum per hour and transporting concrete to site by Transit mixer of 2cum capacity and pumping concrete using pump and using 20mm size graded machine crushed hard Granite metal (coarse aggregate) (consisting of nominal size metal 60% of 20mm , 15% of 13.20/12.50mm , 15% of 10mm and 10% of 6mm) from approved quarry including adding superplasticiser for high range water reducing admixture conforming to IS 9103-1999 including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water, superplasticiser etc., to site and excluding Seigniorage charges but including all materials, centering using Steel scaffolding pipes, jack Props, wallers, Foot plates, brackets, steel Centering Plates, etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402) for following items of work, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge.(Actual payment will be made based on the Design mix Concrete)	10,988.01	18,05,770.00
68	4,22,201.63	Upto Ground Floor level - Supplying, fitting and placing thermo Mechanically Treated (TMT) HYSD (Fe 500/500D/550/ tmt grade as per IS 1786-1985) bars reinforcement from primary producers like TATA, SAIL, VIZAG, JINDAL of different diameters for RCC works , as per drawings and technical specifications for Bars 36 mm dia & Below including over laps and wastage, where they are not welded including labour charges for straightening, cutting, bending to required sizes and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars to site, including all wastages such as overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in position, tying including overheads & contractors profit complete for finished item of work (APSS No.126), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	92.27	3,89,56,544.00
69	48,780.00	1st Floor - Supplying, fitting and placing thermo Mechanically Treated (TMT) HYSD (Fe 500/500D/550/ tmt grade as per IS 1786-1985) bars reinforcement from primary producers like TATA, SAIL, VIZAG, JINDAL of different diameters for RCC works , as per drawings and technical specifications for Bars 36 mm dia & Below including over laps and wastage, where they are not welded including labour charges for straightening, cutting, bending to required sizes and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars to site, including all wastages such as overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in position, tying including overheads & contractors profit complete for finished item of work (APSS No.126), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	94.29	45,99,466.00
70	39,249.00	2nd Floor - Supplying, fitting and placing thermo Mechanically Treated (TMT) HYSD (Fe 500/500D/550/ tmt grade as per IS 1786-1985) bars reinforcement from primary producers like TATA, SAIL, VIZAG, JINDAL of different diameters for RCC works , as per drawings and technical specifications for Bars 36 mm dia & Below including over laps and wastage, where they are not welded including labour charges for straightening, cutting, bending to required sizes and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars to site, including all wastages such as overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in position, tying including overheads & contractors profit complete for finished item of work (APSS No.126), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	96.32	37,80,464.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
71	35,100.00	3rd Floor - Supplying, fitting and placing thermo Mechanically Treated (TMT) HYSD (Fe 500/500D/550/ tmt grade as per IS 1786-1985) bars reinforcement from primary producers like TATA, SAIL, VIZAG, JINDAL of different diameters for RCC works , as per drawings and technical specifications for Bars 36 mm dia & Below including over laps and wastage, where they are not welded including labour charges for straightening, cutting, bending to required sizes and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars to site, including all wastages such as overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in position, tying including overheads & contractors profit complete for finished item of work (APSS No.126), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	98.34	34,51,734.00
72	21,843.00	Terrace - Supplying, fitting and placing thermo Mechanically Treated (TMT) HYSD (Fe 500/500D/550/ tmt grade as per IS 1786-1985) bars reinforcement from primary producers like TATA, SAIL, VIZAG, JINDAL of different diameters for RCC works , as per drawings and technical specifications for Bars 36 mm dia & Below including over laps and wastage, where they are not welded including labour charges for straightening, cutting, bending to required sizes and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars to site, including all wastages such as overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in position, tying including overheads & contractors profit complete for finished item of work (APSS No.126), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	100.37	21,92,382.00
73	27,101.00	Waterproofing to Base Slab - Providing and laying water proofing treatment in Base slab built-up with a primer coat of neat cement mixed with an integral water proofing compound, and two coats of polyurethane / acrylic based component water proofing system laid over plaster of 12mm thick in CM 1:4, finished with a protective layer of plaster of 15mm thick in CM 1:4, sealing all the joints of pipes, corners, edges with epoxy putty all as required, as per specifications, drawings and as directed for all floors and at all levels complete. (For Horizontal areas). Makes Fosroc / Sika / Cera / MC Bauchemie or equivalent, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	1,290.00	3,49,60,290.00
74	1,341.00	Expansion Joint - Providing and fixing of expansion joint system related with wall joint (internal/ external) location: The joints shall be of extruded aluminum base members, self aligning / centering arrangement and support plates as per ASTM B221- 02. The material shall be such that it provides an Expansion Joints system suitable for vertical wall to wall / wall to corner application, both new and existing construction in buildings & complexes with no slipping down tendency amongst the components of the Joint System. The Joint System shall utilize light weight aluminium profiles exhibiting minimal exposed aluminium surfaces mechanically snap locking the multi cellular to facilitate movement. (Material shall confirm to ASTM 6063.) (Wall Joint of 200 mm gap)	5,861.39	78,60,124.00
75	489.64	Ground Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	7,464.07	36,54,707.00
76	97.43	1st Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	7,856.25	7,65,434.00
77	97.43	2nd Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	8,248.43	8,03,645.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
78	97.43	3rd Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	8,640.61	8,41,855.00
79	97.43	4th Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	9,032.79	8,80,065.00
80	97.43	5th Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	9,424.97	9,18,275.00
81	97.43	6th Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	9,817.15	9,56,485.00
82	97.43	7th Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	10,209.33	9,94,695.00
83	97.43	8th Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	10,601.51	10,32,905.00
84	97.43	9th Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	10,993.69	10,71,115.00
85	97.43	10th Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	11,385.87	11,09,325.00
86	97.43	11th Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	11,778.04	11,47,534.00
87	97.43	12th Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	12,170.22	11,85,745.00
88	10.00	Terrance Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - Ledge wall	12,562.40	1,25,624.00
89	291.80	Ground Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - External wall	7,464.07	21,78,016.00
90	362.70	1st Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - External wall	7,856.25	28,49,462.00

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91	148.00	2nd Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - External wall	8,248.43	12,20,768.00
92	148.00	3rd Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - External wall	8,640.61	12,78,810.00
93	5.00	4th Floor - Masorny work in CM (1:5) prop with Supply of Aerated (Cellular) Autoclaved Concrete Blocks conforming to IS:2185 (Part-3) - 1984 and IS:6441-1972 of Compressive strength 3 N/mm2 600 x 200 x 200 mm including cost and conveyance of all materials, labour charges , scafolding and curing etc., complete for walls - External wall	9,032.79	45,164.00
94	5,408.00	Ground Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	188.66	10,20,273.00
95	299.33	1st Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	203.98	61,057.00
96	299.33	2nd Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	219.30	65,643.00
97	299.33	3rd Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	234.62	70,229.00
98	299.33	4th Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	249.94	74,815.00
99	299.33	5th Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	265.25	79,397.00
100	299.33	6th Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	280.57	83,983.00

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101	299.33	7th Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	295.89	88,569.00
102	299.33	8th Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	311.21	93,154.00
103	299.33	9th Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	326.53	97,740.00
104	299.33	10th Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	341.85	1,02,326.00
105	299.33	11th Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	357.17	1,06,912.00
106	299.33	12th Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	372.48	1,11,494.00
107	10.00	Terrance Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For Ledge walls	387.80	3,878.00
108	2,217.00	Ground Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For External walls	202.90	4,49,829.00
109	2,926.00	1st Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For External walls	223.83	6,54,927.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
110	779.00	2nd Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For External walls	244.75	1,90,660.00
111	779.00	3rd Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For External walls	265.69	2,06,973.00
112	10.00	4th Floor - 12 mm thick Internal Plastering in CM(1:4) : Plastering 12mm thick single coat in CM(1:4) using screened sand including cost and conveyance of all materials like cement, sand, water etc., to site, including all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, curing as directed by Engineer-in-charge etc., and overheads & contractors profit complete for finished item of work and as directed by the Engineer-in-Charge - For External walls	286.62	2,866.00
113	867.76	Ground Floor - External Plastering with CM 2 coats, 20 mm thick, base coat in CM (1:6), 16mm thick and top coat in CM (1:4), 4mm thick with Dubara sponze finishing.	622.08	5,39,816.00
114	199.50	1st Floor - External Plastering with CM 2 coats, 20 mm thick, base coat in CM (1:6), 16mm thick and top coat in CM (1:4), 4mm thick with Dubara sponze finishing.	684.65	1,36,588.00
115	119.50	2nd Floor - External Plastering with CM 2 coats, 20 mm thick, base coat in CM (1:6), 16mm thick and top coat in CM (1:4), 4mm thick with Dubara sponze finishing.	747.23	89,294.00
116	119.50	3rd Floor - External Plastering with CM 2 coats, 20 mm thick, base coat in CM (1:6), 16mm thick and top coat in CM (1:4), 4mm thick with Dubara sponze finishing.	809.82	96,773.00
117	10.00	Terrace - External Plastering with CM 2 coats, 20 mm thick, base coat in CM (1:6), 16mm thick and top coat in CM (1:4), 4mm thick with Dubara sponze finishing.	872.40	8,724.00
118	38,244.82	100mm thick for Grade slab level - Providing and laying screed flooring for the following thickness with cement concrete 1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate) using 10 to 12mm graded granite stone aggregate laid to level, curing etc; complete at all levels, as per specification and as directed, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	572.82	2,19,07,398.00
119	28,190.00	Ground Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	229.12	64,58,893.00
120	587.54	1st Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	233.26	1,37,051.00

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121	587.54	2nd Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	237.40	1,39,483.00
122	587.54	3rd Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	241.54	1,41,915.00
123	587.54	4th Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	245.68	1,44,348.00
124	587.54	5th Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	249.82	1,46,780.00
125	587.54	6th Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	253.96	1,49,213.00
126	587.54	7th Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	258.10	1,51,645.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
127	587.54	8th Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	262.23	1,54,072.00
128	587.54	9th Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	266.37	1,56,504.00
129	587.54	10th Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	270.51	1,58,937.00
130	587.54	11th Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	274.65	1,61,369.00
131	587.54	12th Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	278.79	1,63,801.00
132	10.00	Terrance Floor - 40 mm thick below tiles flooring - with 1:3:6 with minimum cement content of 220 kgs per 1 cum of concrete using coarse aggregate 20mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete and overheads & contractors profit complete for finished item of work for levelling course under raft and pile cap . (APSS No. 402), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorties	282.93	2,829.00
133	38,244.81	Providing vacuum de-watered flooring operation consisting of providing side shuttering with MS channels, angles to the required levels, Vibrating the concrete by using screed vibrator, de-watering using vacuum pumps by suction method and finishing the top surface to required level and grade using skim floaters/discs/power trowels. Covering the finished concrete surface with 200 micron thick polythene sheet and curing etc., complete. For Grade Slab level.	150.00	57,36,722.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
134	733.50	Ground Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,580.90	11,59,590.00
135	1,686.09	1st Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,643.55	27,71,173.00
136	1,207.09	2nd Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,706.21	20,59,549.00
137	1,207.09	3rd Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,768.86	21,35,173.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
138	957.59	4th Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,831.52	17,53,845.00
139	952.59	5th Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,894.17	18,04,367.00
140	952.59	6th Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,956.83	18,64,057.00
141	952.59	7th Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	2,019.48	19,23,736.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
142	952.59	8th Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	2,082.14	19,83,426.00
143	952.59	9th Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	2,144.79	20,43,106.00
144	952.59	10th Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	2,207.45	21,02,795.00
145	952.59	11th Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	2,270.10	21,62,475.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
146	952.59	12th Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	2,332.76	22,22,164.00
147	5.00	Terrance Floor - Flooring and Skirting with Double charged / multi charged stain free full body porcelain vitrified tiles with double layer pigment of size 800 x 800 mm and thickness between 9-11mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick over CC bed/slab already laid, including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of tiles to full depth, including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	2,395.41	11,977.00
148	66.50	Ground Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,286.10	85,526.00
149	1,094.90	1st Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,348.76	14,76,757.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
150	1,075.40	2nd Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,411.41	15,17,830.00
151	1,075.40	3rd Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,474.07	15,85,215.00
152	1,052.90	4th Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,536.72	16,18,012.00
153	1,047.90	5th Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,599.38	16,75,990.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
154	1,047.90	6th Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,662.03	17,41,641.00
155	1,047.90	7th Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,724.69	18,07,303.00
156	1,047.90	8th Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,787.34	18,72,954.00
157	1,047.90	9th Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,850.00	19,38,615.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
158	1,047.90	10th Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,912.65	20,04,266.00
159	1,047.90	11th Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,975.31	20,69,927.00
160	1,047.90	12th Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	2,037.96	21,35,578.00
161	1.00	Terrance Floor - Flooring with Non-skid or white full body ceramic floor tiles of size 600 X 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of CM (1:8) prop. 12mm thick with grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the shade of tiles over a bed of C.C., including cost and conveyance of all materials like cement, sand, water, ceramic tiles, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer-in-charge curing, including overheads and contracor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	2,100.62	2,101.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
162	404.40	Ground Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	3,385.40	13,69,056.00
163	147.82	1st Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	3,501.07	5,17,528.00
164	95.82	2nd Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	3,616.74	3,46,556.00
165	95.82	3rd Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	3,732.42	3,57,640.00
166	33.32	4th Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	3,848.09	1,28,218.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
167	28.32	5th Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	3,963.76	1,12,254.00
168	28.32	6th Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	4,079.43	1,15,529.00
169	28.32	7th Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	4,195.10	1,18,805.00
170	28.32	8th Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	4,310.78	1,22,081.00
171	28.32	9th Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	4,426.45	1,25,357.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
172	28.32	10th Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	4,542.12	1,28,633.00
173	28.32	11th Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	4,657.79	1,31,909.00
174	28.32	12th Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	4,773.46	1,35,184.00
175	1.00	Terrance Floor - Supplying and fixing Treads with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) Premium colours (other than black), . set over a base coat of CM (1:8) prop. 20mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - For Treads	4,889.14	4,889.00
176	14.16	Ground Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,018.61	42,744.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
177	14.16	1st Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,097.00	43,854.00
178	14.16	2nd Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,175.39	44,964.00
179	14.16	3rd Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,253.78	46,074.00
180	14.16	4th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,332.17	47,184.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
181	14.16	5th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,410.56	48,294.00
182	14.16	6th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,488.95	49,404.00
183	14.16	7th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,567.34	50,514.00
184	14.16	8th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,645.73	51,624.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
185	14.16	9th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,724.12	52,734.00
186	14.16	10th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,802.51	53,844.00
187	14.16	11th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,880.90	54,954.00
188	14.16	12th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,959.29	56,064.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
189	1.00	Terrance Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick up to 8'-00 (2.43 M) (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	4,037.68	4,038.00
190	80.91	Ground Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	3,385.40	2,73,913.00
191	80.91	1st Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	3,501.07	2,83,272.00
192	80.91	2nd Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	3,616.74	2,92,630.00
193	80.91	3rd Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	3,732.42	3,01,990.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
194	80.91	4th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	3,848.09	3,11,349.00
195	80.91	5th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	3,963.76	3,20,708.00
196	80.91	6th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	4,079.43	3,30,067.00
197	80.91	7th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	4,195.10	3,39,426.00
198	80.91	8th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	4,310.78	3,48,785.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
199	80.91	9th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	4,426.45	3,58,144.00
200	80.91	10th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	4,542.12	3,67,503.00
201	80.91	11th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	4,657.79	3,76,862.00
202	80.91	12th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	4,773.46	3,86,221.00
203	1.00	Terrance Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Landing	4,889.14	4,889.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
204	210.16	Ground Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,018.61	6,34,391.00
205	210.16	1st Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,097.00	6,50,866.00
206	210.16	2nd Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,175.39	6,67,340.00
207	210.16	3rd Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,253.78	6,83,815.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
208	210.16	4th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,332.17	7,00,289.00
209	210.16	5th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,410.56	7,16,764.00
210	210.16	6th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,488.95	7,33,238.00
211	210.16	7th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,567.34	7,49,713.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
212	210.16	8th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,645.73	7,66,187.00
213	210.16	9th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,724.12	7,82,661.00
214	210.16	10th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,802.51	7,99,136.00
215	210.16	11th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,880.90	8,15,610.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
216	210.16	12th Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	3,959.29	8,32,085.00
217	1.00	Terrance Floor - Supplying and fixing High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Wall Clading for Passenger, Service Lift Lobby & skirting	4,037.68	4,038.00
218	66.00	Ground Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads	1,129.33	74,536.00
219	66.00	1st Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads	1,181.81	77,999.00
220	66.00	2nd Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads	1,234.30	81,464.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
221	66.00	3rd Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads	1,286.79	84,928.00
222	66.00	4th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads & Risers	1,339.27	88,392.00
223	66.00	5th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads & Risers	1,391.76	91,856.00
224	66.00	6th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads & Risers	1,444.24	95,320.00
225	66.00	7th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads & Risers	1,496.73	98,784.00
226	66.00	8th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads & Risers	1,549.21	1,02,248.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
227	66.00	9th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads & Risers	1,601.70	1,05,712.00
228	66.00	10th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads & Risers	1,654.18	1,09,176.00
229	66.00	11th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads & Risers	1,706.67	1,12,640.00
230	66.00	12th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads & Risers	1,759.16	1,16,105.00
231	1.00	Terrance Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 40mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Treads & Risers	1,811.64	1,812.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
232	33.00	Ground Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,018.61	99,614.00
233	33.00	1st Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,097.00	1,02,201.00
234	33.00	2nd Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,175.39	1,04,788.00
235	33.00	3rd Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,253.78	1,07,375.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
236	33.00	4th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,332.17	1,09,962.00
237	33.00	5th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,410.56	1,12,548.00
238	33.00	6th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,488.95	1,15,135.00
239	33.00	7th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,567.34	1,17,722.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
240	33.00	8th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,645.73	1,20,309.00
241	33.00	9th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,724.12	1,22,896.00
242	33.00	10th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,802.51	1,25,483.00
243	33.00	11th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,880.90	1,28,070.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
244	33.00	12th Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	3,959.29	1,30,657.00
245	1.00	Terrance Floor - Supplying and fixing Risers of Staircase with High Polished Granite 18 to 20 mm thick (other than black) Premium colours set over a base coat of CM (1:3) prop. 12mm thick and grey cement slurry of honey like consistency sread at the rate of 3.3 Kgs per Sqm and filling the joints with white cement mixed with pigment of matching shade to match the granite stone colour over a bed of C.C. or R.C.C. slab, including cost and conveyance of all materials like cement, sand, water, granite slabs, white cement etc., to site (excluding cost of C.C. bed), excluding cost of seigniorage on all materials cost of base coat, including all labour charges for mixing of cement mortar, laying as directed by the Engineer-in-charge curing, overheads & contractor's profit etc., complete for finished item of work. (APSS No.707 & 701), the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the department Engineers, project in-charge - For Risers	4,037.68	4,038.00
246	107.92	Ground Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,129.33	1,21,877.00
247	107.92	1st Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,181.81	1,27,541.00
248	107.92	2nd Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,234.30	1,33,206.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
249	107.92	3rd Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,286.79	1,38,870.00
250	107.92	4th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,339.27	1,44,534.00
251	107.92	5th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,391.76	1,50,199.00
252	107.92	6th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,444.24	1,55,862.00
253	107.92	7th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,496.73	1,61,527.00
254	107.92	8th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,549.21	1,67,191.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
255	107.92	9th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,601.70	1,72,855.00
256	107.92	10th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,654.18	1,78,519.00
257	107.92	11th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,706.67	1,84,184.00
258	107.92	12th Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,759.16	1,89,849.00
259	1.00	Terrance Floor - Flooring with Tandur / Shabad stone - 40mm thick Rough Flooring Staircaseset over a base coat of CM (1:8) prop. 20mm thick over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste mixed with pigment of matching shade to match the shade of granite slabs to full depth including cost and conveyance of all materials like cement, sand, water, ganite slabs, white cement etc., to site (excluding cost of C.C. bed) excluding cost of seigniorage charges on all materials, but including cost of base coat and all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., including overheads & contractors profit complete for finished item of work. (APSS No.701 & 707) - For Landing	1,811.64	1,812.00
260	2.50	Ground Floor - Granite Pantry: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	3,302.25	8,256.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
261	2.50	1st Floor - Granite Pantry: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	3,826.51	9,566.00
262	2.50	2nd Floor - Granite Pantry: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	3,942.18	9,855.00
263	2.50	3rd Floor - Granite Pantry: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,057.85	10,145.00
264	5.00	Terrace - Granite Pantry: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,173.53	20,868.00
265	19.12	Ground Floor - Granite Toilet Counter: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	3,302.25	63,139.00
266	10.81	1st Floor - Granite Toilet Counter: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	3,826.51	41,365.00
267	2.50	2nd Floor - Granite Toilet Counter: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	3,942.18	9,855.00
268	2.50	3rd Floor - Granite Toilet Counter: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,057.85	10,145.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
269	5.00	Terrace - Granite Toilet Counter: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,173.53	20,868.00
270	2.50	Ground Floor - Granite Change Room: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	3,302.25	8,256.00
271	2.50	1st Floor - Granite Change Room: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	3,826.51	9,566.00
272	2.50	2nd Floor - Granite Change Room: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	3,942.18	9,855.00
273	2.50	3rd Floor - Granite Change Room: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,057.85	10,145.00
274	5.00	Terrace - Granite Change Room: Counter Top withHigh Polished Granite 18 to 20 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,173.53	20,868.00
275	429.44	Ground Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	717.38	3,08,072.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
276	2,789.30	1st Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	733.09	20,44,808.00
277	2,714.33	2nd Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	748.80	20,32,490.00
278	2,714.33	3rd Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	764.51	20,75,132.00
279	2,439.83	4th Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	780.22	19,03,604.00
280	2,434.83	5th Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	795.93	19,37,954.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
281	2,434.83	6th Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	811.65	19,76,230.00
282	2,434.83	7th Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	827.36	20,14,481.00
283	2,434.83	8th Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	843.07	20,52,732.00
284	2,434.83	9th Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	858.78	20,90,983.00
285	2,434.83	10th Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	874.49	21,29,234.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
286	2,434.83	11th Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	890.20	21,67,486.00
287	2,434.83	12th Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	905.91	22,05,737.00
288	1.00	Terrance Floor - Dadooing to walls with glazed or white full body ceramic wall tiles of size 300 X 450 mm and thickness 6mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs set over a base coat of C.M (1:5) proportion, 12mm thick and neat grey cement slurry of honey like consistency, spread at the rate of 3.3kgs per sqm and jointed with white cement or coloured cement to match the shade of the tiles, including cost and conveyance of all materials like cement, sand, water, tiles, coloured cement etc., to site, excluding cost of seigniorage charges on all materials, but including all labour charges for mixing of cement mortar, laying glazed tiles to level, curing, overheads and contractor's profit etc., complete for finished item of work, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.	921.62	922.00
289	3,67,348.55	Providing and applying synthetic plaster putty or plaster of paris putty or lime punning of average 1 to 2 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying knifing paste filler by putty knife / muslin pad, air dry for 2 - 3 hrs, sand with 180 and 320 No., emery paper for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete in all floors as directed by Engineer-in-charge, Putty 2 coats	258.79	9,50,66,131.00
290	6,15,002.00	Internal Painting: Painting to new walls with 2 coats of Premium Acrylic emulsion paint of approved brand and shade after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, over one coat of white cement based primer including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work as per SS 911 for Internal walls	238.54	14,67,02,577.00
291	1,69,584.59	Painting to External new walls with Cement Primer of Exterior Grade- 2of one caot and 2 coats of Acrylic emulsion paint of approved brand and shade after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work as per SS 911 for external walls	326.45	5,53,60,889.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
292	15,450.36	Ground Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	491.48	75,93,543.00
293	13,450.31	Ist Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	527.30	70,92,348.00
294	13,450.31	2nd Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	568.74	76,49,729.00
295	13,450.31	3rd Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	610.17	82,06,976.00
296	12,642.56	4th Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	651.62	82,38,145.00
297	12,642.56	5th Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	693.06	87,62,053.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
298	12,642.56	6th Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	734.49	92,85,834.00
299	12,642.56	7th Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	775.93	98,09,742.00
300	12,642.56	8th Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	817.39	1,03,33,902.00
301	12,642.56	9th Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	858.83	1,08,57,810.00
302	12,642.56	10th Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	900.26	1,13,81,591.00
303	12,642.56	11th Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	941.71	1,19,05,625.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
304	12,642.56	12th Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	983.15	1,24,29,533.00
305	50.00	Terrace Floor - External Walls - Providing and applying synthetic plaster putty or equivalent putty such as birla wall care putty or texture paint or equivalent such as NCL/ Saicoat texture paint of average 2 to 3 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying putty/ texture paint filler by putty knife / muslin pad, air dry for 2 - 3 hrs for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work for external walls	1,024.58	51,229.00
306	397.00	Supply & Fixing : Main Door-1 ((1.2+0.3) X2.40 M) - Door Frame - Medium Quality Kiln Seasoned Solid African Teak Wood Frame (with Trreshold) of finished section 100 x 70to75mm with Architraves of 60to75 x 10mm and 20to25 x 10mm with PU polish or an opening size of 1500 x 2400mm. Door Shutter - 44mm thick Solid teak wood shutter with 34mm panel inserts of width 1100mm and and 6mm clear Glass in the cutout portion Hardware - 4" Ball Bearing Hinges with 102 x 76 x 2.5mm - 4 Nos, 8" - SS Tower Bolt - 1 No, Design Handle - 10" - 1 No, Mortice Lack - 1 No, Door Stopper, Nylon Door Buffer of Dorset or equivalent as approved by engineer in charge.	86,791.00	3,44,56,027.00
307	420.00	Supply & Fixing : Main Door-2 (1.5 X2.40 M) - Door Frame - Medium Quality Kiln Seasoned Solid African Teak Wood Frame (with Trreshold) of finished section 100 x 70to75mm with Architraves of 50-60 x 10mm and 20 x 10mm or an opening size of 1500 x 2400mm. Door Shutter - 44mm thick Flush shutters of solid mango wood infill with Natural Teak veneer on both sides. Hardware - 4" Ball Bearing Hinges with 102 x 76 x 2.5mm - 4 Nos, 18" - Brass Tower Bolt - 1 No, 8" - SS Tower Bolt - 1 No, Design Handle - 10" - 1 No, Door Stopper, Nylon Door Buffer of Dorset or equivalent as approved by engineer in charge.	64,091.00	2,69,18,220.00
308	380.00	Supply & Fixing : Pooja Door-PD (1.2 X2.40 M) - Door Frame - Medium Quality Kiln Seasoned Solid African Teak Wood Frame (with Trreshold) of finished section 100 x 70to75mm with Architraves of 50to60 x 10mm and 20 x 10mm an opening size of 1200 x 2400mm. Door Shutter - 36mm thick Flush shutters (Double) of solid mango wood infill with Natural Teak veneer on both sides and provision of vision panels in each shutter with 5mm clear glass (size of the top and bottom vision panel is equal and the middle is longer) Hardware - 4" Ball Bearing Hinges with 102 x 76 x 2.5mm - 8 Nos, 8" - SS Tower Bolt - 1 No, Aldrop - 300 x 16 SS , Door Stopper, Nylon Door Buffer of Dorset or equivalent as approved by engineer in charge.	51,060.00	1,94,02,800.00
309	1,150.00	Supply & Fixing : Internal Door(D1)- (1.0 X 2.4M) Door Frame - Medium Quality Kiln Seasoned Solid African Teak Wood Frame (without Trreshold) of finished section 100 x 45to75mm with Architraves of 50to60 x 10mm and 20 x 10mm or an opening size of 1000 x 2400mm. Door Shutter - 35to36mm Solid Core with Sapele Veneer Crown Cut Vertical Grains on both sides. Hardware - 4" Ball Bearing Hinges with 102 x 76 x 2.5mm - 4 Nos, 18" - Tower Bolt - 1 No, Cylinder Lock with Key & Knob - 1No , Door Stopper, Nylon Door Buffer of Dorset or equivalent as approved by engineer in charge.	36,471.00	4,19,41,650.00
310	3,169.00	Supply & Fixing : Internal Door - (0.850 X 2.4M) Door Frame - Medium Quality Kiln Seasoned Solid African Teak Wood Frame (without Trreshold) of finished section 100 x 45to75mm with Architraves of 50to60 x 10mm and 20 x 10mm or an opening size of 850 x 2400mm. Door Shutter - 35to36mm Solid Core with Lamination on both sides. Hardware - 4" Ball Bearing Hinges with 102 x 76 x 2.5mm - 4 Nos, 18" - Tower Bolt - 1 No, Cylinder Lock with Key & Knob - 1No , Door Stopper, Nylon Door Buffer of Dorset or equivalent as approved by engineer in charge.	32,898.00	10,42,53,762.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
311	224.00	Supply & Fixing : Door- (0.750 X 2.4M) Door Frame - Medium Quality Kiln Seasoned Solid African Teak Wood Frame (without Trreshold) of finished section 100 x 45to75mm with Architraves of 50to60 x 10mm and 20 x 10mm or an opening size of 850 x 2400mm. Door Shutter - 35to36mm Solid Core with Lamination on both sides. Hardware - 4" Ball Bearing Hinges with 102 x 76 x 2.5mm - 4 Nos, Baby Latch Big - 1 No, Cylinder Lock with Coin & Knob - 1No , Door Stopper, Nylon Door Buffer of Dorset or equivalent as approved by engineer in charge.	29,985.00	67,16,640.00
312	5,965.65	Sliding Door - Supplying and fixing of Unplasticised Poly Vinyl Chloride (UPVC) 3 track sliding doors with mesh shutter ? (2- glass shutters and 1-mesh shutter)- 95 - Series duly manufactured using UPVC reinforced profiles (Composition of profile shall consists a minimum of 5.5 PHR of TiO2 and not more than 12 PHR of CaCo3 for every 100 parts of PVC resin) of (108 mm x 45 mm) x 2.20 mm for outer frames (90 x 39 mm)x 2.20 mm for sliding door shutter frames capable of mounting single glazing system, structurally reinforced with hot dip galvanized up to 50 microns of minimum thickness of 1.2 mm prefabricated & welded through fusion welding the door sash shall be fitted with 6 mm thick clear float Toughned glass of reputed make duly fixed with Grey colour TPV Gasket for sash & Glazing bead shall be co-extruded with Grey colour soft PVC. Mesh shutter shall be made of (75 x 39mm) x 2.0 mm uPVC profile section and fitted with Vinyl Coated Black Fiber mesh and rollers/pulley duly fixed with TPV Gaskets weathering seal resistant Door shall be provided with standard hardware & multi point locking system of Patio/Roto espagulate and the system is to be installed at the site using anchor fasteners, silicon rubber sealant, easy glazing/ deglazing at site etc., including cost and conveyance of all materials, accessories, labour charges for transportation, erection at site complete for finished item of work. (FD1 - 4.5mX2.4m, FD2 - 2.45mX2.1m, FD3 - 1.8mX2.1m, FD4 - 2.75mX2.4m, D3A -850m x 2400m).	8,635.00	5,15,13,388.00
313	2,865.57	Supply & Fixing of Powder Coated Fire Rated doors, frames & shutters made of Skin pass galvanized Iron sheet conforming to Base Steel as per IS 513 ?D? Quality, Galvanized as per IS 277 with Hot Zinc Coating of 120 grams / Sq.Mtr with powder coating of thickness 60-65 Microns, frame with 1.2mm thick Skin pass Galvanized Iron sheet formed to double rebate profile of ize 143 mm X 58 mm with maximum bending radius of 1.4 mm and filled with in-fill Polyurethane foam, the Door Shutters are with 0.80 mm thick Skin pass Galvanized Iron Sheet formed to provide a 46 mm thick fully flush, double skin door shell with Lock Seam joints at stile edges, fitted with in-fill of Honeycomb Kraft Paper and coated with polyester powders of Pure polyester/ epoxy polyester or polyurethane powder for powder coating of thickness 60 ? 65 microns and are coated with Zinc Phosphate Primer to receive any paint on site or finished with Thermosetting Polyurethane paint of Aliphatic Grade providing high levels of scratch resistance and durability, the Shutter provided with 6 MM clear float vision glass in Circular, Square or Rectangular shapes, Stainless Steel Ball Bearing Butt Hinges 3 mm thick fixed flush to the frame and shutter (Profile 102x76x3mm thick).Mortise Sash Lock with Lever Handles, Mortise Dead Bolt, etc for 120 minutes Fire Rated door conforming to IS:3614 (Part2) 1992 - Fire Rated Metal Doors for Stair case and Lobby area.	15,792.49	4,52,54,486.00
314	11,996.50	Supplying and fixing of Unplasticised Poly Vinyl Chloride (UPVC) 3 track sliding windows with mesh shutter ? (2- glass shutters and 1-mesh shutter) duly manufactured using UPVC reinforced profiles (Composition of profile shall consists a minimum of 5.5 PHR of TiO2 and not more than 12 PHR of CaCo3 for every 100 parts of PVC resin) of (94 x 45 mm)x 2.20 mm for outer frames, up to 1200 mm(58 x 39 mm) up to 1650mm (75 x39 mm)x 2.20 mm for sliding shutter frames capable of mounting single glazing system structurally reinforced with hot dip galvanized up to 50 microns of minimum thickness of 1.0/1.2 mm prefabricated & welded through fusion welding. The window sash shall be fitted with 6 mm thick clear float Toughned glass of reputed make and mesh shutter frame shall be (58 x 25 mm) x 2.0 mm fitted with Vinyl Coated Black Clour Fiber mesh- on rollers/ pulley duly fixed with Grey colour TPV Gasket for sash & Glazing bead shall be co-extruded with Grey colour soft PVC. System shall have single point locking with Touch Lock and the system is to be installed at the site using anchor fasteners, silicon rubber sealant, easy glazing/ deglazingat site etc., including cost and conveyance of all materials, accessories, labour charges for transportation, erection at site complete for finished item of work. (W1-1.8mX1.5m, W2-1.5mX1.5m, W3-1.2mX1.5m, W4-1.2mX1.2m, W5-1.8mX1.2m, W6-1.8mX1.65m, W7- 1.5mX1.65m, W8-1.2mX1.65m, W9-1.2mX1.2m, W10-1.2mX0.9m, W11-2.4mX1.5m)	9,698.00	11,63,42,057.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
315	617.76	Supplying and fixing of Unplasticised Poly Vinyl Chloride (UPVC) casement windows openable shutters duly manufactured using UPVC reinforced profiles (Composition of profile shall consists a minimum of 5.5 PHR of TiO2 and not more than 12 PHR of CaCo3 for every 100 parts of PVC resin) of 60 mm x 55 mm x 2.40 mm for outer frames, 74 mm x 60 mm x 2.40 mm for mullion sections for two or more openable shutters 75 mm x 60 mm x 2.40 mm for openable shutter frame capable of mounting single glazing system structurally reinforced with hot dip galvanized up to 50 microns of minimum thickness of 1.0/1.2 mm prefabricated & welded through fusion welding.The window sash shall be fitted with 6 mm thick clear float Toughned glass of reputed make duly fixed with Grey colour TPV Gasket for sash & Glazing bead shall be co- extruded with Grey colour soft PVC and accessories for casement window ? friction hinges of stainless steel grade 304/430- 2 Nos., per sash, handle with zamak alloy casting 1 No. per sash, multipoint locking system suitably concealed 1 No., per sash provided with raiser wedges for smooth operation and the system is to be installed at the site using anchor fasteners, silicon rubber sealant, easy glazing/ deglazing at site etc., including cost and conveyance of all materials, accessories, labour charges for transportation, erection at site complete for finished item of work..(Note:6mm Toughned Glass) CW1-0.6mX2.1m, CW2-0.6mX1.8m, FW1-2.45mX2.1m, FW2- 1.8mX2.1m, FW3 - 2.45mX1.65m, FW4 - 1.8mX1.65m, FW5-2.45mX1.5m, FW6-1.5mX1.5m, FW7- 1.5mX0.6m.)	8,134.00	50,24,860.00
316	565.96	Providing, supplying & fixing of Fixed Louvered Ventilator made out of multi chambered uPVC sections with Glazing bead shall be co-extruded with Grey colour soft PVC. having isolated drainage and reinforced with Galvanized Iron profiles throughout the window. The outer frame having an overall size of 60 mm x 55 mm x 2.40 with reinforcement of 1 mm thickness and Mullion with overall size of 74 mm x 60 mm x 2.40 mm with reinforcement of 1 mm thickness. (Composition of profile shall consists a minimum of 5.5 PHR of TiO2 and not more than 12 PHR of CaCo3 for every 100 parts of PVC resin).Ventilator shall be provided with 4.5 mm Pin Head glass, standard hardware. Wall thickness of frame & Mullion shall be 2.4 mm.,including cost and conveyance of all materials, accessories, labour charges for transportation, erection at site complete for finished item of work.. (V1 - 0.6mX0.9m)	7,121.00	40,30,201.00
317	21.60	MD: Main Door : 10mm thick - Glass Door	12,500.00	2,70,000.00
318	108.00	Supply & fixing of Rolling shutter made of 80 x 1.25 mm machine rolled CRCA laths, interlocked together through their entire length and jointed together at the ends by end-locks, mounted on specially designed pipe shaft of 50mm dia nominal bore MS B class pipe with brackets, plates, guide channels, stoppers, bottom locking plates and arrangements for inside & outside locking with push-pull operations including cost of hood cover and springs complete, painted with one coat of approved steel primer, locks, ball bearings, all accessories etc complete for finished item of work as per special spn: 1108	5,091.09	5,49,838.00
319	1,99,340.00	Providing and fixing of MS Grill and Railing including cost & Conveyance of all materials and all labour charges fabricating steel works like window grills compound wall grills iron doors windows including cost of welding rods power charges and including cost of fixing and position complete as per design drawing approved by the departmental authorities. For Hand Railing	176.91	3,52,65,239.00
320	62,443.20	Providing and fixing of MS Grill and Railing including cost & Conveyance of all materials and all labour charges fabricating steel works like window grills compound wall grills iron doors windows including cost of welding rods power charges and including cost of fixing and position complete as per design drawing approved by the departmental authorities. For Window Grills	172.68	1,07,82,692.00
321	35,748.00	Providing and fixing of stainless steel railing with SS 304 grade including cost & Conveyance of all materials and all labour charges for fabrication of stainless steel railing works using stainless steel welding rods including buffing, polishing, lacquer finish to present seemless finish etc complete as per design and drawings approved by the departmental authorities.	784.51	2,80,44,663.00
322	12,804.04	Toilet Floor and Wall Water Proofing - Providing and Applying Specified Waterproofing System, Acrylic Polymer Modified Flexible Cementitious Coating to Toilet Floor and Wall as specified below and as per approved manufacturer and applicator specification, including screed protection layer, the works shall be complete as per drawings, specification and as directed, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.(Screed will be paid in relevant item)	890.00	1,13,95,596.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
323	9,326.00	Balcony Water Proofing - Providing and Applying Specified Waterproofing System, Acrylic Polymer Modified Flexible Cementitious Coating to Balcony as specified below and as per approved manufacturer and applicator specification, including screed protection layer, the works shall be complete as per drawings, specification and as directed, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities. (Screed will be paid in relevant item)	890.00	83,00,140.00
324	16,391.20	Terrace Water Proofing - Providing and laying waterproofing treatment on the slab with two coats of Acrylic based two component water proofing system from approved manufacturer/ supplier/sub contractor and application as per manufacturer's specification, drawings.Providing and applying primer coat of neat cement mixed with an integral water proofing compound, dosage @ .2% by weight of cement, followed with lying of brickbat at a gradient of 1:120 or as required, the gap between the brick bats shall be about 25 to 40mm.Providing and laying between gaps of brickbats with cement mortar (1:4) admixed with Plastocrete Plus or approved equivalent.Providing and laying a final layer of 20mm thick cement mortar (1:4) admixed with Plastocrete Plus or approved equivalent and finished with smooth coat of cement slurry.Providing and laying a layer of brickbat along the vertical surface on a bed of approved waterproofing cement mortar, plastered and rounded at edges with waterproof cement mortar to a height of 300 mm from floor. The works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the departmental authorities.Terrace Roof	1,980.00	3,24,54,576.00
325	14,512.00	Roof Finish - Pressed Clay Tiles - Providing and laying 20 mm thick Pressed Clay Tiles of approved make (sourced from Calicut or Trishur) laid over 20 mm thick cement mortar 1:3 mixed with crude oil 10% by weight of cement and pointing of joints in same mortar including waterproofing compound, including flashing of corners, the tiles shall be laid with clear slope such as to avoid water stagnation, the works shall be complete as per specification and as directed, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities @ Terrance Floor Level	1,702.26	2,47,03,197.00
326	2,650.00	OHT Water Proofing - Providing and applying Acrylic Polymer Modified Cementitious Waterproof Coating in 2 or 3 coats as per manufacturers? specification and as approved by the Client / Construction Manager to the RCC slab and walls, complete. The treatment to include cleaning and wire-brushing the concrete surface, treating all the cracks, construction joints and honeycombs by grouting with specialized non-shrink cementitious compound, grouting the annular space between the pipe and concrete, providing and applying smooth CM 1:3, 25 mm thick plaster in double coat admixed with integral waterproofing compound @ 1 kg./bag of cement and mortar plasticizer @ 200 ml/bag of cement, using river sand screened and washed, at all leads, lifts, heights, scaffolding, curing, complete, the works shall be complete as per specification and directed, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	1,125.00	29,81,250.00
327	1,260.00	Ladder for OHT - Supply, Fabricating & Fixing Specified Mild Steel Handrailing System with adequate fixtures as per the following details, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities	176.91	2,22,907.00
328	18.00	Structural Stainless Steel Works for Canopy including Glass Roof - Providing and fixing of Unitised Structural Glazing System with approved Sealant joint as per design intent, preparation of shop drawings for approval, supply, fabricate, erect as per approved shop drawings at First Floor levels of all Tower Entries including conducting field test as per the test criteria set out in the Particular specification (Methodology should be got approved by the Client /Architect). Design the framing system to support Vision panels, Spandral panels either with Glass or SS Box Sections on a continuous framing supported for cantilevered Glass Entrance Canopy. Groove width in the system both in horizontal and vertical shall not be more than 10 mm. Toughened Glazing panel shall be done only at factory at the controlled atmosphere as per designs and drawings approved by the departmental authorities.	7,20,000.00	1,29,60,000.00
329	2,336.00	Duct Covering - Aluminium Powder Coated Screeens - Supply & Fixing of Aluminium Powder coated Screens including all necessary fixing screws etc., the works shall be completed as directed, the works shall be completed including all incidental, operations, labour charges, seienorage charges as directed by the departmental authorties	6,900.00	1,61,18,400.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
330	13.00	Providing and fixing SFRC heavy duty manhole Cover with Frame for the manhole inner size of 600 x 600 mm	5,100.00	66,300.00
331	216.00	Providing and fixing in position the PVC coated MS steps of size 300x150mm for UG Sump and OH Tank including placing 150mm inside concrete (while doing form work), aligning during concreting, grouting the junction if required, cleaning etc.,	510.00	1,10,160.00
332	1.00	Ground Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	3,302.25	3,302.00
333	440.50	1st Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	3,826.51	16,85,578.00
334	440.50	2nd Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	3,942.18	17,36,530.00
335	440.50	3rd Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,057.85	17,87,483.00
336	440.50	4th Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,173.53	18,38,440.00
337	440.50	5th Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,289.20	18,89,393.00
338	440.50	6th Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,404.87	19,40,345.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
339	440.50	7th Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,520.54	19,91,298.00
340	440.50	8th Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,636.21	20,42,251.00
341	440.50	9th Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,751.89	20,93,208.00
342	440.50	10th Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,867.56	21,44,160.00
343	440.50	11th Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	4,983.23	21,95,113.00
344	440.50	12th Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	5,098.90	22,46,065.00
345	1.00	Terrance Floor - Granite Counter Top Kitchen & Toilet : Counter Top withHigh Polished Granite 16 to 18 mm thick up to 2.43 M other than black and regular colours set over base coat of cement mortar (1:8), 20 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like cement, sand water and tilesetc., complete, including seigniorage charges, labour charges for dressing of tilesetc., complete for finished item of work.	5,214.58	5,215.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
346	12.00	The Contractor shall provide and maintain separate temporary office accommodation (minimum 30 members) including conference room for the exclusive use of the Departmental Engineers and delegated assistants of not less than 1800 sft. with in site area compound including work stations , storage racks,cabins, Conference room, office desks, toilet facilities, RO drinking water arrangements, with complete air conditioning. The Contractor should also provide for necessary inventory for Engineering department such projector, internet, printer, scanner & xerox facilities, washing, water, electrical & power, benches, tables, Chairs, storage racks, cabinets & other furniture as per requirement during execution period. Arrangement of daily transportation facility to department engineers for use with minimum of three vehicles including fuel, hire & driver charges for the exclusive use of the departmental officers , Engineer and related delegated assistants during execution period. - Temporary Buildings & Facilities for the Departmental Engineers	2,50,000.00	30,00,000.00
347	32,916.84	White washing two coats with lime of approved quality to give an even shade after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials including cost of all materials, labour charges and incidental such as scaffolding, lift charges etc., complete for finished item of work, including conveyance charges of materials.	63.21	20,80,673.00
348	9,644.00	Gyp Board Fine Line Grid false ceiling for Toilets - False Ceiling: Supplying and fixing Gyp Board Fine Line Grid false ceiling (GS-FLC-4.6 as per India Gypsum) in size 600 mm x 600 mm using 12.5 mm thick/ 9.5 mm thick Gyp Board sheet tiles of size 595 mm x 595 mm or 595 mm x 1195 mm conforming to IS 2095 - 1982 fixing to Gyp steel precoated GI wall angle of size 25 mm x 25 mm x of 0.70 mm thick along the perimeter of ceiling screw fixed to brick work/ partition at 610 mm c/c and suspending the frame work using precoated GI Tee section (24 mm x 38 mm x 0.7 mm) from soffit at 1220 mm c/c fixed with GI Soffit Cleat, rawl plugs and steel expansion fasteners & connecting clip to the GI T section with 4 mm dia GI Rod with galvanised spring steel level clip of PVC unversal holding clips system at 1200 mm c/c and fixing the 12.5 mm / 9.5 mm Gypboard Sheet tiles of size 595 mm x 595 mm or 595 mm x 1195 mm and finishing two coats of drywall topcoat complete for finished item of work as per Idia Gypsum Ltd specification.	1,258.50	1,21,36,974.00
349	2,160.00	Providing and fixing ceiling Trap doors of size 600mm x 600mm made with 18mm waterproof plywood with Aluminum frame system all around and one intermediat section. Plywood to be lipped with TW lipping and finished with 1mm laminate on ply and duco paint on lipping. Rate include either concealed or cut hinges (2 pairs) dead lock, concealed aldrop, recessed handles etc all complete. Additional support in the false ceiling to take the weight of the trap doors also to be included in above.	3,125.00	67,50,000.00
350	8,208.00	Providing and fixing in position specified PVC Sleeves of all sizes in slabs and to walls, etc for services to required locations, scope includes required waterproofed grouting and making good the surface after completion of works and the works shall be complete as directed by the departmental authorities.	250.00	20,52,000.00
351	470.00	Main Door - Providing and fixing specified signages made of Stainless Steel as per the below list and as required, the below list are for the purpose of design intent only as directed by the departmental authorities. The sizes of signages are ranging from 100mm x 450mm to 150mm x 600mm. Actual sizes would be decided during execution, depending upon site conditions.	1,250.00	5,87,500.00
352	240.00	Floor Location - Providng and fixing specified signages made of Stainless Steel as per the below list and as required, the below list are for the purpose of design intent only as directed by the departmental authorities. The sizes of signages are ranging from 900mm x 1200mm to 1200mm x 1350mm. Actual sizes would be decided during execution, depending upon site conditions.	1,250.00	3,00,000.00
353	18.00	Ground Floor Lobby Sign Board - Providng and fixing specified signages made of Stainless Steel as per the below list and as required, the below list are for the purpose of design intent only as directed by the departmental authorities. The sizes of signages are ranging from 900mm x 1200mm to 1200mm x 1350mm. Actual sizes would be decided during execution, depending upon site conditions.	62,500.00	11,25,000.00
354	18.00	Letter Box - Providng and fixing specified signages made of Stainless Steel as per the below list and as required, the below list are for the purpose of design intent only as directed by the departmental authorities.	62,500.00	11,25,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
355	94,051.23	Gypboard Suspended false ceiling: False Ceiling: Supplying and fixing Gyp Board Suspended regular single layer false ceiling (GS-MFSC-4.1 as per India Gypsum) using 12.5 mm thick Gyp Board conforming to IS 2095 - 1982 fixing to Gyp steel GI perimeter channels of size 20 mm x 27 mm x 30 mm(web) of 0.55 mm thick along the perimeter of ceiling screw fixed to brick work/ partition at 610 mm c/c and suspending the frame work using Intermediate channels (45 mm x 15mm x 15mm x 0.9 mm) from soffit at 1220 mm c/c with ceiling angle (25 mm x 10 mm x 0.55 mm) fixed with GI Cleat and steel expansion fasteners & connecting clip to the ceiling channels (with knurled web of 51.5 mm x 26 mm x 10.5 mm x 0.55 mm) fixed in direction perpendicular to the intermediate channel at 457 mm c/c and fixing the 12.5 mm tapered edge Gypboard with 25 mm drywall screws at 230 mm c/c & jointing and finishing using joint compound and paper tape to have a flush look including filling the tapered & square edges with jointing compound, two coats of drywall topcoat complete for finished item of work as per Idia Gypsum Ltd specification.	1,347.68	12,67,50,962.00
356	945.00	Providing and laying cinder concrete in cement cinder mix (1:15) prop. using 12.5 mm nominal size cinder laid in layers and compacted as directed for filling sunken floors including cost and conveyance of all materials, water to work site, seigniorage charges and all operational, incidental, labour charges, such as mixing cement & cinder etc. complete for finished item of work for all floors	5,103.20	48,22,524.00
357	210.00	One Coat - New Iron Work Rust converter?rust encapsulating coating for steel During repairs to protect, to convert the rust of reinforcement / steel.	205.25	43,103.00
358	1,346.50	Supply & Fixing of Toughened Plain Glass 12 mm thick for SS railing including wastage, edge chamfering on both sides, making holes.	4,500.00	60,59,250.00
359	13,100.00	Providing and applying Painting, Priming Coat on New Iron Work and two coats of Synthetic Enamel paints For New Iron Work	216.52	28,36,412.00
360	125.00	Masonry work in CM (1:5) prop with Flyash Cement solid blocks of size 290 x 225 x 140 mm for manufacturing of flyash solid blocks using flyash of 80 kgs, cement of 15 kgs. Gypsum of 5 kgs. and stone dust including cost and conveyance of all materials, labour charges, seiniorage charges, scaffolding and curing etc., cpomplete with a compresive strength not lessthan 50 kg/sqm for Upto Plinth	8,133.99	10,16,749.00
361	7,495.50	Supplying and fixing aluminium composite cladding with skin material 0.5 mm thick aluminium sheet cover material natural polyethylene aluminium cladding panel fixed with extruded aluminium basis frame (50x25x1.5mm) angle cleats,weather sealants, rivets, GI brackets all as approved, using suitable bolts on structural steel work including necessary accessories complete in all respects including all scaffolding and labour charges etc., complete for finished item of work but excluding cost of structural steel fabrication, if any, ACP Cladding - 4 mm thk.	3,476.61	2,60,58,930.00
362	2,863.00	Labour charges for Rounding the edges of Tandur stone slabs of any thickness including polishing the same	207.38	5,93,729.00
363	3,346.67	Labour charges for Half Rounding the edges of Marble/ Granite stone slabs of all thicknesses including polishing the same	626.75	20,97,523.00
364	120.00	Labour charges for Full Rounding the edges of Marble/ Granite stone slabs of all thicknesses including polishing the same.	812.62	97,514.00
365	10,040.00	Labour charges for Groove cutting 2-3mm for Granite	113.68	11,41,347.00
366	13.50	Toilet Mirror	6,250.00	84,375.00
367	1,110.00	Augoring and boring of holes in site for BORED CAST-IN-SITU R.C.C PILES for building foundation up to Rock in all types of soils without under reams as per is 2911-1980 as per approved designs including boring with bentonite / polymer solution and temporary casing of appropriate length of setting out and removal of same by hydraulic rotary rigs all complete, including disposal of muck outside upto any lead, the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities.-600 mm dia - Hydraulic piling	3,035.17	33,69,039.00
368	30.00	Sockettting for bored cast in situ piles - Additional cost for Augor Boring for Piles Socketing in to Rock :	7,500.00	2,25,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
369	1,110.00	Pile concrete - Supply and placing of the Design Mix Concrete M30 Grade corresponding to IS 456 with minimum cement content of 400 kgs per 1 cum of concrete using (BATCHING PLANT at site) with 20mm size graded machine crushed hard granite metal (coarse aggregate - as per IS 383 - 1970 and IS 2386 Part 1 to Part 8) from approved quarry including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water etc., to site and sales & other taxes on all materials , centering using Steel scaffolding pipes , jack props , wallers , Foot plates , brackets , steel centering plates etc., including all operational, incidental and labor charges such as weigh batching, machine mixing, laying concrete, curing etc., and overheads & contractors profit complete but excluding cost of steel and its fabrication charges for finished item of work and as directed by the Engineer-in-Charge Concrete only	1,679.09	18,63,790.00
370	20.00	Conducting Pile Integrity Test for all Piles with standard methodology , the works shall be completed including all incidental, operations, labour charges as directed by the departmental authorities - 600mm dia piles	1,200.00	24,000.00
371	10.00	Demolition including stacking of serviceable materials and disposal of unserviceable materials within 100 metres lead - R.C.C. work	4,062.13	40,621.00
372	300.00	Providing, mixing applying bonding coat of approved adhesive on chipped portion of RCC as per specification and direction of EIC - Epoxy bonding adhesive having coverage 2.2 sqm/kg of approved make	285.20	85,560.00
373	2,666.93	Providing Granular sub base with well graded or close graded material of grading 3 including cost of material and all labour charges and mixing the material at OMC in a mechanical mix plant and carriage of material to site and laying in layers on prepared surface and compacting with 8-10 MT Vibratory rollers to achive desired density as per technical specification of MORTH.	2,121.88	56,58,905.00
374	3,266.17	Wet Mix Macadam (Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.)	2,346.66	76,64,590.00
375	14,516.30	Providing and laying heavy duty Paver Blocks 80mm thk M40 grade, using approved shape, size and colours with required combination of colours of blocks having specified load bearing strength obtained from approved manufacturer, over compacted earth/quarry dust/ pit sand/ river sand, (compaction and other base layers are measured seperately), pointed with fine sand, including laying to required level and gradient, cleaning and finishing,	951.00	1,38,05,001.00
376	2,600.00	Providing and laying Precast Cement Concrete Kerbs, M20 grade,(minimum cement content 320 kg/cum), of 115mm wide, 750 mm high, and length not less than 600mm, with chamfered edge at top, into the recess formed in the concrete base (concrete base measured seperately) including cement grouting, laid to proper line and level, including forming of openings to identified kerbs to dischage water.	1,140.00	29,64,000.00
377	18,930.00	Providing and laying waterproofing treatment on the slab with two coats of polyurethane/Acrylic based two component water proofing system from approved manufacturer/ supplier/sub contractor and application as per manufacturer's specification, drawings. - Hardscape Works	1,290.00	2,44,19,700.00
378	19,105.00	Drainage Cell of 30mm thickness- Material:Polypropylene co-polymer,Colour : Black,Discharge capacity :>16.5 1/m.s @1%gradient - For Podium Landscape area	500.00	95,52,500.00
379	19,105.00	Providing and laying of Non Woven Geo Textile Fabric 150Gsm as per the manufacturers specificaitons	403.20	77,03,136.00
380	1.00	Entry Signages - Providng and fixing specified signages as per the below list and as required, the below list are for the purpose of design intent only as directed by the Authorities.	2,40,000.00	2,40,000.00
381	1.00	Facility Location Map Signages - Providng and fixing specified signages as per the below list and as required, the below list are for the purpose of design intent only as directed by the Authorities.	60,000.00	60,000.00
382	18.00	Tower Signages - Providng and fixing specified signages as per the below list and as required, the below list are for the purpose of design intent only as directed by the Authorities.	12,000.00	2,16,000.00
383	15.00	Directional Signages-Route markers,Path markers - Providng and fixing specified signages as per the below list and as required, the below list are for the purpose of design intent only as directed by the Authorities.	18,000.00	2,70,000.00
384	1.00	Parking Signs - Providng and fixing specified signages as per the below list and as required, the below list are for the purpose of design intent only as directed by the Authorities.	6,00,000.00	6,00,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
385	1.00	Landscape Signages - Providng and fixing specified signages as per the below list and as required, the below list are for the purpose of design intent only as directed by the Authorities.	3,36,000.00	3,36,000.00
386	1,100.00	MS Grating for Podium Storm Water Drain - Providng and fixing specified signages as per the below list and as required, the below list are for the purpose of design intent only as directed by the Authorities. - For Podium - Providng and fixing specified signages as per the below list and as required, the below list are for the purpose of design intent only as directed by the Authorities. The size of Stainless Steel Signage considered is 1200 mm X 1350 mm. The actual sizes of Stainless Steel signages would be decided during execution as per site conditions.	8,400.00	92,40,000.00
387	629.00	Column Guards - Providing and fixing of column guards EPDM with reflective stickers including all labour and over head charges etc., complete as directed by the departmental authorties	2,400.00	15,09,600.00
388	1,600.00	Supplying of hot applied thermoplastic road marking compund, 2.5mm thick including reflectorising glass beads @ 250gms with reflectorising glass beads on bituminous surface at 250gms per sqm area thick ness of 2.5mm is esxclusive of surface applied glass bead as per IRC :35 the material should be of BERGER company / BERGER Equivalent and must comply with the following : a) white index for the product should be in the range of 60-70 whebn measured against standard reference The applied panel 7/8 number must be submitted for chedking up the xhite index in the department lab. in case the department approves the white index of any vendor, the department engineer may carryout random checkong of tlhe applied products at site agaist the approved panel in case of any major dseviation, beyond acceptance limit department reserve the right to cancel or reject the total supplied consignment of the said material and will compell the vendor has to replace the full consignment by the desired material as per approved panel at his own cost and additional demurrages may be clained due to loss of man days (as per the rules of the deparment). b) Luminous factor of the material should be in the rane of 80-85% at 45 degree centigrade as pesr AASTHOM246. c) Crack resistance the applied panel cured for 7days under ambient condition and then should be tested as per BS3262, part -I, 1989 and should pass at the range of '0' degree centigrade to '10' degree centigrade d) adhesion : strong e) Softening point 102 degreee centigrade f) dried film furnish smooth and uniform G) Nighit vision High as directed by the Engineer-in-Charge and conforming to IS: 164-1981(First revision reaffirmed in 1986) and clause.	842.40	13,47,840.00
389	1,60,000.00	Providing & Placing on Terrace(at all floor levels) polyethylene water storage tank of Double layer Roto moulded confirming to IS:12701 approved brand & manufacture with suitable cover/cap and suitable locking arrangement & making necessary holes for inlet & outlets and over flow pipes but without fittings & base support for tanks	11.19	17,90,400.00
390	426.00	Gym Flooring - Providing & Fixing of Rubber Tile For Gymnasium Flooring at first floor having following specifications Rubber tile Size 20 inch x20 inch with 10 mm thickness Weight :- 2.35 kg per tile Crumb rubber granules range :0.8 mm to 2 mm Specific gravity (g/cm3):-0.88 Elongation at break (%)47%(ASTM D 573) Anti bacterial and anti skid resistance Anti Microbial Growth Eco friendly Colour:- As decided by competent authority may in two different colour. Complete in all respect to the satisfaction of Engineer-in Charge	5,250.00	22,36,500.00
391	307.00	Tennis court in Terrace Preparation and Installation of Tennis Court in Terrace with complaince of following requirements Spacing - Outdoor courts have at least 12? and indoor courts have at least 18? between each side-line to allow for safe overruns. Court Surfaces - Court surfaces are appropriate, clear of obstructions, and well-maintained. Court lines are accurate and clearly marked. Nets - Tennis nets, posts, and singles sticks are regulation size and height, and well-maintained. The net should be 3' (36") at the center strap, and 3'6" (42") at the posts. Overhead Clearance - Space above courts is clear of obstructions, and clearances are at least 18' at the fence/eaves, 21' over the baseline, and 35' over the net, although 38' is preferred. Dividers - Divider netting and deflection barriers are adequate and well-maintained. If divider netting does not reach the walls, floor barriers prevent balls from rolling onto another court. Fences and Walls - Fences and walls are well-maintained and cleared of overgrowth. Lighting/Illumination - Lighting is adequate and appropriate, and sufficient for safely using the facilities after dark. Lighting is consistent with NPS Night Sky requirements. essentially important to guarantee ideal water drainage from the court. The ground layer material then releases water back to the top layers under the effect of evaporation. Complete in all respect to the satisfaction of Engineer-in Charge	5,000.00	15,35,000.00

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392	310.00	Glazing for Yoga, Gym & Lounge -Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, Including Doors as per approved Drawings including providing and fixing top & bottom pivot & spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Glass make - Modiguard/Saint Gobain/Asahi)	18,750.00	58,12,500.00
393	36.00	Modular Toilet - Providing & Fixing of T Line® Toilet Cubicle System in SS-304 MEDIUM Series of size Width 900mm x Depth 1500mm x Height 2000mm, Door Size - 600mm x 1830mm, Divider Height - 1830mm, Comprising of Rigid SS components: (1) SS304 Indicator Lock (2) SS304 Automatic Reverse Hinges (3) SS304 Height Adjustable Legs (4) SS304 Door Knob (5) SS304 Coat Hook & Aluminum (Brush Finish): (6) Top Rail (7) h Section (8) U Section (9) Silicon Strip to be inserted in h Section to provide Noise Dampening (10) Screws & Plugs with (11) Water, Chemical, Heat, Bacteria, Fire, Impact & Scratch Resistant 12 mm T Line High Pressure Compact Laminate. The 12mm HPL to have a minimum density of 1350 kg/m3 with a warpage limit of .5% of its length. The Top Rail will be fixed end to end and all the mid and end pilasters will get fixed into it. The whole system will have Upto 150 mm clearance height to the floor. U Sections will be used for Board to Board Jointing and Board to Wall Fixing. Complete in all respect to the satisfaction of Engineer-in Charge	43,750.00	15,75,000.00
394	2.00	Badminton Court - Complete Finishes to Floor, Wall, Ceiling - Providing and laying 9layers synthetic acrylic color badminton court: a. 02 layer- Synthetic flooring (re-surfacer)(600 micrometre each layer) b. 04 layer- Cushion Rubber(600 micrometre each layer) c. 03 layer- Top Color Coat (400 micrometre each layer) d. Line marking of the courts to be as per BWF norms. Approved make:- Ebaco/Vector/Decoturf/hatco/frog. Including Badminton pole and net and Supplying & installation, testing and commissioning of prewired flood light LED fitting of 250 watt, lumen output. Complete in all respect to the satisfaction of Engineer-in Charge	18,75,000.00	37,50,000.00
395	91.44	Wall -Mirror - Gym glass wall mirror (5 mm thick) with fixing accessories and safety backing. Complete in all respect to the satisfaction of Engineer-in Charge	6,250.00	5,71,500.00
396	50.00	Aerobics Wall Mirror - Gym glass wall mirror (5 mm thick) with fixing accessories and safety backing. Complete in all respect to the satisfaction of Engineer-in Charge	6,250.00	3,12,500.00
397	11.00	Threadmill - Gym Motor (HP) - Supply Installation Testing and Commissioning of Heavy Duty 5.0 HP AC Motorised Treadmill. Speed Range - Speed Range : 0.8 ~ 22 Kmph (0.5~13.75mph) Incline Range - 0-20% Automatic Speed Controller - INVERTER Frame - Heavy Duty Aluminium Tube, soft Handgrips Chest Strap Transmitter - Optional Display - 3 BIG LED display / 1 LARGE dot matrix red led DISPLAY/ SRCOLL MESSAGE DISPLAY Computer Display - LED for time, distance, calories, pace, speed, AVG.speed, incline, pulse, AVG.HR, Mets Console Buttom - STOP, START, FAST, SLOW, UP, DOWN, PROGRAM, NUMBER MP3 Capable (Speaker) - Optional Computer Programs - Manual, Hill, Fat burn, Cardio, Calorie, Interval, Strength, 5K run, 10K run, Custom1~2, H.R.1~2, Fitness test(Gekin Protecol) Rollers (Front/Rear) -OD. 75mm / 75mm Running Surface - 560mm x 1525mm Running Deck - 700mm x 1390mm x 25mm Product (MM) - 2125 x 884 x 1470mm (expected) Nw/Gw(Kgs) - 185 / 195 kgs Max.User Weight - 180KGS Warranty: 2 Years for Belt & Components Life time for Motor. Complete in all respect to the satisfaction of Engineer-in Charge	1,87,500.00	20,62,500.00
398	9.00	Wieght Bench - Gym Supply Installation Testing and Commissioning of Highly durable and ergonomic stainless steel construct with powder coating to resist scratches. Moulded urethane guards to protect Olympic bars from damage, reduce noise and provide a hand rest for spotters Wide back pad for stabilising users during heavy lifts Should be available with weight storage horns LWH: Approx.1438X1264X1468 mm 56.6X49.8X57.8 in N.W.: Approx. 61 kgs Warranty: 1 Year. Complete in all respect to the satisfaction of Engineer-in Charge	1,25,000.00	11,25,000.00

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399	10.00	Power Mill - Gym Supply Installation Testing and Commissioning of ELLIPTICAL CROSS TRAINER CONSOLE: 7.5? Backlit LCD with muscle profile display, target heart rate display, swivel fan, reading rack, and integrated speakers CONSOLE FEEDBACK: Time, Resistance Level, Stride Length, Distance, Calories, RPM, Segment Time, Program Name, Watts, Laps, Speed, and Heart Rate HEART RATE: Contact & Telemetric, (Heart Rate Strap Not Included) RESISTANCE: 20 Levels POWERPlug-In: 120V FLYWHEEL SYSTEM: 30 lbs. STRIDE LENGTH: Electronically Adjustable 18" - 24" (.5" increments) FRAME: Commercial-Grade Structural Steel w/ durable Powder-Coat Paint MAXIMUM USER WEIGHT400 lbs. WARRANTY: 1 year. Complete in all respect to the satisfaction of Engineer-in Charge	1,50,000.00	15,00,000.00
400	8.00	Power Lifting - Gym Supply Installation Testing and Commissioning of FOUR STATION MULTI GYM WITH TWO WEIGHT STACKS Assembled Space (mm): 2100*2650*2100 G.W (kg) : 357.5 kg N.W (kg) : 346 kg Packing Volume (m3) : 0.603 The Chest extension angle can be adjusted, the construction is compact. It can be used to do the above ? mentioned multi ? function exercise simultaneously. With 24 pieces of steel weight piece 6kg for each one. Exercise Function Chest ?extension, Pedalling, High pull, Sit push, Low Pull, and Parallel bar etc. Exercise part: Chest, back, leg, arm, shoulder muscle group Warranty: 1 year. Complete in all respect to the satisfaction of Engineer-in Charge.	1,25,000.00	10,00,000.00
401	6.00	Racks + Weights - Gym Supply Installation Testing and Commissioning of DUMBBELLS PVC coated - Round Iso solid Dumbbells Warranty: 1 year Quantity: 4 dumbbells each of the below mentioned weights a. 2.5 kg per unit b. 5 kg per unit c. 7.5 kg per unit d. 10 kg per unit e. 12.5 kg per unit f. 15 kg per unit and WEIGHT PLATES PVC coated- Round Iso solid weight plates Warranty: 1 year Quantity: 4 weight plates each of the below mentioned weights a. 2.5 kg per unit b. 5 kg per unit c. 7.5 kg per unit d. 10 kg per unit e. 12.5 kg per unit f. 15 kg per unit and OLYMPIC RODS WITH STAND -The Olympic bars are to be used for weight lifting exercises. Should be solid chrome plated To be supplied with spring collars Warranty: 1 year Lengths: 7 feet(1 no.), 4 feet straight(1 no.), 4 feet curl(1 no.) The stand should be able to hold the supplied rods vertically. Complete in all respect to the satisfaction of Engineer-in Charge	1,25,000.00	7,50,000.00
402	83.20	Pool Floor & Wall Tiling - Swimming Pool & Kid Pool - Providing & fixing Ist quality Swimming pool Supplying, fitting & fixing Glass mosaic tiles at finished plain wall surface of size 20 mm x 20 mm x 4 mm in all colour, design, fixing in customize design as per direction of Engineerin- Charge. The glass mosaic tiles to be fixed on the wall surface with the help of approved adhesive applied at the rate of 2.5 kg per sqm and grouting of the same. The rate is inclusive of all operation, material and required pattern approved by Engineer-in-Charge. glazed wall tiles conforming to IS:13753 of minimum thickness 5 mm of approved make, colour and size laid in dado/ flooring and risers of steps laid on 3 mm average thick cement based high polymer modified quick-set tile adhesive (water based) conforming to IS:15477,using 5 kg. adhesive per sqm. of tile area, filling the joints with filler to match the colour of tiles, complete as directed by the Engineer-incharge. Tiles shall be laid flush with adjoining surface unless directed other wise	3,631.14	3,02,111.00
403	2.00	Security Cabin - Including Civil Works and all other necessary works Complete in all respect to the satisfaction of Engineer-in Charge.	1,25,000.00	2,50,000.00
404	400.00	Landscape - Supply and Installation of all Softscape (All tpes of Trees, Shrubs, Planters and Lawn wherever specificed) Internal and External near Club House as per approved design. Complete in all respect to the satisfaction of Engineer-in Charge.	3,750.00	15,00,000.00
405	429.00	Providing & fixing white vitreous china Wall hung / Extended Wall hung type European type water closet with C.P. bolts, nuts, C.I. chair or other hanging arrangement, including solid plastic seat and cover with lid, C.P. brass hinge rubber buffers, with accessories,C.I/M.S. brackets painted with two coats of enamel paint of approved shade over a coat of primer. C.P. brass screws and wooden cleats, including cutting and making good the wall and floors wherever required .(Make: Make: Duravit EWC wall hung Cat no:- 253609, Seat cover Cat no:- 6379 Or Equivalant model) .	25,406.00	1,08,99,174.00

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406	1,299.00	Providing & fixing white vitreous china Wall hung / Extended Wall hung type European type water closet with C.P. bolts, nuts, C.I. chair or other hanging arrangement, including solid plastic seat and cover with lid, C.P. brass hinge rubber buffers, with accessories,C.I/M.S. brackets painted with two coats of enamel paint of approved shade over a coat of primer. C.P. brass screws and wooden cleats, including cutting and making good the wall and floors wherever required .(Make: Make: Duravit EWC wall hung Cat no:- 253509, Seat cover Cat no:- 6739 Or Equivalant model) .	21,346.00	2,77,28,454.00
407	744.00	Providing and Fixing Concealed in wall Flushing Cistern ,with all component parts of high quality complete including fixing frame and set f(Make: Cistern Grohe cat no:- 3916500i Or Equivalant model)	8,813.00	65,56,872.00
408	1,433.00	Providing and Fixing push plate all component parts (Make: Push Plate Grohe Cat no:- 38505000 Or Equivalant model)	3,226.00	46,22,858.00
409	651.00	Providing & fixing white vitreous china Floor mounted European type water closet with C.P. bolts, nuts or other hanging arrangement, including solid plastic seat and cover with lid and Flush tank, C.P. brass hinge rubber buffers, with accessories, C.P. brass screws and wooden cleats, including cutting and making good the floors wherever required .(Make: Make: Parryware EWC floor mounted Cat no:- C0297, Seat cover - E-8071, Flush tank - E8055 Or Equivalant model) .	6,842.00	44,54,142.00
410	1,908.00	Supply & fixing health faucet with 1 m long flexible tube and wall hook of (Health faucet Grohe Cat no:- 26352000 Or Equivalant model)	3,135.00	59,81,580.00
411	1,836.00	Supply & fixing Two way bib cock (2 way bib cock Grohe Cat no:- 20281000 Or Equivalant model)	3,707.00	68,06,052.00
412	701.00	Supply & Fixing of 2 in 1 Bibcock cum Health Faucet with 1m long tube and wall hook , Chrome Finish with 7 years warranty	3,487.00	24,44,387.00
413	1,825.00	Supplying & Fixing Indian makeFlat Back Wash Hand Basin1st quality conforming to IS:2556-Part-4:1972 with waste fittings like rubber plug, chain,32 mm nominal size C.P. Fitting with parallel pipe thread conforming to IS:2963-1979 complete with standard CI brackets including wooden block: 660 x 460 mm - with waste fittings like rubber plug, chain (Wash basin DURAVIT cat no:- 374560000 Or Equivalant model)	11,232.00	2,04,98,400.00
414	1,628.00	Supply, Installation Single level wash basin mixer (GROHE - cat no - 32848000 Or Equivalant model)	6,678.00	1,08,71,784.00
415	432.00	Supply, Installation CP Basin Mixer (Jaquar - Model - cat no -MQT-ESS-516A Or Equivalant model)	4,763.00	20,57,616.00
416	446.00	Providing and Fixing Vitreous china Rectangular Wall hung Wash Basin of size 550 x 430 mm with brackets painted, including cutting and making good the walls wherever required .(Wash basin DURAVIT cat no:- 2310550000 Or Equivalant model)	10,820.00	48,25,720.00
417	468.00	Providing and Fixing Corner Wash Basin 315x450x175 mm with brackets painted, including cutting and making good the walls wherever required in other than flats.(Jaquar -ECS-WHT-841 Or Equivalant model)	1,454.00	6,80,472.00
418	183.00	Supplying & Fixing Indian make Flat Back Wash Hand Basin1st quality conforming to IS:2556-Part-4:1972 with waste fittings like rubber plug, chain,32 mm nominal size C.P. Fitting with parallel pipe thread conforming to IS:2963-1979 and fitted with 15 mm nominal bore Chromium Plated Pillar Tap of 1st quality Indian make 400 grams or equivalent complete with standard CI brackets including wooden block: 660 x 460 mm - Single C.P. Pillar cock	2,966.00	5,42,778.00
419	508.00	Providing and Fixing Pillar cock for wall hung wash basin for Dining Area in flats (GROHE - Model-Baucurve OHM Cold water basin - 32809000 Or Equivalant model)	3,135.00	15,92,580.00
420	216.00	Supply & fixing pillar cock with 7 years warranty: Chrome plated	1,962.00	4,23,792.00
421	1,453.00	Providing and Fixing New Tempesta 100 Head Shower with Arm, 3 Sprays for all toilets in flats (GROHE - Cat no - 26088001 Or Equivalant model)	6,178.00	89,76,634.00
422	235.00	Providing and Fixing commissioning approved make Concealed diverter with S/L Part Kit and Bath inlet for all toilets in flats (GROHE - Cat no - 29043000 Or Equivalant model)	8,495.00	19,96,325.00
423	1,639.00	Providing and Fixing commissioning approved make Bath inlet (Spout) for all toilets in flats (GROHE - Cat no - 13255000 Or Equivalant model)	2,771.00	45,41,669.00
424	13,235.00	Supply & fixing Angular stop cocks with wall flange with 7 years warranty: Chrome plated	1,935.00	2,56,09,725.00
425	3,075.00	Supply & Fixing of Bottle Trap Jaquar make, Chrome finish with 7 years warranty for Toilets ,dinning area & Kitchen in Flats	1,850.00	56,88,750.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
426	3,075.00	Supply & fixing Waste coupling 32 mm size full thread with 80 mm heightJaquar make with 7 years warranty: Chrome plated	435.00	13,37,625.00
427	1,959.00	Supply & Fixing of towel rail 24" Jaquar make Continental series, Chrome finish with 7 years warranty	1,759.00	34,45,881.00
428	2,403.00	Supply & Fixing of Towel ring with 7 years warranty: Chrome plated	1,379.00	33,13,737.00
429	1,985.00	Supply & Fixing Double coat hook Jaquar make Continental series, Chrome finish with 7 years warranty	813.00	16,13,805.00
430	3,363.00	Supply & fixing soap dish: with 7 years warranty:Chrome plated	1,820.00	61,20,660.00
431	6,762.00	100mm dia meter - Providing and fixing stainless steel anti cockroach trap of required size with clean out facility and stainless grating of approved make (Nirali or equivalent model) for kitchen /bathroom etc. complete as per as per approval of the engineer-in-charge.	398.00	26,91,276.00
432	78.00	Supplying & Fixing white glazed flat back half stall urinals 1st quality conforming to IS:2556-1995 with standard C.P. Spreader of overall size 95 x 95 x 57 mm conforming to IS:2556-Part6, Sec-6-1974 fixed with screws complete Indian make	3,065.00	2,39,070.00
433	1,985.00	Supply & fixing of toilet paper holder. with 7 years warranty: Chrome plated	1,466.00	29,10,010.00
434	27.00	Supply, Installation and commissioning approved make Grab Bar 300 mm in Flats. Grab Bar-(Jaquar-AHS-CHR-1501 Or Equivalant model)	1,391.00	37,557.00
435	27.00	Supply, Installation and commissioning approved make Grab Bar 450 mm in Flats. Grab Bar-(Jaquar-AHS-CHR-15013 Or Equivalant model)	1,580.00	42,660.00
436	702.00	Supply, Transportation and fixing of storage / Pressure type Vertical / Horizontal 230/250V single phase 2000watts ISI mark 5 Star rated water heater with SS tank and ABS plastic body of 25 Ltrs capacity to withstand up to 6.5 bar of water pressure including all standard accessories and dead weight pressure reducing valve on out let side, including cost of 2 Nos nylon / PVC / Metallic hose pipe, testing and all labour charges etc., complete. Makes: Crompton model No. solarium plus SWH 725, Class 1 rated or its equivalent make of Bajaj / Venus / Racold / Usha / V-Guard / Havells	15,678.00	1,10,05,956.00
437	422.00	Supplying & Fixing SS sink on cantilever brackets with waste fittings like rubber plug, chain,32 mm nominal size C.P. Fitting with parallel pipe thread including labour charges (Nirali Or Equivalant model) Model - Elegance medium (1000mm x 510mm) Satin finish	8,428.00	35,56,616.00
438	408.00	Providing and Fixing central hole C.P. brass Sink mixer with Swinging Casted spout & connecting legs and flanges, including cutting and making good the walls wherever required (Make: Grohe 32667001 T01 or equivalent model)	23,076.00	94,15,008.00
439	2,615.00	Providing and Fixing straight / offset type flexible single body push fit type WC pan connector with factory supplied seal guard with integral Single mould sealing fins made of flexible EVA body, including bush / adaptor for use with C.I. Pipe as supplied with the pan connector (Make: Viega Cat No: 103668 Or Equivalant model of Hindware ,Cera or Parryware).).	1,830.00	47,85,450.00
440	21,373.00	75 mm dia - Supply, laying, fixing and commissioning of Single Socket PVC/SWR pipe - 6 Kg/sq.cm including solvent jointing as per standard practice including all labour charges, transportation,loading and unloading and overhead and contractor profit etc.,complete	280.00	59,84,441.00
441	15,502.00	110 mm dia - Supply, laying, fixing and commissioning of Single Socket PVC/SWR pipe - 6 Kg/sq.cm including solvent jointing as per standard practice including all labour charges, transportation,loading and unloading and overhead and contractor profit etc.,complete	418.00	64,79,836.00
442	18.00	63mm dia Supply, laying, fixing and commissioning of Single Socket PVC/SWR pipe - 6 Kg/sq.cm including solvent jointing as per standard practice including all labour charges, transportation,loading and unloading and overhead and contractor profit etc.,complete	313.85	5,649.00
443	4,156.20	Supplying & fixing PVC Floor trap	240.00	9,97,488.00
444	1,200.06	75 mm dia - Providing, fixing, testing & commissioning of UPVC rain water pipes of 6 kg./cm2 conforming to IS: 4985 including jointing with solvent cement , complete as directed by the Engineer-in-Charge.	280.00	3,36,017.00
445	5,220.05	110 mm dia - Providing, fixing, testing & commissioning of UPVC rain water pipes of 6 kg./cm2 conforming to IS: 4985 including and jointing with solvent cement , complete as directed by the Engineer-in-Charge.	418.00	21,81,980.00
446	1,600.00	160 mm outer dia - Providing, fixing, testing & commissioning of UPVC rain water pipes of 6 kg./cm2 conforming to IS: 4985 including jointing with solvent cement , complete as directed by the Engineer-in-Charge.	789.00	12,62,401.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
447	218.00	75 mm dia - Single pushfit Coupler - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	37.00	8,066.00
448	614.54	110 mm dia - Single pushfit Coupler - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	60.00	36,872.00
449	174.00	160 mm dia - Single pushfit Coupler - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	88.73	15,439.00
450	599.54	90x90x90 mm - Single tee with door - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	113.00	67,748.00
451	599.54	110x110x110 mm - Single tee with door - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	136.00	81,537.00
452	595.54	75 mm dia - Bend 87.5° - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	52.00	30,968.00
453	595.54	110 mm dia - Bend 87.5° - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	87.00	51,812.00
454	592.54	75 mm dia - Shoe Plain - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	489.00	2,89,752.00
455	587.54	110 mm dia - Shoe Plain - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	571.00	3,35,485.00
456	158.00	160 mm dia - Shoe Plain - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	832.00	1,31,456.00
457	281.00	75 mm dia - Bend 'y' - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	78.00	21,918.00
458	209.00	110 mm dia - Bend 'y' - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	143.00	29,887.00
459	240.00	75 mm dia - Bend 45° - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	40.00	9,600.00
460	206.00	110 mm dia - Bend 45° - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	72.00	14,832.00
461	150.00	90 x 75 mm dia - Reducer - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	62.00	9,300.00
462	150.00	110 x 75 mm dia - Reducer - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	113.00	16,950.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
463	150.00	90 x 110mm dia - Reducer - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	136.00	20,400.00
464	150.00	75 mm dia - Single Tee - UPVC/SWR Pipe fittings - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	62.00	9,300.00
465	150.00	90 mm dia - Single Tee - UPVC/SWR Pipe fittings - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	93.00	13,950.00
466	150.00	110 mm dia - Single Tee - UPVC/SWR Pipe fittings - Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.	113.00	16,950.00
467	794.54	75 mm dia - Providing and fixing unplasticised -PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50x50x50 mm hard wood plugs, screwed with M.S. screws of required length, including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse san and making good the wall etc. complete.	296.00	2,35,184.00
468	692.54	110 mm dia - Providing and fixing unplasticised -PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50x50x50 mm hard wood plugs, screwed with M.S. screws of required length, including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse san and making good the wall etc. complete.	297.00	2,05,684.00
469	110.00	160 mm dia - Providing and fixing unplasticised -PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50x50x50 mm hard wood plugs, screwed with M.S. screws of required length, including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse san and making good the wall etc. complete.	432.00	47,520.00
470	1,578.00	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.	44.00	69,432.00
471	626.00	34.90mm OD Pipe - SDR 11 - Supply and Fixing of Premium make CPVC Pipes and Fittings to meet the requirement of ASTM-D 2846 and are produced in CTS (Copper Tube Sizes 1/2" ton 2" Ashirvad Flowgurard SDR11 pipes are made from idential CPVC compounds having the same physical Properties for Hot and Cold Water (IS 15778:2007) including transportation,loading, unloading and overhead and contractor profit etc.,complete	364.00	2,27,864.00
472	1,051.00	41.30mm ODPipe - SDR 11 - Supply and Fixing of Premium make CPVC Pipes and Fittings to meet the requirement of ASTM-D 2846 and are produced in CTS (Copper Tube Sizes 1/2" ton 2" Ashirvad Flowgurard SDR11 pipes are made from idential CPVC compounds having the same physical Properties for Hot and Cold Water (IS 15778:2007) including transportation,loading, unloading and overhead and contractor profit etc.,complete	497.00	5,22,347.00
473	1,115.00	54.00mm ODPipe - SDR 11 - Supply and Fixing of Premium make CPVC Pipes and Fittings to meet the requirement of ASTM-D 2846 and are produced in CTS (Copper Tube Sizes 1/2" ton 2" Ashirvad Flowgurard SDR11 pipes are made from idential CPVC compounds having the same physical Properties for Hot and Cold Water (IS 15778:2007) including transportation,loading, unloading and overhead and contractor profit etc.,complete	681.00	7,59,315.00
474	1,074.00	Making khurras 30x30 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal siz over P.V.C. sheet 1 m x1 m x 400 micron, finished with 12 mm cement plaster 1:3 (1 cement : 3 coarse san and a coat of neat cement, rounding the edges and making and finishing the outlet complete.	216.00	2,31,984.00
475	492.00	Making khurras 45x45 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal siz over P.V.C. sheet 1 m x1 m x 400 micron, finished with 12 mm cement plaster 1:3 (1 cement : 3 coarse san and a coat of neat cement, rounding the edges and making and finishing the outlet complete.	239.00	1,17,588.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
476	80.00	15.90 mm OD Pipe - SDR 11 - Supply and Fixing of Premium make CPVC Pipes and Fittings to meet the requirement of ASTM-D 2846 and are produced in CTS (Copper Tube Sizes 1/2" ton 2" Ashirvad Flowgurard SDR 11 pipes are made from idential CPVC compounds having the same physical Properties for Hot and Cold Water (IS 15778:2007)	190.00	15,200.00
477	15,592.95	22.20 mm OD Pipe - SDR 11 - Supply and Fixing of Premium make CPVC Pipes and Fittings to meet the requirement of ASTM-D 2846 and are produced in CTS (Copper Tube Sizes 1/2" ton 2" Ashirvad Flowgurard SDR 11 pipes are made from idential CPVC compounds having the same physical Properties for Hot and Cold Water (IS 15778:2007)	224.00	34,92,821.00
478	1,481.89	28.60 mm OD Pipe - SDR 11 - Supply and Fixing of Premium make CPVC Pipes and Fittings to meet the requirement of ASTM-D 2846 and are produced in CTS (Copper Tube Sizes 1/2" ton 2" Ashirvad Flowgurard SDR 11 pipes are made from idential CPVC compounds having the same physical Properties for Hot and Cold Water (IS 15778:2007)	278.00	4,11,965.00
479	200.00	34.90mm OD Pipe - SDR 11 - Supply and Fixing of Premium make CPVC Pipes and Fittings to meet the requirement of ASTM-D 2846 and are produced in CTS (Copper Tube Sizes 1/2" ton 2" Ashirvad Flowgurard SDR 11 pipes are made from idential CPVC compounds having the same physical Properties for Hot and Cold Water (IS 15778:2007)	364.00	72,800.00
480	84.00	41.30mm ODPipe - SDR 11 - Supply and Fixing of Premium make CPVC Pipes and Fittings to meet the requirement of ASTM-D 2846 and are produced in CTS (Copper Tube Sizes 1/2" ton 2" Ashirvad Flowgurard SDR 11 pipes are made from idential CPVC compounds having the same physical Properties for Hot and Cold Water (IS 15778:2007)	497.00	41,748.00
481	27.00	54.00mm ODPipe - SDR 11 - Supply and Fixing of Premium make CPVC Pipes and Fittings to meet the requirement of ASTM-D 2846 and are produced in CTS (Copper Tube Sizes 1/2" ton 2" Ashirvad Flowgurard SDR 11 pipes are made from idential CPVC compounds having the same physical Properties for Hot and Cold Water (IS 15778:2007)	681.00	18,387.00
482	18.00	73.03mm ODPipe - SCH 40 WITH SCH 80 FITTINGS	922.34	16,602.00
483	1,109.00	20 mm Nominal Bore - S& F GI pipe Medium Grade properties & weight as per IS 1239 ISI mark with GI fittings including the cost of pipe & its fittings & labour charges complete	325.00	3,60,425.00
484	227.00	25 mm Nominal Bore - S& F GI pipe Medium Grade properties & weight as per IS 1239 ISI mark with GI fittings including the cost of pipe & its fittings & labour charges complete	400.00	90,800.00
485	1,355.00	32 mm Nominal Bore - S& F GI pipe Medium Grade properties & weight as per IS 1239 ISI mark with GI fittings including the cost of pipe & its fittings & labour charges complete	527.00	7,14,085.00
486	1,499.00	40 mm Nominal Bore - S& F GI pipe Medium Grade properties & weight as per IS 1239 ISI mark with GI fittings including the cost of pipe & its fittings & labour charges complete	585.00	8,76,915.00
487	1,343.00	50 mm Nominal Bore - S& F GI pipe Medium Grade properties & weight as per IS 1239 ISI mark with GI fittings including the cost of pipe & its fittings & labour charges complete	674.00	9,05,182.00
488	1,421.00	65 mm dia. nominal bore - Providing and fixing G.I. pipes complete with G.I. fittings and clamps, i/c cutting and making good the walls etc. exposed on wall	1,476.80	20,98,533.00
489	1,220.00	80 mm dia. nominal bore - Providing and fixing G.I. pipes complete with G.I. fittings and clamps, i/c cutting and making good the walls etc. exposed on wall	1,817.60	22,17,474.00
490	533.00	100 mm dia. nominal bore - Providing and fixing G.I. pipes complete with G.I. fittings and clamps, i/c cutting and making good the walls etc. exposed on wall	2,272.00	12,10,976.00
491	269.00	150 mm dia. nominal bore - Providing and fixing G.I. pipes complete with G.I. fittings and clamps, i/c cutting and making good the walls etc. exposed on wall	3,408.00	9,16,752.00
492	2.00	25 to 40 mm nominal bore - Making connection of G.I. Distribution branch with G.I. main of following sizes by providing and fixing tee, including cutting and threading the pipe etc. complete.	729.00	1,458.00
493	353.00	20mm dia. nominal bore - Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :	25.00	8,825.00
494	227.00	25mm dia. nominal bore - Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :	33.00	7,491.00
495	1,355.00	32mm dia. nominal bore - Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :	40.00	54,200.00
496	1,499.00	40mm dia. nominal bore - Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :	46.00	68,954.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
497	1,343.00	50mm dia. nominal bore - Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :	55.00	73,865.00
498	1,421.00	65mm dia. nominal bore - Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :	72.00	1,02,312.00
499	1,220.00	80mm dia. nominal bore - Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :	88.00	1,07,360.00
500	533.00	100mm dia. nominal bore - Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :	110.00	58,630.00
501	269.00	150mm dia. nominal bore - Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :	165.00	44,385.00
502	10.00	S& F GIunion 19.05 mm - G.I. PIPES & FITTINGS(Materials shall be procured from the list of approved Brands/ Manufacturers/ Suppliers) G.I. Union	57.00	570.00
503	14.16	S& F GIunion 25.4 mm - G.I. PIPES & FITTINGS(Materials shall be procured from the list of approved Brands/ Manufacturers/ Suppliers) G.I. Union	87.00	1,232.00
504	14.16	S& F GIunion 31.75 mm - G.I. PIPES & FITTINGS(Materials shall be procured from the list of approved Brands/ Manufacturers/ Suppliers) G.I. Union	107.00	1,515.00
505	14.16	S& F GIunion 38.1 mm - G.I. PIPES & FITTINGS(Materials shall be procured from the list of approved Brands/ Manufacturers/ Suppliers) G.I. Union	129.00	1,827.00
506	14.16	S& F GIunion 50.8 mm - G.I. PIPES & FITTINGS(Materials shall be procured from the list of approved Brands/ Manufacturers/ Suppliers) G.I. Union	161.00	2,280.00
507	58.00	65 mm dia - Supplying, fixing, testing and commissioning of butterfly valve PN 1.6, with Bronze / Gun metal seat duly ISI marked complete with Nuts, Bolts, Washers, gaskets, conforming to IS 13095 of following sizes as required. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/ Zolotto / Intervalve.	3,485.00	2,02,130.00
508	27.00	80 mm dia - Supplying, fixing, testing and commissioning of butterfly valve PN 1.6, with Bronze / Gun metal seat duly ISI marked complete with Nuts, Bolts, Washers, gaskets, conforming to IS 13095 of following sizes as required. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/ Zolotto / Intervalve.	4,288.00	1,15,776.00
509	43.00	100 mm dia - Supplying, fixing, testing and commissioning of butterfly valve PN 1.6, with Bronze / Gun metal seat duly ISI marked complete with Nuts, Bolts, Washers, gaskets, conforming to IS 13095 of following sizes as required. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/ Zolotto / Intervalve.	4,659.00	2,00,338.00
510	33.00	150 mm dia - Supplying, fixing, testing and commissioning of butterfly valve PN 1.6, with Bronze / Gun metal seat duly ISI marked complete with Nuts, Bolts, Washers, gaskets, conforming to IS 13095 of following sizes as required. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/ Zolotto / Intervalve.	6,063.00	2,00,079.00
511	3.00	15 mm NB Size - S & F Gunmetal (GM) Ball valve with SS Ball and SS Spindle as per IS - Class - I, Indian make heavy type - do - labour charges only	1,007.00	3,021.00
512	1,275.00	20 mm NB Size - S & F Gunmetal (GM) Ball valve with SS Ball and SS Spindle as per IS - Class - I, Indian make heavy type - do - labour charges only	1,523.00	19,41,825.00
513	140.00	25mm NB Size - S & F Gunmetal (GM) Ball valve with SS Ball and SS Spindle as per IS - Class - I, Indian make heavy type - do - labour charges only	1,900.00	2,66,000.00
514	48.00	32mm NB Size - S & F Gunmetal (GM) Ball valve with SS Ball and SS Spindle as per IS - Class - I, Indian make heavy type - do - labour charges only	3,699.00	1,77,552.00
515	123.00	40mm NB Size - S & F Gunmetal (GM) Ball valve with SS Ball and SS Spindle as per IS - Class - I, Indian make heavy type - do - labour charges only	5,242.00	6,44,766.00
516	47.00	50mm NB Size - S & F Gunmetal (GM) Ball valve with SS Ball and SS Spindle as per IS - Class - I, Indian make heavy type - do - labour charges only	8,259.00	3,88,173.00
517	9.00	For 15mm Dia - Providing and fixing thermal insulation over hot water pipes in chase having Red Oxide Primer Coat with 6mm thick 'Kaiflex' /Careflex or approved equivalent thermal insulation tubing, a elastomeric flexible material having hermetic blister closed cell structure of expanded synthetic rubber having density of 60-90 Kg/m3 over pipes of following sizes including all required accessories complete as per Manufactuer's specifications and finishing it as per site requirement with Cement Plaster of 1:3 (1 Cement: 3 Coarse sand).	375.00	3,375.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
518	2,636.00	For 20mm Dia - Providing and fixing thermal insulation over hot water pipes in chase having Red Oxide Primer Coat with 6mm thick 'Kaiflex' /Careflex or approved equivalent thermal insulation tubing, a elastomeric flexible material having hermetic blister closed cell structure of expanded synthetic rubber having density of 60-90 Kg/m3 over pipes of following sizes including all required accessories complete as per Manufactuer's specifications and finishing it as per site requirement with Cement Plaster of 1:3 (1 Cement: 3 Coarse sand).	437.50	11,53,252.00
519	41.33	For 25mm Dia - Providing and fixing thermal insulation over hot water pipes in chase having Red Oxide Primer Coat with 6mm thick 'Kaiflex' /Careflex or approved equivalent thermal insulation tubing, a elastomeric flexible material having hermetic blister closed cell structure of expanded synthetic rubber having density of 60-90 Kg/m3 over pipes of following sizes including all required accessories complete as per Manufactuer's specifications and finishing it as per site requirement with Cement Plaster of 1:3 (1 Cement: 3 Coarse sand).	562.50	23,250.00
520	116.00	For 32mm Dia - Providing and fixing thermal insulation over hot water pipes in chase having Red Oxide Primer Coat with 6mm thick 'Kaiflex' /Careflex or approved equivalent thermal insulation tubing, a elastomeric flexible material having hermetic blister closed cell structure of expanded synthetic rubber having density of 60-90 Kg/m3 over pipes of following sizes including all required accessories complete as per Manufactuer's specifications and finishing it as per site requirement with Cement Plaster of 1:3 (1 Cement: 3 Coarse sand).	625.00	72,499.00
521	744.00	For 40mm Dia - Providing and fixing thermal insulation over hot water pipes in chase having Red Oxide Primer Coat with 6mm thick 'Kaiflex' /Careflex or approved equivalent thermal insulation tubing, a elastomeric flexible material having hermetic blister closed cell structure of expanded synthetic rubber having density of 60-90 Kg/m3 over pipes of following sizes including all required accessories complete as per Manufactuer's specifications and finishing it as per site requirement with Cement Plaster of 1:3 (1 Cement: 3 Coarse sand).	781.25	5,81,250.00
522	2.00	32mm dia - Providing and fixing 750 mm long hot dipped G.I. Puddle flanges for water tanks as per I.S. 1239 (Class C) with 6mm thick M.S. Plate of suitable size and welded alround the pipe fixed in walls, beams and top slab of R.C.C tanks, complete with all details in all respects and as per drawing.	1,250.00	2,500.00
523	20.00	40mm dia - Providing and fixing 750 mm long hot dipped G.I. Puddle flanges for water tanks as per I.S. 1239 (Class C) with 6mm thick M.S. Plate of suitable size and welded alround the pipe fixed in walls, beams and top slab of R.C.C tanks, complete with all details in all respects and as per drawing.	1,500.00	30,000.00
524	84.00	50mm dia - Providing and fixing 750 mm long hot dipped G.I. Puddle flanges for water tanks as per I.S. 1239 (Class C) with 6mm thick M.S. Plate of suitable size and welded alround the pipe fixed in walls, beams and top slab of R.C.C tanks, complete with all details in all respects and as per drawing.	1,750.00	1,47,000.00
525	137.00	65 mm dia - Providing and fixing 750 mm long hot dipped G.I. Puddle flanges for water tanks as per I.S. 1239 (Class C) with 6mm thick M.S. Plate of suitable size and welded alround the pipe fixed in walls, beams and top slab of R.C.C tanks, complete with all details in all respects and as per drawing.	2,125.00	2,91,125.00
526	21.00	80mm dia - Providing and fixing 750 mm long hot dipped G.I. Puddle flanges for water tanks as per I.S. 1239 (Class C) with 6mm thick M.S. Plate of suitable size and welded alround the pipe fixed in walls, beams and top slab of R.C.C tanks, complete with all details in all respects and as per drawing.	2,750.00	57,750.00
527	183.00	100mm dia - Providing and fixing 750 mm long hot dipped G.I. Puddle flanges for water tanks as per I.S. 1239 (Class C) with 6mm thick M.S. Plate of suitable size and welded alround the pipe fixed in walls, beams and top slab of R.C.C tanks, complete with all details in all respects and as per drawing.	3,375.00	6,17,625.00
528	21.00	150mm dia - Providing and fixing 750 mm long hot dipped G.I. Puddle flanges for water tanks as per I.S. 1239 (Class C) with 6mm thick M.S. Plate of suitable size and welded alround the pipe fixed in walls, beams and top slab of R.C.C tanks, complete with all details in all respects and as per drawing.	4,500.00	94,500.00
529	18.00	25mm dia - Providing and fixing heavy duty Gunmetal float valve including all required accessories complete in all respect as per direction of the engineer -in-charge .	4,000.00	72,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
530	18.00	32mm dia - Providing and fixing heavy duty Gunmetal float valve including all required accessories complete in all respect as per direction of the engineer -in-charge .	5,625.00	1,01,250.00
531	3.00	40mm dia - Providing and fixing heavy duty Gunmetal float valve including all required accessories complete in all respect as per direction of the engineer -in-charge .	7,031.25	21,094.00
532	3.00	50mm dia - Providing and fixing heavy duty Gunmetal float valve including all required accessories complete in all respect as per direction of the engineer -in-charge .	8,789.06	26,367.00
533	18.00	25 mm dia - Providing and fixing enclosed type water meter (bulk type) conforming to IS : 2373 and tested by Municipal Board complete with bolts, nuts, rubber insertions etc. (The tail pieces if required will be paid separately) :	7,500.00	1,35,000.00
534	18.00	32 mm dia - Providing and fixing enclosed type water meter (bulk type) conforming to IS : 2373 and tested by Municipal Board complete with bolts, nuts, rubber insertions etc. (The tail pieces if required will be paid separately) :	8,125.00	1,46,250.00
535	2.00	40mm dia - Providing and fixing enclosed type water meter (bulk type) conforming to IS : 2373 and tested by Municipal Board complete with bolts, nuts, rubber insertions etc. (The tail pieces if required will be paid separately) :	10,156.25	20,313.00
536	2.00	50mm dia - Providing and fixing enclosed type water meter (bulk type) conforming to IS : 2373 and tested by Municipal Board complete with bolts, nuts, rubber insertions etc. (The tail pieces if required will be paid separately) :	12,695.31	25,391.00
537	1.00	20 mm dia - Providing and fixing bronze pressure reducing valve complete in all respect with pressure setting for inlet 5 to 7 kg/cm2 and for outlet 3 kg/cm2.	23,750.00	23,750.00
538	1.00	25 mm dia - Providing and fixing bronze pressure reducing valve complete in all respect with pressure setting for inlet 5 to 7 kg/cm2 and for outlet 3 kg/cm2.	27,500.00	27,500.00
539	14.00	32 mm dia - Providing and fixing bronze pressure reducing valve complete in all respect with pressure setting for inlet 5 to 7 kg/cm2 and for outlet 3 kg/cm2.	35,200.00	4,92,800.00
540	6.00	40 mm dia - Providing and fixing bronze pressure reducing valve complete in all respect with pressure setting for inlet 5 to 7 kg/cm2 and for outlet 3 kg/cm2.	44,000.00	2,64,000.00
541	87.00	50 mm dia - Providing and fixing bronze pressure reducing valve complete in all respect with pressure setting for inlet 5 to 7 kg/cm2 and for outlet 3 kg/cm2.	50,000.00	43,50,000.00
542	30.00	65 mm dia - Providing and fixing bronze pressure reducing valve complete in all respect with pressure setting for inlet 5 to 7 kg/cm2 and for outlet 3 kg/cm2.	65,000.00	19,50,000.00
543	3.00	Hydropneumatic Booster system for Top Floors at Terrace Level (Domestic Water Supply)Providing, fixing and commissioning suitable complete composite hydropneumatic system consisting of horizontal /vertical multistage centrifugal pump having stainless steel (SS 304) impellers, shaft and housing, with single mechanical seal and pressurised tank of 50 liters capacity, complete with all standard accessories including pressure switch, pressure gauges, non-return & isolating valves on suction and delivery side with nuts, bolts & washer including mild steel flanges, where ever required with 3 mm thick rubber insertion, with necessary protection and operational devices i.e alternate pumping operation and shut-off during dry running conditions etc. with suitable electrical motor to be operated on 210/220 OR 400/440 volt 50 cycle AC supply, suitable for following duty and with total no. of pumps - 2 nos.(1 working+1standby) complete with Control Unit Panel, manifolds & chassis, as per the approval of Project-in-charge complete with base frame, nuts, bolts and washer, necessary RCC foundation as per requirement.No. of Pumps/Set : 2 (1 Working + 1 Stand by)Capacity : app. 150 lpm per pumpHead : app. 20-25 m	3,43,754.00	10,31,262.00
544	3.00	Pressure Tank 200 Liters 10 Bar	9,967.00	29,901.00
545	24.00	1 No. 100mm dia puddle flange outlet pipe - Supplying, fixing & testing inlet, outlet & pipes & fittings to storm water sump with steps & CI frame and cover as shown on the drawings etc., complete with accessories comprising of the following. Approximate depth. - 3.0 M	34,540.00	8,28,960.00
546	52.00	Width of the drain = 450 mm - Supplying and installing MS fabricated ramp drain grating at entrance where ever indicated using 50mm nominal bore,MS pipes at 105mm C/C and 8mm thick MS flats welded together and placed on MS angles of size 65mm x 65mm x 6mm as enumerated in the drawings, the quoted rates shall include for painting two coats of enamel paint over a coat of primer etc.,complete.	10,368.75	5,39,175.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
547	114.00	600mm x 600mm (clear internal dimension) - Construction of Catch Basin with 230mm best quality approved Table Moulded bricks in CM 1:4 over a bed of 100mm thick PCC 1:4:8, internal walls plastered in CM 1:3 and external wall with CM 1:6 with sponge finish. Supplying and fixing RCC perforated square frame & cover of size 600 x 600mm (Medium duty), PVC steps in position . The quoted rate shall also include necessary excavation and internal size of the chamber 600 x 600mm maximum depth not exceeding 1200mm.	22,936.00	26,14,704.00
548	7,101.00	200 mm dia - Supplying, installing, testing and commissioning of R.C.C NP2 class Hume pipe laid to the required level and grade with collars joining in CM 1:3 and filling the excavated trench with approved quality quarry dust on sides, bottom and top surface of pipe with all leads and lifts, making necessary connections as required etc.,complete.	1,387.00	98,49,087.00
549	213.50	25 mm dia - Supplying, installing, testing and commissioning of approved make uPVC schedule 40 pipes and schedule 80 fittings conforming to ASTM D-1785. Quoted rate shall include necessary fittings like, bends, elbows, reducers, collars, flanges, saddles, adapters, etc., with necessary drilling holes, chasing walls and making the same good in cement mortar 1:1 restore the same original condition neatly as directed by the Engineer in-charge and also including primer and solvent for joints. The Shaft piping to be supported with MS brackets with " U " Bolts and Nuts and Ceiling Piping with 8 mm GI threaded rod with Anchor Fastener with GI nuts and washers and supported with " U " clamps.	314.00	67,039.00
550	1,644.00	32 mm dia - Supplying, installing, testing and commissioning of approved make uPVC schedule 40 pipes and schedule 80 fittings conforming to ASTM D-1785. Quoted rate shall include necessary fittings like, bends, elbows, reducers, collars, flanges, saddles, adapters, etc., with necessary drilling holes, chasing walls and making the same good	376.00	6,18,144.00
551	194.00	40 mm dia - Supplying, installing, testing and commissioning of approved make uPVC schedule 40 pipes and schedule 80 fittings conforming to ASTM D-1785. Quoted rate shall include necessary fittings like, bends, elbows, reducers, collars, flanges, saddles, adapters, etc., with necessary drilling holes, chasing walls and making the same good	415.00	80,510.00
552	5,002.00	50 mm dia - Supplying, installing, testing and commissioning of approved make uPVC schedule 40 pipes and schedule 80 fittings conforming to ASTM D-1785. Quoted rate shall include necessary fittings like, bends, elbows, reducers, collars, flanges, saddles, adapters, etc., with necessary drilling holes, chasing walls and making the same good	500.00	25,01,000.00
553	4,879.00	65 mm dia - Supplying, installing, testing and commissioning of approved make uPVC schedule 40 pipes and schedule 80 fittings conforming to ASTM D-1785. Quoted rate shall include necessary fittings like, bends, elbows, reducers, collars, flanges, saddles, adapters, etc., with necessary drilling holes, chasing walls and making the same good	709.00	34,59,211.00
554	880.00	32 mm dia - Supplying, installing, fixing, jointing, testing and commissioning of approved make Chlorinated Polyvinyl Chloride pipes (CPVC) up to 50mm dia SDR.11, ASTM CTS, and above 50mm dia CPVC schedule 40 ASTM IPS. Fittings up to 50mm dia SDR.11. The fittings and specials such as tees, elbows, couplers, bends, enlargers etc.,with CPVC brass threaded combination / transition specials such as male adapters brass threaded female adapters, brass FPT Tee, Brass FPT elbow etc., where connection with metal is to be made including necessary drilling holes, chasing walls and making the same good in cement martor 1:1 restore the same original condition neatly as directed by the Engineer in-charge. Joints to be made with CPVC solvent cement up to 50mm dia as per ASTM D-2846 and above 50mm dia primer P-70, and solvent confirming to ASTM F - 4931 / 724.	365.00	3,21,200.00
555	2,198.00	40 mm dia - Supplying, installing, fixing, jointing, testing and commissioning of approved make Chlorinated Polyvinyl Chloride pipes (CPVC) up to 50mm dia SDR.11, ASTM CTS, and above 50mm dia CPVC schedule 40 ASTM IPS. Fittings up to 50mm dia SDR.11. The fittings and specials such as tees, elbows, couplers, bends, enlargers etc.,with CPVC brass threaded combination / transition specials such as male adapters brass threaded female adapters, brass FPT Tee, Brass FPT elbow etc., where connection with metal is to be made including necessary drilling holes, chasing walls and making the same good in cement martor 1:1 restore the same original condition neatly as directed by the Engineer in-charge. Joints to be made with CPVC solvent cement up to 50mm dia as per ASTM D-2846 and above 50mm dia primer P-70, and solvent confirming to ASTM F - 4931 / 724.	863.00	18,96,874.00

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556	44.00	50 mm dia - Supplying, installing, fixing, jointing, testing and commissioning of approved make Chlorinated Polyvinyl Chloride pipes (CPVC) up to 50mm dia SDR.11, ASTM CTS, and above 50mm dia CPVC schedule 40 ASTM IPS. Fittings up to 50mm dia SDR.11. The fittings and specials such as tees, elbows, couplers, bends, enlargers etc.,with CPVC brass threaded combination / transition specials such as male adapters brass threaded female adapters, brass FPT Tee, Brass FPT elbow etc., where connection with metal is to be made including necessary drilling holes, chasing walls and making the same good in cement martor 1:1 restore the same original condition neately as directed by the Engineer in-charge. Joints to be made with CPVC solvent cement up to 50mm dia as per ASTM D-2846 and above 50mm dia primer P-70, and solvent confirming to ASTM F - 4931 / 724.	1,545.00	67,980.00
557	3,816.00	65 mm dia - Supplying, installing, fixing, jointing, testing and commissioning of approved make Chlorinated Polyvinyl Chloride pipes (CPVC) up to 50mm dia SDR.11, ASTM CTS, and above 50mm dia CPVC schedule 40 ASTM IPS. Fittings up to 50mm dia SDR.11. The fittings and specials such as tees, elbows, couplers, bends, enlargers etc.,with CPVC brass threaded combination / transition specials such as male adapters brass threaded female adapters, brass FPT Tee, Brass FPT elbow etc., where connection with metal is to be made including necessary drilling holes, chasing walls and making the same good in cement martor 1:1 restore the same original condition neately as directed by the Engineer in-charge. Joints to be made with CPVC solvent cement up to 50mm dia as per ASTM D-2846 and above 50mm dia primer P-70, and solvent confirming to ASTM F - 4931 / 724.	2,008.50	76,64,436.00
558	4,750.00	80 mm dia - Supplying, installing, fixing, jointing, testing and commissioning of approved make Chlorinated Polyvinyl Chloride pipes (CPVC) up to 50mm dia SDR.11, ASTM CTS, and above 50mm dia CPVC schedule 40 ASTM IPS. Fittings up to 50mm dia SDR.11. The fittings and specials such as tees, elbows, couplers, bends, enlargers etc.,with CPVC brass threaded combination / transition specials such as male adapters brass threaded female adapters, brass FPT Tee, Brass FPT elbow etc., where connection with metal is to be made including necessary drilling holes, chasing walls and making the same good in cement martor 1:1 restore the same original condition neately as directed by the Engineer in-charge. Joints to be made with CPVC solvent cement up to 50mm dia as per ASTM D-2846 and above 50mm dia primer P-70, and solvent confirming to ASTM F - 4931 / 724.	2,472.00	1,17,42,000.00
559	65.00	50 mm dia - Supplying, installing, testing and commissioning CI butterfly valves with standard lever confirming to IS standard 13039 with necessary flanges, nuts and bolts etc., complete.	3,514.00	2,28,410.00
560	65.00	50 mm dia - Supplying and fixing in position approved make GM non-return valve conforming to IS 778 with necessary fittings etc., complete.	6,070.00	3,94,550.00
561	32.00	50 mm dia - Supplying, installing, testing and commissioning CI body Water Meter confirming to IS 2373 with necessary flanges, nuts and bolts etc., complete.	9,186.25	2,93,960.00
562	32.00	65 mm dia - Supplying, installing, testing and commissioning CI body Water Meter confirming to IS 2373 with necessary flanges, nuts and bolts etc., complete.	9,792.50	3,13,360.00
563	8.00	100 mm dia - Supplying, installing, testing and commissioning CI body Water Meter confirming to IS 2373 with necessary flanges, nuts and bolts etc., complete.	40,123.75	3,20,990.00
564	7.00	100 mm dia - Supplying and fixing in position approved make Y - strainer with necessary fittings conforming to IS standards etc., complete.	18,959.00	1,32,713.00
565	8.00	Supplying, fixing & testing in position of Hot deep Galvanise C class pipe puddle flanges fabricated of 750 mm long pipe pieces to R.C.C. water tanks wall / slab. The entire fitting shall be hot dipped galvanised (Flanges shall confirm to BS10 Table E) .	1,85,381.25	14,83,050.00
566	24.00	a) CI manhole frame and cover (Medium duty) with locking facility	8,322.50	1,99,740.00
567	200.00	100 mm dia - Supplying, installing, testing & commissioning of approved make medium quality (Class B') GI pipes and fittings confirming to IS1239 PI & II, Malleable Specials such as tees, elbows, checknuts, unions, flanges, nipples, etc including cutting, threading, fixing in/on walls, ceiling, under floor etc.,as per drawing. The quoted rate shall include for necessary excavation in any type of soil and back filling, chasing the walls, making bore in walls etc.,and making good the chased surfaces and bores in cement mortar etc.complete. (Municipal water supply)	2,513.00	5,02,600.00
568	432.00	100 mm dia - Supplying & wrapping the concealed and buried GI pipes with approved protective PVC tape with 50% overlap etc., complete	400.00	1,72,800.00

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569	200.00	100 mm dia - Supplying and painting two coats of enamel paint over a coat of each primer to the exposed GI pipes of approved make and colour etc.,complete.	113.75	22,750.00
570	12.00	100mm nominal dia - Supplying, installing, testing and commissioning of approved make cast brass body water meter with necessary unions for fixing on the inlet main as shown on the drawing, etc., complete with water meter chamber of 800 x 800mm with cover etc., complete.(of approved makes - both analog / digital)(Municipal & Borewell inlet line)	59,156.25	7,09,875.00
571	12.00	Supplying, fixing and testing of approved make 100 mm dia inlet SS float operated CI ball valve for the municipal inlet to the Fire water tank.	7,160.40	85,925.00
572	12.00	Supplying, installing and testing of 100mm dia tanker inlet connection system near the raw water storage tank. This includes 100 dia standpost, non return valve, Butterfly Valve & instantaneous brass coupler, etc.,complete	18,008.75	2,16,105.00
573	4.00	Providing, installing, testing and commissioning of approved make Microprocessor based automatic industrial electronic liquid level controller with SS 316 plastic moulded sensor which includes timer for Sequential operation of Main & Standby pump. - WATER LEVEL CONTROLLER	69,285.00	2,77,140.00
574	4.00	Providing, installing, testing and commissioning of approved make percentage digital water level indicator for sumps.	28,601.25	1,14,405.00
575	276.00	Excavation in all sorts of soil for laying RCC hume pipes upto 600mm dia (internal) including forming bottom surface to required level refilling selected excavated earth around the pipe in layers of 150mm thick watering consolidating and disposing off the surplus earth with in the site or as directed by the site Engineer with in a lead of 300m etc., complete.	176.94	48,835.00
576	2,050.00	250 mm dia - Supplying, installing, testing and commissioning of R.C.C NP2 class Hume pipe laid to the required level and grade with collars joining in CM 1:3 and filling the excavated trench with approved quality quarry dust on sides, bottom and top surface of pipe with all leads and lifts, making necessary connections as required etc.,complete.	1,644.00	33,70,200.00
577	1,800.00	300 mm dia - Supplying, installing, testing and commissioning of R.C.C NP2 class Hume pipe laid to the required level and grade with collars joining in CM 1:3 and filling the excavated trench with approved quality quarry dust on sides, bottom and top surface of pipe with all leads and lifts, making necessary connections as required etc.,complete.	2,253.00	40,55,400.00
578	700.00	450 mm dia - Supplying, installing, testing and commissioning of R.C.C NP2 class Hume pipe laid to the required level and grade with collars joining in CM 1:3 and filling the excavated trench with approved quality quarry dust on sides, bottom and top surface of pipe with all leads and lifts, making necessary connections as required etc.,complete.	3,039.00	21,27,300.00
579	9.00	Providing & constructing rain water deep recharge well of 1350mm dia upto 25M depth as per the details given in the drawing. The quoted rate shall include pre-cast RCC rings, top cover RCC etc., complete (Tank Size 5m X 2.5m X 3.5m. Depth of the borehole will be upto 60m)	2,59,533.75	23,35,804.00
580	92.00	Construction of catch basin of 1200mm x 900mm size and depth 1200mm to 2500mm for external storm water drainage with 230mm thick walls in well burnt table moulded bricks in CM 1:4 over a bed of 100 mm thick PCC 1:4:8 internal walls plastered smooth in CM 1:3 and external walls plastered in1:6 with sponge finish. Fixing precast RCC grating of size 600 x 600mm on top surface flushed to the finished floor level with necessary excavation, back filling the selected excavated earth with all leads and lifts etc., complete. The quoted rate shall include 110dia PVC pipe sleeves from road GSM to the chamber as shown in the drawings. RCC grating : Southern concrete Industries a) 1200mm x 900mm (clear internal dimension)	59,110.00	54,38,120.00
581	80.00	Construction of man hole with best quality, approved table moulded bricks in CM 1:6, 500mm dia @ top and 1200mm dia. @ bottom over a bed of 250mm thick PCC 1:4:8, walls plastered smooth inside in CM 1:3 and outside with CM 1:6 with sponge finish benching and channelling in PCC 1:3:6 supplying & fixing PVC steps as per drawing for maintenance. The manhole shall be provided with heavy duty RCC frame & cover. Circular 550 mm dia. Clear opening etc., complete. The quoted rate shall also include for necessary pvc steps, excavation, refilling, disposing off surplus earth with in a lead of 300M etc., complete. Depth upto 3.5 Mtrs. Manhole cover/pvc steps : Southern concrete Industries.	45,551.25	36,44,100.00
582	20.00	Supply & Installation of Cattle Trap - 1000mm wide as per drawing & Specificatio to complete the work	22,775.00	4,55,500.00
583	155.00	PRM pipe from basement sump, 50mm dia	436.25	67,619.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
584	35.00	Supply & Installation of RCC Hume Pipe - 100mm dia	1,033.00	36,155.00
585	300.00	Supply & Installation of Landscape Pipe for Free flow - 110mm dia	540.00	1,62,000.00
586	220.00	Supply & Installation of Landscape Pipe - 40mm dia	400.00	88,000.00
587	2.00	PUMPS AND EQUIPMENTS (Hydropneumatic Pumping System With Variable Frequency Drive) for Cluster A onlySupply, Installation, Testing and Commissioning of compact packaged type skid mounted, self contained variable frequency drive hydropneumatic system complete as per directions of the engineer-in-charge & as per following specification:-(i) In- line vertical multistage centrifugal clear water pump set with SS-304 casing, SS-304 impeller with SS-316/SS431 shaft ,CI base with CED coating complete directly coupled with TEFC induction motor of class "F" insulation & efficiency class IE-2, 2900rpm, suitable for opertion on 415 Volts ±10%, 3 phase, 50 Hz A.C. supply complete. (ii) The entire system shall be mounted on a common base frame i/c common suction and common delivery of MS Ced coating pipe headers with flanges, interconnecting piping with all required Conrol Valves, Non-return valves, pressure guage with isolation cock etc. and all requried accessories.(iii) Pressure vessel of non corrosive MS composite construction lined with NSF and/or FDA listed material, like high density polyethylene with fully replaceable polyurethane. Air cell burst pressure of minimum of 3 times the vessel operating pressure and prototype cycle tested for 80,000 cycles with charging connections to dischage pipe line with necessary flanges, gaskets, isolating valve, nuts/ bolts etc. with suitable foundation boits & other accessories, complete.(iv) Panel mounted microprocessor multi pump contoller with large graphical display and Flying variable frequency drive (VFD) mounted inside a panel complete with pressure sensor transmitter. The graphical display capable to show number of pumps running & also communicate with other controllers following with open protocol through RS485 port. System should be capable to compensate for frictional losses at lower flows. All alarms should be displayed in the controller. The panel should also have provision for manual / automatic alternate (cyclic) operation of pumps, ON/OFF switch, complete.(v) Necessary foundationing bolts, vibration elimination pads and other accessories complete as required.Duty of each pump suitable for:-DOMESTIC WATER SUPPLY PUMPNo. of Pumps : 3nos. (2 W + 1 S)Capacity : 300 LPMHead : 80 MetersAir Vessel :100 ltr tankNote:-1 set consists of 3 nos. of pumps (2Working + 1Standby)	12,40,500.00	24,81,000.00
588	2.00	ELECTRICAL SYSTEMFor WTP Pump RoomDesign, manufacture, supply, installation, testing and commissioning of the Plumbing panel, front operated, cubicle construction, Floor mounted type, fabricated out of 16 swg thick CRCA Sheet, Compartmentalized with hinged lockable doors, dust and vermin proof, Powder coated of approved shade, Cable alley, inter-connections, having Switch gear and accessories mounting, internal wiring, earth terminals, Top/ Bottom cable entry, numberings etc. suitable for operation of 415 volts, 3 phase, 50 Hz, AC Supply with enclosure protection class IP 54 complete as required and as specified with the following:INCOMER - Each Incomer shall consit of :250 Amps,Four pole, 11 KA MCCB with rotary handle on door. Voltmeter (0-500 Volts) with selector Switch & protected by MCB's.Ammeter (0-300 Amps) with selector Switch &CT's etc.Set of (R,Y,B) LED phase and ON & OFF indication Lamps.BUSBAR1 Set 11KV, 300 Amps Three Phase busbars of aluminium with Rear cable termination.OUT GOING FOR :-Domestic Water Supply hydropneumatic pumps set 100 Amps. TP with nuetral link MCCB (Motor Duty) 1.1 KA with rotary handle on door suitable for 12.5 HP and for Connection to Built up Hydro Panel.---1No.Flushing Water Supply hydropneumatic pumps set 25 Amps. TP with nuetral link MCCB (Motor Duty) 1.1 KA with rotary handle on door suitable for 7 HP and for Connection to Built up Hydro Panel.---1No.GARDEN HYDRANT PUMP 2(1w+1s) pumpsPump feeder shall consit of :Suitable rating MPCB with DOL Starter for outgoing feeder of 5 HP. Each Compartment shall contain Auto/Manual Selector Switch and Indicating Lamp for ON/TRIP Status of Motor---4 NosAmmeter (0-100 Amps) with selector Switch & CT's etc.Set of ON / OFF LED indication Lamps protected by MCB. For Drainage Sump Pumps Plant Room area Pump feeder shall consit of :32 Amps. TP MCCB 25 KA with rotary handle on door suitable for Connection to Built up Panel.--1NoAmmeter (0-100 Amps) with selector Switch & CT's etc.Set of ON / OFF LED indication Lamps protected by MCB.NOTE:-1. All MCCB shall have 100% Ics =Icu 2.Panel shall be provided with NO-NC Potential free contact for BMS compliance.Complete Set as mentioned above	11,40,500.00	22,81,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
589	2.00	Pump motor controller cum water level indicating panel at WTP Plant RoomSupply, installation, testing and commissioning of Centralised PLC control panel front operated, cubicle construction, wall mounted type, fabricated out of 1.6 mm thick CRCA Sheet, with hinged lockable doors, dust and vermin proof, powder coated of approved shade, inter-connections, having, internal wiring, earth terminals, Top / Bottom control cable entry, numberings etc.comprises of touch-screen display board (Min.Diag. size 8") along with all accessories for complete Programmable logical controls & indications,having necessary interlocks, Inputs/Outputs, required number of repeater amplifiers, all audio-visual alarms as per the requirements listed below i/c emergency stop push button on the panel etc. The panel shall have BMS compatible Modbus protocol complete as required and as specified.Water level indicators and controllers :The hydrostatic pressure sensor (Water level indicator) is working on hydrostatic pressure measurement principle made of Stainless Steel for installation in storage tanks, and capable of providnig 4 to 20 mA analog signal compatible with PLC signal inputs and all control outputs to MCC panel (Plumbing/Water supply),complete as per working requirements for equipment detailed below. A) Fire Static Underground tanks- 2 No.Real-Time water level indication monitoringLow Level audio-visual alarm at less than 30% total capacity. B) Domestic Water Underground tanks- 2 No.Real-Time water level indication monitoringLow Level audio-visual alarm at less than 30% total capacity.High Level audio-visual alarm at more than 100% total capacity.Auto cut-out of raw water pumps at 100% C) Flushing Water Underground tanks- 2 No.Real-Time water level indication monitoringLow Level audio-visual alarm at less than 30% total capacity.High Level audio-visual alarm at more than 100% total capacity.Auto cut-out of domestic water hydronuematic pumps at 100% Complete Set as mentioned above	4,80,500.00	9,61,000.00
590	120.00	Supply, laying, dressing, testing & commissioning of 2 Core 1.5Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	169.40	20,328.00
591	100.00	Supply, laying, dressing, testing & commissioning of 3 Core 2.5Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	199.50	19,950.00
592	120.00	Supply, laying, dressing, testing & commissioning of 3 Core 4.0Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	263.10	31,572.00
593	100.00	Supply, laying, dressing, testing & commissioning of 3 Core 6.0Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	340.40	34,040.00
594	100.00	Supply, laying, dressing, testing & commissioning of 3 Core 10.0Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	416.50	41,650.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
595	80.00	Supply, laying, dressing, testing & commissioning of 3 Core 16.0Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	571.00	45,680.00
596	4.00	Providing independent earthing for Important equipment with 40mm dia 'B' class 2.5m long G.I pipe and 19mm dia 'B' class G.I pipe of 0.3mtr. long connected with reducer providing G.I funnel with mesh enclosed in C.C.Chamber of 400m x 400m x 400mm with R.C.C. Slab cover duly providing staggered holes filling with salt and charcoal from the bottom of the pipe giving earth connection from electrode through G.I strip of 25 x 6mm x 200mm length with all accessories and labour charges complete, as per IS specifications 732/1982 (Part II)	10,928.00	43,712.00
597	2.00	50 mm dia nominal bore - Providing and fixing enclosed type water meter (bulk type) conforming to IS : 2373 and tested by Municipal Board complete with bolts, nuts, rubber insertions etc. (The tail pieces if required will be paid separately) :	3,000.00	6,000.00
598	2.00	150 mm dia nominal bore - Providing and fixing enclosed type water meter (bulk type) conforming to IS : 2373 and tested by Municipal Board complete with bolts, nuts, rubber insertions etc. (The tail pieces if required will be paid separately) :	8,179.26	16,359.00
599	12.00	Supply and fixing of Class A insulation having 2mm thickness upto 3.3KV PVC synthetic elastomer electrically insulated mat conforming to IS: 15652-2006 complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make.	5,224.00	62,688.00
600	2.00	SUBMERSIBLE SUMP PUMPS FOR LIFTING DRAINAGEPlant room Drainage Sump PumpProviding and fixing compact monoblock dry motor submersible pumps of suitable rating, with non-clog free flow open impeller, solid handling capacity of upto at least 28mm suitable for operation on 415 volts +10% , 3 Phase, 50Hz, A.C supply, speed 2900 RPM including oil chamber, guide wire for lifting & lowering of pump, M.S. galvanized lifting chain, complete. The pump sets shall be supplied with required accessories & as per specification with the following : (a) Complete piping 80 mm dia common delivery upto 7.5 m in heavy Duty Class 'C' G.I. -- 1 Set (b) 65mm dia Butterfly valve.-- 2 Nos (c) 65 mm dia Flap type Non-return valve.-- 2 Nos (d) Necessary cables from pump set to control panel (position of panel marked on enclosed drawings).- 1 Set (e) Electrical control panel having all necessary accessories & safety devices of standard specifications and suitable for receiving incommer cable from main plumbing panel to conncet sump pump panel complete as required. (Panels with sump pumps near each sump as per site conditions). --1 No. Each set consist of 2 nos.of pumps - 1 working & 1 stand by (Complete set as above with 2 nos. pumps including cost for valves, piping, Control Panel and Cabling, Level Controllers etc as required and as specified) 2.The entire system alongwith pumps & control panel must be sourced from single manufacturer only for unit responsibility. Discharge - 250 LPM EachTotal head - 15 Meters (minimum)	5,50,500.00	11,01,000.00
601	20.00	50mm dia - Provding and fixing heavy duty G.I. pipe (For Suction & Delivery of pumps and equipment) confiming to IS. 1239 upto 150 mm and IS 3589 for dia 200 mm and above with reducers, tees, flanges, elbow, crosses, union etc. and fixing the pipes on wall / ceiling / beam / floor including Clamping/Supporting the same, including painting with 2 coats of synthetic enamel paint as per the site requirement and shall be duly painted with two coats of approved quality synthetic enamel paint & shade over a readymix primer coat complete as required & as per directions of the engineer-in-charge for the following sizes:	1,136.00	22,720.00
602	190.00	80mm dia - Provding and fixing heavy duty G.I. pipe (For Suction & Delivery of pumps and equipment) confiming to IS. 1239 upto 150 mm and IS 3589 for dia 200 mm and above with reducers, tees, flanges, elbow, crosses, union etc. and fixing the pipes on wall / ceiling / beam / floor including Clamping/Supporting the same, including painting with 2 coats of synthetic enamel paint as per the site requirement and shall be duly painted with two coats of approved quality synthetic enamel paint & shade over a readymix primer coat complete as required & as per directions of the engineer-in-charge for the following sizes:	1,817.60	3,45,344.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
603	180.00	100mm dia - Provding and fixing heavy duty G.I. pipe (For Suction & Delivery of pumps and equipment) confiming to IS. 1239 upto 150 mm and IS 3589 for dia 200 mm and above with reducers, tees, flanges, elbow, crosses, union etc. and fixing the pipes on wall / ceiling / beam / floor including Clamping/Supporting the same, including painting with 2 coats of synthetic enamel paint as per the site requirement and shall be duly painted with two coats of approved quality synthetic enamel paint & shade over a readymix primer coat complete as required & as per directions of the engineer-in-charge for the following sizes:	2,272.00	4,08,960.00
604	218.50	150mm dia - Provding and fixing heavy duty G.I. pipe (For Suction & Delivery of pumps and equipment) confiming to IS. 1239 upto 150 mm and IS 3589 for dia 200 mm and above with reducers, tees, flanges, elbow, crosses, union etc. and fixing the pipes on wall / ceiling / beam / floor including Clamping/Supporting the same, including painting with 2 coats of synthetic enamel paint as per the site requirement and shall be duly painted with two coats of approved quality synthetic enamel paint & shade over a readymix primer coat complete as required & as per directions of the engineer-in-charge for the following sizes:	3,408.00	7,44,648.00
605	212.50	200mm dia - Provding and fixing heavy duty G.I. pipe (For Suction & Delivery of pumps and equipment) confiming to IS. 1239 upto 150 mm and IS 3589 for dia 200 mm and above with reducers, tees, flanges, elbow, crosses, union etc. and fixing the pipes on wall / ceiling / beam / floor including Clamping/Supporting the same, including painting with 2 coats of synthetic enamel paint as per the site requirement and shall be duly painted with two coats of approved quality synthetic enamel paint & shade over a readymix primer coat complete as required & as per directions of the engineer-in-charge for the following sizes:	4,544.00	9,65,600.00
606	4.00	50mm dia - Providing and fixing reinforced neoprene rubber vibration eliminators/expansion joints (to provide relief from stresses at pipe flanges) suitable for upto 20 kg/cm2 pressure, as per specification of the manufacturers complete as required and as specified complete as per directions of the engineer-in-charge.	3,360.00	13,440.00
607	4.00	65mm dia - Providing and fixing reinforced neoprene rubber vibration eliminators/expansion joints (to provide relief from stresses at pipe flanges) suitable for upto 20 kg/cm2 pressure, as per specification of the manufacturers complete as required and as specified complete as per directions of the engineer-in-charge.	5,160.00	20,640.00
608	16.00	80mm dia - Providing and fixing reinforced neoprene rubber vibration eliminators/expansion joints (to provide relief from stresses at pipe flanges) suitable for upto 20 kg/cm2 pressure, as per specification of the manufacturers complete as required and as specified complete as per directions of the engineer-in-charge.	6,600.00	1,05,600.00
609	16.00	100mm dia - Providing and fixing reinforced neoprene rubber vibration eliminators/expansion joints (to provide relief from stresses at pipe flanges) suitable for upto 20 kg/cm2 pressure, as per specification of the manufacturers complete as required and as specified complete as per directions of the engineer-in-charge.	7,800.00	1,24,800.00
610	4.00	150mm dia - Providing and fixing reinforced neoprene rubber vibration eliminators/expansion joints (to provide relief from stresses at pipe flanges) suitable for upto 20 kg/cm2 pressure, as per specification of the manufacturers complete as required and as specified complete as per directions of the engineer-in-charge.	11,040.00	44,160.00
611	10.00	150 mm dia - Providing & fixing of Stainless Steel double flange suction " Y" type strainer fabricated out of minimum 1.2 mm thick Stainless Steel sheet with 3 mm dia. perforation holes including nuts, bolts and 3 mm thick rubber insertion complete & tested to 16 Kg/Sq.cm pressure complete as required and as specified complete as per directions of the engineer-in-charge.	12,636.00	1,26,360.00
612	4.00	65mm dia - Providing and fixing C.I butterfly valve, class PN 1.6 as per I.S:13095 or BS:5155, including necessary nuts, bolts, gaskets / flanges etc., complete as required and specified by the engineer-in-charge.	3,565.20	14,261.00
613	22.00	80mm dia - Providing and fixing C.I butterfly valve, class PN 1.6 as per I.S:13095 or BS:5155, including necessary nuts, bolts, gaskets / flanges etc., complete as required and specified by the engineer-in-charge.	3,962.40	87,173.00
614	74.00	100mm dia - Providing and fixing C.I butterfly valve, class PN 1.6 as per I.S:13095 or BS:5155, including necessary nuts, bolts, gaskets / flanges etc., complete as required and specified by the engineer-in-charge.	5,622.00	4,16,028.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
615	10.00	150mm dia - Providing and fixing C.I butterfly valve, class PN 1.6 as per I.S:13095 or BS:5155, including necessary nuts, bolts, gaskets / flanges etc., complete as required and specified by the engineer-in-charge.	7,096.80	70,968.00
616	4.00	50mm dia - Providing and fixing forged brass ball valve having stainless steel / brass ball tested to 20 kg/cm2 complete as required and as specified complete as per directions of the engineer-in-charge.	2,520.00	10,080.00
617	4.00	50 mm nominal bore - Providing & fixing C.I horizontal/vertical type non return valve (dual plate) conforming to IS:5312 with C.I. body, SS Disc, SS stem, EPDM seal, complete with companion flanges, bolts, nuts, washers & inserted rubber gasket complete as required to I.S:5312, Part-I, dual plate type, class PN 1.6.	5,400.00	21,600.00
618	16.00	80mm nominal bore - Providing & fixing C.I horizontal/vertical type non return valve (dual plate) conforming to IS:5312 with C.I. body, SS Disc, SS stem, EPDM seal, complete with companion flanges, bolts, nuts, washers & inserted rubber gasket complete as required to I.S:5312, Part-I, dual plate type, class PN 1.6.	6,000.00	96,000.00
619	4.00	200 mm dia - Providing and fixing 750 mm long hot dipped G.I. Puddle flanges for water tanks as per I.S. 1239 (Class C) with 6mm thick M.S. Plate of suitable size and welded alround the pipe fixed in walls, beams and top slab of R.C.C tanks, complete with all details in all respects and as per drawing.	6,000.00	24,000.00
620	16.00	150mm dia - Providing and fixing 750 mm long hot dipped G.I. Puddle flanges for water tanks as per I.S. 1239 (Class C) with 6mm thick M.S. Plate of suitable size and welded alround the pipe fixed in walls, beams and top slab of R.C.C tanks, complete with all details in all respects and as per drawing.	4,500.00	72,000.00
621	78.00	100mm dia - Providing and fixing 750 mm long hot dipped G.I. Puddle flanges for water tanks as per I.S. 1239 (Class C) with 6mm thick M.S. Plate of suitable size and welded alround the pipe fixed in walls, beams and top slab of R.C.C tanks, complete with all details in all respects and as per drawing.	3,375.00	2,63,250.00
622	600.00	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mmx25mm and over all minimum length 263 mm and width as 165mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) complete as per design.	409.88	2,45,928.00
623	12.00	100mm dia - Providing and fixing insect-proof coupling to vent pipes of overhead tank with threaded or flanged joints, including G.I. flanges, nuts, bolts, 3mm thick rubber insertions complete.	1,740.00	20,880.00
624	2,000.00	Providing and Fixiing extra heavy duty, water tight double sealed Ductile iron Circular Manhole cover and frames specially casted for placing over the UG Water tanks with lifting and locking arrangements as per approved sample, complete in all respect including fixing in PCC as per site Requirement .	180.00	3,60,000.00
625	1,000.00	Providing & fixing M.S. structural work fabricated from standard section e.g. M.S Flat Strips, Round Bars, angles, channels, plates etc.. including cutting to size, drilling, welding, fixing either by welding to insert plates in RCC structural members including cutting and making good the walls, ceilings and floors or by dash fasteners. (As per the Instructions of the Project-in-Charge)	169.92	1,69,922.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
626	1.00	STP (Civil works will be paid in the respective items) Designing, Preparation of Shop Drawings, Supplying, Erection, Testing, Commissioning, handing over, operation & maintenance up to succesfull commissioning including getting approval of successful test results from approved Government pollution & environmental authorities, for 300 KLD Sewage Treatment Plant based on MBBR technology for cluster 6 (MLA&MLC) complete in all respects on a Turnkey Basis, as per Tender Document comprising Preamble, Technical Conditions, Technical Specifications, Data, Drawings, Annexures- I & II, Design Basis Report and any other documents attached with this Tender. (Any item not specifically mentioned in these sections but required for the successful completion including handing over, shall be included in the Quote by the Contractor.) Turnkey Cost for Designing, Supply, Installation, testing & Commissioning handing over, operation & maintenance upto successful commissioning, including purchase and usage of chemical / consumables for operation and maintenance of all Mechanical & Electrical Equipment, Piping, Valves & Accessories for the Complete Turnkey Sewage Treatment Plant as per approved Hydraulic Calculations, Design and Shop Drawings, as per details given in (but not restricted to) Annexures II. Electromechanical EquipmentsEqualization Tank Sewage Pumps: The pump sets shall be supplied with required accessories, valves, fittings, cables etc. & as per specification. Air Blower: Air Blowers of twin-lobe type (air cooled) for continuous service with construction in cast iron casing, supply complete with testing and commissioning etc.as specified and as required.Air Diffusers: Membrane diffusers in EPDM / High Grade Silicon material (Coarse & Fine Bubble as per requirements) with connections to air piping by threaded means, of tube/disc type as required as per process requirements complete with testing and commissioning etc.as specified and as required Sludge Return / Relift Pump: Centrifugal Sludge Return / Re-lift pumps for the transfer of sludge from secondary clarifier complete in all respects and as per specifications.Agitator for Anoxic tankSludge Loading/Disposal Pump: Screw Type Sludge loading / Disposal pump, complete in all respects and as per specifications. Filter Feed Pumps: In-line vertical multistage centrifugal clear water pump set of approved make, complete in all respects and as per specifications.Hydropneumatic Pumping System With Variable Frequency Drive: Supply, Installation, Testing and Commissioning of compact packaged type skid mounted, self contained variable frequency drive hydropneumatic system complete as required & as per specifications.(i) Flushing Water Supply pumps(ii) Horticulture Water supply PumpsPressure Sand Filter: Providing and fixing vertical Dual Media Pressure Filter with suitable foundation boits & other accessories, mounting frame, complete with testing and commissioning etc.as required & as specified.Activated Carbon Filter: Providing and Fixing of Activated carbon filter as per Manufacturer's standard and testing & commissioning complete.Dosing System for CCT and Anoxic tank: Providing and fixing chemical dozing system of approved make with all standard accessories & structural arrangement including suitable foundation bolts & other accessories etc. complete as required and as specified.Drainage Sump Pumps: Providing and fixing compact dry motor submersible pumps of suitable rating. The pump sets shall be supplied with required accessories & as per specifications with all accessories and control system.Sludge Handling Mechanism (Centrifuge): Providing and fixing of sludge handling arrangement (Centrifuge bowl type) complete with testing & commissioning as required and as specified.UV for Supply to Flushing/Garden Line: Providing and installation of Online UV system complete with testing & commissioning as required and as specified.Sludge Trolley: Fabrication and supply of sludge trolley for transport of sludge complete as per requirements as specified.MBBR Bio-Media complete as per specifications.Tubesettler Media complete as per specifications. Bar Screens: Providing and fixing manually cleaned Bar Screens, to remove coarse and fine material in the water made up of FRP/SS complete as required and as specified, consisting of coarse screen & fine screen.PIPING AND VALVES ACCESSORIESG.I. Pipe: Provding and fixing heavy duty G.I. pipe confiming to IS. 1239 upto 150 mm and IS 3589 for dia 200 mm and above complete as required & as per specifications.uPVC Threaded Water Pipes: Providing and fixing uPVC threaded water pipes (I.S:4985-2000) Class - 3 (Min. 6 Kg/cm2) complete as required & as per specifications.Butterfly Valves: Providing & fixing butterfly valve of rating PN 25, wafer type, in cast iron body with Ductile Iron disc, EPDM seal, SS single piece shaft, conforming to IS-13095,	85,00,000.00	85,00,000.00
627	1.00	STP (Civil works will be paid in the respective items) Designing, Preparation of Shop Drawings, Supplying, Erection, Testing, Commissioning, handing over, operation & maintenance up to succesfull commissioning including getting approval of successful test results from approved Government pollution & environmental authorities, for 150 KLD Sewage Treatment Plant based on MBBR technology for (AIS) complete in all respects on a Turnkey Basis, as per Tender Document comprising Preamble, Technical Conditions, Technical Specifications, Data, Drawings, Annexures- I & II, Design Basis Report and any other documents attached with this Tender. (Any item not specifically mentioned in these sections but required for the successful completion including handing over, shall be included in the Quote by the Contractor.) Turnkey Cost for Designing, Supply, Installation, testing & Commissioning handing over, operation & maintenance upto successful commissioning, including purchase and usage of chemical / consumables for operation and maintenance of all Mechanical & Electrical Equipment, Piping, Valves & Accessories for the Complete Turnkey Sewage Treatment Plant as per approved Hydraulic Calculations, Design and Shop Drawings, as per details given in (but not restricted to) Annexures II. Electromechanical EquipmentsEqualization Tank Sewage Pumps: The pump sets shall be supplied with required accessories, valves, fittings, cables etc. & as per specification. Air Blower: Air Blowers of twin-lobe type (air cooled) for continuous service with construction in cast iron casing, supply complete with testing and commissioning etc.as specified and as required.Air Diffusers: Membrane diffusers in EPDM / High Grade Silicon material (Coarse & Fine Bubble as per requirements) with connections to air piping by threaded means, of tube/disc type as required as per process requirements complete with testing and commissioning etc.as specified and as required Sludge Return / Relift Pump: Centrifugal Sludge Return / Re-lift pumps for the transfer of sludge from secondary clarifier complete in all respects and as per specifications.Agitator for Anoxic tankSludge Loading/Disposal Pump: Screw Type Sludge loading / Disposal pump, complete in all respects and as per specifications. Filter Feed Pumps: In-line vertical multistage centrifugal clear water pump set of approved make, complete in all respects and as per specifications.Hydropneumatic Pumping System With Variable Frequency Drive: Supply, Installation, Testing and Commissioning of compact packaged type skid mounted, self contained variable frequency drive hydropneumatic system complete as required & as per specifications.(i) Flushing Water Supply pumps(ii) Horticulture Water supply PumpsPressure Sand Filter: Providing and fixing vertical Dual Media Pressure Filter with suitable foundation boits & other accessories, mounting frame, complete with testing and commissioning etc.as required & as specified.Activated Carbon Filter: Providing and Fixing of Activated carbon filter as per Manufacturer's standard and testing & commissioning complete.Dosing System for CCT and Anoxic tank: Providing and fixing chemical dozing system of approved make with all standard accessories & structural arrangement including suitable foundation bolts & other accessories etc. complete as required and as specified.Drainage Sump Pumps: Providing and fixing compact dry motor submersible pumps of suitable rating. The pump sets shall be supplied with required accessories & as per specifications with all accessories and control system.Sludge Handling Mechanism (Centrifuge): Providing and fixing of sludge handling arrangement (Centrifuge bowl type) complete with testing & commissioning as required and as specified.UV for Supply to Flushing/Garden Line: Providing and installation of Online UV system complete with testing & commissioning as required and as specified.Sludge Trolley: Fabrication and supply of sludge trolley for transport of sludge complete as per requirements as specified.MBBR Bio-Media complete as per specifications.Tubesettler Media complete as per specifications. Bar Screens: Providing and fixing manually cleaned Bar Screens, to remove coarse and fine material in the water made up of FRP/SS complete as required and as specified, consisting of coarse screen & fine screen.PIPING AND VALVES ACCESSORIESG.I. Pipe: Provding and fixing heavy duty G.I. pipe confiming to IS. 1239 upto 150 mm and IS 3589 for dia 200 mm and above complete as required & as per specifications.uPVC Threaded Water Pipes: Providing and fixing uPVC threaded water pipes (I.S:4985-2000) Class - 3 (Min. 6 Kg/cm2) complete as required & as per specifications.Butterfly Valves: Providing & fixing butterfly valve of rating PN 25, wafer type, in cast iron body with Ductile Iron disc, EPDM seal, SS single piece shaft, conforming to IS-13095, complete as	55,00,000.00	55,00,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
628	6.00	Supply, Installation, Testing and Commissioning of Indoor floor mounted metal clad, 33 KV 800A VCB Panel with 1 Nos. VCBs suitable for 50Hz 3-phase system, suitable for 26.3 to 31.5kA/3sec short circuit withstand capacity & 26.3-31.5kA/1sec Internal Arc capacity . Switchgear Panel enclosure of sheet steel (preferably Aluzinc), dust tight, vermin proof, totally enclosed cubicle floor mounting, free standing type with single break, horizontally drawout type breaker with trip free mechanism as per latest standard i.e. IS/IEC 62271-200 as amended up to date and as per Technical specifications, IP4X for VCB Panel & IP55 with Type tested enclosure. Switchgear Panel shall be electrically & mechanically interlocked as per IEC 62271-1, full voltage insulated copper Busbar with heat shrinkable sleeving, complete with suitable metering & protection devices, breaker featured with mechanical ON-OFF indicator with hand trip device and all accessories such as shunt trip coil, motorized & manually operated spring charging mechanism, emergency trip push buttons, auxiliary switch of 2NO + 2NC, interconnections, space heaters, panel earthing etc. and equipped with following switchgear and accessories including connection suitable for 3x400sqmm XLPE 33kV cable (cable entry from bottom) to be connected through heat shrinkable jointing material etc as required and as directed by Engineer In Charge/departmental authorities as per detailed technical specifications and approved make.All Bi-Directional multifunction meters true rms value sensing type with RS485 ports for communication in Modbus; power / energy meters (of accuracy class 0.2) for down loading data to PC. supply voltage monitoring relay for monitoring and control incoming 33KV supply with trip & alarm contacts with adjustable high & low value limits for voltage & frequency complete with suitable port for downloading historical data to PC. All VCBs with communicable protection relays with ports wired out and with 4NO + 4NC integral aux. contact plus cradle aux. contact wired out for monitoring of each type of fault trip, OPEN / CLOSE / CRADLE POSITION & relay trip settings from PC. All VCBs complete with T/N/C switches, lamp indications, shunt trip healthy check lamps, trfo. fault annunciators & hooter etc. each VCB panel comprising the following: ICOG- Nos. 800 Amp. VCB. 26.3 to 31.5KA, 3 No. dual core CTs of approved rating of 7.5VA burden max and accuracy Class 0.2 or as per the arrived load demand & selected transformer rating as directed by Engineer-InCharge for metering and class 5P10 for protection, 3 No. Cast Resin 33000V/v3/110V/v3/110V/v3 PT Class 0.2/3P accuracy and 30VA burden max with and protection fuses / MCB. 1 No. Digital voltmeter with selector switch, 1 No. Digital Ammeter with selector switch, 1 No. Microprocessor based numerical relays with O/L, E/F and S/C protection with Integrated Arc sensing feature alongwith trip/lockout / antipumping / aux. relays.1 No. Bi Directional multi function meter, Set of MCBs for Panel AC/DC, Set of MCBs for Main AC/DC,Set of Indication lamps LED types,TNC Switch, L-R Switch, Pushbuttons for ON-OFF,1 set of Mechanical & Electrical interlocking set Incomer Surge Protection Device (SPD) required, 1 set of earthing trunck,1 trolley for each 4 VCB as a Complementary,1 No. DC self power pack suitable for 3 trips with 110V output, complete etc for control circuit. Makes:ABB/Schneider/Seimens/Kirlos kar/Amara Raja/Megawin/L&T or as directed by Eingineer In Charge and as per aproved make. Note: The contractor or OEM is completely held responsible for replacing of spares or any required consumables during defects liability period for a period of 2 years from the date of handing over to client as detailed in technical specifications..33 KV HT PANEL (In addition to the above requirement the panel should be as per detailed technical specifications / Andhra Pradesh Central Power Distribution Company Limited). Makes:ABB/Schneider/Seimens/Kirlos kar/Amara Raja/Megawin/L&T	11,93,412.00	71,60,472.00
629	3.00	Supply, Installation, Testing and Commissioning of Indoor type floor mounted metal clad, 33 KV 800A VCB Panel with 7 Nos. VCBs (2-I/C, 4-O/G, 1-B/C) suitable for 50Hz 3-phase system, suitable for 26.3-31.5kA/3sec short circuit withstand capacity & 26.3-31.5kA/1sec Internal Arc capacity. Switchgear Panel enclosure of sheet steel (preferably Aluzinc), dust tight, vermin proof, totally enclosed cubicle floor mounting, free standing type with single break, horizontally drawout type breaker with trip free mechanism as per latest standard i.e. IS/IEC 62271-200 as amended up to date and as per Technical specifications, IP4X for VCB Panel & IP55 with Type tested enclosure. Switchgear Panel shall be electrically & mechanically interlocked as per IEC 62271-1, full voltage insulated copper Busbar with heat shrinkable sleeving, complete with suitable metering & protection devices, breaker featured with mechanical ON-OFF indicator with hand trip device and all accessories such as shunt trip coil, motorized & manually operated spring charging mechanism, emergency trip push buttons, auxiliary switch of 2NO + 2NC, interconnections, space heaters, panel earthing etc. and equipped with following switchgear and accessories including connection suitable for 3x400sqmm XLPE 33kV cable (cable entry from bottom) to be connected through heat shrinkable jointing material etc as required and as directed by Engineer In Charge/departmental authorities as per detailed technical specifications and approved make.All Bi Directional multifunction meters true rms value sensing type with RS485 ports for communication in Modbus; power / energy meters (of accuracy class 0.2) for down loading data to PC. supply voltage monitoring relay for monitoring and control incoming 33KV supply with trip & alarm contacts with adjustable high & low value limits for voltage & frequency complete with suitable port for downloading historical data to PC. All VCBs with communicable protection relays with ports wired out and with 4NO + 4NC integral aux. contact plus cradle aux. contact wired out for monitoring of each type of fault trip, OPEN / CLOSE / CRADLE POSITION & relay trip settings from PC. All VCBs complete with T/N/C switches, lamp indications, shunt trip healthy check lamps, trfo. fault annunciators & hooter etc. each VCB panel comprising the following: Incomer- 2 Nos. 800 Amp. VCB. 26.3 to 31.5KA, Outgoings- 4 Nos. 800 Amp. VCB. 26.3 to 31.5KA, 1 Bus Coupler VCB 26.3 to 31.5kA, 3 No. dual core CTs of approved rating of 7.5VA burden max and accuracy Class 0.2 or as per the arrived load demand & selected transformer rating as directed by Engineer-InCharge for metering and class 5P10 for protection, 3 No. Cast Resin 33000V/v3/110V/v3/110V/v3 PT Class 0.2/3P accuracy and 30VA burden max with and protection fuses / MCB. 1 No. Digital voltmeter with selector switch, 1 No. Digital Ammeter with selector switch, 1 No. Microprocessor based numerical relays with O/L, E/F and S/C protection with Integrated Arc sensing feature alongwith trip/lockout / antipumping / aux. relays.1 No. Bi Directional Multi-function meter, Set of MCBs for Panel AC/DC, Set of MCBs for Main AC/DC,Set of Indication lamps LED types,TNC Switch, L-R Switch, Pushbuttons for ON-OFF,1 set of Mechanical & Electrical interlocking set Incomer Surge Protection Device (SPD) required, 1 set of earthing trunk,1 trolley for 4 VCB's as a Complementary,1 No. DC self power pack suitable for 3 trips with 110V output, complete etc for control circuit. as directed by Eingineer In Charge and as per aproved make.Note: The contractor or OEM is completely held responsible for replacing of spares or any required consumables during defects liability period for a period of 2 years from the date of handing over to client as detailed in technical specifications. . 33 KV 7M PANEL (EB SIDE) HT PANEL (In addition to the above requirement the panel should be as per detailed technical specifications / Andhra Pradesh Central Power Distribution Company Limited). Makes:ABB/Schneider/Seimens/Kirlos kar/Amara Raja/Megawin/L&T	83,53,884.00	2,50,61,652.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
630	6.00	Supply, installation, testing and commissioning of floor mounted, dust, damp and vermin proof, cubicle, H. T. Metering Panel made out of 2 mm thick CRCA sheet steel complete with electronic trivector meter, CT?s of 50/25/5+5 amp, 0.2S class 15 VA Burden or as per the arrived load demand & selected transformer rating as directed by Engineer-InCharge, and PT?s of 33 KV / v3 , 110 V / v3 , 50 VA, conforming to relevant IS standard and complete as required and as directed by Engineer In Charge/departmental authorities as per detailed technical specifications and approved make. CT?s, PT?s and trivector meter shall be got tested and approved from local electricity supply authority.The GA drawing also shall be got approved from State authorities before fabrication.The unit shall have provision for sealing and Acrylic window shall be provided to facilitate meter reading. Supply of HT Meter Mounting Box as required as per APCPDCL Dept Norms with sealing arrangement, box sizing, window, TB, to accomidate HT Meter as per APCPDCL norms and HT meter specification, CT and PT ratio etc shall also be as per APCPDCL standards and requirements.33 KV APCPDCL /APSEB Metering Cubicle - Outdoor Type (In addition to the above requirement the panel should be as per detailed technical specifications / Andhra Pradesh Central Power Distribution Company Limited).	5,50,000.00	33,00,000.00
631	3.00	Supply, Installation, Testing and Commissioning of 110V- 200AH MF VRLA battery bank consisting of 2V-200AH-55nos with complete acessories as per enclosed specificaitons. TYPE OF BATTERY : 110V/200AH VRLA BATTERY OF 55 CELLS. Battery rack of suitable size with requried no of stackings to fit for 55 nos battery cells made of MS HRCA sheet duly painted with approved colour as per OEM .All cell connectors are made up of lead coated copper bus bar and batteries shall be interconnected with requried copper cabling of required size and lugs, all the connectors shall be suitable to withstand up to current rating of 150A as per technical specifications and as directed by engineer in charge .Makes for battery: Exide/Racket/Quanta/Amaraja	2,82,134.00	8,46,402.00
632	3.00	Supply, Installation, Testing and Commissioning of 110V-50Amps Float Cum Boost Charger-FCBC suitable for 110V/200AH VRLA Battery of 55 cells comprising of the follwoing specifications: FULL WAVE FULL CONTROLLED Input- Three phase Input : 415V AC ±10% (Three Phase, Three/Four Wire), Frequency : 50Hz ± 5% OUTPUT: Output Currents : 50A DC, Ripple : 2% RMS (Without Battery connected), Efficiency : > 80% Float Voltage: 123.75V DC (2.25VPC x 55 Cells) Boost Voltage: 126.5V DC (2.3VPC x 55 Cells) Load Voltage (DC Voltage that is applied on the Load): 123.75V DC when Charger operates in Float Mode 126.5V DC when Charger operates in Boost Mode Voltage regulation: (FLOAT /BOOST/AUTO) Load variation : 10-100% Line variation : ± 10% Frequency Variations : ± 5% Temperature Variations : 0 ºC to +50 ºC Battery charger shall be provided with suitable indications lamps for FLOAT ON, BOOST ON, CHARGER ON, MAINS ON, CHARGER OVER VOLTAGE, CHARGER UNDER VOLTAGE, BATTERY FUSE FAIL, SCR FUSE FAIL, LOAD UNDER VOLTAGE, LOAD OVER VOLTAGE Shall have LDC display for all techical parameters to show , requried alarm with buzzer shall be provided, potetnial free contacts, necessary protection devices, controls & switches (DCDB of required nos as per site conditions and specs/SLD) etc with suitable IP raitng 42, operating temperature -5 deg C to 50 deg C, Noise level <70 dB etc as per technical specifications for finished job work and as directed by Engineer In-Charge with DCDB . Make: Amaraja/Green Secure Energy	2,38,480.00	7,15,440.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
633	1,350.00	Supply,Transportation, Installation, testing and commissioning of 3C X 400 Sq.mm. (E) XLPE HT cable insulated IS:7098/II FRLS H.T.cable for working voltage 33 K.V.Earthed with Stranded Compacted Circular Aluminium Conductor Screened with Extruded Semiconducting compound, XLPE Insulated Screened with extruded semi-conducting compound in combination with Copper Tape, cores laid up, inner sheath of Thermoplastic tape, galvanised flat steel strip armoured and overall Extruded PVC Type ST- 2 Outer Sheathed cable with cable route markers to be provided for every 20 mtrs complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. Make: Torrent / Universal / Havells / KEI /Polycab/Gloster/RR Kabel/RPG	4,816.00	65,01,600.00
634	48.00	Supply,Transportation, installation, testing and commissioning of 3C X 400 Sq.mm. (E) XLPE HT cable heat shrinkable type indoor terminations/joint kit of approved make suitable for XLPE insulated 33 KV cable, with required components, prepration of cable ends, testing complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. Make: Raychem /M seal/ Denson/ Multy/ TransealHongshang	23,096.00	11,08,608.00
635	6.00	Supply,Transportation, installation, testing and commissioning of 3C X 400 Sq.mm. (E) XLPE HT cable heat shrinkable type outdoor terminations/joint kit of approved make suitable for XLPE insulated 33 KV cable, with required components, prepration of cable ends, testing complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. Make: Raychem /M seal/ Denson/ Multy/ TransealHongshang	32,479.00	1,94,874.00
636	108.00	Supply, installation, testing and commissioning of 1600 Amp, up to 80 kA breaking capacity (100% Neutral busbar) sandwich busduct system made of CRCA sheet/Hot Galvanized steel encloser of thickness not less than 1.5mm having degree of protection of IP 55/IP 65 indoor/Outdoor as per site requirement and as per IEC/EN 61439-6, PVC/Plastic insulated reinforced with glass fibre four strip ALUMINIUM busbar in convenient sections including end cover units suitable for 415 volts 3 phase, 4 wire, 50 Hz A.C. system etc., with necessary joints, fire barrier at each floor, provision of tapping at each floor/every meter, continuous earthing with 2 no of aluminum strip of suitable size (one on each side) including GI clamping brackets, angle iron brackets, steel fasteners, connecting to earth system as required . Makes: Legrand (Zucchini) Lauritz Knudsen (Formerly L&T)/ Schneider/C&S/Advance-Anant.	28,228.00	30,48,624.00
637	27.00	Supply and fixing of 1600 Amps Horizontal / Vertical bends for sandwich Bus Duct including all accessories & Supporting structure as complete as required and as per technical specifications and as directed by engineer in charge. Makes: Legrand (Zucchini) Lauritz Knudsen (Formerly L&T)/ Schneider/C&S/Advance-Anant.	24,802.00	6,69,654.00
638	18.00	Supply and fixing of 1600 Amps Copper Flexibles for three phases and neutral for Air Insulated / sandwich Busduct etc as complete as required and as per technical specifications and as directed by engineer in charge.. Makes: Legrand (Zucchini) Lauritz Knudsen (Formerly L&T)/ Schneider/C&S/Advance-Anant.	52,704.00	9,48,672.00
639	18.00	Supply, installation, testing and commissioning of 1000 Amp, up to 50 kA breaking capacity (100% Neutral busbar) sandwich busduct system made of CRCA sheet/Hot Galvanized steel encloser of thickness not less than 1.5mm having degree of protection of IP 55/IP 65 indoor/Outdoor as per site requirement and as per IEC/EN 61439-6, PVC/Plastic insulated reinforced with glass fibre four strip ALUMINIUM busbar in convenient sections including end cover units suitable for 415 volts 3 phase, 4 wire, 50 Hz A.C. system etc., with necessary joints, fire barrier at each floor, provision of tapping at each floor/every meter, continuous earthing with 2 no of aluminum strip of suitable size (one on each side including GI clamping brackets, angle iron brackets, steel fasteners, connecting to earth system as required. Makes: Legrand (Zucchini) Lauritz Knudsen (Formerly L&T)/ Schneider/C&S/Advance-Anant.	21,538.00	3,87,684.00
640	6.00	Supply and fixing of 1000 Amps Horizontal / Vertical bends for sandwich Bus Duct including all accessories & Supporting structure as complete as required and as per technical specifications and as directed by engineer in charge.. Makes: Legrand (Zucchini) Lauritz Knudsen (Formerly L&T)/ Schneider/C&S/Advance-Anant.	20,070.09	1,20,421.00
641	6.00	Supply and fixing of 1000 Amps Copper Flexibles for three phases and neutral for Air Insulated / sandwich Busduct etc as complete as required and as per technical specifications and as directed by engineer in charge.. Makes: Legrand (Zucchini) Lauritz Knudsen (Formerly L&T)/ Schneider/C&S/Advance-Anant.	46,176.54	2,77,059.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
642	990.00	Supply, installation, testing and commissioning of 800 Amp, up to 80 kA breaking capacity (100% Neutral busbar) sandwich busduct system made of CRCA sheet/Hot Galvanized steel encloser of thickness not less than 1.5mm having degree of protection of IP 55/IP 65 indoor/Outdoor as per site requirement and as per IEC/EN 61439-6, PVC/Plastic insulated reinforced with glass fibre four strip ALUMINIUM busbar in convenient sections including end cover units suitable for 415 volts 3 phase, 4 wire, 50 Hz A.C. system etc., with necessary joints, fire barrier at each floor, provision of tapping at each floor/every meter, continuous earthing with 2 no of aluminum strip of suitable size (one on each side0 including GI clamping brackets, angle iron brackets, steel fasteners, connecting to earth system as required and as per technical specifications and as directed by engineer in charge. .Makes: Legrand (Zucchini) Lauritz Knudsen (Formerly L&T)/ Schneider/C&S/Advance-Anant.	19,580.00	1,93,84,200.00
643	216.00	Supply, Erection, Testing and Commisioning of 100A FP 10KA Ics MCCB Tap off Boxes for tapping supply from vertical rising mains (for GF to 12th floor) with necessary accessories and as per technical specifications and as directed by engineer in charge..Makes: Legrand (Zucchini) Lauritz Knudsen (Formerly L&T)/ Schneider/C&S/Advance-Anant.	16,000.00	34,56,000.00
644	18.00	Supply and fixing of Flange end for 800 Amps for sandwich bus ducts and as per technical specifications and as directed by engineer in charge.. Makes: Legrand (Zucchini) Lauritz Knudsen (Formerly L&T)/ Schneider/ C&S/ Advance-Anant.	29,533.00	5,31,594.00
645	18.00	Supply and fixing of 800 Amps Copper Flexibles for three phases and neutral for Air Insulated / sandwich Busduct etc as complete as required and as per technical specifications and as directed by engineer in charge. Makes: Legrand (Zucchini) Lauritz Knudsen (Formerly L&T)/ Schneider/C&S/Advance-Anant.	43,893.00	7,90,074.00
646	9.00	Supply, Transportation, Installation, Testing and Commissioning of copper wound Transformers 1000kVA, 33/0.433 KV, 3ph, 50 Hz, DYN 11, ONAN type , Standard accessories, winding temperature rise of 45°C/40°C first fill oil, having permissible total loss values as per the latest amendment no.4 of BIS in march 2021 (as per latest) for 33 KV as per energy efficiency level - 2 at basic Insulation level conforming to IS-2026 (Part- I to Part - II), latest amended and IS 1180 Part-I described as above with Cable box on HV side and Bus duct on LV Side , ON load Tap changer(OLTC) with RTCC etc., with initial filling of oil as per IS 335 complete required for successful commissioning of Transformer and as per technical specifications and as directed by engineer in charge..Makes: Esennar/ Voltamp/ Kirloskar/ CG /ABB /Alstom /Siemens/Schneider	35,90,828.08	3,23,17,453.00
647	6.00	Supply Installation Testing And commissioning of 625kVA CPCB IV+ DG Set complete with 1500 RPM Diesel Engine of suitable BHP & AC Brush less Alternator mounted on a common base Frame & coupled through a flexible coupling or close coupled. Alternator 1. 1500 RPM, 1P or 3P, Brushless type, screen protected, revolving field, Self-excited alternator conforming to IS/IEC 60034-1 IP23, with standard Alternator Protection (over voltage, over speed & Under voltage) 2. A reliable long life with superior class 'H' insulation with temperature rise to Class H Diesel Engine: Engine: Engine should comprise of Silencer, Electronic governor from >25 KVA & above, suitable rating battery , Battery charging alternator, battery charger , Inbuilt Fuel tank with fuel pipe, AVM pads , Control panel with 3P MCCB of suitable rating with short circuit protections (25kA,36kA, 50kA) with microprocessor based controller indicating genset parameters (i.e. volt, amps, KWH, KVAR, Hrs etc.), The diesel engine shall be capable of providing 10% overload for 1 Hr for every 11 Hrs of continuous running at full load. The DG set shall be supplied as per OEM specifications and shall be tested at site along with below. 1. CRDI Engine >25 KVA DG set 2. Water cooled Radiator coupled to engine 3. Dry type air cleaner with service indicator 4. First fill of lube oil, Coolant & first fill of Diesel 5. Electrical starter motor with soft start System 6. Battery charging alternator 7. Remote Monitor system >58.5 KVA & Above 8. 2 years / 5000 Hrs Warranty from commissioning or 30-month form supply inclduing AMC & requried consumables from the date of handing over to client for a period of 24 months. 9. Emission control system - EGR & (DOC, SCR for >75 KVA DG set) 10.10 Mtrs Exhaust pipe from Silencer Genset Controller: 1. Microprocessor based genset monitoring, metering and control system with full graphics LCD display for easy front panel access. 2. AMF relay, manual and remote start / stop modes for 1-ph & 3-ph gensets 3. Backlit and full graphics display with power saving feature 4. Engine parameter monitoring -Lube oil pressure, Engine coolant temperature, Fuel level, Battery voltage, Engine running hours 5. AC Alternator parameter monitoring -Voltage L-N & L_L, Current, kW, kVA (Phase & Total), Frequency, kWH, PF 6. Genset Protection: Engine: Low lube oil pressure, High coolant temperature, Battery High/Low Volts, Fail to Start, Sensor failure, Low fuel level, Overspeed AC Alternator: Over/Under Voltage, Over/Under, Frequency, Loss of AC sensing, Over frequency, Over Current, kW Overload, Unbalancing load 7. Maintenance notification based on Engine Run Hour & due date 8.Communication: USB port, RS485, CAN 9.30-50 Event logs Acoustic Enclosure: 1. Specially designed to meet stringent MOEF/CPCB IV+ norms 2. Weatherproof, powder coated Acoustic enclosure for DG set for sound attenuation fabricated from 1.2 mm / 1.6 mm CRCA sheet steel (structure) with side wall fabricated from 1.2mm /1.6 mm CRCA sheet and filled with PU Foam/Rockwood for Fire retardant acoustic and for better safety 3. Designed to operate in extreme climatic conditions in temperatures ranging from -10 deg to 55 deg without any external aid 4. Fabricated base frame with AVM pads. 5. Noise level is less than 75 db (A) at a distance of 1 Mtrs as per CPCB norms, complete in all respect and as directed by Engineer in Charge: Engine Makes:Caterpillar/Perkins/Cummins/Greaves/KOEL Alternator Make:Leroy somer/Crompton Greaves/Stamford	74,16,955.00	4,45,01,730.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
648	108.00	Supply & installation of CLASS B MS PIPE 8" (200 mm) dia. (considering right angle bends, horizontal & vertical runs), include Thermal Insulation with Rock/Glass Wool with Aluminum cladding (Density -96 Kg/m3 thickness -50mm) for Exhaust pipe complete finished item of work and as directed by Engineer in Charge.Makes: Tata/Jindal/JSW	5,908.00	6,38,064.00
649	72.00	Supply & installation of CLASS B MS PIPE 6" (150 mm) dia. (considering right angle bends, horizontal & vertical runs), include Thermal Insulation with Rock/Glass Wool with Aluminum cladding (Density -96 Kg/m3 thickness -50mm) for Exhaust pipe complete finished item of work and as directed by Engineer in Charge. Makes: Tata/Jindal/JSW	4,525.00	3,25,800.00
650	3,000.00	Supply, fabrication and installation of supports for Residential silencer/ exhaust pipe, etc., made out of MS channels/angles including cutting, welding and fabrication to the required size and painting with one coats of primer and two coats of enamel paint complete etc as required and as directed by Engineer In Charge/departmental authorities as per detailed technical specifications and approved make. Makes: Tata/Jindal/JSW	93.00	2,79,000.00
651	6.00	Supply, Installation, testing & commissioning of 990 ltr day tank made out of 2 mm thick MS sheet complete etc as required and as directed by Engineer In Charge/departmental authorities as per detailed technical specifications and approved make.Makes: Tata/Jindal/JSW	2,50,000.00	15,00,000.00
652	3.00	Preparation of drawings & documents & Liaisoning Panel approval from CEIG/CPCB & all other required approvals from local district/state authorities other necessary for complete installation of 2 nos-625kVA DG sets and 3 nos - 1000kVA Transformers as required.	3,00,000.00	9,00,000.00
653	300.00	Supply, Installation, testing & commissioning 40 mm dia MS fuel pipe with accessories, 1 coat of primer & 2 coats of enamel paint complete etc as required and as directed by Engineer In Charge/departmental authorities as per detailed technical specifications and approved make. Makes: Tata/Jindal/JSW	700.00	2,10,000.00
654	12.00	Supply, Installation, testing & commissioning of 40 mm dia flanged end ball valve complete etc as required and as directed by Engineer In Charge/departmental authorities as per detailed technical specifications and approved make. Makes: Zoloto/Santt	2,000.00	24,000.00
655	300.00	Supply, laying, dressing, testing & commissioning of 12 Core 2.5Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with unarmoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torrent / Universal / Unicab / Havells / KEI /Polycab/Gloster /orbit/ Paragon / RR Kabel/ RPG/Pawancab/AKG/LS cable/Polywires	509.00	1,52,700.00
656	300.00	Supply, laying, dressing, testing & commissioning of 10 Core 2.5Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with unarmoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torrent / Universal / Unicab / Havells / KEI /Polycab/Gloster /orbit/ Paragon / RR Kabel/ RPG/Pawancab/AKG/LS cable/Polywires	457.00	1,37,100.00
657	300.00	Supply, laying, dressing, testing & commissioning of 6 Core 2.5Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torrent / Universal / Unicab / Havells / KEI /Polycab/Gloster /orbit/ Paragon / RR Kabel/ RPG/Pawancab/AKG/LS cable/Polywires	340.00	1,02,000.00
658	300.00	Supply, laying, dressing, testing & commissioning of 2 Core 4Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torrent / Universal / Unicab / Havells / KEI /Polycab/Gloster /orbit/ Paragon / RR Kabel/ RPG/Pawancab/AKG/LS cable/Polywires	215.00	64,500.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
659	338.00	Supply, laying, dressing, testing & commissioning of 4 Core 2.5Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with unarmoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torrent / Universal / Unicab / Havells / KEI /Polycab/Gloster /orbit/ Paragon / RR Kabel/ RPG/Pawancab/AKG/LS cable/Polywires	227.00	76,726.00
660	348.00	Supply, laying, dressing, testing & commissioning of 3 Core 2.5Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with unarmoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torrent / Universal / Unicab / Havells / KEI /Polycab/Gloster /orbit/ Paragon / RR Kabel/ RPG/Pawancab/AKG/LS cable/Polywires	200.00	69,600.00
661	12.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and copper lugs duly crimped with crimping tool, PVC tape etc., for 12Core 2.5 Sq.mm PVC insulated sheathed PVC/XLPE copper conductor unarmoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	316.00	3,792.00
662	12.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and copper lugs duly crimped with crimping tool, PVC tape etc., for 10Core 2.5 Sq.mm PVC insulated sheathed PVC/XLPE copper conductor unarmoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	316.00	3,792.00
663	12.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and copper lugs duly crimped with crimping tool, PVC tape etc., for 6Core 2.5 Sq.mm PVC insulated sheathed PVC/XLPE copper conductor unarmoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	316.00	3,792.00
664	42.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and copper lugs duly crimped with crimping tool, PVC tape etc., for 2Core 4 Sq.mm PVC insulated sheathed PVC/XLPE copper conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	316.00	13,272.00
665	50.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and copper lugs duly crimped with crimping tool, PVC tape etc., for 4Core 2.5 Sq.mm PVC insulated sheathed PVC/XLPE copper conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	316.00	15,800.00
666	50.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and copper lugs duly crimped with crimping tool, PVC tape etc., for 3Core 2.5 Sq.mm PVC insulated sheathed PVC/XLPE copper conductor unarmoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	316.00	15,800.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
667	1.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of Main LT Panel for Club House as per latest IEC 61439 (TTA Design), with a set of Automatic Fire Supression System (AFSS) complete with fire extinguisher of suitable capacity on either side of panel including with Fire snibber & fire detection tube through out the length of the panel including incoming & outgoing feeders, cable chambers etc as requried and fabricated with 2mm thick CRCA sheet steel in cubicle formation, compartmentalized, Form 4B construction, free standing floor mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T? sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 2000A breakers. EB Incomer: 1 No. 1000A 50KA 4P ACB. 1 No. Mult Fuction Enegy meter with BMS Compitable (KWH+KW+A+V+F with RS - 485 port) , 3 set - 1000/5A CT's for metering, APFCR 1 set - RYB LED type indicating lamps , 1 set - Control MCB with Neutral link , 50kA Surge Protection device 1 set - CBCT & Earth leakage relay. DG Incomer: 1 No. 1000A 50KA 4P ACB. 1 No. Mult Fuction Enegy meter with BMS Compitable (KWH+KW+A+V+F with RS - 485 port) , 1 set - 1000/5A CT's for metering , 1 set - RYB LED type indicating lamps , 1 set - Control MCB with Neutral link , 1 set - Earth leakage relay, Bus bar: 1 set - 1000A, 4Wire, 50KA, 415V, TPN Aluminium busbars, interconnections with colour coded heat shrinkable sleeves and SMC Busbar supports. Outgoings: 2 Nos. 630A FP 50KA FP ACB, 2nos of 400A FP MCB. 8nos of 160A FP MCBs, 2nos of 125A FP MCBs, 6nos of 63A, FP MCCBs each outgoing feeder shall have dual source energy metet with required size of CTs. all ACB shall be EDO TYPE (Motorised) MP based with O/C, S/C, E/F & U/V (LSIG) protection and confirms to IS 13947-2, IEC 60947-2 and BS-EN 60947 with display and 20 faults History backup with BMS compatible communication ports. Separate DC bus shall be provided with required control transformers/MCB control, supporting insulators, sleeves etc of required rating for control circuit system. All panels shall be of Top / Bottom cable entry. Panels shall be extandable type on either ends complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. ACB Makes: Siemens/ Lauritz Knudsen (Formerly L&T)/ Schneider /Legrand /C&S /HPL, MCCB make: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus) Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. all energy meter will be connected in to the Energy Billing system for monitoring, mesureing, recording and billing purpose of all electrical parameters including prinitout purpose. all breakers wil be connected to the Intigrated Building Management System for Swithcgear ON/OFF/TRIP purpose.	21,78,450.00	21,78,450.00
668	2.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of Main LT Panel-1 (TTA design) as per latest IEC 61439 , with a set of Automatic Fire Supression System (AFSS) complete with fire extinguisher of suitable capacity on either side of panel including with Fire snibber & fire detection tube through out the length of the panel including incoming & outgoing feeders, cable chambers etc as requried and fabricated with 2mm thick CRCA sheet steel in cubicle formation, compartmentalized, Form 4B construction, free standing floor mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T? sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 2000A breakers. EB Incomer: 1 No. 1600A 50KA 4P ACB. 1 No. Mult Fuction Enegy meter with BMS Compitable (KWH+KW+A+V+F with RS - 485 port) , 3 set - 1600/5A ,10VA, CL 1.0, CT's for metering & APFCR , 1 set - RYB LED type indicating lamps , 1 set - Control MCB with Neutral link , 80kA Surge Protection device 1 set - CBCT & Earth leakage relay. DG Incomer: 1 No. 1000A 50KA 4P ACB. 1 No. Mult Fuction Enegy meter with BMS Compitable (KWH+KW+A+V+F with RS - 485 port) , 1 set - 1000/5A ,10VA, CL 1.0, CT's for metering , 1 set - RYB LED type indicating lamps , 1 set - Control MCB with Neutral link , 1 set - Earth leakage relay, Bus bar: 1 set - 1600A, 4Wire, 50KA, 415V, TPN Aluminium busbars, interconnections with colour coded heat shrinkable sleeves and SMC Busbar supports. Outgoings: 4 Nos. 1000A FP 50KA FP ACB, 1nos of 630A FP MCB. 2nos of 250A FP MCBs, 1nos of 160A FP MCBs, each outgoing feeder shall have dual source energy metet with required size of CTs. all ACB shall be EDO TYPE (Motorised) MP based with O/C, S/C, E/F & U/V (LSIG) protection and confirms to IS 13947-2, IEC 60947-2 and BS-EN 60947 with display and 20 faults History backup with BMS compatible communication ports.Separate DC bus shall be provided with required control transformers/MCB control, supporting insulators, sleeves etc of required rating for control circuit system. All panels shall be of Top / Bottom cable entry. Panels shall be extandable type on either ends complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. ACB Makes: Siemens/ Lauritz Knudsen (Formerly L&T)/ Schneider /Legrand /C&S /HPL, MCCB make: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus) Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. Panels with all switchgears & energy meters shall be compatible and suitable to implement for Integrated Building Management System as directed by Engineer-In-Charge.	41,45,189.00	82,90,378.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
669	3.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of Main LT Panel-2 (TTA design) as per latest IEC 61439 , with a set of Automatic Fire Supression System (AFSS) complete with fire extinguisher of suitable capacity on either side of panel including with Fire snibber & fire detection tube through out the length of the panel including incoming & outgoing feeders, cable chambers etc as requried and fabricated with 2mm thick CRCA sheet steel in cubicle formation, compartmentalized, Form 4B construction, free standing floor mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T? sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 2000A breakers. EB Incomer: 1 No. 1600A 50KA 4P ACB. 1 No. Mult Fuction Enegy meter with BMS Compitable (KWH+KW+A+V+F with RS - 485 port) , 2 set - 1600/5A ,10VA, CL 1.0, CT's for metering & APFCR , 1 set - RYB LED type indicating lamps , 1 set - Control MCB with Neutral link , 80kA Surge Protection device 1 set - CBCT & Earth leakage relay. DG Incomer: 1 No. 1000A 50KA 4P ACB. 1 No. Mult Fuction Enegy meter with BMS Compitable (KWH+KW+A+V+F with RS - 485 port) , 1 set - 1000/5A ,10VA, CL 1.0, CT's for metering , 1 set - RYB LED type indicating lamps , 1 set - Control MCB with Neutral link , 1 set - Earth leakage relay, Bus bar: 1 set - 1600A, 4Wire, 50KA, 415V, TPN Aluminium busbars, interconnections with colour coded heat shrinkable sleeves and SMC Busbar supports. Outgoings: 7 Nos. 1000A FP 50KA FP ACB, 1nos of 630A FP MCB. 1nos of 400A FP MCB, 2nos of 250A FP MCBs, 2nos of 160A FP MCBs, 2nos of 100A FP MCBeach outgoing feeder shall have dual source energy metet with required size of CTs. all ACB shall be EDO TYPE (Motorised) MP based with O/C, S/C, E/F & U/V (LSIG) protection and confirms to IS 13947-2, IEC 60947-2 and BS-EN 60947 with display and 20 faults History backup with BMS compatible communication ports.Separate DC bus shall be provided with required control transformers/MCB control, supporting insulators, sleeves etc of required rating for control circuit system.All panels shall be of Top / Bottom cable entry. Panels shall be extandable type on either ends complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. ACB Makes: Siemens/ Lauritz Knudsen (Formerly L&T)/ Schneider /Legrand /C&S /HPL, MCCB make: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus) Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. Panels with all switchgears & energy meters shall be compatible and suitable to implement for Integrated Building Management System as directed by Engineer-In-Charge.	57,22,268.00	1,71,66,804.00
670	3.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of Main LT Panel-3 (TTA Design) as per latest IEC 61439 , with a set of Automatic Fire Supression System (AFSS) complete with fire extinguisher of suitable capacity on either side of panel including with Fire snibber & fire detection tube through out the length of the panel including incoming & outgoing feeders, cable chambers etc as requried and fabricated with 2mm thick CRCA sheet steel in cubicle formation, compartmentalized, Form 4B construction, free standing floor mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T? sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 2000A breakers. EB Incomer: 1 No. 1600A 50KA 4P ACB. 1 No. Mult Fuction Enegy meter with BMS Compitable (KWH+KW+A+V+F with RS - 485 port) , 2 set - 1600/5A ,10VA, CL 1.0, CT's for metering & APFCR , 1 set - RYB LED type indicating lamps , 1 set - Control MCB with Neutral link , 80kA Surge Protection device 1 set -CBCT & Earth leakage relay. DG Incomer: 1 No. 1000A 50KA 4P ACB. 1 No. Mult Fuction Enegy meter with BMS Compitable (KWH+KW+A+V+F with RS - 485 port) , 1 set - 1000/5A ,10VA, CL 1.0, CT's for metering , 1 set - RYB LED type indicating lamps , 1 set - Control MCB with Neutral link , 1 set - Earth leakage relay, Bus bar: 1 set - 1600A, 4Wire, 50KA, 415V, TPN Aluminium busbars, interconnections with colour coded heat shrinkable sleeves and SMC Busbar supports. Outgoings: 4 Nos. 1000A FP 50KA FP ACB, 1nos of 400A FP MCB, 2nos of 250A FP MCBs, 2nos of 160A FP MCBs, 2nos of 100A FP MCB, each outgoing feeder shall have dual source energy metet with required size of CTs. A all ACB shall be EDO TYPE (Motorised) MP based with O/C, S/C, E/F & U/V (LSIG) protection and confirms to IS 13947-2, IEC 60947-2 and BS-EN 60947 with display and 20 faults History backup with BMS compatible communication ports.Separate DC bus shall be provided with required control transformers/MCB control, supporting insulators, sleeves etc of required rating for control circuit system. All panels shall be of Top / Bottom cable entry. Panels shall be extandable type on either ends complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. ACB Makes: Siemens/ Lauritz Knudsen (Formerly L&T)/ Schneider /Legrand /C&S /HPL, MCCB make: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus) Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. Panels with all switchgears & energy meters shall be compatible and suitable to implement for Integrated Building Management System as directed by Engineer-In-Charge.	43,73,775.00	1,31,21,325.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
671	3.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of DG Synchronization panel (TTA Design) as per latest IEC 61439 , with a set of Automatic Fire Supression System (AFSS) complete with fire extinguisher of suitable capacity on either side of panel including with Fire snibber & fire detection tube through out the length of the panel including incoming & outgoing feeders, cable chambers etc as requried and fabricated with 2mm thick CRCA sheet steel in cubicle formation, compartmentalized, Form 4B construction, free standing floor mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T? sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 250A breakers. The Panel shall be type tested IEC 61439,with a set of Automatic Fire Supression System (AFSS) complete with fire extinguisher of suitable capacity on either side of panel including with Fire snibber & fire detection tube through out the length of the panel including incoming & outgoing feeders, cable chambers etc as requried DG Incomer: 1 1 No. - 1000A 50KA FP ACB , 1 No. Multifunction meter (KWH+KW+A+V+F+MD with RS - 485 port , 1 set - 1000A ,15VA, CL 0.5, CT's for metering , 1 set - RYB LED type indicating lamps 1set - Control MCB with Neutral link .DG Incomer: 2 1 No. - 1000A 50KA FP ACB , 1 No. Multifunction meter (KWH+KW+A+V+F+MD with RS - 485 port , 1 sets - 1000A ,15VA, CL 0.5, CT's for metering , 1 set - RYB LED type indicating lamps, 1 set - Control MCB with Neutral link.Bus bar:1 set - 3000A, 4Wire, 50KA, 415V, TPN Aluminium busbars, interconnections with colour coded heat shrinkable sleeves and SMC Busbar supports. Outgoings: 3 Nos 1000A TPN 50KA ACB.All panels shall be of Top / Bottom cable entry. Separate DC bus shall be provided with required control transformers/MCB control, supporting insulators, sleeves etc of required rating for control circuit system. Panels shall be extandable type on either ends complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. all ACB shall be EDO TYPE (Motorised) MP based with O/C, S/C, E/F & U/V (LSIG) protection and confirms to IS 13947-2, IEC 60947-2 and BS-EN 60947 with display and 20 faults History backup with BMS compatible communication ports. Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. Panels with all switchgears & energy meters shall be compatible and suitable to implement for Integrated Building Management System as directed by Engineer-In-Charge.	39,85,036.00	1,19,55,108.00
672	3.00	Design, manufacturing, supply, installation, testing and commissioning of floor mounted PLC control Panel as per SLD with requried control transformers, DC power pack, HMI-7-9" size having online monitoring facility, with required PLC Inpus & Outputs as per SLD, logical interlocking between all incomers like transformers, DG sets, Bus couplers including all 3 Main LT panels etc complete as requried for finished item of work and as directed by Engineer-In-Charge. Makes: Siemens/Schneider/ABB etc or as approved by the competent authority. Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. Panels with all switchgears & energy meters shall be compatible and suitable to implement for Integrated Building Management System as directed by Engineer-In-Charge.	2,15,460.00	6,46,380.00
673	9.00	Supply, installation, testing & commissioning of 3Ph, 4W, 415V, 50Hz, AC 630A, FP, Al. bus bar, fault level 50kA for 1 sec, IP-42 floor mounting free standing totally enclosed indoor 350kVAR APFCR Panel (TTA design) as per latest IEC 61439 , with a set of Automatic Fire Supression System (AFSS) complete with fire extinguisher of suitable capacity on either side of panel including with Fire snibber & fire detection tube through out the length of the panel including incoming & outgoing feeders, cable chambers etc as requried and both side extendable, Form 4B Construction, compartmentalized front operational, vertical, dust and vermin proof, This panels fabricated with 2 mm thick for load bearing members, side sheet, removable top & bottom sheets, equipment mounting plate, front , rear doors & covers, partition and 3mm HRCA for undrilled gasket removable gland plate and base frame is ISMC -75 and fully meeting the requirement as per IEC-61439-1&2. The panel shall be painted with texture finish electro static paint SIEMENS GREY RAL -7035 (powder coating). Ventilation Cross members, LOGOS and Handle is RAL 7016 including interanl wiring complete. Suitable size of Bus Bar for 800A rating 1no of Incomer:-800 A FP, (50 KA), ACB with MP based O/C, S/C, E/F with Amp Metering (LCD Display) and with accessories a) Spring Charged Motor, 230V AC b) Closing Coil 230V AC c) Shunt Trip release 230V AC d) U/V release 415V AC e) Aux. Switch with 2NO+2NC Contacts f) Fault Trip Contact g) Drawout frame shutter assembly h) Neutral 100%. 3 nos of Cast Resin CT: 800/5A, CL-1.0. 15VA for MFM meter, 1 no of Load Multi Function with BMS compitable Meter96 sq.mm, with RS-485 Communication port, Cl-1.0, Nominal Voltage:3Ph, 4W, 415V AC, CTR/5A, Aux. Voltage 230V AC Microprocessor based intelligent automatic power factor correction relay with BMS compitable having sensitivity up to 50 milli Amp secondary current and min. 24 stage controller,	20,56,149.00	1,85,05,341.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
		self-analyzing auto c/k setting according to targeted power factor setting, the relay shall have minimum three digit display unit for display of real power factor, targeted power factor, lag/lead capacitor switching status, alarm output for under current, over current, insufficient compensation, indication of switching on units, auto/manual status, and shall have over load protection, no volt release etc. as required 3ph, Automatic Power factor correction relay. 5nos of Outgoing Feeders: 1nos of 160A TP MCCB with 2 set of 50kVAR Capacitor bank, heavy duty contactors, ON & OFF push buttons with indiations, 1nos of 125A TP MCCB with 4 set of 25kVAR Capacitor bank, heavy duty contactors, ON & OFF push buttons with indiations, 1nos of 100A TP MCCB with 5 set of 20kVAR Capacitor bank, heavy duty contactors, ON & OFF push buttons with indiations, 1nos of 100A TP MCCB with(3 set of 10kVAR + 2set of 5kVAR + 5 set of 2kVAR) Capacitor bank, heavy duty contactors, ON & OFF push buttons with indiations, and with following accessories : 350kVAR self-healing MPP/MP type Heavy duty Three phase 440 V, 50 Hz shunt capacitor (banks) conforming to IS:13340-41 / IEC :831-1&2 , the capacitor shall be fitted with discharge resistors, pressure sensitive disconnector (PSD) and shall have dissipation factor less than 0.0025 at 50 Hz and total wattage loss less than 0.5 Watt per KVAR. 440 Volt 3 pole capacitor (AC 6 B) duty contactor with 3 no early make and post break auxiliary contacts in series with quick discharge damping resistors/ reactors to limit the inrush current, conforming to IS:13947-4-1/IEC:947-4-1, Din rail mounting type including making connections, testing etc. as required. suitable for following capacity capacitor bank a) 50kVAR, TP =2 nos, b) 25kVAR, TP = 4 nos, c) 20kVAR, TP = 5 nos, d) 10kVAR, TP =3nos,e) 5kVAR, TP =2 nos,f) 2kVAR, TP =5 nos Detuned Reactors 7% at 440V AC with thermal cut off (NC) Aluminium wound are used. including all requeided accesories local & Remote Selector Switch, luminous type ON and OFF Push Button actuators and integral contact block of dia. 22.5 mm, Space heater & illumination ckt, 22.5dia mm 230V AC Indication Light LED		
		type for R, Y, B for incomers, 2NO+2NC, 230V AC Aux. Contactor, 230V AC Aux. 4 NO Contactor, 2 nos of Contact block 2No+2NC, 22.5dia mm 230V AC Indication Light LED type for (RED- Capacitor ON), (Green-Capacitor-OFF), 6A,1NC+1NO Door switch, 30-80 deg C thermostate, 230V, 60W space heater,5W, 230V LED lamp with holder, 230V 6A Switch and 6A socket for Incomer.Separate DC bus shall be provided with required control transformers/MCB control, supporting insulators, sleeves etc of required rating for control circuit system.ACB Makes: Siemens/ Lauritz Knudsen (Formerly L&T)/ Schneider /Legrand /C&S /HPL, MCCB make: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus,) APFCR Make: L&T/Seimens/Epcos /Schneider/ ABB/Neptune.Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. Above specification is indicative only, contractor has to design the capacitor bank to achive unity power factor at all times (selection start from 1,2, 3,5 10, 20, 25, 50 to achive 500kVAR load and sizing of APFCR relay shall be done accorindgly).Panels with all switchgears & energy meters shall be compatible and suitable to implement for Integrated Building Management System as directed by Engineer-In-Charge.		

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
674	1.00	Supply, installation, testing & commissioning of 3Ph, 4W, 415V, 50Hz, AC 630A, FP, Al. bus bar, fault level 50kA for 1 sec, IP-42 floor mounting free standing totally enclosed indoor 325kVAR APFCR Panel (TTA design) as per latest IEC 61439 with a set of Automatic Fire Supression System (AFSS) complete with fire extinguisher of suitable capacity on either side of panel including with Fire snibber & fire detection tube through out the length of the panel including incoming & outgoing feeders, cable chambers etc as requried , This panels fabricated with 2 mm thick CRCA sheet steel in cubicle formation, both side extendable, compartmentalized, Form 4B construction, free standin floor mounted, dust and vermin proof, or load bearing members, side sheet, removable top & bottom sheets, equipment mounting plate, front , rear doors & covers, partition and 3mm HRCA for undrilled gasket removable gland plate and base frame is ISMC -75 . The panel shall be painted with texture finish electro static paint SIEMENS GREY RAL - 7035 (powder coating). Ventilation Cross members, LOGOS and Handle is RAL 7016 including interanl wiring complete. Suitable size of Bus Bar for 800A rating 1no of Incomer:-630 A FP, (50 KA), ACB with MP based O/C, S/C, E/F with Amp Metering (LCD Display) and with accessories a) Spring Charged Motor, 230V AC b) Closing Coil 230V AC c) Shunt Trip release 230V AC d) U/V release 415V AC e) Aux. Switch with 2NO+2NC Contacts f) Fault Trip Contact g) Drawout frame shutter assembly h) Neutral 100%. 3 nos of Cast Resin CT: 630/5A, CL-1.0. 15VA for MFM meter, 1 no of Load Multi Function with BMS compitable Meter96 sq.mm, with RS-485 Communication port, Cl-1.0, Nominal Voltage:3Ph, 4W, 415V AC, CTR/5A, Aux. Voltage 230V AC Microprocessor based intelligent automatic power factor correction relay with BMS compitable having sensitivity up to 50 milli Amp secondary current and min. 24 stage controller, self-analyzing auto c/k setting according to targeted power factor setting, the relay shall have minimum three digit display unit for display of real power factor, targeted power factor, lag/lead capacitor switching status, alarm output for under current, over current,	19,09,282.00	19,09,282.00
		insufficient compensation, indication of switching on units, auto/manual status, and shall have over load protection, no volt release etc. as required 3ph, Automatic Power factor correction relay. 5nos of Outgoing Feeders: 1nos of 160A TP MCCB with 2 set of 50kVAR Capacitor bank, heavy duty contactors, ON & OFF push buttons with indiations, 1nos of 125A TP MCCB with 3 set of 25kVAR Capacitor bank, heavy duty contactors, ON & OFF push buttons with indiations, 1nos of 100A TP MCCB with 5 set of 20kVAR Capacitor bank, heavy duty contactors, ON & OFF push buttons with indiations, 1nos of 100A TP MCCB with(3 set of 10kVAR + 2set of 5kVAR + 5 set of 2kVAR) Capacitor bank, heavy duty contactors, ON & OFF push buttons with indiations, and with following accessories : 325kVAR self-healing MPP/MP type Heavy duty Three phase 440 V, 50 Hz shunt capacitor (banks) conforming to IS:13340-41 / IEC :831-1&2 , the capacitor shall be fitted with discharge resistors, pressure sensitive disconnector (PSD) and shall have dissipation factor less than 0.0025 at 50 Hz and total wattage loss less than 0.5 Watt per KVAR. 440 Volt 3 pole capacitor (AC 6 B) duty contactor with 3 no. early make and post break auxiliary contacts in series with quick discharge damping resistors/ reactors to limit the inrush current, conforming to IS:13947-4-1/IEC:947-4-1, Din rail mounting type including making connections, testing etc. as required. suitable for following capacity capacitor bank a) 50kVAR, TP =2 nos, b) 25kVAR, TP = 4 nos, c) 20kVAR, TP = 5 nos, d) 10kVAR, TP =3nos,e) 5kVAR, TP =2 nos,f) 2kVAR, TP =5 nos Detuned Reactors 7% at 440V AC with thermal cut off(NC) Aluminium wound are used. including all requeided accesories local & Remote Selector Switch, luminous type ON and OFF Push Button actuators and integral contact block of dia. 22.5 mm, Space heater & illumination ckt, 22.5dia mm 230V AC Indication Light LED type for R, Y, B for incomers, 2NO+2NC, 230V AC Aux. Contactor, 230V AC Aux. 4 NO Contactor, 2 nos of Contact block 2No+2NC, 22.5dia mm 230V AC Indication Light LED type for (RED- Capacitor ON), (Green-Capacitor-OFF), 6A,1NC+1NO Door switch,		

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
		30-80 deg C thermostate, 230V, 60W space heater,5W, 230V LED lamp with holder, 230V 6A Switch and 6A socket for Incomer.Separate DC bus shall be provided with required control transformers/MCB control, supporting insulators, sleeves etc of required rating for control circuit system. ACB Makes: Siemens/ Lauritz Knudsen (Formerly L&T)/ Schneider /Legrand /C&S /HPL, MCCB make: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus,) APFCR Make: L&T/Seimens/Epcos /Schneider/ ABB/Neptune.Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. Above specification i indicative only, contractor has to design the capacitor bank to achive unity power factor at all times (selection start from 1,2, 3,5 10, 20, 25, 50 to achive 500kVAR load and sizing of APFCR relay shall be done accorindgly)		

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
675	18.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of IP-42 floor mounting free standing totally enclosed indoor Sub-LT Panel TTA Panel as per latest IEC 61439 1& 2, with a set of Automatic Fire Supression System (AFSS) complete with fire extinguisher of suitable capacity on either side of panel including with Fire snibber & fire detection tube through out the length of the panel including incoming & outgoing feeders, cable chambers etc as requried , fabricated out of 14 gauge CRCA sheet steel in cubicle formation, compartmentalized, Form 4B construction, free standing floor mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T? sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 2000A breakers. EB Incomer: 2 No. 1000A 50KA 4P ACB. 2 No. Mult Fuction Enegy meter with BMS Compitable (KWH+KW+A+V+F with RS - 485 port) , 2 set - 1000/5A ,10VA, CL 1.0, CT's for metering, 2 set - RYB LED type indicating lamps , 2 set - Control MCB and required size of CBCT & ELRs. Outgoings: 1 Nos. 800A FP 50KA FP ACB, 2nos of 100A FP MCB, 6nos of 63A FP MCBs, A all ACB shall be EDO TYPE (Motorised) MP based with O/C, S/C, E/F & U/V (LSIG) protection and confirms to IS 13947-2, IEC 60947-2 and BS-EN 60947 with display and 20 faults History backup with BMS compatible communication ports..	18,28,434.00	3,29,11,812.00
		All panels shall be of Top / Bottom cable entry. Panels shall be extandable type on either ends complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. Separate DC bus shall be provided with required control transformers/MCB control, supporting insulators, sleeves etc of required rating for control circuit system. ACB Makes: Siemens/ Lauritz Knudsen (Formerly L&T)/ Schneider /Legrand /C&S /HPL, MCCB make: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus) Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. Panels with all switchgears & energy meters shall be compatible and suitable to implement for Integrated Building Management System as directed by Engineer-In-Charge.		
676	1.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of LIFT PANEL (OUTDOOR TYPE) , fabricated out of 2mm thick CRCA sheet steel in cubicle formation, compartmentalized, Form 3B/4B construction, with a set of Automatic Fire Supression System (AFSS) complete with fire extinguisher of suitable capacity on either side of panel including with Fire snibber & fire detection tube through out the length of the panel including incoming & outgoing feeders, cable chambers etc as requried free standing floor mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T? sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 250A breakers. Incomer: 1 No. 160A 25KA FP MCCB , 1 set - RYB LED type indicating lamps with Multfunction Energy meter (KWH+KW+A+V+F with RS - 485 port) & BMS compitable , 1 set - 160/5A ,10VA, CL 0.5, CT's for metering , 1 set - Control MCB with Neutral link. Bus bar: 1 set - 160A, 4Wire, 25KA, 415V, TPN Aluminium busbars, interconnections with colour coded heat shrinkable sleeves and SMC Busbar supports. Outgoings: 6 Nos 63 FP 10KA MCB, 5nos 25A TP MCB, 4 nos 32A FP MCB .All panels shall be of Top / Bottom cable entry.	1,77,233.00	1,77,233.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
		Panels shall be extandable type on either ends complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. MCCB make: Makes: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus) Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication.		
677	38.00	Supply installation, testing and comisssioning of Lift ATS Panel consisting incomer of 1No 63A 415V 4P, Auto Transfer Switch with BMS compitable for instantaneous switching between sources as per IEC 60947-6-1, Closed transition, (bare unit- without enclosure) with voltage surge suppressor, communication interface, with a set of Automatic Fire Supression System (AFSS) complete with fire extinguisher of suitable capacity on either side of panel including with Fire snibber & fire detection tube through out the length of the panel including incoming & outgoing feeders, cable chambers etc as requrie etc., complete., & 1 No 63A 4P MCCB OL, SC , EF protection after the ATS with RYB indication lamps with backup MCB. An ammeter of required capacity with CT's and voltmeter . 1 No 30 ma 25A DP RCCB connected to output of ATS. 4Nos 20A DP MCB connected to DP RCCB bus.1 No 32A SP MCB connected to DP RCCB bus. Panel shall be suitable for 3Ph, 4wire, 50 Hz, in Powdercoated CRCA Sheeet steel enclosure of 14 swg thickness. The panel shall be of Wall mounted type and suitable for termination of 4CX16Sq mm Aluminim conductor, XLPE insulated Strip armoured Cable. Panel shall be located in the top most most floor and within the lift shaft for finished item of work and as directed by Engineer-In-Charge. ATS Make; Socomec /Hager /ABB/ HPL/ Lauritz Knudsen (Formerly L&T)/Havells, MCCB make: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus) Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. Panels with all switchgears & energy meters shall be compatible and suitable to implement for Integrated Building Management System as directed by Engineer-In-Charge.	1,12,718.00	42,83,284.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
678	4.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of (G.F,1ST.F,2ND.F & 3RD.F) Panel, to club house fabricated out of 2mm thick CRCA sheet steel in cubicle formation, compartmentalized, Form 3B/4B construction, free standing floor mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T? sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 250A breakers. Incomer: 1 No. 160A 25KA FP MCCB , 1 set - RYB LED type indicating lamps with Multfunction Energy meter (KWH+KW+A+V+F with RS - 485 port) & BMS compitable , 1 set - 160/5A ,10VA, CL 0.5, CT's for metering , 1 set - Control MCB with Neutral link. Bus bar: 1 set - 160A, 4Wire, 25KA, 415V, TPN Aluminium busbars, interconnections with colour coded heat shrinkable sleeves and SMC Busbar supports. Outgoings: 11 Nos 63 FP 10KA MCB, .All panels shall be of Top / Bottom cable entry. Panels shall be extandable type on either ends complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. MCCB make: Makes: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens-3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus) Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication.	2,61,360.00	10,45,440.00
679	1.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of HVAC Panel (OUTDOOR TYPE), fabricated out of 2mm thick CRCA sheet steel in cubicle formation, compartmentalized, Form 3B/4B construction, free standing floor mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T? sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 250A breakers. Incomer: 1 Nos. 400A 36KA FP MCCB , 1 set - RYB LED type indicating lamps with Multfunction Energy meter (KWH+KW+A+V+F with RS - 485 port) & BMS compitable , 1 set - 400/5A ,10VA, CL 0.5, CT's for metering , 1 set - Control MCB . Bus bar: 1 set - 400A, 4Wire, 36KA, 415V, TPN Aluminium busbars, interconnections with colour coded heat shrinkable sleeves and SMC Busbar supports. Outgoings: 20 Nos 63 FP 16KA MCCB .All panels shall be of Top / Bottom cable entry. Panels shall be extandable type on either ends complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. MCCB make: Makes: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus) Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication.	2,79,450.00	2,79,450.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
680	1.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of WALL MOUNDED PANEL PHE panels, fabricated out of 2mm thick CRCA sheet steel in cubicle formation, compartmentalized, Form 3B/4B construction, free standing floor mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T' sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 250A breakers. WALL MOUNDED PANEL C,D,I& J. INCOMER -1 63 A 16 KA TPN MCCB - 1 nos R,Y,B Indication lamps with MCB control BUSBAR 63 A TPN CU busbar with Colour PVC Sleeve. OUTGOING 32-25A 10kA TP MCB 8 nos Dual Source Energy Meter-1 Nos Detachable cable gland's plates separate for power & control cables.as per technical specifications and as directed by engineer in charge MCCB make: Makes: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand –(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S - Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus) Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication.	2,43,450.00	2,43,450.00
681	18.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of Comman Area Panel, fabricated out of 14 gauge CRCA sheet steel in cubicle formation, compartmentalized, Form 3B/4B construction, free standing floor mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T? sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 250A breakers. Incomer: 1 No. 100A 16KA FP MCCB , 1 set - RYB LED type indicating lamps with Multfunction Energy meter (KWH+KW+A+V+F with RS - 485 port) & BMS compitable , 1 set - 100/5A ,10VA, CL 0.5, CT's for metering , 1 set - Control MCB with Neutral link. Bus bar: 1 set - 100A, 4Wire, 16KA, 415V, TPN Aluminium busbars, interconnections with colour coded heat shrinkable sleeves and SMC Busbar supports. Outgoings: 6 Nos 63 TP 10KA MCB, 2nos 25A TP MCB, 5 nos 6-32A SP MCB .All panels shall be of Top / Bottom cable entry.	2,12,081.00	38,17,458.00
		Panels shall be extandable type on either ends complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. MCCB make: Makes: Lauritz Knudsen (Formerly L&T)-D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus)Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. Panels with all switchgears & energy meters shall be compatible and suitable to implement for Integrated Building Management System as directed by Engineer-In-Charge.		

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
682	18.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of utility Panel, fabricated out of 14 gauge CRCA sheet steel in cubicle formation, compartmentalized, Form 3B/4B construction, free standing floor mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T? sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 250A breakers. Incomer: 2 Nos. 160A 25KA FP MCCB , 2 set - RYB LED type indicating lamps with Multfunction Energy meter (KWH+KW+A+V+F with RS - 485 port) & BMS compitable , 2 set - 160/5A ,10VA, CL 0.5, CT's for metering , 2 set - Control MCB . Bus bar: 1 set - 160A, 4Wire, 16KA, 415V, TPN Aluminium busbars, interconnections with colour coded heat shrinkable sleeves and SMC Busbar supports. Outgoings: 4 Nos 63 TP 10KA MCB, 4 nos 6-32A SP MCB .	3,36,681.00	60,60,258.00
		All panels shall be of Top / Bottom cable entry. Panels shall be extandable type on either ends complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. MCCB make: Makes: Lauritz Knudsen (Formerly L&T)- D shine / Schneider-CVS/Legrand ?(DP X3/DRX)/ Siemens- 3VL / Hager-h3/C&S -Winbreak/HPL-Techno MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus) Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. Panels with all switchgears & energy meters shall be compatible and suitable to implement for Integrated Building Management System as directed by Engineer-In-Charge.		
683	432.00	Design, fabrication, assembling, wiring, supply, testing at works, packaging, forwarding to site, installation, testing & commissioning of WALL MOUNDED PANEL (PTTA) METER BOARD fabricated with 2mm thick CRCA sheet steel in cubicle formation, compartmentalized, Form 3B /4B construction, free standing wall mounted, dust and vermin proof with reinforcement of suitable size angle iron, channel, `T? sections and / or flats wherever necessary. 3 mm thick cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before powder coating as per specifications and final approved shade. 2 Nos. earthing terminals shall be provided for all distrtibution panels. Panels shall be suitable for 415V, 3 phase, 4 wire, 50 HZ supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. Galvanised hardwares with zinc passivation shall be used in fabrication of panels. MP based release to be provided for above 250A breakers. INCOMER -1nos of 100 A 36 KA TPN MCCB - 1 nos of 3 phase , 60 -100A Whole Current/CT Operated, Class-1, Smart Energy meter - Dual Source (EB & DB) as per IS 16444 ,DLMS COSEM (GPRS/ Optical Port),Inbuilt Latching relay WAN: Cellular LTE, GSM|GPRS:900/1800MHz, NAN 865-867 MHz With External Antenna, With Inbuilt/ Plug-in Options, and having provision for prepaid/Post paid,	39,028.00	1,68,60,096.00
		Bi-Directional, having back-up power, anti tamper features, Load control, over voltage & over load, remote monitoring as per IS 13779/IS 16444/IS 15959 and required gateways for integration to BMS server as per recommendation made by METER OEM , R,Y,B Indication lamps, with ON-OFF-TRIP Indiactions with suitable MCB control, suitable spreader links with required aluminium extention bus bar links and control wiring, Detachable cable gland's plates separate for power & control cables. Note: Approval shall be taken for each panel in the form of shop drawings & scheme before fabrication. Panels with all switchgears & energy meters shall be compatible and suitable to implement for Integrated Building Management System as directed by Engineer-In- Charge.		

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
684	432.00	Supply,installation, testing and commissiong of Ac operated heavy duty 230 /440 Volt 63Amps 4 pole AC 1 Rating power contactor conforming to IS:13947-4-1/IEC:947-4-1 having provision of mechanical interlocking, existing Din rail mounting type including making connections, etc. Complete for satisifactory operation on DG mode without nuisance tripping during 50% backup DG operation for each flat with all required such as finxing accessories, interconnection wiring from existing DB incomer to Contractor to AC/Geyser MCB's as required and as per technical specifications and as directed by engineer in charge.. Make:Seimens /ABB /Schneider /L&T /C&S /HPL/ Havells/Legrand/Elmeasure	5,664.00	24,46,848.00
685	87.00	Supply and fixing of 12 Way 7 Segment DB with IP 43, suitable for 36 Nos 6-32A,10kA S.P MCB out goings C/D Curve ISI Mark as per IS 60898-1 and 3 No 63A, 30 mA, DP RCCB (ELCB/RCD) CONFIRMS TO IEC:61008 AND IS:12640-1 and 2nos of 63A MCB as incomer confirms to IEC:610898-1 for overload, short-circuit and earth leakage protection etc complete and DB as per IS 8623; IS 13032; IEC 61439-3 including internal connection and labour charges for surface/flush mounting etc., complete and as per technical specifications and as directed by engineer in charge.Makes: Legrand / Schneider/Hager/ Seimens/Havells/L&T/Indo Asian/ HPL.	40,052.00	34,84,524.00
686	33.00	Supply and fixing of 12 Way 7 Segment DB with IP 43, suitable for 36 Nos 6-32A,10kA S.P MCB out goings C/D Curve ISI Mark as per IS 60898-1 and 3 No 63A, 30 mA, DP RCCB (ELCB/RCD) CONFIRMS TO IEC:61008 AND IS:12640-1 and 2nos of 63A MCB as incomer confirms to IEC:610898-1 for overload, short-circuit and earth leakage protection etc complete as per IS 8623; IS 13032; IEC 61439-3 including internal connection and labour charges for surface/flush mounting etc., complete and as per technical specifications and as directed by engineer in charge.Makes: Legrand(Ekinox 3) / Schneider-Acti9/Hager - Novello+/ Seimens/Havells STADx/L&T-Newrange/Indo Asian-Opti Pro/ HPL (Techno).	40,052.00	13,21,716.00
687	32.00	Supply and fixing of 12 Way SPN DB with IP 43 suitable for 10 Nos 6-32A,10kA S.P MCB as per IS 60898-1 as out goings and for 1 No Incommer 40A DP RCCB 30mA (ELCB/RCD) CONFIRMS TO IEC:61008 AND IS:12640-1 including internal connection and labour charges for flush mounting etc., complete. and DB as per IS 8623; IS 13032; IEC 61439-3 as per technical specifications and as directed by engineer in charge. DB Makes: Legrand / Schneider/Hager/ Seimens/Havells/L&T/Indo Asian/ HPL.	11,477.00	3,67,264.00
688	18.00	Supply and fixing of 12 Way 7 Segment DB with IP 43, suitable for 36 Nos 6-32A,10kA S.P MCB as per IS 60898-1 as out goings C/D Curve ISI Mark and 3 nos of 40A, 2 Pole,30mA confirms to IEC:61008 AND IS:12640-1 and 63A MCB as incomer confirms to IEC:60898-1 as Incommer for overload, short-circuit and earth leakage protection etc complete and DB as per IS 8623; IS 13032; IEC 61439-3 including internal connection and labour charges for surface/flush mounting etc., complete and as directed by Engineer in charge Makes: Legrand / Schneider/Hager/ Seimens/Havells/L&T/Indo Asian/ HPL.	37,472.00	6,74,496.00
689	18.00	Supply and fixing of 16 Way SPN DB with IP 43 suitable for 14 Nos 6-32A,10kA S.P MCB as per IS 60898-1 as a out goings and for 1 No Incommer 40A DP RCCB 30mA (ELCB/RCD) CONFIRMS TO IEC:61008 AND IS:12640-1 and and DB as per IS 8623; IS 13032; IEC 61439-3 including internal connection and labour charges for flush mounting etc., complete. and as directed by Engineer in chargeDB Makes: Legrand(Ekinox 3) / Schneider-A9/Hager -Novello+/ Seimens/Havells STADx/ Lauritz Knudsen (Formerly L&T)-Newrange/Indo Asian-Opti Pro/ HPL (Techno)/ Anchor (Uno Plus), MCB Make: Legrand / Schneider/Hager/ Seimens/Havells/L&T/Indo Asian/ HPL.	13,559.00	2,44,062.00
690	18.00	Supply and fixing of 8 Way SPN DB with IP 43 suitable for 6 Nos 6-32A,10kA S.P MCB as per IS 60898-1 as a out goings and for 1 No Incommer 40 DP RCCB 30mA Curve ISI Mark etc complete as per IS 8623; IS 13032; IEC 61439-3 and DB as per IS 8623, IS 13032, IEC 61439-3 including internal connection and labour charges for flush mounting etc., complete. and as per technical specifications and as directed by engineer in charge. DB Makes: Legrand / Schneider/Hager/ Seimens/Havells/L&T/Indo Asian/ HPL.	10,047.00	1,80,846.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
691	18.00	Supply and fixing of 12 Way SPN DB with IP 43 suitable for 10 Nos 6-32A,10kA S.P MCB as per IS 60898-1 as out goings and for 1 No Incommer 40A DP RCCB 30mA (ELCB/RCD) CONFIRMS TO IEC:61008 AND IS:12640-1 including internal connection and labour charges for flush mounting etc., complete. and DB as per IS 8623; IS 13032; IEC 61439-3 as per technical specifications and as directed by engineer in charge. DB Makes: Legrand(Ekinox 3) / Schneider-A9/Hager -Novello+/ Seimens/Havells STADx/ Lauritz Knudsen (Formerly L&T)-Newrange/Indo Asian-Opti Pro/ HPL (Techno)/ Anchor (Uno Plus), MCB Make: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus)	11,477.00	2,06,586.00
692	1,395.00	Supply, laying, dressing, testing & commissioning of 3.5 Core 25Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	310.00	4,32,450.00
693	668.00	Supply, laying, dressing, testing & commissioning of 3.5 Core 35Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	377.00	2,51,836.00
694	1,028.00	Supply, laying, dressing, testing & commissioning of 3.5 Core 50Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	490.00	5,03,720.00
695	465.00	Supply, laying, dressing, testing & commissioning of 3.5 Core 70Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	649.00	3,01,785.00
696	548.00	Supply, laying, dressing, testing & commissioning of 3.5 Core 95Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	820.00	4,49,360.00
697	333.00	Supply, laying, dressing, testing & commissioning of 3.5 Core 120Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	1,008.00	3,35,664.00
698	773.00	Supply, laying, dressing, testing & commissioning of 3.5 Core 150Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	1,166.00	9,01,318.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
699	795.00	Supply, laying, dressing, testing & commissioning of 3.5 Core 185 Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	1,464.00	11,63,880.00
700	14,515.00	Supply, laying, dressing, testing & commissioning of 3.5 Core 240 Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	1,850.00	2,68,52,750.00
701	2,175.00	Supply, laying, dressing, testing & commissioning of 3.5 Core 300 Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	2,241.00	48,74,175.00
702	1,800.00	Supply, laying, dressing, testing & commissioning of 3.5 Core 400 Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	2,870.00	51,66,000.00
703	2,753.00	Supply, laying, dressing, testing & commissioning of 4 Core 10 Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	225.00	6,19,425.00
704	2,853.00	Supply, laying, dressing, testing & commissioning of 4 Core 16 Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	259.00	7,38,927.00
705	2,925.00	Supply, laying, dressing, testing & commissioning of 4 Core 6 Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed Aluminium conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	196.00	5,73,300.00
706	2,025.00	Supply, laying and dressing of 4Core 4Sq.mm 1100 volt grade XLPE insulated FRLS PVC sheathed Copper conductor armoured XLPE/PVC cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning. Make: Torrent / Universal / Havells / KEI /Polycab/RR Kabel	353.00	7,14,825.00
707	675.00	Supply, laying, dressing, testing & commissioning of 4 Core 2.5Sq.mm 1100 volts grade XLPE insulated FRLS PVC sheathed copper conductor as per IS 8130 with armoured XLPE/PVC cables as per IS 7098 / IS 1554 (Part-I & II) as per detailed technical specifications suitable to lay in cable trays/shafts/hume pipes/HDPE DWC pipes with requried accessories etc as required includingall labour charges and as directed by Engineer-In-Charge. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt.	227.00	1,53,225.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
708	1,425.00	Supply, laying and dressing of 3Core 2.5Sq.mm 1100 volt grade FRLS PVC sheathed Copper armoured Fleixble cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning. Make: Torrent / Universal / Havells / KEI /Polycab/RR Kabel	199.00	2,83,575.00
709	72.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 3.5Core 25Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	310.00	22,320.00
710	39.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 3.5Core 35Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	412.00	16,068.00
711	39.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 3.5Core 50Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	482.00	18,798.00
712	15.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 3.5Core 70Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	715.00	10,725.00
713	15.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 3.5Core 95Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	819.00	12,285.00
714	15.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 3.5Core 120Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	1,032.00	15,480.00
715	27.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 3.5Core 150Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	1,237.00	33,399.00
716	30.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 3.5Core 185Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	1,375.00	41,250.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
717	147.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 3.5Core 240Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	2,062.00	3,03,114.00
718	45.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 3.5Core 300Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	2,475.00	1,11,375.00
719	72.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 3.5Core 400Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	3,299.00	2,37,528.00
720	75.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 4Core 10Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	316.00	23,700.00
721	78.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 4Core 16Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	316.00	24,648.00
722	78.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 4Core 6Sq.mm PVC insulated sheathed PVC/XLPE Aluminium conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	316.00	24,648.00
723	58.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and Copper lugs duly crimped with crimping tool, PVC tape etc., for 4Core 4Sq.mm PVC insulated sheathed PVC/XLPE copper conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	316.00	18,328.00
724	42.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and copper lugs duly crimped with crimping tool, PVC tape etc., for 4Core 2.5Sq.mm PVC insulated sheathed PVC/XLPE copper conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	316.00	13,272.00
725	198.00	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121, IP 66 complete, SIBG type, and copper lugs duly crimped with crimping tool, PVC tape etc., for 3Core 2.5Sq.mm PVC insulated sheathed PVC/XLPE copper conductor armoured cables of 1100 volt grade with suitable earth tag and earthing facility at both ends of cables etc. complete as required including all labour charges and as directed by Engineer-In-Charge.. Make: Dowells/Comet/ SMI	316.00	62,568.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
726	219.00	Supply,Transportation, installation, testing and commissioning of earthling as per IS 3043 with perforated 3 mtr long 40 mm dia B class GI pipe including all accessories like nuts bolts reducer,nipple, wire meshed funnel andCCfinished chamber covered with hinged type with CI cover ,CI frame of size 300 X 300 mm and embodying the pipe complete with alternate layers of salt and coke /charcoal/bentonite powder testing earth resistance as required etc., complete as per detailed technical specifications and approved make. Make: Obo/Beterman/ISI approved or equivalent make as approved by the competent authority.	11,612.00	25,43,028.00
727	36.00	Supply,Transportation, installation, testing and commissioning of earthing as per IS 3043 with 100 mm CI pipe of 3 mtrs long including all accessories like nuts bolts reducer,nipple, wire meshed funnel and CCfinished chamber covered with hinged type with CI cover ,CI frame of size 300 X 300 mm and embodying the pipe complete with alternate layers of salt and coke /charcoal/bentonite powder testing earth resistance as required etc., complete as per detailed technical specifications and approved make. Make: Obo/Beterman/ISI approved or equivalent make as approved by the competent authority.	10,311.00	3,71,196.00
728	78.00	Supply,Transportation, installation, testing and commissioning ofearthing as per IS 3043 with copper earth plate of size 600 x 600 x 3.15 mm by embodying 3 to 4 mtr below the ground level with 40mm dia 'B' Class G.I Pipe by exacavating a pit to a depth of 3 to 4 Mtr in all soils for Sophisticated Electronic equipment as per National Electric Code and earth connection from electrode Copper strip of 25mm x 5mm x 200mm length to be bolted with nut bolts to G.I.pipe including 25mm x 3mm copper strip of 6Mtrs length connected from plate to Copper strip including filling with 20Kg Salt and 40Kg Charcoal or 40Kg bentonite powderincluding all accessories like nuts bolts reducer,nipple, wire meshed funnel and CCfinished chamber covered with hinged type with CI cover ,CI frame of size 300 X 300 mm ,testing earth resistance as required.etc., complete as per detailed technical specifications and approved make. (2 X'fer+2 DG Set). Make: Obo/Beterman/DEHN ISI approved	27,200.00	21,21,600.00
729	2,325.00	Supply and laying of 8 SWG Copper wire(0.16 Kgs/1 Mtr) Earth wire/Strip in horizontal /Vertical run in Ground/surface/Recess including, revitting,soldering,saddles,making connection etc as required. Make: Obo/Beterman/I DEHN SI approved	120.00	2,79,000.00
730	1,275.00	Supply and laying of 10 SWG Copper wire(0.028Kgs/1Mtr) Earth wire/Strip in horizontal /Vertical run in Ground/surface/Recess including, revitting,soldering,saddles,making connection etc as required. Make: Obo/Beterman/DEHN ISI approved	78.00	99,450.00
731	333.00	Supply and laying of 25mm x 6mm GI Flat(0.656 Kgs/Mtr) Earth wire/Strip in horizontal /Vertical run in Ground/surface/Recess including, revitting,soldering,saddles,making connection etc as required. Make: Obo/Beterman/DEHN ISI approved	110.00	36,630.00
732	915.00	Supply and laying of 75 mm x 10mm GI Flat(5.9 Kgs/mtr) Earth wire/Strip in horizontal /Vertical run in Ground/surface/Recess including, revitting,soldering,saddles,making connection etc as required. Make: Obo/Beterman/DEHN ISI approved	667.00	6,10,305.00
733	1,335.00	Supply and laying of 50 mm x 6mm GI Flat (2.36 Kgs/mtr) Earth wire/Strip in horizontal /Vertical run in Ground/surface/Recess including, revitting,soldering,saddles,making connection etc as required. Make: Obo/Beterman/DEHN ISI approved	236.00	3,15,060.00
734	975.00	Supply and laying of 40 mm x 6mm GI Flat (1.89 Kgs/mtr) Earth wire/Strip in horizontal /Vertical run in Ground/surface/Recess including, revitting,soldering,saddles,making connection etc as required. Make: Obo/Beterman/DEHN ISI approved	201.00	1,95,975.00
735	48.00	Supply and fixing of EARTH BUS -1 Mtr length of 40mm x 6mm G.I Strip with required no of holes, insualtors for supporting etc., including cost of all accessories and labour charges etc., complete in main LT panel room for earthing connectivity. Make: Obo/Beterman/DEHN ISI approved	467.00	22,416.00
736	42.00	Supply and fixing of EARTH BUS -1 Mtr length of 25mm x 6mm G.I Strip with required no of holes, insualtors for supporting etc., including cost of all accessories and labour charges etc., complete in main LT panel room for earthing connectivity. Make: Obo/Beterman/DEHN ISI approved	372.00	15,624.00
737	975.00	Supply and laying of 40 mm x 6mm Cu Flat Earth wire/Strip in horizontal /Vertical run in Ground/surface/Recess including, revitting,soldering,saddles,making connection etc as required. Make: Obo/Beterman/DEHN ISI approved	2,545.00	24,81,375.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
738	1,028.00	Supply and laying of 50 mm x 6mm Cu Flat Earth wire/Strip in horizontal /Vertical run in Ground/surface/Recess including, revitting,soldering,saddles,making connection etc as required. Make: Obo/Beterman/DEHN ISI approved	2,795.00	28,73,260.00
739	825.00	Supply and laying of 75 mm x 10 mm Cu Flat Earth wire/Strip in horizontal /Vertical run in Ground/surface/Recess including, revitting,soldering,saddles,making connection etc as required. Make: Obo/Beterman/DEHN ISI approved	8,071.00	66,58,575.00
740	13,293.00	Supply, installation, testing and commissioning of 8 mm Aluminum Round Conductor complete as specified in drawing & meets the requirements of DIN EN 50164-2 (VDE 0185 part 202) & VDE 0185-305 (IS/IEC 62305) and as directed by Engineer In Charge and as per technical speicifications and of approved make. Make: Obo/Beterman/ DEHN ISI approved	124.00	16,48,332.00
741	2,321.00	Supply, installation, testing and commissioning of Roof conductor holder for parapet- Polyamide Conductor holder: With M8 female thread or diameter 7mm, M8 Screw to connect the conductor holder. Weather and temperature resistant from -35 to +90 degree Celsius tested. Conductorholder @ 1 meter distance as per detailed technical specifications.Make: Obo/Beterman/DEHN ISI approved	69.00	1,60,149.00
742	10,806.00	Supply, installation, testing and commissioning of Polyamide roof cable holder for flat roof: DIN 48829 Form B1. Closed form with bottom. Filling weight 1Kg (frost-resistant concrete). Sleeve from polyethylene, black @ 1 meter distance as per detailed technical specifications. Make: Obo/Beterman/ DEHN ISI approved	178.00	19,23,468.00
743	186.00	Supply, installation, testing and commissioning of Fang Fix Junior system - Inclusive of Al intrception rod of 1Mtr length(10mm dia) , Quick mounting of the interception rod in the base using plug technology as per detailed technical specifications. Make: Obo/Beterman/ DEHN ISI approved	2,269.00	4,22,034.00
744	906.00	Supply, installation, testing and commissioning of cross universal connector: For T and cross connection, to route vertical down conductor /mesh formation made of hot dipped galvanised iron with necessary screws etc as required. Installed with 4 hexagonal bolts M8*25 with M8 hexagonal nuts as per detailed technical specifications. Make: Obo/Beterman/ DEHN ISI approved	182.00	1,64,892.00
745	186.00	Supply, installation, testing and commissioning of expansion piece with connector: For equalising temperature related length changes. Necessary on conductors length over 20 meters. For round conductor Rd 8/ALU.Connector: For T cross and parallel connectors. Quick installation using hexagonal bolt M10X30 high-grade hot dip galvanised. Conforms to the requirements according to DIN VDE 0185-305 (IS-IEC 62305)(2nos/expansion piece). as per detailed technical specifications. Make: Obo/Beterman/DEHN ISI approved	544.00	1,01,184.00
746	186.00	Supply, installation, testing and commissioning of Fang Fix Junior system - Inclusive of Al interception rod of 1Mtr length (10mm dia), Quick mounting of the interception rod in the base using plug technology. Make: Obo/Beterman/DEHN ISI approved	2,269.00	4,22,034.00
747	42.00	Supply, installation, testing and commissioning of Lightnig counter - To count no of lightning strike & it can record the date and time of the lightning incident also tested as per IEC 62561-6 as per detailed technical specifications. Make: Obo/Beterman/DEHN ISI approved or equivalent make as approved by the competent authority.	22,683.00	9,52,686.00
748	102.00	Providing earth electrode of low carbon steel rod, UL listed of 17.2 mm dia, 3 Mtr long, coated with copper of 254 microns thickness, CPRI tested for short time current withstand test of 25 kA, coating thickness, environmental test (Salt Mist Test), Bend test, Tensile strength, Yield / tensile ratio, Electrical Resistivity test, complete with clamps and 2 bags of (Earth plus ULTRA /TIRUMALA) high grade earthing compound IEC 62561-7 complaint Eco-friendly, Maintenance free, anti-corrosive, lead-free, super conductive, mineral based high-grade earthing compound, to enhance soil conductivity. With resistance <0.20 ohms-meter, should be leach proof & Sulphur free complete with earth inspection chamber of dimensions: width: 320 mm x 320 mm, Height : 192 mm, weight : 30 Kgs, Load bearing capacity : 5000 Kgs Make: Obo/Beterman/DEHN ISI approved	13,060.00	13,32,120.00
749	765.00	Supply,transporatation & installation of 100mm x 50mm x 1.6mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	424.00	3,24,360.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
750	525.00	Supply,transporatation & installation of 150mm x 50mm x 1.6mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	492.00	2,58,300.00
751	315.00	Supply,transporatation & installation of 300mm x 62.5mm x 2.0mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	1,088.00	3,42,720.00
752	285.00	Supply,transporatation & installation of 450mm x 62.5mm x 2.0mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	1,460.00	4,16,100.00
753	195.00	Supply,transporatation & installation of 600mm x 75mm x 2.0mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	2,020.00	3,93,900.00
754	75.00	Supply,transporatation & installation of 750mm x 75mm x 2.0mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	2,223.00	1,66,725.00
755	75.00	Supply,transporatation & installation of 900mm x 75mm x 2.0mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	2,615.00	1,96,125.00
756	180.00	Supply,transporatation & installation of 450mm x 50mm x 2.0mm of Hot Dipped Galvanized Iron ladder type cable trays with rungs at span of 250 mm including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/wall with suspenders and etc., complete. Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	1,028.00	1,85,040.00
757	225.00	Supply,transporatation & installation of 600mm x 75mm x 2.0mm of Hot Dipped Galvanized Iron ladder type cable trays with rungs at span of 250 mm including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/wall with suspenders and etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	1,270.00	2,85,750.00
758	165.00	Supply,transporatation & installation of 750mm x 75mm x 2.0mm of Hot Dipped Galvanized Iron ladder type cable trays with rungs at span of 250 mm including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/wall with suspenders and etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	1,346.00	2,22,090.00
759	75.00	Supply,transporatation & installation of 900mm x 75mm x 2.0mm of Hot Dipped Galvanized Iron ladder type cable trays with rungs at span of 250 mm including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/wall with suspenders and etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	1,429.00	1,07,175.00
760	90.00	Supply,transporatation & installation of 150mm x 50mm x 2.0mm of Hot Dipped Galvanized Iron Wire Mesh Type cable trays, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	796.00	71,640.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
761	75.00	Supply,transporatation & installation of 300mm x 50mm x 2.0mm of Hot Dipped Galvanized Iron Wire Mesh Type cable trays, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	990.00	74,250.00
762	75.00	Supply,transporatation & installation of 450mm x 50mm x 2.0mm of Hot Dipped Galvanized Iron Wire Mesh Type cable trays, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	1,140.00	85,500.00
763	100.00	Supply,transporatation & installation of 150mm x 50mm x 1.6mm of Hot Dipped Galvanized Iron perforated cable trays with cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	640.00	64,000.00
764	50.00	Supply,transporatation & installation of 300mm x 50mm x 1.6mm of Hot Dipped Galvanized Iron perforated cable trays with cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	1,180.00	59,000.00
765	45.00	Supply,transporatation & installation of 1200mm x 75mm x 2.0mm of Hot Dipped Galvanized Iron ladder type cable trays with rungs at span of 250 mm including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/wall with suspenders and etc., complete. Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	2,185.00	98,325.00
766	45.00	Supply,transporatation & installation of 225mm x 50mm x 2.0mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete (NB:Add 30% Extra for perforated cable tray with cover). Make: Profab/Inidana/legrand/H-Fab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	916.00	41,220.00
767	4,988.00	Supply and Fixing of 20mm dia (1.9-2.1mm) thick (ISI MARK) heavy grade with IS:9537-part 3 rigid PVC Conduit. fixed on walls/ceiling/cable trays with all required accessories such as conduit, junction boxes, bends, elbows, rawl plug, screws, saddle with base and ceiling rose etc., with all necessary fixing accessories like mounting screws .clamps etc. including all labour charges complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. Makes: Precision/Universal& Marudhar/VIP / GoldMedal / Million plast / GM / Sudhakar/Polycab/Anchor/ Polyline/Orbit/AKG/Beljin/Vasavi/DEC	118.00	5,88,584.00
768	9,600.00	Supply and Fixing of 25mm dia (2-2.20) mm thick (ISI MARK) with IS:9537-part 3 rigid PVC Conduit. fixed on walls/ceiling/cable trays with all required accessories such as conduit, junction boxes, bends, elbows, rawl plug, screws, saddle with base and ceiling rose etc., with all necessary fixing accessories like mounting screws .clamps etc. including all labour charges complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. . Makes: Precision/Universal& Marudhar/VIP /GoldMedal / Million plast / GM / Sudhakar/Polycab/Anchor/ Polyline/ Orbit/AKG/Beljin/Vasavi/DEC	131.00	12,57,600.00
769	1,650.00	Supply and fixing of ISI 32 mm(1.90 -2.10mm thickness) (ISI MARK) medium grade with IS:9537-part 3 rigid PVC Conduit fixed on walls/ceiling/cable trays with all required accessories such as as conduit, junction boxes, bends, elbows, rawl plug, screws, saddle with base and ceiling rose etc., with all necessary fixing accessories like mounting screws .clamps etc. including all labour charges complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. . Makes: Precision/Universal& Marudhar/VIP / GoldMedal / Million plast / GM / Sudhakar/Polycab/Anchor/ Polyline/ Orbit/AKG/Beljin/Vasavi/DEC	152.00	2,50,800.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
770	1,650.00	Supply and Fixing of 25mm dia (2-2.20) mm thick PVC pipe heavy grade (ISI MARK) concealed in wall with all required accessories such as junction boxes, conduit , bends, elbows and ceiling rose, with all necessary fixing accessories like mounting screws .clamps etc. including all labour charges complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. . Makes: Precision/Universal& Marudhar/VIP / GoldMedal / Million plast / GM / Sudhakar/Polycab/Anchor/ Polyline/ Orbit/AKG/Beljin/Vasavi/DEC	149.00	2,45,850.00
771	788.00	Supply and Fixing of 20mm dia (1.9-2.1) mm thick P.V.C. pipe heavy grade (ISI MARK) concealed in wall with all required accessories accessories such as junction boxes, conduit , bends, elbows and ceiling rose, with all necessary fixing accessories like mounting screws .clamps etc. including all labour charges complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. . Makes: Precision/Universal& Marudhar/VIP /GoldMedal / Million plast / GM / Sudhakar/Polycab/Anchor/ Polyline/ Orbit/AKG/Beljin/Vasavi/DEC or its equivalent make as approved by the competent authority.	137.00	1,07,956.00
772	255.00	Supply and fixing of ISI 32 mm (1.90 -2.10mm thickness) P.V.C. pipe (ISI MARK) medium grade concealed in wall with all required accessories accessories such as junction boxes, conduit , bends, elbows and ceiling rose, with all necessary fixing accessories like mounting screws .clamps etc. including all labour charges complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. . Makes: Precision/Universal& Marudhar/VIP /GoldMedal / Million plast / GM / Sudhakar/Polycab/Anchor/ Polyline/ Orbit/AKG/Beljin/Vasavi/DEC	165.00	42,075.00
773	263.00	Supply and fixing of 2 Modular Hot Dip galvanized 18 SWG Module box with earthing terminal. Makes: Legrand /Schneider / Crabtree/Lauritz Knudsen.	77.00	20,251.00
774	456.00	Supply and fixing of 3 Modular Hot Dip galvanized 18 SWG Module box with earthing terminal. Makes: Legrand /Schneider / Crabtree/Lauritz Knudsen.	108.00	49,248.00
775	135.00	Supply and fixing of 4 Modular Hot Dip galvanized 18 SWG Module box with earthing terminal.Makes: Legrand /Schneider / Crabtree/Lauritz Knudsen.	130.00	17,550.00
776	165.00	Supply and fixing of 6 Modular Hot Dip galvanized 18 SWG Module box with earthing terminal. Makes: Legrand /Schneider / Crabtree/Lauritz Knudsen.	176.00	29,040.00
777	68.00	Supply and fixing of 8 Modular Hot Dip galvanized 18 SWG Module box with earthing terminal. Makes: Legrand /Schneider / Crabtree/Lauritz Knudsen.	231.00	15,708.00
778	32.00	Supply and fixing of 12 Modular Hot Dip galvanized 18 SWG Module box with earthing terminal.Makes: Legrand /Schneider / Crabtree/Lauritz Knudsen.	278.00	8,896.00
779	23,483.00	Supply and fixing of 2 Modular Cover frames.Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	132.00	30,99,756.00
780	11,256.00	Supply and fixing of 3 Modular Cover frames..Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	147.00	16,54,632.00
781	1,575.00	Supply and fixing of 4 Modular Cover frames.Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	154.00	2,42,550.00
782	5,565.00	Supply and fixing of 6 Modular Cover frames..Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	282.00	15,69,330.00
783	4,028.00	Supply and fixing of 8 Modular Cover frames..Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	313.00	12,60,764.00
784	4,712.00	Supply and fixing of 12 Modular Cover frames..Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	482.00	22,71,184.00
785	59,655.00	Supply and finxing of 6A / 10A 1 Way 1 Module Modular Switch ISI Marked. .Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	121.00	72,18,255.00
786	7,583.00	Supply and fixing of 6A / 10A 2 Way 1 Module Modular Switch ISI Marked. .Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	177.00	13,42,191.00
787	30,210.00	Supply and fixing of 6A / 10A 3 Pin 2 Module Universal / Modular Socket with shutter (universal socket or normal standard socket) ISI Marked. .Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	158.00	47,73,180.00
788	8,115.00	Supply of 20A 1 Way 1 Module Modular Switch with Indicator.ISI Marked. .Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz KnudsenKnudsen.	254.00	20,61,210.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
789	7,668.00	Supply and fixing of 16A/6A 1 way Combi Socket Universal/ Modular Socket with shutter. ISI Marked. .Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	318.00	24,38,424.00
790	7,598.00	Supply and fixing of 1 Modular regulator.ISI Marked. .Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	589.00	44,75,222.00
791	3,098.00	Supply and fixing of Modular socket type Telephone jack with Connector. ISI Marked. .Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	183.00	5,66,934.00
792	3,075.00	Supply and fixing of Modular co-Axial socket type TV Antenna outlet. ISI Marked. .Makes: Legrand (Arteor) /Schneider (Zen celo)/ equivalent range/model in Crabtree/Lauritz Knudsen	183.00	5,62,725.00
793	1,838.00	Supply installation testing and commissioning of 1no of Cat6 Tool less built-in crimping mechanism Information Outlet with Dust Cover Exceed ANSI/ TIA-568-C.2 and ISO/IEC 11801 standards with 1module face plate for Category 6 component performance & Compatible to T568A, T568B wiring pattern and UL-940V0 Rated Plastic &RoHS Compliant. Legrand (Arteor) /Schneider / Crabtree /Lauritz Knudsen.	591.00	10,86,258.00
794	1,095.00	Supply & fixing of 63A 4 Pole MCB, 10 kA C/D Curve ISI Mark as per IS:60898-1 including internal connection and labour charges etc., complete. Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus)	2,506.00	27,44,070.00
795	12,975.00	Supply & fixing of 6-32A SP MCB, 10 kA C/D Curve ISI Mark as per IS:60898-1 including internal connection and labour charges etc., complete. Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus)	259.00	33,60,525.00
796	1,104.00	Supply & fixing of 63A, 2 Pole,30mA, RCCB for earth leakage protection (ELCB/RCD) confirms to IEC:61008 AND IS:12640-1 including internal connection and labour charges etc., complete. Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus).	4,506.00	49,74,624.00
797	44.00	Supply, Transportation, Erection, Testing & Commissioning of 32A Double Pole Isolator confirm to IEC 60947 in sheet steel enclosure including internal connection and labour charges for surface / flush mounting etc., complete as per detailed technical specifications and approved make. Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus)	1,018.00	44,792.00
798	39.00	Supply, Transportation, Erection, Testing & Commissioning of 40A 4 Pole Isolator confirm to IEC 60947 in sheet steel enclosure including internal connection and labour charges for surface / flush mounting etc., complete as per detailed technical specifications and approved make. Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus)	1,666.00	64,974.00
799	24.00	Supply, Transportation, Erection, Testing & Commissioning of 63A 4 Pole Isolator confirm to IEC 60947 in sheet steel enclosure including internal connection and labour charges for surface / flush mounting etc., complete as per detailed technical specifications and approved make. Makes:Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus)	1,803.00	43,272.00
800	30.00	Supply, Transportation, Erection, Testing & Commissioning of 100A 4 Pole Isolator confirm to IEC 60947 in sheet steel enclosure including internal connection and labour charges for surface / flush mounting etc., complete as per detailed technical specifications and approved make. Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus)	1,871.00	56,130.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
801	96.00	Supplying and fixing 32 amps, 415 volts, 3P metali/industrial type, socket outlet, with plug top along with 32 amps "C" curve, FPMCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required as per detailed technical specifications and approved make.As directed by Eingineer In Charge. Make: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx / Lauritz Knudsen (Formerly L&T)-AU/Indo Asian-Opti pro/ HPL (Techno) /Anchor (Uno Plus), Enclosure make:Legrand(Ekinox 3) / Schneider-A9/Hager -Novello+/ Seimens/Crabtree Xpro classique-II/ Lauritz Knudsen (Formerly L&T)-Newrange/Indo Asian-Opti Pro/ HPL (Techno)/ Anchor (Uno Plus)	4,874.00	4,67,904.00
802	4,488.00	Supply and Fixing of 25mm dia 16 SWG (ISI Mark) MS Surface conduit pipe duly threading at Joints with all required accessories fixing on Separators with chromium plated base saddles and No.18 SWG MS box for light, fan and separate plug points including cost of Cement, all materials, accessories and all labour charges etc., complete as per detailed technical specifications and approved make. Makes: NAI / Bharath / GB / AKG/Precision.	318.00	14,27,184.00
803	40.00	Supply,Installation, Testing & Commissioning of 12" (300mm) Light duty exhaust fan with metalic blades and wire guard etc complete including labour charges and as direted by Engineer in charge. .Makes: Crompton / Bajaj Bahar WG / Havells Ventil Air-DSP / Orient hill air/Halonix /Polycab/G.M. (Xenix)/Goldmedal (Rapido-12)	2,504.00	1,00,160.00
804	2,616.00	Supplying, installing, testing, and commissioning of 6" (150mm), Light duty exhaust fan PVC type with required ball bearings as needed and wire guard etc complete as per specification including transportation to site, all mounting arrangements like brackets etc., and cost of all accessories and all labour charges complete. Crompton / Bajaj Bahar / Havells Ventil Air-LX / Orient hill air/Halonix /Polycab/G.M. (Eco Air)/Goldmedal (Rapido-12)	1,632.00	42,69,312.00
805	1,110.00	Supply and fixing of 48" (1200mm) Sweep 5 star rated Ceiling Fan, with double ball bearings, air delivery more than 200 cubic meter/min, but without Regulator including all labour charges etc as directed by Engineer In Charge and as per technical speicifications and of approved make. Makes: Atomberg/ Halonix /Havells/ Crompton/Superfan/RJP/Usha	3,007.00	33,37,770.00
806	5,333.00	Supply and fixing of 48" (1200mm) Sweep 5 star rated BLDC (Brush less Direct Current) Ceiling Fan with double ball bearings, input voltage 230V AC converted to 24 V DC, power input not more than 30W, air delivery not less than 220 cubic meter/min and a minimum service value of 7.0, with remote and without Regulator.as directed by Engineer In Charge and as per technical speicifications and of approved make. Makes: Atomberg/ Halonix /Havells/ Crompton/Superfan/RJP/Usha	4,191.00	2,23,50,603.00
807	4,39,438.00	Supply and run of 3 runs of 1.5 Sqmm FRLS -H/ HFFR / ZHFR PVC insulated 1100V grade as per IS : 694 specification for Copper cable including all labour charges. Makes: Finolex / RR kabel / Havells/Finecab/ KEI/Polycab/Gloster/Goldmedal/GM/ Fortune Arrt/Anchor/Million/ APAR(Anushakthi)	120.00	5,27,32,560.00
808	3,96,053.00	Supply and run of 3 runs of 2.5 Sqmm FRLS-H / HFFR / ZHFR PVC insulated 1100V grade as per IS : 694specification for Copper cable including all labour charges. Makes: Finolex / RR kabel / Havells/Finecab/ KEI/Polycab/Gloster/Goldmedal/GM/ Fortune Arrt/Anchor/Million/ APAR(Anushakthi)	163.00	6,45,56,639.00
809	75,533.00	Supply and run of 3 runs of 4.0 Sqmm FRLS -H/ HFFR / ZHFR PVC insulated 1100V grade as per IS : 694specification for Copper cable including all labour charges. Makes: Finolex / RR kabel / Havells/Finecab/ KEI/Polycab/Gloster/Goldmedal/GM/ Fortune Arrt/Anchor/Million/ APAR(Anushakthi)	248.00	1,87,32,184.00
810	64,938.00	Supply and run of 1 runs of 6.0 Sqmm FRLS -H/ HFFR / ZHFR PVC insulated 1100V grade as per IS : 694specification for Copper cable including all labour charges. Makes: Makes: Finolex / RR kabel / Havells/Finecab/ KEI/Polycab/Gloster/Goldmedal/GM/ Fortune Arrt/Anchor/Million/ APAR(Anushakthi)	113.00	73,37,994.00
811	28,278.00	Supply and run of 4 runs of 10.0 Sqmm FRLS-H / HFFR / ZHFR PVC insulated 1100V grade as per IS : 694specification for Copper cable including all labour charges. Makes: Finolex / RR kabel / Havells/Finecab/ KEI/Polycab/Gloster/Goldmedal/GM/ Fortune Arrt/Anchor/Million/ APAR(Anushakthi)	642.00	1,81,54,476.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
812	1,238.00	Supply and run of 4 runs of 16.0 Sqmm FRLS-H / HFFR / ZHFR PVC insulated 1100V grade as per IS : 694specification for Copper cable including all labour charges. Makes: Finolex / RR kabel / Havells/Finecab/ KEI/Polycab/Gloster/Goldmedal/GM/ Fortune Arrt/Anchor/Million/ APAR(Anushakthi)	956.00	11,83,528.00
813	1,00,438.00	Supply, laying ,testing and commissioning of 4-pair Cat 6 UTP Cable, Cat6 Solid (Third party ETL Intertek tested up to 700 MHZ) to support 1Gbps with Cross (+) filler pair separator & PVC sheath 23 AWG, STP/UTP Cable , Meets or exceeds ANSI/TIA-568-C.2 and UL Listed &RoHS Compliant in the existing raceways /PVC conduits including making connections to information outlets and patch panels with ferruling at both ends for identification with necessary tools for punching stripping crimping and testing required etc., complete. Makes: Systimax /Panduit/ Siemond/ Legrand/Molex/Beldon	51.00	51,22,338.00
814	45,800.00	Supply and laying of RG 6 co-axial cable complete as per technical specification and as directed by Engineer in Charge. for TVs.Makes: Finolex / RR kabel / Havells KEI/Polycab/Gloster/Goldmedal/GM/Million	42.00	19,23,600.00
815	90.00	Supply, installing, testing and commissioning of surface mounted batten Smart Bright Essential IP65 dust and waterproof LED 34W-40W-4100lm, (>=110-120 lumens/watt) CCT 6500K, CRI>80, housing made of Polycarbonate Co-extrusion, IK08, Life Span 30K hours hours (L70B50@Ta45°C), THD<10%, PF>0.85. The luminaire shall be designed for operations under diverse environment from -10 deg C to 45 deg C, Input Voltage Range 140-270V, surge protection 2.5KV, high transmission PC diffuser. The fixture should be BIS certified. LM 79 and LM80 reports need to be submitted.Makes:Philips/Wipro/Havells/Crompton/Bajaj/Jaquar	1,750.00	1,57,500.00
816	864.00	Supply and fixing of 1X24W LED wall mounted light fixture with stainless steel base with glass cover. The fixture should be BIS certified.Makes:Philips/Wipro/Havells/Crompton/Bajaj/Jaquar	2,600.00	22,46,400.00
817	90.00	Supply and fixing of 26 W heavy duty LED Down lighter, suitable for Recessed/Surface mounting (Square/Circular) made of pressure diecast aluminum body with powder coating, acrylic diffuser with driver as per IS: 15885 (Part 2/ Sec 13) : , operating voltage of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV, THD<10% with high power LEDs, having System Efficacy of >= 110-120 lumens / watt, CCT: 3000K - 5700K, minimum CRI > 70, Luminaire performance complies to IS 10322 (Part 5 / Sec-3) etc., complete with earth connection and not less than two years warranty. Makes:Philips/Wipro/Havells/Crompton/Bajaj/Jaquar	1,645.00	1,48,050.00
818	558.00	Supply and fixing of 24/26 W LED Slim Panel Round /Square suitable for Recessed / Surface mounting made of diecast aluminum body with powder coating, acrylic diffuser with driver as per IS: 15885 (Part 2/ Sec 13) : 2012, operating voltage range of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV, THD<10%, with high power LEDs, having System Efficacy of >=110 to 120 lumens /watt, CCT: 3000K - 5700K, minimum CRI>70, .etc., complete with earth connection and not less than two years warranty.and as per technical specification and as directed by Engineer in charge a) LUMINAIRE MAKE : Phillips / GE- Venture / Crompton / Wipro / Bajaj / Havells / Halonix/ Jaquar/ HPL/GM / GreenLites / Gold Medal/Eveready / FortuneArrt/ Rhino/Panasonic b) LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG/Everlight	1,509.00	8,42,022.00
819	3,510.00	Supply and fixing of 18 W LED Slim Panel Round /Square suitable for Recessed / Surface mounting made of diecast aluminum body with powder coating, acrylic diffuser with driver as per IS: 15885 (Part 2/ Sec 13) operating voltage range of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV, THD<10%, with high power LEDs, having System Efficacy of >=110-120 lumens /watt, CCT: 3000K - 5700K, minimum CRI>70, .etc., complete with earth connection and not less than two years warranty.and as per technical specification and as directed by Engineer in charge a) LUMINAIRE MAKE : Phillips / GE- Venture / Crompton / Wipro / Bajaj / Havells / Halonix/ Jaquar/ HPL/GM / GreenLites / Gold Medal/Eveready / FortuneArrt/ Rhino/Panasonic b) LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG/Everlight	1,196.00	41,97,960.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
820	93.00	Supply and fixing of Elevate Glow Shaped Luminaire Fixture to be made of extrusion Aluminum housing in white finish with high efficiency polycarbonate/PS diffuser. LED Used shall be SMD type with Minimum system Lumens & efficacy70- 80lm/W for opal diffuser and 60-70lm/W for microprismatic diffuser,Its an IP 20 Product with 25 W with 2400 lumen ,Life of fixture : 50000 burning Hrs. @ L70B50 Lumen maintenance, CCT of 4000K/5700K/6500K (SDCM<=5), CRI Ra >=80, PF >0.95, operating Voltage Range of 140-270 V AC. Minimum Internal Surge Protection 4.0KV THD is less than 10%. LM 79 and LM80 reports need to be submitted from a NABL/UL accredited lab to verify above parameters. Both the fixture and Driver should have separate BIS approval.Makes:Philips/Wipro/Havells/Crompton/Bajaj/Jaquar	4,489.00	4,17,477.00
821	2,361.00	Supply, Erection, Testing & Commissioning of 10/11W Mirror light wall/ceiling mounting luminaire with all other accessories as requiredsuitable for Recessed / Surface mounting made of diecast alluminium body with powder coating, acrylic diffuser with Driver as per IS: 15885 (Part 2/ Sec 13) , operating voltage range of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV,THD<10%, with high power LED?s having efficacy of > 120 lumins/watt,CCT: 3000K - 5700K, minimum CRI>70, .etc., complete as per detailed technical specifications and as directed by Engineer in charge Makes : Philips/Bajaj / Crompton / Havells/ HPL	625.00	14,75,625.00
822	90.00	Supply, installing, testing and commissioning of SURFACE MOUNTED Powered by the VariLume technology, havnig modern LED integrated fixture requirements of Slim design, antique finish, and dual light mode for brighter days,BIS Safety standards registered,Colour of Bronze, material made up of metal and the lamp based being LED. Dual wattage having 15W and 6W with lumen being 800lm and 300lm and CCT being 3000K, CRI >=80, Operating Voltage being AC: 220V-240V .Makes:Philips/Wipro/Havells/Crompton/Bajaj/Jaquar	3,510.00	3,15,900.00
823	2,592.00	Supply, installing, testing and commissioning of Wall light with soft indirect lighting in brilliant matte chrome and easy to maintain,bright without glare,tmaterial made out of metal and white in colour having a Wattage as 2 X 20 W. Makes:Philips/Wipro/Havells/Crompton/Bajaj/Jaquar	2,900.00	75,16,800.00
824	1,240.00	Supply, installing, testing and commissioning of foot light LED 3000K 220-240V,AC, CRI > 80 Input power: 10 W having Electronic driver ON/OFF CE mark. IP rating IP67 and impact resistance IK08. Material made up of metal and plastic housing with polycarbonate UV-resistant optical cover, aluminum and white color. Operating ambient temperature range is from -20°C to +40°C . Makes:Philips/Wipro/Havells/Crompton/Bajaj/Legrand/Klite/Jaquar/Reytek	586.00	7,26,640.00
825	3,995.00	Supply, installing, testing and commissioning of LED WARDROBE LIGHT/KITCHEN with required acessories of Space Glow 2ft LED Linear Cabinet Light | 12-watt LED Under Cabinet Wardrobe and Kitchen Light, Lumens-900 lumens, Cool Day Light/Warm White as approved by Engineer-In-ChargeMakes:Philips/Wipro/Havells/Crompton/Bajaj/Jaquar	890.00	35,55,550.00
826	907.00	Supply, installing, testing and commissioning of Architecural Design SUSPENSION TYPE CHANDELIER LED LIGHT FIXTURE OF BRONZE BASE & FLORAL BLOWN GLASS METAL of 5 x 15W LED. Makes:Philips/Wipro/Havells/Crompton/Bajaj/Jaquar	12,250.00	1,11,10,750.00
827	200.00	Supply, installing, testing and commissioning of RECESS MOUNTED LED DOWN LIGHT FIXTURE having diverse frame shapes incluing round, square, rectangle and trimless options with multi light configuration of approved colour and finish, having beam angles of 15, 26 or 36, LED Colours 3000 K- 4000K, CRI>90 with llight fixtures of 3 x 12 W LED . Makes:Philips/Wipro/Havells/Crompton/Bajaj/Jaquar	8,245.00	16,49,000.00
828	56.00	Supply, Transportation and Fixing of 40W 1100mm length Linear Profile LED Luminaire recessed/surface mounted with Aluminum extrusion, powder coated cover, input voltage AC 90-270 volts with PF>0.95, with high power LEDs, having system efficacy of >=100 lumens / watt, surge protection: 2KV, THD<15%, with inbuilt driver and frosted cover CCT: 3000K - 5700K, minimum CRI>70, .etc., complete including fixing of 40W Linear light duly recessed in the ceiling/surface mounted by hanging from ceiling with necessary mounting arrangements, jointing kit, connecting wire leads etc., and all accessories, giving connections and all labour charges etc., complete with earth connection and not less than two years warranty. Makes:a) LUMINAIRE MAKE : Phillips (Pureline Slim) / GE-Venture / Crompton / Wipro / Bajaj / Havells (Dustello) b) LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG/LG	6,276.00	3,51,456.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
829	30.00	Supply and fixing of 24/26 W LED Slim Panel Round /Square suitable for Recessed / Surface mounting made of diecast aluminum body with powder coating, acrylic diffuser with driver as per IS: 15885 (Part 2/ Sec 13) : 2012, operating voltage range of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV, THD<10%, with high power LEDs, having System Efficacy of >=110 to 120 lumens /watt, CCT: 3000K - 5700K, minimum CRI>70, .etc., complete with earth connection and not less than two years warranty.and as per technical specification and as directed by Engineer in charge a) LUMINAIRE MAKE : Phillips / GE- Venture / Crompton / Wipro / Bajaj / Havells / Halonix/ Jaquar/ HPL/GM / GreenLites / Gold Medal/Eveready / FortuneArrt/ Rhino/Panasonic b) LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG/Everlight	1,509.00	45,270.00
830	26,597.00	Supply and fixing of 18 W heavy duty LED Down lighter, suitable for Recessed/Surface mounting (Square/Circular) made of pressure diecast aluminum body with powder coating, acrylic diffuser with driver as per IS: 15885 (Part 2/ Sec 13) : 2012 , operating voltage of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV, THD<10% with high power LEDs, having System Efficacy of >= 110-120 lumens / watt, CCT: 3000K - 5700K, minimum CRI > 70, Luminaire performance complies to IS 10322 (Part 5 / Sec-3) etc., complete with earth connection and not less than two years warranty.Makes :a) LUMINAIRE MAKE : Phillips / GE-Venture / Crompton / Wipro / Bajaj / Havells / Halonix/Jaquar/HPL/GM / GreenLites / Gold Medal/Eveready/ FortuneArrt/ Rhino/Panasonic b) LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG/Everlight	1,532.00	4,07,46,604.00
831	738.00	Supply and fixing of 12 W LED Slim Panel Round /Square suitable for Recessed / Surface mounting made of diecast aluminum body with powder coating, acrylic diffuser with driver as per IS: 15885 (Part 2/ Sec 13) : 2012, operating voltage range of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV, THD<10%, with high power LEDs, having System Efficacy of >=110 -120lumens /watt, CCT: 3000K - 5700K, minimum CRI>70, .etc., complete with earth connection and not less than two years warranty.Makes : a) LUMINAIRE MAKE : Phillips / GE-Venture / Crompton / Wipro / Bajaj / Havells / Halonix/Jaquar/HPL/GM / GreenLites / Gold Medal/Eveready/ FortuneArrt/ Rhino/Panasonic b) LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG/Everlight	865.00	6,38,370.00
832	353.00	Supply, transportation and fixing of 36 W Recessed / Surface mounting 2' x 2' (600x600 mm) LED luminaire made of CRCA sheet housing with powder coated with acrylic diffuser, constant current driver as per IS: 15885 (Part 2/ Sec 13) : 2012 , with operating voltage range of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV, THD<10%, with high power LEDs, having System Efficacy of >=110-120 lumens / watt, CCT: 3000K - 5700K, minimum CRI>70, .etc., complete with earth connection and not less than two years warranty.Makes : a) LUMINAIRE MAKE : Phillips / GE-Venture / Crompton / Wipro / Bajaj / Havells / Halonix/Jaquar/HPL/GM / GreenLites / Gold Medal/Eveready / FortuneArrt// Rhino/Panasonic b) LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG/Everlight.	3,164.00	11,16,892.00
833	60.00	Supply, transportation and fixing of 45 W Recessed / Surface mounting 2' x 2' (600x600 mm) LED luminaire made of CRCA sheet housing with powder coated with acrylic diffuser, constant current driver as per IS: 15885 (Part 2/ Sec 13) : , with operating voltage range of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV, THD<10%, with high power LEDs, having System Efficacy of >=110 -120lumens / watt, CCT: 3000K - 5700K, minimum CRI>70, .etc., complete with earth connection and not less than two years warranty. Makes :a) LUMINAIRE MAKE : Phillips / GE-Venture / Crompton / Wipro / Bajaj / Havells / Halonix/Jaquar/HPL/GM / GreenLites / Gold Medal/Eveready / FortuneArrt// Rhino/Panasonic b) LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG/Everlight.	3,525.00	2,11,500.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
834	135.00	Supply and fixing of 20-24W, not less than 1100mm length LED batten light with extruded aluminum housing and polycarbonate cover, input voltage AC 220 - 260 Volts, with high power LEDs, having System Efficacy of >=110-120lumens/watt , PF>0.9, Surge protection: 2KV, THD<15%, with inbuilt driver and frosted cover CCT: 3000K - 5700K, minimum CRI>70, etc., complete with earth connection and not less than two years warranty. as per detailed technical specifications.and as directed by Engineer in charge. a) LUMINAIRE MAKE : Phillips / GE- Venture / Crompton / Wipro / Bajaj / Havells / Halonix/Jaquar/HPL/GM / GreenLites / Gold Medal/Eveready// Rhino/Panasonic b) LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG/ Everlight.	700.00	94,500.00
835	1,920.00	Supply , installation testing and commissioning of 10W LED Bulk head fitting with Pressure die cast alluminum with opal diffuser with IP 65 Protection etc., complete.,as per detailed technical specifications. and as directed by Engineer in charge Makes : Philips/Bajaj/ Crompton / Surya / Havells / Greenlites/ Insta Power/HPL /Halonix/ Panasonic. / FortuneArrt	1,251.00	24,01,920.00
836	150.00	Supply, Transportation, Erection, Testing & Commissioning of hot-dip galvanized Octogonal Pole with BSEN - 10025 grade S355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, including the supply of suitable boards with bakelite sheet as per IS specification suitable to withstand the wind speed of 180 KMPH for 7.5 Mtrs height Pole having dimensions Bottom 130 mm,. Top 70mm with 3mm thick, base plate 220 x 220 x 12mm and 4 Nos of M20 x 700 long 'J' bolts along with template.as per detailed technical specifications. Makes:Bajaj / Valmont/Laasma /Transrail/ Skipper /Consoul /Surya /Vakrangee/Lysaght Pole	15,727.00	23,59,050.00
837	153.00	Supply, Transportation, Erection, Testing & Commissioning of 1.0 Mtr Length Single Arm Bracket made with MS galvanized 40mm /50mm dia Pipe. Makes:Bajaj / Valmont/Laasma /Transrail/ Skipper /Consoul /Surya /Vakrangee/Lysaght Pole	1,738.00	2,65,914.00
838	150.00	Foundation and erection charges with special T&P, for 7.50 Mtrs long Octagonal /Conical pole duly erecting on base plate duly providing 4 Nos foundation bolts with nuts with providing of 0.45Mtr x 0.45Mtrs x1.20 Mtr size M20 cc work vibrated concreting mixing with necessary steel (10kgs) reinforcement and curing for 7 days as directed by the field engineers during execution including excavation of Earth/BT all labour charges and cost and conveyance of materials etc.complete.	6,614.00	9,92,100.00
839	153.00	Supply, Transportation, Erection, Testing & Commissioning of 60W LED Street light Luminaire made of pressure diecast alluminium body with powder coated, having protective toughned glass, poly corbrate Supply Input voltage 120 - 270 V AC, P.F > 0.90, high power LED's having System efficacy > 95 lm/W and junction temprature < 70°C, with Ingrees protection IP65, Luminaire performance complies to IS 10322 (Part 5 /Sec-3), Driver surge protection 4KV, external Surge protection = 5KV with optics distribution , THD<10% at 110 Volts AC, driver efficiency >90%, CCT: 3000K -5700K, minimum CRI>70, etc., complete as per detailed technical specifications. and as directed by Engineer in charge. a) LUMINAIRE MAKE : Wipro(Skyline) / Philips (Green line) / GE-Venture / Crompton(Neo Series) / Bajaj (Edge) / Halonix(Lumos - Super) / Havells (Endura Series) /Capart(Premium)/Greenlites(Hi-Lux) /Polycab/Keselec/ HPL(City Vision)/ Jaquar(Premium)/Eveready/ Surya (Pollux) / FortuneArrt (Leaf) / Rhino(GPSL04) b) LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG / LG	5,601.00	8,56,953.00
840	440.00	Supply and fixing of 1 Module Bell push on a common switch board with earth continuity including wire leads, earth connections along with all labour charges etc., complete and as directed by Engineer in charge.Makes: Legrand (Arteor/Schneider(Zencelo) or equivalent range in L&K, Havells.	229.00	1,00,760.00
841	2,200.00	Supply and fixing of 1 Module Dummy or blank plate along with all labour charges etc., complete and as directed by Engineer in charge.Makes: Legrand (Arteor/Schneider(Zencelo) or equivalent range in L&K, Havells.	24.00	52,800.00
842	4,360.00	Supply of 25mm dia FRPP corrugated Flexible conduit. Make: Precision/ VIP / GoldMedal / Million plast / Sudhakar / Polyline/Anchor/Beljin	24.00	1,04,640.00
843	2,200.00	Supply of 19/20mmdia FRPP corrugated Flexible conduit. Makes : Precision/ VIP / GoldMedal / Million plast / Sudhakar / Polyline/Anchor/Beljin	19.00	41,800.00
844	3,970.00	Supply of 3 Plate Jumbo Ceiling Rose.Makes: GMGHome/GoldMedalOlive/MillionZoom /GreatwhiteOmega/Koncept/Vimalopel/ Anchor/Vihan/CPL/ Havells Reo/Elleys	22.00	87,340.00
845	160.00	Supply and fixing of Anchor fastener with fan hook / Providing MS Fan hook with grouting and cement plastering	158.00	25,280.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
846	100.00	Supply and fixing of 2 Pole weather proof Modular box suitable to fix DP MCB, IP 67 rating including fixing and labour charges etc as directed by Engineer-In-Charge.	1,450.00	1,45,000.00
847	440.00	Supply and fixing of 4 Pole weather proof Modular box suitable to fix FP MCB, IP 67 rating including fixing and labour charges etc as directed by Engineer-In-Charge.	1,650.00	7,26,000.00
848	12,870.00	Supply, Erection, Testing & Commissioning of minimum 5W/Mtr Cove/rope light to be laid on existing gypesum ceiling board of approved CCT as directed by Engineer-In-Charge. Makes:Philips/Wipro/Havells/Crompton/Bajaj/ K Lite/Jaquar/Reytek	130.00	16,73,100.00
849	435.00	Supply & fixing of single pahse adopter for powering up cove/rope light as directed by Engineer-In-Charge. Makes:Philips/Wipro/Havells/Crompton/Bajaj/ K Lite/Jaquar/Reytek	250.00	1,08,750.00
850	168.00	Supply, Erection, Testing & Commissioning of Building Facade 40W/Equivalent Light Fixture with accessories complete as per detailed technical specifications and approved make. Makes:Philips/Wipro/Havells/Crompton/Bajaj/ K Lite/Jaquar/Reytek	35,000.00	58,80,000.00
851	36.00	Supply, Erection, Testing & Commissioning of Main Entrance Gate Light Fixture with accessories complete as per detailed technical specifications and approved make. Makes:Philips/Wipro/Havells/Crompton/Bajaj/ K Lite/Jaquar/Reytek	14,500.00	5,22,000.00
852	1,580.00	Supply, Erection, Testing & Commissioning of 40 W IP 65 weather proof LED light with wall /ceiling mounting luminaire with all other accessories as requiredsuitable for Recessed / Surface mounting made of diecast alluminium body with powder coating, acrylic diffuser with Driver as per IS: 15885 (Part 2/ Sec 13) , operating voltage range of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV,THD<10%, with high power LED?s having efficacy of > 120 lumins/watt,CCT: 3000K - 5700K, minimum CRI>70, .etc., complete as per detailed technical specifications and approved make. Makes:Philips/Wipro/Havells/Crompton/Bajaj/ K Lite/Jaquar/Reytek	3,950.00	62,41,000.00
853	128.00	Supply ,erection ,testing& commisioning and transportation of bollard of 9 Watts capacity including of Base plate, Nuts,Fondations andl all accessories conveyance,labour charges and all taxes etc..complete as per detailed technical specifications and approved make.(Colour of the pole/ bracket will be desided by the client/Engineer in Charge) Makes:Philips/Wipro/Havells/Crompton/Bajaj/ K Lite/Jaquar/Reytek	4,762.00	6,09,536.00
854	273.00	Supply ,erection ,testing& commisioning and transportation of pergola down lights of 28 Watts capacity including of Base plate, Nuts,Fondations andl all accessories conveyance,labour charges and all taxes etc..complete as per detailed technical specifications and approved make.(Colour of the pole/ bracket will be desided by the client/Engineer in Charge). Makes:Philips/Wipro/Havells/Crompton/Bajaj/ K Lite/Jaquar/Reytek	10,500.00	28,66,500.00
855	186.00	Supply ,erection ,testing& commisioning and transportation of tree up lights or spike lights of 3 Watts capacity including of Base plate, Nuts,Fondations andl all accessories conveyance,labour charges and all taxes etc..complete. as per detailed technical specifications and approved make.(Colour of the pole/ bracket will be desided by the client/Engineer in Charge) Makes:Philips/Wipro/Havells/Crompton/Bajaj/ K Lite/Jaquar/Reytek	9,500.00	17,67,000.00
856	18.00	Supply, fixing installation, testing and commissioning of ,fixed type aviation obstruction twin lights with dual on /off or Standby feture confirming to ICAO/FAA Standards,Low intensity, Type-A, 5 mm high. power LED, Red coloured With Power consumption less than 5W, LED lamps operating with 90V-220V on AC 0r 24V-60V on DC . The fixture must be provided with necessary baseplate. Enclosure must be IP 65, Pressure Die cast Aluminium body. Luminous intensity shall be >40 Cd, UV Stabilised optical lens for 360 degree illumination, inbuilt ON-OFF photocell. LPM Technology driven.Gasket shall be provided for moisture protection and all the screws must be of SS 304 to protect from rusting. The light fixture shall be Tested and approved by ERDA as per ICAO Specifications as per detailed technical specifications and approved make.Makes:Philips/Wipro/Havells/Crompton/Bajaj/Reytek	9,509.00	1,71,162.00
857	19.00	Supply installation Testing and commissioning of 6.0 KVA, 192/240 VDC with Isolation Transformer on line UPS system confirms to IS 16242(Part-I):2014 and IEC 60240-1 with IGBT technology pure sine wave output, double conversion with auto and manual static by pass switch single phase input / Single phase output and as per technical specifications and as directed by engineer in charge.Makes: Numeric/APC/Fuji Electric Consul Neowatt/Sakshham /Emerson	1,10,143.00	20,92,717.00
858	380.00	Supply and fixing of 12V 26 AH SMF battery with 3 years Warrenty, including wire leads ,connections etc complete., Makes: Quanta / Racket / Exide	3,999.00	15,19,620.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
859	19.00	Supply and providing of battery rack upto 11 to 20 batteries (26 AH) complete as required and as directed by Engineer in Charge	6,249.00	1,18,731.00
860	20.00	Supply installation Testing and commissioning of 3.0 KVA, 72/96 VDC with Isolation Transformer on line UPS system confirms to IS 16242(Part-I):2014 and IEC 60240-1 with IGBT technology pure sine wave output, double conversion with auto and manual static by pass switch single phase input / Single phase output.Makes: Numeric/APC/Fuji Electric Consul Neowatt/Sakshham /Emerson	64,052.00	12,81,040.00
861	160.00	Supply and fixing of 12V 26 AH SMF battery with 3 years Warrenty, including wire leads ,connections etc complete., Makes: Quanta / Racket / Exide	3,999.00	6,39,840.00
862	20.00	Supply and providing of battery rack upto 5 to 10 batteries (26 AH) complete as required and as directed by Engineer in Charge	3,749.00	74,980.00
863	21.00	Supply of Rubber hand gloves suitable for 33KV as directed by Engineer In Charge and as per technical speicifications and of any reputed ISI approved make. as directed by engineer in charge	294.00	6,174.00
864	27.00	Supplying and fixing of Shock treatment chart both in Regional Language & English and framed with 5mm thick glass as required of any reputed ISI approved make.and as per technical specifications and as directed by engineer in charge	662.00	17,874.00
865	33.00	Supply & fixing 33000V danger notice plate of 250 mm x 200mm, made of mild steel sheet of at least 2mm thick & vitreous enamelled white on both sides and with inscription in signal red colour on front side as required of any reputed ISI approved make.and as per technical specifications and as directed by engineer in charge	332.00	10,956.00
866	321.00	Supply & fixing 415V danger notice plate of 200 mm x 150mm, made of mild steel sheet of at least 2mm thick & vitreous enamelled white on both sides and with inscription in signal red colour on front side as required of any reputed ISI approved make.and as per technical specifications and as directed by engineer in charge	294.00	94,374.00
867	24.00	Supply and fixing G.I. 4 nos. Fire buckets 9 litre capacity filled with dry sand and fixed on wall hook made out of canopy type 13mm dia MS structure for 4 nos. bucket. conforming IS : 2546 of any reputed ISI approved make. and as per technical specifications and as directed by engineer in charge	2,998.00	71,952.00
868	21.00	Supply of First aid box containing material as prescribed by St. John Ambulance brigade OR Indian Red Cross complete as required of any reputed ISI approved make.and as per technical specifications and as directed by engineer in charge	1,582.00	33,222.00
869	56.00	Supply and fixing of Class A insulation having 2mm thickness upto 3.3KV PVC synthetic elastomer electrically insulated mat conforming to IS: 15652-2006 of any reputed ISI approved make. and as per technical specifications and as directed by engineer in charge	5,224.00	2,92,544.00
870	407.00	Supply and fixing of Class C insulation having 3mm thickness upto 33KV PVC synthetic elastomer electrically insulated mat conforming to IS: 15652-2006 of any reputed ISI approved make. and as per technical specifications and as directed by engineer in charge	5,499.00	22,38,093.00
871	5.00	Providing & fixing of Single Line Diagram on 5mm thick Aluminium sheet in A0 Size duly laminated.and as per technical specifications and as directed by engineer in charge	2,993.00	14,965.00
872	6.00	Providing & fixing of Single Line Diagram on 5mm thick Aluminium sheet in A1 Size duly laminated. and as per technical specifications and as directed by engineer in charge	2,299.00	13,794.00
873	1,500.00	Supply, fabricating , installing structural steel supports for fixing all sizes of MS pipes from ceiling / wall with MS Channels, Angles, Flats, Rods, as required at site with anchor fasteners, Clamps, threaded rods, nuts, bolts,washers etc complete with painting.	93.00	1,39,500.00
874	3.00	Supply & Fixing of Energizer with dual mode pulse &, LED INDICATORS for operations SFIS-SN5000 MAKE With IS standard Conformity. DUAL MODE of any reputed ISI approved make.and as per technical specifications and as directed by engineer in charge	35,000.00	1,05,000.00
875	3.00	Supply & Fixing of Power generator system with PVM and Battery backup of any reputed ISI approved make.and as per technical specifications and as directed by engineer in charge	11,200.00	33,600.00
876	5.00	Supply & Fixing ofPower supply regulation Digital control unit of any reputed ISI approved make. and as per technical specifications and as directed by engineer in charge	3,900.00	19,500.00
877	3.00	Supply & Fixing of External Audio system of any reputed ISI approved make. and as per technical specifications and as directed by engineer in charge	500.00	1,500.00
878	3.00	Supply & Fixing of IP65 Grade Mounting Box for all necessary field controller/components and with mounting structure to mount the SPVM system of any reputed ISI approved make.	13,500.00	40,500.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
879	3.00	Supply & Fixing of Earthing of all the zone controllers independently and isolated from the mains supply (4 SEKs per Set) as per IS standards of any reputed ISI approved make.	6,000.00	18,000.00
880	975.00	Supply and installation of Intermediate poles 3?feet Height Sheet molded ?V? with pre punched holes and compound wall interfacing arrangementas per the standards of any reputed ISI approved make.	550.00	5,36,250.00
881	75.00	Supply and installation of Step Poles: 4ft 40x40x2.5mmsq with 30NB supports and accessories to fix into the compound wall (Final At Site Actuals) of any reputed ISI approved make.	2,400.00	1,80,000.00
882	12.00	Supply and installation of End with supports Pole: 3feet to 40x40x2.5mmsq with 32NB supports and accessories to fix into the compound wall (Final At Site Actuals) of any reputed ISI approved make.	2,400.00	28,800.00
883	24.00	Supply and installation of Corner Poles with supports Pole:3feet to 40x40x2.5mmsq with 32NB supports and accessories to fix into the compound wall (Final At Site Actuals) of any reputed ISI approved make.	3,000.00	72,000.00
884	2,928.00	Supply and installation of Fence: With 12G hot dip GI wire horizontally run through the HV resistance pre fixed insulators and the ends terminated at the section ending poles with super strain HV insulators as an active fence. The wire securely tightened with the wire tightners for preventing the entanglement possibility. All such statutory and visual indicators for knowing fence health at glance of any reputed ISI approved make.	180.00	5,27,040.00
885	3.00	Supply and installation of Earthing of entire fence till achieving less than 200 Ohms resistance and isolated from the mains supply and fixing as per IS of any reputed ISI approved make.	2,500.00	7,500.00
886	30.00	Supply and installation of Gate Top fence of any reputed ISI approved make.	8,500.00	2,55,000.00
887	106.00	Supply and installation of Warning Sign Boards 12? X 6? X 2mm written in English & Hindi of any reputed ISI approved make.	150.00	15,900.00
888	36.00	Supply, Transportation, erection and Commissioning of MNRE approved and confirming to IS 12933 P-1,2,3&5 for 1000 LPD Flate plate Collector type Solar Water heating System with temperature application of 60 degrees with Stain less steel - 304L grade inner tank with PUF Insulation and Aluminum Cladding for Outer Cover, suitable EPDM rubber pipe connection from Collector to Solar Tank with electrical Heating back up etc., with 3 years Guarantee for Solar system and additional 2 years warranty. Make:TATA / BHEL/ BOSCH/ ETC/V-GUARD /RACOLD	2,15,584.46	77,61,041.00
889	2,625.00	Supply,Transportation and laying ofOuter dia 50mm and Inner dia 38mm double walled corrugated HDPE duct made as per specification BSEN - 500 86/IS 14930 Part-II and as per technical specifications and as directed by engineer in charge. Makes:DURA LINE (Dura Guard)/Precision/CPE	164.00	4,30,500.00
890	1.00	Supply of 10 HP Air cooled VRV / VRF Air Conditioning system of having high COP complete with indoor and outdoor units duly charged with refrigerant R-410A and oil (first charge) suitable for cooling with individual controller, (suitable for 415 +/- 10% for outdoor and 230 +/- 5% for indoor units) and complete with all accessories, fittings etc. The units shall be BMS Compatible. Outdoor Units shall be fully inverter system complete with 100% scroll/rotary compressor and drive arrangement, initial charge of refrigerant (R-410A),refrigerant piping, drier, sight glass, dual pressure cutout all housed and supported properly in cabinet, air cooled condenser & its controller for following capacities. The VRV system shall be cooling only system. Hermitic sealed Inverter Scroll/Twin Rotary. ODU should delvier the required capacity at the ambient conditions of the place as per ISHRAE Standards. The System should be highly energy efficient and COP shall not be less than 3.7. The outdoor units shall be suitable for operation between 5 and 53 deg C in cooling mode and as per technical specifications and as directed by engineer in charge.Makes: Mitsubishi /DAIKIN/Toshiba/O General. 10 HP at Vijayawada ambient conditions	3,07,306.00	3,07,306.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
891	224.00	Supply of 12 HP Air cooled VRV / VRF Air Conditioning system of having high COP complete with indoor and outdoor units duly charged with refrigerant R-410A and oil (first charge) suitable for cooling with individual controller, (suitable for 415 +/- 10% for outdoor and 230 +/- 5% for indoor units) and complete with all accessories, fittings etc. The units shall be BMS Compatible. Outdoor Units shall be fully inverter system complete with 100% scroll/rotary compressor and drive arrangement, initial charge of refrigerant (R-410A),refrigerant piping, drier, sight glass, dual pressure cutout all housed and supported properly in cabinet, air cooled condenser & its controller for following capacities. The VRV system shall be cooling only system. Hermitic sealed Inverter Scroll/Twin Rotary. ODU should delvier the required capacity at the ambient conditions of the place as per ISHRAE Standards. The System should be highly energy efficient and COP shall not be less than 3.7. The outdoor units shall be suitable for operation between 5 and 53 deg C in cooling modeand as per technical specifications and as directed by engineer in charge .Makes: Mitsubishi /DAIKIN/Toshiba/O General. 12 HP at Vijayawada ambient conditions	3,44,935.00	7,72,65,440.00
892	12.00	Supply of 14 HP Air cooled VRV / VRF Air Conditioning system of having high COP complete with indoor and outdoor units duly charged with refrigerant R-410A and oil (first charge) suitable for cooling with individual controller, (suitable for 415 +/- 10% for outdoor and 230 +/- 5% for indoor units) and complete with all accessories, fittings etc. The units shall be BMS Compatible. Outdoor Units shall be fully inverter system complete with 100% scroll/rotary compressor and drive arrangement, initial charge of refrigerant (R-410A),refrigerant piping, drier, sight glass, dual pressure cutout all housed and supported properly in cabinet, air cooled condenser & its controller for following capacities. The VRV system shall be cooling only system. Hermitic sealed Inverter Scroll/Twin Rotary. ODU should delvier the required capacity at the ambient conditions of the place as per ISHRAE Standards. The System should be highly energy efficient and COP shall not be less than 3.7. The outdoor units shall be suitable for operation between 5 and 53 deg C in cooling mode.and as per technical specifications and as directed by engineer in chargeMakes: Mitsubishi /DAIKIN/Toshiba/O General. 14 HP at Vijayawada ambient conditions	3,90,404.00	46,84,848.00
893	3.00	Supply of 16 HP Air cooled VRV / VRF Air Conditioning system of having high COP complete with indoor and outdoor units duly charged with refrigerant R-410A and oil (first charge) suitable for cooling with individual controller, (suitable for 415 +/- 10% for outdoor and 230 +/- 5% for indoor units) and complete with all accessories, fittings etc. The units shall be BMS Compatible. Outdoor Units shall be fully inverter system complete with 100% scroll/rotary compressor and drive arrangement, initial charge of refrigerant (R-410A),refrigerant piping, drier, sight glass, dual pressure cutout all housed and supported properly in cabinet, air cooled condenser & its controller for following capacities. The VRV system shall be cooling only system. Hermitic sealed Inverter Scroll/Twin Rotary. ODU should delvier the required capacity at the ambient conditions of the place as per ISHRAE Standards. The System should be highly energy efficient and COP shall not be less than 3.7. The outdoor units shall be suitable for operation between 5 and 53 deg C in cooling mode.and as per technical specifications and as directed by engineer in charge Makes: Mitsubishi /DAIKIN/Toshiba/O General. 16 HP at Vijayawada ambient conditions	4,45,280.00	13,35,840.00
894	3.00	Supply of 18 HP Air cooled VRV / VRF Air Conditioning system of having high COP complete with indoor and outdoor units duly charged with refrigerant R-410A and oil (first charge) suitable for cooling with individual controller, (suitable for 415 +/- 10% for outdoor and 230 +/- 5% for indoor units) and complete with all accessories, fittings etc. The units shall be BMS Compatible. Outdoor Units shall be fully inverter system complete with 100% scroll/rotary compressor and drive arrangement, initial charge of refrigerant (R-410A),refrigerant piping, drier, sight glass, dual pressure cutout all housed and supported properly in cabinet, air cooled condenser & its controller for following capacities. The VRV system shall be cooling only system. Hermitic sealed Inverter Scroll/Twin Rotary. ODU should delvier the required capacity at the ambient conditions of the place as per ISHRAE Standards. The System should be highly energy efficient and COP shall not be less than 3.7. The outdoor units shall be suitable for operation between 5 and 53 deg C in cooling mode.Makes: Mitsubishi /DAIKIN/Toshiba/O General. 18 HP at Vijayawada ambient conditions	4,89,181.00	14,67,543.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
895	2.00	Supply of 20 HP Air cooled VRV / VRF Air Conditioning system of having high COP complete with indoor and outdoor units duly charged with refrigerant R-410A and oil (first charge) suitable for cooling with individual controller, (suitable for 415 +/- 10% for outdoor and 230 +/- 5% for indoor units) and complete with all accessories, fittings etc. The units shall be BMS Compatible. Outdoor Units shall be fully inverter system complete with 100% scroll/rotary compressor and drive arrangement, initial charge of refrigerant (R-410A),refrigerant piping, drier, sight glass, dual pressure cutout all housed and supported properly in cabinet, air cooled condenser & its controller for following capacities. The VRV system shall be cooling only system. Hermitic sealed Inverter Scroll/Twin Rotary. ODU should delvier the required capacity at the ambient conditions of the place as per ISHRAE Standards. The System should be highly energy efficient and COP shall not be less than 3.7. The outdoor units shall be suitable for operation between 5 and 53 deg C in cooling mode.and as per technical specifications and as directed by engineer in charge Makes: Mitsubishi /DAIKIN/Toshiba/O General. 20 HP at Vijayawada ambient conditions	5,37,785.00	10,75,570.00
896	405.00	Supply of 1.0 TR Hi-wall Indoor Units consisting of 2/3/4 row deep DX coil, filter, blower section and drive arrangement, initial charge of refrigerant & oil, integral refrigerant piping, electronic expansion valve, electrical panel with controls and duly wired, thermostatic control. and as per technical specifications and as directed by engineer in charge.Makes: Mitsubishi /DAIKIN/Toshiba/O General.	39,524.00	1,60,07,220.00
897	1,479.00	Supply of 1.6 TR Hi-wall Indoor Units consisting of 2/3/4 row deep DX coil, filter, blower section and drive arrangement, initial charge of refrigerant & oil, integral refrigerant piping, electronic expansion valve, electrical panel with controls and duly wired, thermostatic control. and as per technical specifications and as directed by engineer in charge.Makes: Mitsubishi /DAIKIN/Toshiba/O General.	43,117.00	6,37,70,043.00
898	1,202.00	Supply of 2.0 TR Hi-wall Indoor Units consisting of 2/3/4 row deep DX coil, filter, blower section and drive arrangement, initial charge of refrigerant & oil, integral refrigerant piping, electronic expansion valve, electrical panel with controls and duly wired, thermostatic control. .Makes: Mitsubishi /DAIKIN/Toshiba/O General.	44,554.00	5,35,53,908.00
899	7.00	8.0 TR - CEILING SUSPENDED UNITS - Supply of High static duct Indoor Units consisting of 2/3/4 row deep DX coil, filter, blower section and drive arrangement, initial charge of refrigerant & oil, integral refrigerant piping, electronic expansion valve, electrical panel with controls and duly wired, thermostatic control.and as per technical specifications and as directed by engineer in charge Makes: Mitsubishi /DAIKIN/Toshiba/O General.	1,34,382.00	9,40,674.00
900	2.00	6.3 TR - CEILING SUSPENDED UNITS -Supply of High static duct Indoor Units consisting of 2/3/4 row deep DX coil, filter, blower section and drive arrangement, initial charge of refrigerant & oil, integral refrigerant piping, electronic expansion valve, electrical panel with controls and duly wired, thermostatic control. and as per technical specifications and as directed by engineer in charge Makes: Mitsubishi /DAIKIN/Toshiba/O General.	1,27,483.00	2,54,966.00
901	9.00	3.2 TR - CEILING SUSPENDED UNITS - Supply of High static duct Indoor Units consisting of 2/3/4 row deep DX coil, filter, blower section and drive arrangement, initial charge of refrigerant & oil, integral refrigerant piping, electronic expansion valve, electrical panel with controls and duly wired, thermostatic control.and as per technical specifications and as directed by engineer in charge Makes: Mitsubishi /DAIKIN/Toshiba/O General.	67,550.00	6,07,950.00
902	8.00	4.5 TR - Supply of Round flow/4 way Cassette Indoor Units consisting of 2/3/4 row deep DX coil, filter, blower section and drive arrangement, initial charge of refrigerant & oil, integral refrigerant piping, electronic expansion valve, electrical panel with controls and duly wired, thermostatic contro and as per technical specifications and as directed by engineer in chargel. Makes: Mitsubishi /DAIKIN/Toshiba/O General..	72,293.00	5,78,344.00
903	3.00	4.0 TR - Supply of Round flow/4 way Cassette Indoor Units consisting of 2/3/4 row deep DX coil, filter, blower section and drive arrangement, initial charge of refrigerant & oil, integral refrigerant piping, electronic expansion valve, electrical panel with controls and duly wired, thermostatic control and as per technical specifications and as directed by engineer in charge. Makes: Mitsubishi /DAIKIN/Toshiba/O General..	68,987.00	2,06,961.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
904	9.00	3.2 TR - Supply of Round flow/4 way Cassette Indoor Units consisting of 2/3/4 row deep DX coil, filter, blower section and drive arrangement, initial charge of refrigerant & oil, integral refrigerant piping, electronic expansion valve, electrical panel with controls and duly wired, thermostatic control. and as per technical specifications and as directed by engineer in charge Makes: Mitsubishi /DAIKIN/Toshiba/O General..	67,550.00	6,07,950.00
905	16.00	2.6 TR - Supply of Round flow/4 way Cassette Indoor Units consisting of 2/3/4 row deep DX coil, filter, blower section and drive arrangement, initial charge of refrigerant & oil, integral refrigerant piping, electronic expansion valve, electrical panel with controls and duly wired, thermostatic control.and as per technical specifications and as directed by engineer in charge Makes: Mitsubishi /DAIKIN/Toshiba/O General..	66,113.00	10,57,808.00
906	16.00	2.0 TR - Supply of Round flow/4 way Cassette Indoor Units consisting of 2/3/4 row deep DX coil, filter, blower section and drive arrangement, initial charge of refrigerant & oil, integral refrigerant piping, electronic expansion valve, electrical panel with controls and duly wired, thermostatic control. Makes: Mitsubishi /DAIKIN/Toshiba/O General..	60,364.00	9,65,824.00
907	2.00	1.6 TR - Supply of Round flow/4 way Cassette Indoor Units consisting of 2/3/4 row deep DX coil, filter, blower section and drive arrangement, initial charge of refrigerant & oil, integral refrigerant piping, electronic expansion valve, electrical panel with controls and duly wired, thermostatic control. Makes: Mitsubishi /DAIKIN/Toshiba/O General..	58,926.00	1,17,852.00
908	8.00	4.5 TR - 4-WAY CASETTE UNITS - Lifting Shifting, Positioning ,Installation Testing and commissioning of the 4-way casette indoor units with including all required accessoires etc complete., and as per technical specifications and as directed by engineer in charge	3,528.00	28,224.00
909	3.00	4.0 TR - 4-WAY CASETTE UNITS - Lifting Shifting, Positioning ,Installation Testing and commissioning of the 4-way casette indoor units with including all required accessoires etc complete.,and as per technical specifications and as directed by engineer in charge	3,528.00	10,584.00
910	9.00	3.2 TR - 4-WAY CASETTE UNITS - Lifting Shifting, Positioning ,Installation Testing and commissioning of the 4-way casette indoor units with including all required accessoires etc complete., and as per technical specifications and as directed by engineer in charge	3,528.00	31,752.00
911	16.00	2.6 TR - 4-WAY CASETTE UNITS - Lifting Shifting, Positioning ,Installation Testing and commissioning of the 4-way casette indoor units with including all required accessoires etc complete., and as per technical specifications and as directed by engineer in charge	3,528.00	56,448.00
912	16.00	2.0 TR - 4-WAY CASETTE UNITS - Lifting Shifting, Positioning ,Installation Testing and commissioning of the 4-way casette indoor units with including all required accessoires etc complete.,and as per technical specifications and as directed by engineer in charge	2,117.00	33,872.00
913	2.00	1.6 TR - 4-WAY CASETTE UNITS - Lifting Shifting, Positioning ,Installation Testing and commissioning of the 4-way casette indoor units with including all required accessoires etc complete.and as per technical specifications and as directed by engineer in charge	2,117.00	4,234.00
914	3.00	Supply, installation, testing & commissioning of stand-alone, intelligent Touch controller with Display for controlling the indoor & outdoor units from a Remote place for all the circuits. Makes: Dakin/Mitsubushi/Ogrand/Toshuba	1,06,355.00	3,19,065.00
915	20.00	Supply and Installation of Ref Nets for Double ODU connections.Makes: Daikin/Mitsubhishi/Ogeneral/Toshibha.	6,899.00	1,37,980.00
916	2,605.00	Supply and Installation of Multi Connection Joint / Ref Nets for IDUs .Makes: Daikin/Mitsubhishi/Ogeneral/Toshibha.	6,036.00	1,57,23,780.00
917	435.00	10 TO 12 HP - LOW SIDE WORKS - VRF SYSTEM - Lifting, shifting, positioning, Installation and testing of ODUs including all accessories with Vibration Isolators for ODUs etc., complete.	14,111.00	61,38,285.00
918	20.00	14 TO 20HP - LOW SIDE WORKS - VRF SYSTEM - Lifting, shifting, positioning, Installation and testing of ODUs including all accessories with Vibration Isolators for ODUs etc., complete.	16,933.00	3,38,660.00
919	405.00	Lifting Shifting, Positioning ,Installation Testing and commissioning of the 1.0 TR TR Hi-Wall indoor units with including all required accessoires etc complete.,	1,693.00	6,85,665.00
920	1,479.00	Lifting Shifting, Positioning ,Installation Testing and commissioning of the 1.6 TR Hi-Wall indoor units with including all required accessoires etc complete.,	1,693.00	25,03,947.00
921	1,202.00	Lifting Shifting, Positioning ,Installation Testing and commissioning of the 2.0 TR Hi-Wall indoor units with including all required accessoires etc complete.,	1,693.00	20,34,986.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
922	9.00	Lifting Shifting, Positioning, Installation Testing and commissioning 3.2 TR to 5.5 TR High static Indoor duct units with including all required accessories etc complete.,	4,233.00	38,097.00
923	9.00	Lifting Shifting, Positioning, Installation Testing and commissioning 6.3 TR to 8.0 TR High static Indoor duct units with including all required accessories etc complete.,	6,350.00	57,150.00
924	1,040.00	24 G-GSS Duct- Supply, installation, testing & commissioning of 24 G GSS Ducting with required angle flanges & installation materials such as heavy duty supports by anchor fasteners etc as required asper IS 655 /SMACNA Standards suitable for rectangular ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications Makes:TATA/Jindal/JSW.	1,186.00	12,33,440.00
925	1,092.00	22 G-GSS Duct- Supply, installation, testing & commissioning of 22 G GSS Ducting with required angle flanges & installation materials such as heavy duty supports by anchor fasteners etc as required asper IS 655 /SMACNA Standards suitable for rectangular ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications Makes:TATA/Jindal/JSW.	1,329.00	14,51,268.00
926	45.00	20 G-GSS Duct- Supply, installation, testing & commissioning of 20 G GSS Ducting with required angle flanges & installation materials such as heavy duty supports by anchor fasteners etc as required asper IS 655 /SMACNA Standards suitable for rectangular ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications Makes:TATA/Jindal/JSW.	1,582.00	71,190.00
927	190.00	18 G-GSS Duct- Supply, installation, testing & commissioning of 18 G GSS Ducting with required angle flanges & installation materials such as heavy duty supports by anchor fasteners etc as required asper IS 655 /SMACNA Standards suitable for rectangular ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications Makes:TATA/Jindal/JSW.	1,725.00	3,27,750.00
928	186.00	Supply, Erection of Fresh air louver/Exhaust with extruded aluminum grill with SS wire mesh and GI volume control damper with 20 micron filters.Makes: System air/Crystal air/Carry air/Edgetech/Greenheck	6,181.00	11,49,666.00
929	20.00	Supply, Installation, Testing and commissioning of extruded Aluminum powder coated grills/ diffusers for return air with removable core type without collar damper. Makes: System air/Crystal air/Carry air/Edgetech/Greenheck	8,003.00	1,60,060.00
930	24.00	Supply, Installation, Testing and Commissioning of extruded aluminium powder coated collar dampers as per the specifications and approved drawings. Makes: System air/Crystal air/Carry air/Edgetech/Greenheck	10,972.00	2,63,328.00
931	180.00	Ø34.9 mm - REFRIGERANT PIPING - Supply, installation and testing of Refrigerant Piping consisting of Copper tubes of wall thickness 20G/22G inclusive of Suction Gas Piping & Fittings,Liquid Line Piping & Fittings, with class "O" nitrile rubber Insulation with finish as required.The piping to be mounted & supported properly with suitable size of clamp,M.S. hanger, tray etc., as required at site.The insulation shall be closed cell/cross linked elastomeric Nitrile rubber of thickness 13/19 mm. The insulation thickness upto 19.1 mm dia pipe shall be 13 mm and above 19.1 mm dia, the insulation thickness shall be 19 mm. Testing of refrigerant piping and procedure shall be done as per Manufacturer's recommendations.Makes:Totaline/Mandav/Mexico/TObo. Note: The rate is considered per pipe either Liquid or Suction only.	1,093.00	1,96,740.00
932	2,060.00	Ø28.6 mm - REFRIGERANT PIPING - Supply, installation and testing of Refrigerant Piping consisting of Copper tubes of wall thickness 20G/22G inclusive of Suction Gas Piping & Fittings,Liquid Line Piping & Fittings, with class "O" nitrile rubber Insulation with finish as required.The piping to be mounted & supported properly with suitable size of clamp,M.S. hanger, tray etc., as required at site.The insulation shall be closed cell/cross linked elastomeric Nitrile rubber of thickness 13/19 mm. The insulation thickness upto 19.1 mm dia pipe shall be 13 mm and above 19.1 mm dia, the insulation thickness shall be 19 mm. Testing of refrigerant piping and procedure shall be done as per Manufacturer's recommendations.Makes:Totaline/Mandav/Mexico/TObo. Note: The rate is considered per pipe either Liquid or Suction only.	998.00	20,55,880.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
933	2,597.00	Ø22.2 mm - REFRIGERANT PIPING - Supply, installation and testing of Refrigerant Piping consisting of Copper tubes of wall thickness 20G/22G inclusive of Suction Gas Piping & Fittings,Liquid Line Piping & Fittings, with class "O" nitrile rubber Insulation with finish as required.The piping to be mounted & supported properly with suitable size of clamp,M.S. hanger, tray etc., as required at site.The insulation shall be closed cell/cross linked elastomeric Nitrile rubber of thickness 13/19 mm. The insulation thickness upto 19.1 mm dia pipe shall be 13 mm and above 19.1 mm dia, the insulation thickness shall be 19 mm. Testing of refrigerant piping and procedure shall be done as per Manufacturer's recommendations.Makes:Totaline/Mandav/Mexico/TObo. Note: The rate is considered per pipe either Liquid or Suction only.	902.50	23,43,793.00
934	1,374.00	Ø19.1 mm - REFRIGERANT PIPING - Supply, installation and testing of Refrigerant Piping consisting of Copper tubes of wall thickness 20G/22G inclusive of Suction Gas Piping & Fittings,Liquid Line Piping & Fittings, with class "O" nitrile rubber Insulation with finish as required.The piping to be mounted & supported properly with suitable size of clamp,M.S. hanger, tray etc., as required at site.The insulation shall be closed cell/cross linked elastomeric Nitrile rubber of thickness 13/19 mm. The insulation thickness upto 19.1 mm dia pipe shall be 13 mm and above 19.1 mm dia, the insulation thickness shall be 19 mm. Testing of refrigerant piping and procedure shall be done as per Manufacturer's recommendations.Makes:Totaline/Mandav/Mexico/TObo. Note: The rate is considered per pipe either Liquid or Suction only.	808.50	11,10,879.00
935	8,193.00	Ø15.9 mm - REFRIGERANT PIPING -Supply, installation and testing of Refrigerant Piping consisting of Copper tubes of wall thickness 20G/22G inclusive of Suction Gas Piping & Fittings,Liquid Line Piping & Fittings, with class "O" nitrile rubber Insulation with finish as required.The piping to be mounted & supported properly with suitable size of clamp,M.S. hanger, tray etc., as required at site.The insulation shall be closed cell/cross linked elastomeric Nitrile rubber of thickness 13/19 mm. The insulation thickness upto 19.1 mm dia pipe shall be 13 mm and above 19.1 mm dia, the insulation thickness shall be 19 mm. Testing of refrigerant piping and procedure shall be done as per Manufacturer's recommendations.Makes:Totaline/Mandav/Mexico/TObo. Note: The rate is considered per pipe either Liquid or Suction only.	713.00	58,41,609.00
936	11,100.00	Ø12.7 mm - REFRIGERANT PIPING - Supply, installation and testing of Refrigerant Piping consisting of Copper tubes of wall thickness 20G/22G inclusive of Suction Gas Piping & Fittings,Liquid Line Piping & Fittings, with class "O" nitrile rubber Insulation with finish as required.The piping to be mounted & supported properly with suitable size of clamp,M.S. hanger, tray etc., as required at site.The insulation shall be closed cell/cross linked elastomeric Nitrile rubber of thickness 13/19 mm. The insulation thickness upto 19.1 mm dia pipe shall be 13 mm and above 19.1 mm dia, the insulation thickness shall be 19 mm. Testing of refrigerant piping and procedure shall be done as per Manufacturer's recommendations.Makes:Totaline/Mandav/Mexico/TObo. Note: The rate is considered per pipe either Liquid or Suction only.	618.00	68,59,800.00
937	11,460.00	Ø9.5 mm - REFRIGERANT PIPING - Supply, installation and testing of Refrigerant Piping consisting of Copper tubes of wall thickness 20G/22G inclusive of Suction Gas Piping & Fittings,Liquid Line Piping & Fittings, with class "O" nitrile rubber Insulation with finish as required.The piping to be mounted & supported properly with suitable size of clamp,M.S. hanger, tray etc., as required at site.The insulation shall be closed cell/cross linked elastomeric Nitrile rubber of thickness 13/19 mm. The insulation thickness upto 19.1 mm dia pipe shall be 13 mm and above 19.1 mm dia, the insulation thickness shall be 19 mm. Testing of refrigerant piping and procedure shall be done as per Manufacturer's recommendations.Makes:Totaline/Mandav/Mexico/TObo. Note: The rate is considered per pipe either Liquid or Suction only.	456.00	52,25,760.00
938	9,183.00	Ø6.4 mm - REFRIGERANT PIPING - Supply, installation and testing of Refrigerant Piping consisting of Copper tubes of wall thickness 20G/22G inclusive of Suction Gas Piping & Fittings,Liquid Line Piping & Fittings, with class "O" nitrile rubber Insulation with finish as required.The piping to be mounted & supported properly with suitable size of clamp,M.S. hanger, tray etc., as required at site.The insulation shall be closed cell/cross linked elastomeric Nitrile rubber of thickness 13/19 mm. The insulation thickness upto 19.1 mm dia pipe shall be 13 mm and above 19.1 mm dia, the insulation thickness shall be 19 mm. Testing of refrigerant piping and procedure shall be done as per Manufacturer's recommendations.Makes:Totaline/Mandav/Mexico/TObo. Note: The rate is considered per pipe either Liquid or Suction only.	399.50	36,68,609.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
939	4,160.00	Supply, installation and testing of 25mm dia UPVC Drain Piping with 6mm Nitrile Rubber class "O" Insulation covered with interwoven glass cloth protection. Necessary pipe fittings(Including enlarger, bends, T Joints etc) has to be considered to connect the UPVC drain pipe to cast iron floor trap. Makes: Ashirvad/Supreme/Flowguard/Astral/Finolex.	214.00	8,90,240.00
940	90.00	Supply, installation and testing of 32mm dia UPVC Drain Piping with 6mm Nitrile Rubber class "O" Insulation covered with interwoven glass cloth protection. Necessary pipe fittings(Including enlarger, bends, T Joints etc) has to be considered to connect the UPVC drain pipe to cast iron floor trap. Makes: Ashirvad/Supreme/Flowguard/Astral/Finolex.	254.00	22,860.00
941	120.00	Supply, installation and testing of 40mm dia UPVC Drain Piping with 6mm Nitrile Rubber class "O" Insulation covered with interwoven glass cloth protection. Necessary pipe fittings(Including enlarger, bends, T Joints etc) has to be considered to connect the UPVC drain pipe to cast iron floor trap. Makes: Ashirvad/Supreme/Flowguard/Astral/Finolex.	311.00	37,320.00
942	38,900.00	Supply and Transportation of 2C x 1.5 sqmm PVC insulated and sheathed FRLS copper round cable for voltage up to 1100V as per IS 694 etc complete in existing hume pipe/trench/cable tray with necessary fixing arrangments as required (as directed by departmental official) complete including labour charges etc sutiable for communication between indoor and outdoor units connected to VRF system. Makes: Finolex / RR kabel / Havells /KEI/Polycab/ Gloster/Goldmedal/GM.	99.00	38,51,100.00
943	180.00	Supply, laying and dressing of 3 Core 16 Sq.mm 1100 volt grade XLPE insulated FRLS PVC sheathed Copper conductor armoured XLPE/PVC cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning complete etc. as directed by Engineer In Charge Makes: Torrent / Universal / Unicab / Havells / KEI /Polycab.	571.00	1,02,780.00
944	5,675.00	Supply, laying and dressing of 3 Core 10 Sq.mm 1100 volt grade XLPE insulated FRLS PVC sheathed Copper conductor armoured XLPE/PVC cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning complete etc. as directed by Engineer In Charge Makes: Torrent / Universal / Unicab / Havells / KEI /Polycab.	417.00	23,66,475.00
945	1,290.00	Supply, Transportation, Laying, testing and commisisoning of Remote Controller cable of size 4C x 1.5 sqmm PVC insulated and sheathed FRLS copper round cable for voltage up to 1100V as per IS 694 etc complete in existing hume pipe/trench/cable tray with necessary fixing arrangements as required (as directed by departmental official) complete including labour charges etc . Makes: Finolex / RR kabel / Havells /KEI/Polycab/ Gloster/Goldmedal/GM.	154.00	1,98,660.00
946	39,300.00	Supply and Fixing of 20mm dia (1.9-2.1mm) thick (ISI MARK) heavy grade with IS:9537-part 3 rigid PVC Conduit. fixed on walls/ceiling/cable trays with all required accessories such as conduit, junction boxes, bends, elbows, rawl plug, screws, saddle with base and ceiling rose etc., with all necessary fixing accessories like mounting screws .clamps etc. including all labour charges complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. Makes: Precision/Universal& Marudhar/VIP / GoldMedal / Million plast / GM / Sudhakar/Polycab/Anchor/ Polyline/ rbit/AKG/Beljin/Vasavi/DEC.	118.00	46,37,400.00
947	5,528.00	Providing Pressure testing of entire system with Nitrogen and vacuuming nitrogen for all indoor and outdoor units. The pressure testing shall be done asper OEM recommendation.	1,797.00	99,33,816.00
948	4,144.00	Supply and transportation of R 410A Gas for the system.	1,487.00	61,62,128.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
949	3.00	VENTILATION FANS: - Supply, installation, testing and commissioning of tube axial flow type Supply/Exhaust Air Fan of suitable capacity 2300 CFM @ 25 mm wc static with powder coated MS/GSS casing and aluminum alloy impellers with high efficiency aero-foil sections, blades, the impeller directly driven by TEFC induction motor (IE-2/3) and ?F? class insulation suitable for 3 Phase, 50 Hz, 415±10% Volt, ac supply (and as per manufacturer specification) for a static pressure as indicated below. Fan section shall be suitable for Floor Mounted outdoor application as well as ceiling suspended indoor applications with suitable capacity of starter with Four Pole MCB etc., and other protective devices of approved brands within MS enclosure box complete as required and as per specifications. The fan shall be equipped with mounting bracket Inlet & outlet cone required at discharge. The sound pressure should not exceed 80 db(A) at a distance of 3 Mts. The Fan should be complete with all accessories including fire rated canvas connection with metallic flange, vibration isolators, gravity louvers, bird screen etc., as per specification including transportation to site, all mounting arrangements like brackets etc., and cost of all accessories and all labour charges complete. Fan total efficiency should not be less than 60%. Makes: Crystal Air/Kruger/ System Air/ Carry Air/ Edgetech/ Greenheck/ Aerotech/Trane.Note: The noise criterion mentioned has to be met at a distance of 3 m from equipment at room conditions. Fan shall be sutiable for BMS compatability.	90,725.00	2,72,175.00
950	36.00	Supply, installation, testing and commissioning of tube axial flow type Supply Air Fan of suitable capacity 12500 CFM for Lift well pressurisation , (35mm Total Static Pressure. Maximum Noise level - 85 DBA) WC static pressure with powder coated MS/GSS casing and aluminum alloy impellers with high efficiency aero-foil sections, blades, the impeller directly driven by TEFC induction motor (IE-2/3) and ?F? class insulation suitable for 3 Phase, 50 Hz, 415±10% Volt, ac supply (and as per manufacturer specification) for a static pressure as indicated below. Fan section shall be suitable for Floor Mounted outdoor application as well as ceiling suspended indoor applications with suitable capacity of starter with Four Pole MCB etc., and other protective devices of approved brands within MS enclosure box complete as required and as per specifications. The fan shall be equipped with mounting bracket Inlet & outlet cone required at discharge. The sound pressure should not exceed 80 db(A) at a distance of 3 Mts. The Fan should be complete with all accessories including fire rated canvas connection with metallic flange, vibration isolators, gravity louvers, bird screen etc., as per specification including transportation to site, all mounting arrangements like brackets etc., and cost of all accessories and all labour charges complete. Fan total efficiency should not be less than 60%. Makes: Crystal Air/Kruger/ System Air/ Carry Air/ Edgetech/ Greenheck/ Aerotech/Trane .Note: The noise criterion mentioned has to be met at a distance of 3 m from equipment at room conditions.	3,04,445.00	1,09,60,020.00
951	36.00	Design, manufacturing, installation, testing & commissioning of 5.5 KW DOL Starter panel suitable for 415v,3 phase, 4 wire system, made out of 16 SWG CRCA MS Sheet totally enclosed floor mounted dust and vermin proof enclosure, electrostatic powder coated with RAL 7032 with the following components 25A, TP MPCB, 25 KA, Trip alarm contact, 25A TP -Power contactor, with required NO-NC, Over load relay, indication lamps for ON-OFF-TRIP, Selector swithc for Auto -manual, Single Phase Preventor, Digital ammeter with required CT's and selector switches, power & control terminals, as required including auxiliary relay with contacts for smoke signal etc as requried for finished item of work as diected by Engineer-In-Charge. Makes: L&T/Schneider/ABB/Siemens/Legrand/Havells etc	32,509.00	11,70,324.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
952	6.00	Supply, installation, testing and commissioning of tube axial flow type Supply Air Fan of suitable capacity 4100 CFM @ 25 mm wc static for LT Panel Room with powder coated MS/GSS casing and aluminum alloy impellers with high efficiency aero-foil sections, blades, the impeller directly driven by TEFC induction motor (IE-2/3) and ?F? class insulation suitable for 3 Phase, 50 Hz, 415±10% Volt, ac supply (and as per manufacturer specification) for a static pressure as indicated below. Fan section shall be suitable for Floor Mounted outdoor application as well as ceiling suspended indoor applications with suitable capacity of starter with Four Pole MCB etc., and other protective devices of approved brands within MS enclosure box complete as required and as per specifications. The fan shall be equipped with mounting bracket Inlet & outlet cone required at discharge. The sound pressure should not exceed 80 db(A) at a distance of 3 Mts. The Fan should be complete with all accessories including fire rated canvas connection with metallic flange, vibration isolators, gravity louvers, bird screen etc., as per specification including transportation to site, all mounting arrangements like brackets etc., and cost of all accessories and all labour charges complete. Fan total efficiency should not be less than 60%. Makes: Crystal Air/Kruger/ System Air/ Carry Air/ Edgetech/ Greenheck/ Aerotech/Trane.Note: The noise criterion mentioned has to be met at a distance of 3 m from equipment at room conditions.Fan should be suitable for BMS compatability.	91,359.00	5,48,154.00
953	6.00	Supply, installation, testing and commissioning of tube axial flow type Supply Air Fan of suitable capacity 2300 CFM @ 25 mm wc static for RMU & 33 KV Panel Room with powder coated MS/GSS casing and aluminum alloy impellers with high efficiency aero-foil sections, blades, the impeller directly driven by TEFC induction motor (IE-2/3) and ?F? class insulation suitable for 3 Phase, 50 Hz, 415±10% Volt, ac supply (and as per manufacturer specification) for a static pressure as indicated below. Fan section shall be suitable for Floor Mounted outdoor application as well as ceiling suspended indoor applications with suitable capacity of starter with Four Pole MCB etc., and other protective devices of approved brands within MS enclosure box complete as required and as per specifications. The fan shall be equipped with mounting bracket Inlet & outlet cone required at discharge. The sound pressure should not exceed 80 db(A) at a distance of 3 Mts. The Fan should be complete with all accessories including fire rated canvas connection with metallic flange, vibration isolators, gravity louvers, bird screen etc., as per specification including transportation to site, all mounting arrangements like brackets etc., and cost of all accessories and all labour charges complete. Fan total efficiency should not be less than 60%. Makes: Crystal Air/Kruger/ System Air/ Carry Air/ Edgetech/ Greenheck/ Aerotech/Trane.Note: The noise criterion mentioned has to be met at a distance of 3 m from equipment at room conditions.Fan should be suitable for BMS compatability.	90,725.00	5,44,350.00
954	2.00	Supply, installation, testing and commissioning of tube axial flow type Fire rated Exhaust Air Fan of suitable capacity 8200 CFM @ 25 mm wc static for Fire Pump room exhaust with powder coated MS/GSS casing and aluminum alloy impellers with high efficiency aero-foil sections, blades, the impeller directly driven by TEFC induction motor (IE-2/3) and ?F? class insulation suitable for 3 Phase, 50 Hz, 415±10% Volt, ac supply (and as per manufacturer specification) for a static pressure as indicated below. Fan section shall be suitable for Floor Mounted outdoor application as well as ceiling suspended indoor applications with suitable capacity of starter with Four Pole MCB etc., and other protective devices of approved brands within MS enclosure box complete as required and as per specifications. The fan shall be equipped with mounting bracket Inlet & outlet cone required at discharge. The sound pressure should not exceed 80 db(A) at a distance of 3 Mts. The Fan should be complete with all accessories including fire rated canvas connection with metallic flange, vibration isolators, gravity louvers, bird screen etc., as per specification including transportation to site, all mounting arrangements like brackets etc., and cost of all accessories and all labour charges complete. Fan total efficiency should not be less than 60%. Makes: Crystal Air/Kruger/ System Air/ Carry Air/ Edgetech/ Greenheck/ Aerotech/Trane.Note: The noise criterion mentioned has to be met at a distance of 3 m from equipment at room conditions.Fan should be suitable for BMS compatability.	1,41,735.00	2,83,470.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
955	2.00	Supply, installation, testing and commissioning of tube axial flow type Supply Air Fan of suitable capacity 6600 CFM @ 25 mm wc static for Fire Pump room supply with powder coated MS/GSS casing and aluminum alloy impellers with high efficiency aero-foil sections, blades, the impeller directly driven by TEFC induction motor (IE-2/3) and ?F? class insulation suitable for 3 Phase, 50 Hz, 415±10% Volt, ac supply (and as per manufacturer specification) for a static pressure as indicated below. Fan section shall be suitable for Floor Mounted outdoor application as well as ceiling suspended indoor applications with suitable capacity of starter with Four Pole MCB etc., and other protective devices of approved brands within MS enclosure box complete as required and as per specifications. The fan shall be equipped with mounting bracket Inlet & outlet cone required at discharge. The sound pressure should not exceed 80 db(A) at a distance of 3 Mts. The Fan should be complete with all accessories including fire rated canvas connection with metallic flange, vibration isolators, gravity louvers, bird screen etc., as per specification including transportation to site, all mounting arrangements like brackets etc., and cost of all accessories and all labour charges complete. Fan total efficiency should not be less than 60%.Makes: Crystal Air/Kruger/ System Air/ Carry Air/ Edgetech/ Greenheck/ Aerotech/Trane.Note: The noise criterion mentioned has to be met at a distance of 3 m from equipment at room conditions.Fan should be suitable for BMS compatability.distance of 3 m from equipment at room conditions.	1,26,194.00	2,52,388.00
956	2.00	Supply, installation, testing and commissioning of tube axial flow type Fire rated exhaust Air Fan of suitable capacity 7200 CFM @ 25 mm wc static for Fire Pump room Exhaust with powder coated MS/GSS casing and aluminum alloy impellers with high efficiency aero-foil sections, blades, the impeller directly driven by TEFC induction motor (IE-2/3) and ?F? class insulation suitable for 3 Phase, 50 Hz, 415±10% Volt, ac supply (and as per manufacturer specification) for a static pressure as indicated below. Fan section shall be suitable for Floor Mounted outdoor application as well as ceiling suspended indoor applications with suitable capacity of starter with Four Pole MCB etc., and other protective devices of approved brands within MS enclosure box complete as required and as per specifications. The fan shall be equipped with mounting bracket Inlet & outlet cone required at discharge. The sound pressure should not exceed 80 db(A) at a distance of 3 Mts. The Fan should be complete with all accessories including fire rated canvas connection with metallic flange, vibration isolators, gravity louvers, bird screen etc., as per specification including transportation to site, all mounting arrangements like brackets etc., and cost of all accessories and all labour charges complete. Fan total efficiency should not be less than 60%. Makes: Crystal Air/Kruger/ System Air/ Carry Air/ Edgetech/ Greenheck/ Aerotech/Trane.Note: The noise criterion mentioned has to be met at a distance of 3 m from equipment at room conditions.Fan should be suitable for BMS compatability.	1,32,473.00	2,64,946.00
957	2.00	Supply, installation, testing and commissioning of tube axial flow type Supply Air Fan of suitable capacity 6600 CFM @ 25 mm wc static for Fire Pump room supply with powder coated MS/GSS casing and aluminum alloy impellers with high efficiency aero-foil sections, blades, the impeller directly driven by TEFC induction motor (IE-3) and ?F? class insulation suitable for 3 Phase, 50 Hz, 415±10% Volt, ac supply (and as per manufacturer specification) for a static pressure as indicated below. Fan section shall be suitable for Floor Mounted outdoor application as well as ceiling suspended indoor applications with suitable capacity2/ of starter with Four Pole MCB etc., and other protective devices of approved brands within MS enclosure box complete as required and as per specifications. The fan shall be equipped with mounting bracket Inlet & outlet cone required at discharge. The sound pressure should not exceed 80 db(A) at a distance of 3 Mts. The Fan should be complete with all accessories including fire rated canvas connection with metallic flange, vibration isolators, gravity louvers, bird screen etc., as per specification including transportation to site, all mounting arrangements like brackets etc., and cost of all accessories and all labour charges complete. Fan total efficiency should not be less than 60%. Makes: Crystal Air/Kruger/ System Air/ Carry Air/ Edgetech/ Greenheck/ Aerotech/Trane.Note: The noise criterion mentioned has to be met at a distance of 3 m from equipment at room conditions.Fan should be suitable for BMS compatability.	1,26,194.00	2,52,388.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
958	4.00	Supply, installation, testing and commissioning of tube axial flow type 37000 CFM @ 25mmwc for Pump Room in STP for supply and exhaust with powder coated MS/GSS casing and aluminum alloy impellers with high efficiency aero-foil sections, blades, the impeller directly driven by TEFC induction motor (IE-2/3) and ?F? class insulation suitable for 3 Phase, 50 Hz, 415±10% Volt, ac supply (and as per manufacturer specification) for a static pressure as indicated below. Fan section shall be suitable for Floor Mounted outdoor application as well as ceiling suspended indoor applications with suitable capacity of starter with Four Pole MCB etc., and other protective devices of approved brands within MS enclosure box complete as required and as per specifications. The fan shall be equipped with mounting bracket Inlet & outlet cone required at discharge. The sound pressure should not exceed 80 db(A) at a distance of 3 Mts. The Fan should be complete with all accessories including fire rated canvas connection with metallic flange, vibration isolators, gravity louvers, bird screen etc., as per specification including transportation to site, all mounting arrangements like brackets etc., and cost of all accessories and all labour charges complete. Fan total efficiency should not be less than 60%. Makes: Crystal Air/Kruger/ System Air/ Carry Air/ Edgetech/ Greenheck/ Aerotech/Trane.Note: The noise criterion mentioned has to be met at a distance of 3 m from equipment at room conditions.Fan should be suitable for BMS compatability.	4,64,034.00	18,56,136.00
959	8.00	Supply, installation, testing and commissioning of tube axial flow type 26000 CFM @ 25mmwc for STP tank area for supply and exhaust with powder coated MS/GSS casing and aluminum alloy impellers with high efficiency aero-foil sections, blades, the impeller directly driven by TEFC induction motor (IE-2/3) and ?F? class insulation suitable for 3 Phase, 50 Hz, 415±10% Volt, ac supply (and as per manufacturer specification) for a static pressure as indicated below. Fan section shall be suitable for Floor Mounted outdoor application as well as ceiling suspended indoor applications with suitable capacity of starter with Four Pole MCB etc., and other protective devices of approved brands within MS enclosure box complete as required and as per specifications. The fan shall be equipped with mounting bracket Inlet & outlet cone required at discharge. The sound pressure should not exceed 80 db(A) at a distance of 3 Mts. The Fan should be complete with all accessories including fire rated canvas connection with metallic flange, vibration isolators, gravity louvers, bird screen etc., as per specification including transportation to site, all mounting arrangements like brackets etc., and cost of all accessories and all labour charges complete. Fan total efficiency should not be less than 60%. Makes: Crystal Air/Kruger/ System Air/ Carry Air/ Edgetech/ Greenheck/ Aerotech/Trane.Note: The noise criterion mentioned has to be met at a distance of 3 m from equipment at room conditions.Fan should be suitable for BMS compatability.	2,94,358.00	23,54,864.00
960	23.00	Design, manufacturing, installation, testing & commissioning of 3.7 KW DOL Starter panel suitable for 415 V,3 phase, 4 wire system, made out of 16 SWG CRCA MS Sheet totally enclosed floor mounted dust and vermin proof enclosure, electrostatic powder coated with RAL 7032 with the following components 20 A, TP MPCB, 25 KA, Trip alarm contact, 25A TP -Power contactor, with required NO-NC, Over load relay, indication lamps for ON-OFF-TRIP, Selector swithc for Auto -manual, Single Phase Preventor, Digital ammeter with required CT's and selector switches, power & control terminals etc as required including auxiliary relay with contacts for smoke signal etc as requried for finished item of work as diected by Engineer-In-Charge. Makes: L&T/Schneider/ABB/Siemens/Legrand/Havells etc	28,090.00	6,46,070.00
961	12.00	Design, manufacturing, installation, testing & commissioning of 11 KW Star -Delta starter panel suitable for 415 V,3 phase, 4 wire system, made out of 16 SWG CRCA MS Sheet totally enclosed floor mounted dust and vermin proof enclosure, electrostatic powder coated with RAL 7032 with the following components 32 A, TP MPCB, 25 KA, Trip alarm contact, 50A TP -Power contactor, with required NO-NC, Over load relay, indication lamps for ON-OFF-TRIP, Selector swittch for Auto -manual, Single Phase Preventor, Digital ammeter with required CT's and selector switches, power & control terminalsas required including auxiliary relay with contacts for smoke signal etc as requried for finished item of work as diected by Engineer-In-Charge. Makes: L&T/Schneider/ABB/Siemens/Legrand/Havells etc	52,261.00	6,27,132.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
962	54.00	Supply of 1.5 TR, 5 star capable of delivering 18000 BTU/hr and above with operating on refrigerant R-32/ R410A, COP not less than 4.5 INVERTER Model Cool type split AC unit with high wall mounted Single Split indoor unit and outdoor condensing unit Hermetically sealed compressor suitable for operation on 230V, 50Hz, 1Phase AC supply capable of performing Heat cool dehumidifying air circulating and filtering with cooling and condensing units with 3 mts of copper piping, insulation kit and 4 mts of 4 core copper flexible chord with cordless remote control etc., dual barrier coating in order to protect coil form oxidation. Makes: Daikin/Carrier/LG/llyodd/Bluestar	57,142.00	30,85,668.00
963	54.00	Installation of 1.5 TR Split Air Conditioners.	2,500.00	1,35,000.00
964	54.00	Supply, Fabrication of 1set MS bracket suitable for fixing outdoor unit of split AC unit.	1,650.00	89,100.00
965	36.00	Supply, Installation, testing and commissioning of Motorized Volume Control dampers for the Lift Well Pressurization Dia 1000 mm	35,780.00	12,88,080.00
966	3.00	Supply, Installation, Testing & Commissioning of BMS server with following latest Intel i9 processor 14th generation or higher processor, 24 MB cache, 14 cores, 20 threads, up to 5.1 GHz Turbo, 125 W) or above clock speed, 32 GB, 4 x 8 GB, DDR5, 4000 MT/s, V2,HDD - 1TB SSD,MIN 2 SATA PROVISIONS, R/W CD / DVD drive, Flat Monitor - 32" LED, Serial Ports - 2 Nos, USB Ports - 4 Nos,VGA/HDMI Display - Each 1 nos, Network Card 10/100/1000MB, T400 8GB, 8GB, 3 mDP to DP adapterGraphics Card, Windows 10 Operating System / Higher, OFFICE 365 Genuine suite Anti virus, Optical mouse & key board,Multi function Laserjet Printer - A3 etc.as per detailed technical specifications and approved make including all charges complete etc as directed by Engineer In charge/ departmental authorities.Makes HP/IBM/DELL/Honeywell/Johnson /DElta/Trace/Scenag/Schendal	5,73,175.00	17,19,525.00
967	3.00	Supply, Installation, Testing & Commissioning of BMS Client Workstation with following Latest Intel microprocessor i7 / higher 14th Generation ,12 MB cache, 4 cores, 8 threads, up to 4.5 GHz Turbo, 65 W 2or above clock speed, 16GB expandable up to 32GB DDR 4 RAM, HDD - 1TB SSD ,R/W CD / DVD drive, Flat Monitor - 32" LED, Serial Ports - 2 Nos. USB Ports - 4 Nos with at least 2 NOs USB 3.0 Ports, Network Card 10/100/1000MB - 2 NVIDIA® T1000, 4 GB GDDR6, 4 mDP to DP adapters,Windows 10 Operating System / Higher,OFFICE 365 Genuine suite Anti virus, Optical mouse & key board etc.as per detailed technical specifications and approved. Makes HP/IBM/DELL. /Honeywell/Johnson Controls /Delta/Trane/Siemens/Schneider	4,06,055.00	12,18,165.00
968	3.00	Supply, Installation, Testing & Commissioning of Reporting Software with Customized Reports As per Department Format including Daily Email, All Meter Data, on/off Data ,all Alarms & trip Data From DDC Controllers following Latest Intel microprocessor i7 / higher , 2.7 to 3.0Ghz or above clock speed, 16GB expandable up to 32GB DDR 4 RAM, HDD - 1TB SSD ,R/W CD / DVD drive, Flat Monitor - 32" LED, Serial Ports - 2 Nos. USB Ports - 4 Nos with at least 2 NOs USB 3.0 Ports, Network Card 10/100/1000MB - 2 Nosography card 1GB,Windows 10 Operating System / Higher,OFFICE 365 Genuine suite Anti virus, Optical mouse & key board etc.as per detailed technical specifications with Customized Reports As per Department Format including Daily Email, All Meter Data, on/off Data ,all Alarms & trip Data From All Electrical Panels Meter Data License up to 80 Meters. Makes HP/IBM/DELL/Trane/Honey well/JC/Schneider	2,52,000.00	7,56,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
969	3.00	Supply, Installation, Testing & Commissioning of Building Control System Software - MAIN BMS SERVER SOFTWARE, of the following windows based graphical software for IBMS system with 1No Client for Operator workstation, 1No Client for Engineer workstation. The following software packages shall have below minimum features and compliances. a) 3D & HD vector dynamic graphics with Autocad import of plan with Zoom In & Zoom Out facility b) Native 64 Bit System , BTL,UL,EN Certified System, BACnet Profile B-AWS (Advanced workstation) as per the BTL Listing c) Multi-Monitor Support-(Min 4 Nos), Multi-language support,Object tracking on multiple cameras d) Certified OPC DA Server by OPC Foundation e) HTML5 based Web-Server software shall permit use of Standard Web-Browsers such as Microsoft Edge, Google Chrome, Mozilla Firefox, etc f) The Software shall comply to international standards and strive to deliver products that meet security standards such as ISA/IEC 62443, UL2900, ISO/IEC 27001, ISO/IEC62443 and OWASP g) Cybersecurity SL2, Seamless integration of Security certificates within customer IT infrastructure, Microsoft?s active directory-based authentication, LDAP integration, Use of network infrastructure that supports physical network or VLAN segmentation, End-to-end encryption from client to server, End-to-end encryption between servers, Certificate-based data exchange, Encrypted backups h) Audit Trail , 4-Eye Principle, Data Point Validation, Verified tempering evidence for report transmission i) The software shall integrate with BIM data seamlessly j) Ability to provide data to other systems thru OPC DA Server and / Or Rest web services interface. .Makes HP/IBM/DELL/Trane/JC/Scneider/Delta/Honeywell	20,18,600.00	60,55,800.00
970	3.00	SITC of True IP Based DDC-01 Standalone 32 Bit Intelligent for APFC Panel-1, peer to peer communication, interoperable DDC as per the specification. The compact controller shall have inbuilt 2-port Ethernet switch . The controller shall have 16 inputs/outputs inbuilt and can be expandable upto max 40 points by Input/Output Modules. The DDC shall have 300 Mhz processor with 128 MByte SDRAM (DDR3) and 512 MByte NAND Flash. DDC Controller shall be equipped with a battery-free real-time clock with backup for min 7 days using super capacitor. The controller shall be freely programmable and have System functions (alarming, scheduling, trending, access protection with individually definable user profiles and categories). It should have WLAN interface, Cloud connectivity for remote access and inbuilt port for POT for local interface. Note: Comissioning tool should not be dependent on any license / dongle and no extra cost should be charged. Make: - Honeywell / Siemens/ Schneider/Johnson Controls/Delta /Trane	1,90,070.00	5,70,210.00
971	3.00	SITC of True IP Based DDC-02 Standalone 32 Bit Intelligent for Main LT Panel-2, peer to peer communication, interoperable DDC as per the specification. The compact controller shall have inbuilt 2-port Ethernet switch . The controller shall have 16 inputs/outputs inbuilt and can be expandable upto max 40 points by Input/Output Modules. The DDC shall have 300 Mhz processor with 128 MByte SDRAM (DDR3) and 512 MByte NAND Flash. DDC Controller shall be equipped with a battery-free real-time clock with backup for min 7 days using super capacitor. The controller shall be freely programmable and have System functions (alarming, scheduling, trending, access protection with individually definable user profiles and categories). It should have WLAN interface, Cloud connectivity for remote access and inbuilt port for POT for local interface. Note: Comissioning tool should not be dependent on any license / dongle and no extra cost should be charged. Make: - Honeywell / Siemens/ Schneider/Johnson Controls/Delta /Trane	3,63,908.00	10,91,724.00
972	3.00	SITC of True IP Based DDC-03 Standalone 32 Bit Intelligent for Main LT Panel-3, peer to peer communication, interoperable DDC as per the specification. The compact controller shall have inbuilt 2-port Ethernet switch . The controller shall have 16 inputs/outputs inbuilt and can be expandable upto max 40 points by Input/Output Modules. The DDC shall have 300 Mhz processor with 128 MByte SDRAM (DDR3) and 512 MByte NAND Flash. DDC Controller shall be equipped with a battery-free real-time clock with backup for min 7 days using super capacitor. The controller shall be freely programmable and have System functions (alarming, scheduling, trending, access protection with individually definable user profiles and categories). It should have WLAN interface, Cloud connectivity for remote access and inbuilt port for POT for local interface. Note: Comissioning tool should not be dependent on any license / dongle and no extra cost should be charged. Make: - Honeywell / Siemens/ Schneider/Johnson Controls/Delta /Trane	1,74,413.00	5,23,239.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
973	3.00	SITC of True IP Based DDC-04 Standalone 32 Bit Intelligent for APFC Panel-3, peer to peer communication, interoperable DDC as per the specification. The compact controller shall have inbuilt 2-port Ethernet switch . The controller shall have 16 inputs/outputs inbuilt and can be expandable upto max 40 points by Input/Output Modules. The DDC shall have 300 Mhz processor with 128 MByte SDRAM (DDR3) and 512 MByte NAND Flash. DDC Controller shall be equipped with a battery-free real-time clock with backup for min 7 days using super capacitor. The controller shall be freely programmable and have System functions (alarming, scheduling, trending, access protection with individually definable user profiles and categories). It should have WLAN interface, Cloud connectivity for remote access and inbuilt port for POT for local interface. Note: Comissioning tool should not be dependent on any license / dongle and no extra cost should be charged. Make: - Honeywell / Siemens/ Schneider/Johnson Controls/Delta /Trane	3,83,091.00	11,49,273.00
974	3.00	SITC of True IP Based DDC-05 Standalone 32 Bit Intelligent for DG Synch Panel, peer to peer communication, interoperable DDC as per the specification. The compact controller shall have inbuilt 2-port Ethernet switch . The controller shall have 16 inputs/outputs inbuilt and can be expandable upto max 40 points by Input/Output Modules. The DDC shall have 300 Mhz processor with 128 MByte SDRAM (DDR3) and 512 MByte NAND Flash. DDC Controller shall be equipped with a battery-free real-time clock with backup for min 7 days using super capacitor. The controller shall be freely programmable and have System functions (alarming, scheduling, trending, access protection with individually definable user profiles and categories). It should have WLAN interface, Cloud connectivity for remote access and inbuilt port for POT for local interface. Note: Comissioning tool should not be dependent on any license / dongle and no extra cost should be charged.Make: - Honeywell / Siemens/ Schneider/Johnson Controls/Delta /Trane	1,90,069.00	5,70,207.00
975	18.00	SITC of True IP Based DDC-06 Standalone 32 Bit Intelligent for Typical tower, peer to peer communication, interoperable DDC as per the specification. The compact controller shall have inbuilt 2-port Ethernet switch . The controller shall have 16 inputs/outputs inbuilt and can be expandable upto max 40 points by Input/Output Modules. The DDC shall have 300 Mhz processor with 128 MByte SDRAM (DDR3) and 512 MByte NAND Flash. DDC Controller shall be equipped with a battery-free real-time clock with backup for min 7 days using super capacitor. The controller shall be freely programmable and have System functions (alarming, scheduling, trending, access protection with individually definable user profiles and categories). It should have WLAN interface, Cloud connectivity for remote access and inbuilt port for POT for local interface. Note: Comissioning tool should not be dependent on any license / dongle and no extra cost should be charged.Make: - Honeywell / Siemens/ Schneider/Johnson Controls/Delta /Trane	4,99,675.00	89,94,150.00
976	3.00	Third Party Systems Integration- SITC of True IP Based BTL & UL Listed for third party integration with required Gateway/Router/Converter for AHU VFD's, VRV System, Thermostats, DG/UPS/LT/HT Panel and Fire Alarm Systems. The controller shall have 2port Ethernet switch and WLAN interface. It should have BTL label (BACnet communications passed the BTL test), Modbus, , RS485 and consisting of Dual microprocessor with Storage capacity of 1 GB RAM. It should support Real Time clock upto 7 Days. It should Support of the major communication protocols: BACnet,/IP, BACnet MS/TP, Modbus IP and Modbus RTU upto minimum 500 points or above as per approved IO summary list. Integrator shall be of same make only with all other mounting accessories complete as required and as directed by Engineer-In-Charge for not less than the follwoing integration points. Energy Meter - RS 485 MODBUS RTU DG - RS 485 (MODBUS RTU/Bacnet MSTP) FAS Panel- RS 485 (MODBUS RTU/Bacnet MSTP), (BACnet IP) Solar RS 485 (MODBUS RTU/Bacnet MSTP) Hydropneumatic system RS 485 (MODBUS RTU/Bacnet MSTP), VRF system RS 485 Bacnet MSTP or BACnet IP, Fire Fighting System RS 485 (MODBUS RTU/Bacnet MSTP), Lift RS 485 (MODBUS RTU/Bacnet MSTP) Make: - Honeywell / Siemens/ Schneider/Johnson Controls/Delta /Trane	10,36,347.00	31,09,041.00
977	6.00	Supply, Installation, Testing & Commissioning of Duct Static Pressure Sensor with all the mounting accessories included. The maximum pr limit shall be 0-500Pa all other mounting accessories complete as required. Field Devices & internal cabling of AHU shall be BMS vendor scope including all charges complete etc as directed by Engineer In charge/ departmental authorities. Make: - Honeywell / Siemens/ Schneider/Johnson Controls/Delta /Trane/Omecron/Greystone/ Dwyer/Omicron/Ace instruments	8,560.00	51,360.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
978	6.00	Supply, fixing, Testing & Commissioning of Duct Temperature Sensors including all charges complete etc as directed by Engineer In charge/ departmental authorities.Make: - Honeywell / Siemens/ Schneider/Johnson Controls/Delta /Trane/Omecron/Greystone/ Dwyer/Omicron/Ace instruments	4,241.00	25,446.00
979	6.00	Supply, fixing, Testing & Commissioning of Current Relay including all charges complete etc as directed by Engineer In charge/ departmental authorities. Makes: L&T/ABB/Meco/Schneider/Siemens/Trane/Omecron/Greystone/Omecron/Dwyer/Omicron/Ace instruments	2,562.00	15,372.00
980	6.00	Supply, fixing, Testing & Commissioning of Voltage Transducer including all charges complete etc as directed by Engineer In charge/ departmental authorities.Makes: L&T/ABB/Meco/Schneider/Siemens/Trane/Omecron/Greystone/Omecron/Dwyer/Omicron/Ace instruments	8,123.00	48,738.00
981	3.00	Supply, fixing, Testing & Commissioning of Ultrasonic Water Level Sensor (Note: Level should indicate as Litre basis in BMS Screen) for Water tank as technical specification with all other mounting accessories including all charges complete etc as directed by Engineer In Charge/ departmental authorities. Make: - Honeywell / Siemens/ Schneider/Johnson Controls/Delta /Trane/Omecron/Greystone/ Dwyer/Omicron/Ace instruments	24,356.00	73,068.00
982	3.00	Supply, fixing, Testing & Commissioning of Flame Proof Diesel Level Sensor for Diesel Day Tank Monitoring. Tank Height 1 Mtr including all charges complete etc as directed by Engineer In charge/ departmental authorities.Make: - Honeywell / Siemens/ Schneider/Johnson Controls/Delta /Trane/Omecron/Greystone/ Dwyer/Omicron/Ace instruments	15,445.00	46,335.00
983	10,125.00	Supply, Laying, Termination of 2 Core 1.5 sq.mm ISI Certified (for Signal & Field devices, Third Party Integration etc....) ATSC, FRLS/PVC insulated, armored, Tinned Copper, twisted, shielded, PE insulated, Cable with proper ferrules, lugs, and other necessary accessories. The spec shall meet the system manufacturer specifications including all charges complete etc., as directed by Engineer in Charge/ departmental authorities. Makes: Torent / Universal / Unicab / Havells / KEI / Gloster/Finecab / Polycab /RR Kabel/ Polywires	80.00	8,10,000.00
984	6,075.00	Supply, Laying, Termination of 4 Core 1.5 sq.mm ISI Certified (for Signal & Field devices, Third Party Integration etc....) ATSC, FRLS/PVC insulated, armored, Tinned Copper, twisted, shielded, PE insulated, Cable with proper ferrules, lugs, and other necessary accessories. The spec shall meet the system manufacturer specifications including all charges complete etc., as directed by Engineer in Charge/ departmental authorities. Makes:Torent / Universal / Unicab / Havells / KEI / Gloster/Finecab / Polycab /RR Kabel/ Polywires	134.00	8,14,050.00
985	4,050.00	Supply and Transportation of 2 Core 1.5 Sqmm stranded/solid copper conductor FRLS-XLPE/PVC insulated & PVC sheathed, unarmoured and Overall Shielded instrumentation/control cables of 1.1 KV grade with copper conductor as per IS 7098 Part-I etc., complete.Makes:Torent / Universal / Unicab / Havells / KEI / Gloster/Finecab / Polycab /RR Kabel/ Polywires	74.00	2,99,700.00
986	3,240.00	Supply and Transportation of 2 Core 0.75 Sqmm stranded/solid copper conductor FRLS-XLPE/PVC insulated & PVC sheathed, unarmoured and Overall Shielded instrumentation/control cables of 1.1 KV grade with copper conductor as per IS 7098 Part-I etc., complete.Makes: Torent / Universal / Unicab / Havells / KEI / Gloster/Finecab / Polycab /RR Kabel/ Polywires	107.00	3,46,680.00
987	810.00	Supply,transporatation & installation of 100mm x 50mm x 1.6mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. Makes: Profab/Inidana/legrand/Hfab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	424.00	3,43,440.00
988	405.00	Supply,transporatation & installation of 150mm x 50mm x 1.6mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. Makes: Profab/Inidana/legrand/Hfab/Patny/Akshara made up with raw material like Tata/Jindal/JSW	492.00	1,99,260.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
989	6,075.00	Supply and Fixing of 20mm dia (1.9-2.1) mm thick P.V.C. pipe (ISI MARK) heavy grade with all required accessories suitable for fixing on walls or laying above exisitng false ceiling for switches for elv works/Light, Fan and separate plug point including all labour charges etc., complete. Makes : Precision/Universal& Marudhar/VIP / GoldMedal / Million plast / GM / Sudhakar /Polycab/Anchor/ Polyline/ Orbit/AKG/Beljin/Vasavi/DEC.	118.00	7,16,850.00
990	3.00	Building Control System Software -CLIENT LICENSE Supply, Installation, Testing & Commissioning of Additional Client License Software with minimum 5 Client License with all accessories. This software shall communicate with main BMS Software on real time basis and monitor and control all BMS functionality of entire BMS system including alarm and reporting. Make: - Honeywell / Siemens/ Schneider/Johnson Controls/Delta /Trane	1,84,500.00	5,53,500.00
991	18.00	Supply, Installation, Testing and Commissioning of 24 Port cat 6 Patch Panel , Rack mounted 19", Cat 6 UTP,1.5-1.6 MM CRS chasis, powder coated Modular Patch Panels (upgradable to intelligent panels with use of sensor strips) with collapsible shutters on jacks to support latest amendments of TIA / EIA Cat 6 Specifications in Existing Communication Rack along with necessary connections of Cat 6 UTP Cables, With Rear Cable management trays and clamps Makes: Systimax /Panduit/ Siemond/ Legrand.	8,915.00	1,60,470.00
992	324.00	Supply installation testing and commissioning of 2 Mtr/7 Ft 4 pair 23AWG Cat-6 UTP, flexible, double ended patch cords along with 2 nos of RJ 45 connectors with strain relief boots Compatible to T568A,T568Bspecifications including making connections to information outlets. Makes: Systimax /Panduit/ Siemond/ Legrand.	339.00	1,09,836.00
993	3,000.00	Supply installation testing and commissioning of 6 fiber Outdoor, steel tape armoured Single mode [9/125um] glass Fiber Optic Cable as per latest amendments of TIA /EIA 568B.3 , GR 20 CORE/ UEC 794-1/ EN 187000 Standards in existing MSPVC Conduits/ hume pipe including making terminations to active passive equipment with ferruling at both ends for identification with necessary tools for Terminations and testing required. Makes: Systimax /Panduit/ Siemond/ Legrand.	74.00	2,22,000.00
994	6,000.00	Supply, laying ,testing and commissioning of 4-pair Cat 6 UTP Cable, Cat6 Solid (Third party ETL Intertek tested up to 700 MHZ) to support 1Gbps with Cross (+) filler pair separator & PVC sheath 23 AWG, STP/UTP Cable , Meets or exceeds ANSI/TIA-568-C.2 and UL Listed &RoHS Compliant in the existing raceways /PVC conduits including making connections to information outlets and patch panels with ferruling at both ends for identification with necessary tools for punching stripping crimping and testing required etc., complete. Makes: Systimax /Panduit/ Siemond/ Legrand.	51.00	3,06,000.00
995	18.00	Supply, Installation, Testing and Commissioning of 6U Wall mounted Communication rack in one section with glass doors, swing handles, lock, Top and Bottom Cable entries, supports for mounting rack on wall, Cable managers, Fan tray with 2 x 230 Volt fans, Equipment mounting hardware, wire managers, power supply box for supplying power to hubs, fans etc., along with earth continuity kit, MCB, indicator, moulded power supply cable, Blank panels, sliding shelves etc.Makes: APW/HCL/Valrack/Netrack.	9,429.00	1,69,722.00
996	3.00	Supply, Installation, Testing and Commissioning of 9U Wall mounted Communication rack in one section with glass doors, swing handles, lock, Top and Bottom Cable entries, supports for mounting rack on wall, Cable managers, Fan tray with 2 x 230 Volt fans, Equipment mounting hardware, wire managers, power supply box for supplying power to hubs, fans etc., along with earth continuity kit, MCB, indicator, moulded power supply cable, Blank panels, sliding shelves etc.Makes: APW/HCL/Valrack/Netrack.	11,156.00	33,468.00
997	18.00	Supply, Installation, Testing and Commissioning of Layer 2, 24GE port, POE 10/100/1000 4X 10 G SFP Uplink Ports, LAN base Manageable Network switch including all connectors, power supply modules and licenses etc as required and as direcetd by Engineer-In-Charge. Makes: HP/Aruba/Cisco/Xtreme	1,75,290.00	31,55,220.00
998	18.00	Supply, Installation Testing and commissioning of 12 Port LIU, 19 " Rack mounted/surface mounted aluminum / CRS powder coated multimode glass Fiber Optic Cable Patch panel/ LIU(upgradable to intelligent panels with use of sensor strips) along with cable tray/ fiber management system , adapters for ST II/ SC/FC/MT/PC/LC connections including making connections to active / passive equipment with ferruling at both ends for identification with necessary tools for Terminations and testing required. Makes: Systimax /Panduit/ Siemond/ Legrand.	10,908.00	1,96,344.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
999	288.00	Supply installation testing and commissioning of 3 Mtr/10 Ft 4 pair 23AWG Cat-6 UTP, flexible, double ended patch cords along with 2 nos of RJ 45 connectors with strain relief boots Compatible to T568A,T568Bspecifications including making connections to information outlets. Makes: Systimax /Panduit/ Siemond/ Legrand.	390.00	1,12,320.00
1000	417.00	Supply installation testing and commissioning Patch Cards 2 / SC-APC + FTTH T Box 1 including making terminations to active passive equipment with ferruling at both ends for identification with necessary tools for Terminations and testing required. Makes: Systimax /Panduit/ Siemon/ Legrand	600.00	2,50,200.00
1001	8,700.00	Supply installation testing and commissioning of 6 fiber Outdoor, steel tape armoured Single mode [9/125um] glass Fiber Optic Cable as per latest amendments of TIA /EIA 568B.3 , GR 20 CORE/ UEC 794-1/ EN 187000 Standards in existing MSPVC Conduits/ hume pipe including making terminations to active passive equipment with ferruling at both ends for identification with necessary tools for Terminations and testing required. Makes: Systimax /Panduit/ Siemon/ Legrand	74.00	6,43,800.00
1002	3,150.00	Supply installation testing and commissioning of 12 fiber Outdoor, steel tape armoured Single mode [9/125um] glass Fiber Optic Cable as per latest amendments of TIA /EIA 568B.3 , GR 20 CORE/ UEC 794-1/ EN 187000 Standards in existing MSPVC Conduits/ hume pipe including making terminations to active passive equipment with ferruling at both ends for identification with necessary tools for Terminations and testing required. Makes: Systimax /Panduit/ Siemon/ Legrand	86.00	2,70,900.00
1003	219.00	Supply installation testing and commissioning of Fiber Termination Box / Joint Closures	8,220.00	18,00,180.00
1004	57.00	Supply installation testing and commissioning of GPON PLC Splitter (1:8 or based on requirement) rack mountable, Splicing, Pig Tails and all required connectors and fixing accessories in complete. required and as directed by Engineer in Charge.Makes.Commscope/STERLITE/OPTIK/ R&M/Legrand	2,100.00	1,19,700.00
1005	39.00	Supply, Installation Testing and commissioning of 24 Port LIU, 19 " Rack mounted/surface mounted aluminum / CRS powder coated multimode glass Fiber Optic Cable Patch panel/ LIU(upgradable to intelligent panels with use of sensor strips) along with cable tray/ fiber management system , adapters for ST II/ SC/FC/MT/PC/LC connections including making connections to active / passive equipment with ferruling at both ends for identification with necessary tools for Terminations and testing required. Makes: Systimax /Panduit/ Siemond/ Legrand.	20,643.00	8,05,077.00
1006	21.00	Supply, Installation Testing and commissioning of 48 Port LIU, 19 " Rack mounted/surface mounted aluminum / CRS powder coated multimode glass Fiber Optic Cable Patch panel/ LIU(upgradable to intelligent panels with use of sensor strips) along with cable tray/ fiber management system , adapters for ST II/ SC/FC/MT/PC/LC connections including making connections to active / passive equipment with ferruling at both ends for identification with necessary tools for Terminations and testing required. Makes: Systimax /Panduit/ Siemond/ Legrand.	42,000.00	8,82,000.00
1007	21.00	Supply, Installation, Testing and Commissioning of 12U (44mm) Wall mounted Communication rack in one section with glass doors, swing handles, lock, Top and Bottom Cable entries, supports for mounting rack on wall, Cable managers, Fan tray with 2 x 230 Volt fans, Equipment mounting hardware, wire managers, power supply box for supplying power to hubs, fans etc., along with earth continuity kit, MCB, indicator, moulded power supply cable, Blank panels, sliding shelves etc. Makes: APW/HCL/Valrack/Netrack	11,299.00	2,37,279.00
1008	3.00	Supply, Installation, Testing and Commissioning of Floor mounted 42U communication rack in on Section with glass doors, swing handles, lock on both doors, Top and Bottom Cable entries with gland plates, Castor with brakes , 7 no Cable managers, 1 no Fan tray with 2 x 230 Volt fans, Equipment mounting hardware, wire managers, power supply box for supplying power to hubs, fans etc., along with earth continuity kit, MCB, indicator, moulded power supply cable, Blank panels of 1u / 2 u, sliding shelves. Frame of communication rack should be made of heavy grade Aluminum profile PS grey painted and panels should be made from CRCA steel 18 SWG RS Beige painted. Makes: APW/HCL/Valrack/Netrack	69,271.00	2,07,813.00
1009	417.00	Supply, Installation, Testing and Commissioning of TATA SKY DTH Services Tower Antenna, RG 6 Cable PVC Pipes , Splitters including all accessories to enable DTH Services etc	1,800.00	7,50,600.00
1010	93.00	Supply, Installation and Testing and commissioning of indoor 1 pair Singlemode [9/125um] glass Fiber Optic Patch Cords of required length in mtrs as per latest ammendments of TIA/EIA 568B.3 and IEC 794 Standard Specifications including ST II / SC/FC/MT/PC connectors at both ends as per requirements. Makes:Systimax /Panduit/ Siemond/ Legrand	2,034.00	1,89,162.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1011	3.00	Supply, installation, Testing and commissioning of GPON OLT 16 PON Port Hardware comparatable with the ONT along with all required connectors and fixing accessories in complete. required and as directed by Engineer in Charge.Make-NOKIA/ALPHIONS/TEJAS/GX	3,00,000.00	9,00,000.00
1012	3.00	Supply, Installation, Testing and commissioning of SIP Server for 200 Extn HYBRID / IP PBX with required software and comparatable to integrate with the GePON / GPON OLT & AOLT, including all fixing connectors and fixing accessories in complete. required and as directed by Engineer in Charge. Makes-CISCO/NEC/MATRIX/GRANDSTREM	1,41,000.00	4,23,000.00
1013	417.00	Supply, installation, Testing and commissioning of GPON ONT Hardware with minimum 4 Port Ethernet port, 1 WIFI router (1GBPS)& 2 Voice output comparatable with the OLT along with all required connectors , backbox, and fixing accessories. GPON ONT shall be with Wifi Router in complete. required and as directed by Engineer in Charge.Make-NOKIA/ALPHIONS/TEJAS/GX	4,000.00	16,68,000.00
1014	21.00	Supply, Installation, testing and commissioning of 1 WAN + 4 LAN Port with 300 mbps speed and coverage 30 meters range Wi-Fi Router with all connectors , adapters and fixing accessories. Qty Shall vary as per client requirement in complete. required and as directed by Engineer in Charge.Makes-DLINK/TPLINK/TENDA	2,900.00	60,900.00
1015	417.00	Supply, Installation and testing of Analogue Telephone Handsets with Display and Connecting cables.. Etc in complete. required and as directed by Engineer in Charge.Makes-PANASONIC/BEETAL/NEC/ MATRIX	1,350.00	5,62,950.00
1016	6.00	Supply and Installation of Mikrotik CCIR Server CCR2116 1U rack mount, 1x Gigabit Ethernet, 4 nos 10G SFP+ cages, LCD, including required power supply , SFP modules, Communications modules , etcFor Controlling the Users Bandwidth and Software	2,88,750.00	17,32,500.00
1017	6.00	Supply installation Testing and commissioning of 3.0 KVA, 72/96VDC on line UPS system confirms to IS 16242(Part-I):2014 and IEC 60240-1: 2008 with IGBT technology pure sine wave output, double conversion with auto and manual static by pass switch single phase input / Single phase output. Makes: Numeric/APC/Fuji Electric/ Sakshham /Emerson.	48,625.00	2,91,750.00
1018	6.00	Supply and providing of battery rack for 5 to 10 batteries (42 AH)	3,749.00	22,494.00
1019	48.00	Supply and fixing of 12V 42 AH SMF battery with 3 years warranty including wire leads, connections etc complete. Makes: Quanta / Racket / Exide.	7,124.00	3,41,952.00
1020	87.00	Supply, Installation, Testing and Commissioning of 4-5 MP IR Motorized, Focus & Zoom (MFZ) Dome, 2.7-13.5mm DC Iris, 1/2.8" progressive CMOS image sensor, Min. Illumination 0.005 (color), S/N Ratio: 50dB, Electronics Shutter: 1/8 ~ 1/32000, IR Distance: up to 50M, WDR~120dB/BLC/HLC/3D DNR,defog, Gain Control: 0 ~100%, Alarm In& Out; SD card up to 256GB, 30fps; PAN: 0-355, Tilt: 0-75, Rotation: 0-354; Video Compression: H.265 HEVC/H.264/MJPEG, Smart Codec; Triple Stream; 2way Full duplex, Line IN & Out; Protocals:IPv4, IPv6, TCP / IP, HTTP, HTTPS, RTSP / RTP / RTCP, IGMP / Multicast, SMTP, DHCP, NTP, DNS, QoS, SNMP, 802.1X, UDP, ICMP, ARP, TLS; ONVIF: S/G/T; MAx. 10 user; User account and password protection, HTTPS, IP Filter, Digest authentica tion, TLS1.2 only, Stream encryption, AES128 / 256, SSH / Telnet closed, PCI-DSS compliance; Edge Analytics: : People Counter, Multi Loitering, Intrusion, Tampering, Smart Motion Detection (SMD), Motion Detection; Events: Video motion detection, Alarm input, Recording notification, Tampering; Op. Temp: -40 to 60 Deg; power consumption max. 7W; IP67, IK10, UL, NDAA Compliance. Manufacturer Authorization Form (MAF) to be provided from OEM by the contractor for taking arppoval. Makes: Honeywell,Panasonic, Matrix, Bosch, PELCO, Axis	19,200.00	16,70,400.00

Contractor

Chief Engineer(H and B-H)
APCRDA , Vijayawada

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1021	93.00	Supply, Installation, Testing and Commissioning of 4-5 MP IR Motorized, Focus & Zoom (MFZ) MFZ Bullet, 2.7-13.5mm DC Iris, 1/2.8" progressive CMOS image sensor, Min. Illumination 0.005 (color), S/N Ratio: 50dB, Electronics Shutter: 1/8 ~ 1/32000, IR Distance: up to 60M, WDR~120dB/BLC/HLC/3D DNR,defog, Gain Control: 0 ~100%, Alarm In& Out; SD card up to 256GB, 30fps; Video Compression: H.265 HEVC/H.264/MJPEG, Smart Codec; Triple Stream; 2way Full duplex, Line IN & Out; Protocals:IPv4, IPv6, TCP / IP, HTTP, HTTPS, RTSP / RTP / RTCP, IGMP / Multicast, SMTP, DHCP, NTP, DNS, QoS, SNMP, 802.1X, UDP, ICMP, ARP, TLS; ONVIF: S/G/T; Max. 10 user; User account and password protection, HTTPS, IP Filter, Digest authentication, TLS1.2 only, Stream encryption, AES128 / 256, SSH / Telnet closed, PCI-DSS compliance; Edge Analytics: : People Counter, Multi Loitering, Intrusion, Tampering, Smart Motion Detection (SMD), Motion Detection; Events: Video motion detection, Alarm input, Recording notification, Tampering; Op. Temp: -40 to 60 Deg; power consumption max. 7W; IP67, IK10, UL, NDAA Compliance. Manufacturer Authorization Form (MAF) to be provided from OEM by the contractor for taking arppoval. Makes: Honeywell,Panasonic, Matrix, Bosch, PELCO, Axis	19,200.00	17,85,600.00
1022	126.00	Supply, Installation, Testing and Commissioning of 4 MP or higher IR Bullet Camera, DC Iris, 1/2.8" progressive CMOS image sensor, Min. Illumination 0.005 (color), S/N Ratio: 50dB, Electronics Shutter: 1/8 ~ 1/32000, IR Distance: up to 60M, WDR~120dB/BLC/HLC/3D DNR,defog, Gain Control: 0 ~100%, Alarm In& Out; SD card up to 256GB, 30fps; Video Compression: H.265 HEVC/H.264/MJPEG, Smart Codec; Triple Stream; 2way Full duplex, Line IN & Out; Protocals:IPv4, IPv6, TCP / IP, HTTP, HTTPS, RTSP / RTP / RTCP, IGMP / Multicast, SMTP, DHCP, NTP, DNS, QoS, SNMP, 802.1X, UDP, ICMP, ARP, TLS; ONVIF: S/G/T; Max. 10 user; User account and password protection, HTTPS, IP Filter, Digest authentication, TLS1.2 only, Stream encryption, AES128 / 256, SSH / Telnet closed, PCI-DSS compliance; Edge Analytics: : People Counter, Multi Loitering, Intrusion, Tampering, Smart Motion Detection (SMD), Motion Detection; Events: Video motion detection, Alarm input, Recording notification, Tampering; Op. Temp: -40 to 60 Deg; power consumption max. 7W; IP67, IK10, UL, NDAA Compliance. Manufacturer Authorization Form (MAF) to be provided from OEM by the contractor for taking arppoval. Makes: Honeywell,Panasonic, Matrix, Bosch, PELCO, Axis	16,133.00	20,32,758.00
1023	536.00	Supply, Installation, Testing and Commissioning of 4 MP or higher IR Dome Camera, DC Iris, 1/2.8" progressive CMOS image sensor, Min. Illumination 0.005 (color), S/N Ratio: 50dB, Electronics Shutter: 1/8 ~ 1/32000, IR Distance: up to 60M, WDR~120dB/BLC/HLC/3D DNR,defog, Gain Control: 0 ~100%, Alarm In& Out; SD card up to 256GB, 30fps; Video Compression: H.265 HEVC/H.264/MJPEG, Smart Codec; Triple Stream; 2way Full duplex, Line IN & Out; Protocals:IPv4, IPv6, TCP / IP, HTTP, HTTPS, RTSP / RTP / RTCP, IGMP / Multicast, SMTP, DHCP, NTP, DNS, QoS, SNMP, 802.1X, UDP, ICMP, ARP, TLS; ONVIF: S/G/T; Max. 10 user; User account and password protection, HTTPS, IP Filter, Digest authentication, TLS1.2 only, Stream encryption, AES128 / 256, SSH / Telnet closed, PCI-DSS compliance; Edge Analytics: : People Counter, Multi Loitering, Intrusion, Tampering, Smart Motion Detection (SMD), Motion Detection; Events: Video motion detection, Alarm input, Recording notification, Tampering; Op. Temp: -40 to 60 Deg; power consumption max. 7W; IP67, IK10, UL, NDAA Compliance. Manufacturer Authorization Form (MAF) to be provided from OEM by the contractor for taking arppoval. Makes: Honeywell,Panasonic, Matrix, Bosch, PELCO, Axis	15,679.00	84,03,944.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1024	24.00	Supply, Installation, Testing and Commissioning of 4-5 MP IR Speed PTZ, Optical zoom 30X, optical Zoom 16X, 5.3 ~159mm, P-Iris, 1/2.8" progressive CMOS image sensor, Min. Illumination 0.007 (color), S/N Ratio: 50dB, Electronics Shutter: 1/1 ~ 1/30000sec, IR Distance: up to 150M, WDR~120dB/BLC/HLC/3D DNR, Gain Control: 0 ~100%, Alarm 2 IN& 2 OUT; SD card up to 256GB, PAN Range/Speed: 0-360/.1 ~ 180/s deg, Tilt Range/Speed: -10 ~ +90/.1 ~ 90deg/s, 400 preset locations, 12 tours, 6 patterns; Video Compression: H.265 HEVC/H.264/MJPEG, Smart Codec; Triple Stream;30fps; Video analytics: People counting, intrusion, tampering,Loitering,Motion Detection, SMD; 2 way audio stream with full duplex Protocals: IPv4, IPv6, TCP / IP, HTTP, HTTPS, UPnP, RTSP / RTP / RTCP, IGMP / Multicast, SMTP, DHCP, NTP, DNS, QoS, SNMP, 802.1X, UDP, ICMP, ARP, TLS; User account and password protection, HTTPS, IP Filter, Digest authentication, TLS1.2 only, Stream encryption, AES128 / 256, SSH / Telnet closed, PCI-DSS complianceONVIF: S/G/T; Op. Temp: -40 to 60 Deg; power consumption max. 25W; IP66, IK10, UL, NDAA, Price to be inclusive of all required mounts. Manufacturer Authorization Form (MAF) to be provided from OEM by the contractor for taking arppoval. Makes: Honeywell,Panasonic, Matrix, Bosch, PELCO, Axis	1,34,066.00	32,17,584.00
1025	25.00	Supply, Installation, Testing and Commissioning of 32CH Embedded 4K NVR 8 SATA expandable each BAY up to 10TB, audio input & Output, Two way communication supported, G7.11 audio format support, 320 Mbps recording throughput, 16 alarm inputs & 4 Outputs, RS485, Esata,RAID and RS232 to be supported with max. 16 users, Op. temp -10 to 50 deg. C, NDAA compliant, UL, CE, FCC certified.Manufacturer Authorization Form (MAF) to be provided from OEM by the contractor for taking arppoval. Makes: Honeywell,Panasonic, Matrix, Bosch, PELCO, Axis	1,15,649.00	28,91,225.00
1026	1.00	Supply, Installation, Testing and Commissioning of 64CH Embedded 4K NVR 8 SATA expandable each BAY up to 10TB, audio input & Output, Two way communication supported, G7.11 audio format support, 320 Mbps recording throughput, 16 alarm inputs & 4 Outputs, RS485, Esata,RAID and RS232 to be supported with max. 16 users, Op. temp -10 to 50 deg. C, NDAA compliant, UL, CE, FCC certified.Manufacturer Authorization Form (MAF) to be provided from OEM by the contractor for taking arppoval. Makes: Honeywell,Panasonic, Matrix, Bosch, PELCO, Axis	2,44,800.00	2,44,800.00
1027	66.00	Supply and installation of Surveillance 8TB HDD Storage upto 256 Cameras of continous recording at resolution of 1080 p @ 25 Fps for 30 Days. Makes:Seagate/Hitachi/TOSHIBA/ED	23,314.00	15,38,724.00
1028	850.00	Fabrication, supply and transportation of all sizes swaged poles up to site confirming to IS 2713 / 1980 specifications. The pole should be painted with primary coat of red oxide and black bituminous paint up to ground level with base plate, including cost of all materials etc., complete. (Rate per K. G). Makes: Hissar / Tata pipes/Prakash Surya	100.00	85,000.00
1029	600.00	Fabrication and Supply of M.S. Poles for garden posts with 'B' class 60.25mm outer dia with base plate and suitable pole cap including cost and conveyance of all material including fixing of luminaire and labour charges etc., complete. (Rate per K. G). Makes: Hissar / Tata pipes/Prakash Surya	90.00	54,000.00
1030	150.00	Supply of different sizes of M. S. Pipe brackets (Rate per K.G) of approved shape as directed by Engineer-In-charge..Makes: Hissar / Tata pipes/Prakash Surya	90.00	13,500.00
1031	15.00	Supply and transportation of following glass reinforced polymer (GRP) composite type Conical pole with single arm bracket of length 1Mtr and internal junction box including labour charges etc., complete. Makes: As per list of recommended brands. - 4.00 Mtrs height, Bottom dia 143mm, Top 76mm, AV thickness 6mm and to withstand maximum wind velocity 180Km/Hr. Makes: Bajaj / Kemrock / Valmont/Sumip/Helipole.	14,443.00	2,16,645.00
1032	15.00	Supply and transportation of base bracket suitable for glass reinforced polymer (GRP) composite type pole including labour charges etc., complete - For 4.00 Mtrs Pole. Makes: Bajaj / Kemrock / Valmont/Sumip/Helipole.	2,072.00	31,080.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1033	6.00	Supply, Installation, Testing & Commissioning of Client Workstation with following Latest Intel microprocessor i7 / higher , 2.7 to 3.0Ghz or above clock speed, 8GB expandable up to 32GB DDR 4 RAM, HDD - 1TB SATA ,R/W CD / DVD drive, Flat Monitor - 32" LED, Serial Ports - 2 Nos. USB Ports - 4 Nos with at least 2 NOs USB 3.0 Ports, Network Card 10/100/1000MB - 2 Nosography card 1GB,Windows 10 Operating System / Higher, MS office suite Anti virus, Optical mouse & key board etc.as per detailed technical specifications and approved makes as directed by Engineer-In-Charge-Note:Work Station / Server to be consider as per OEM Recomendation. Makes : HP/IBM/DELL	1,18,728.00	7,12,368.00
1034	3.00	Supply, Transportation and installation of All-in-One Laser type print technology (Print, Copy, Scan) with duplex, auto document feeder features: -Print Resolution 600 x 600dpi -Print Speed (A4) 27ppm -Auto Duplex Printing Standard -Available Paper Size for Auto Duplex Print A4, Letter, Legal (*1), Indian Legal, Fulllscape -COPY Copy Speed (A4) 27ppm Maximum Number of Copies Up to 999 copies Scan Type Colour Contact Image Sensor Scan Resolution Optical Up to 600 x 600dpi Pull Scan Yes, USB and Network. Makes: HP/IB/Dell	28,182.00	84,546.00
1035	30.00	Supply, Installation, Testing and Commissioning of Layer 2, 8 GE port, POE 10/100/1000 4 X 10 G SFP Uplink Ports, LAN base Manageable Network switch including all connectors, power supply modules and licenses etc as required and as direcetd by Engineer-In-Charge.Makes: HP/Aruba/Cisco/Xtreme	28,631.00	8,58,930.00
1036	6.00	Supply, Installation, Testing and Commissioning of 24 ports of Layer 3-1/10GbE (SFP+) ports with four 40GbE (QSFP+) or 25/50 GbE (SFP56) Uplink interface ports or higher.Switching Capacity 800 Gpbs or higher, Forwarding packet rate of min 600 Mpps or higher,Stacking up to 8 units, Multicore CPU, 8GB DRAM or higher, 16GB Flash or higher, Packet buffer minimum 8MB. Support for minimum 60,000 routing table, BGP, MP-BGP, VRF, OSPF, OSPFv3, Policy-Based Routing (PBR), PIM SM, VXLAN, ERPS from day 1. Integrated TPM chip or equivalent, Sflow, UDLD or equivalent and modular operating system. Certifications: IPv6 logo phase 2, EAL/NDPP etc as required including all connectors, power supply modules and licenses etc and as direcetd by Engineer-In- Charge.Makes:HP/Aruba/Cisco/Xtreme etc as required and as per detailed technical specifications as directed by Engineer-In-Charge.Manufacturer Authorization Form (MAF) to be provided from OEM by the contractor for taking arppoval. Makes: HP/Aruba/Cisco/Xtreme	6,94,074.00	41,64,444.00
1037	30.00	Supply, Installation, Testing and Commissioning of Layer-2, 24 port of 100/1000 Base-Tx PoE (minimum 370W or more as required) ports with 4 x 1GE/10G SPF+ Uplink interface ports or higher.Switching Capacity 128 Gpbs or higher, Forwarding packet rate of min 95 Mpps or higher,Multicore CPU, 4GB DRAM or higher, 16GB Flash or higher, Packet buffer minimum 12MB. Support for Staic routing & 512 unicast routs for IPV4/V6. Integrated TPM chip or equivalent, Sflow, UDLD or equivalent and modular operating etc as required including all connectors, power supply modules and licenses etc and as direcetd by Engineer-In- Charge.Makes:HP/Aruba/Cisco/Xtreme etc as required and as per detailed technical specifications as directed by Engineer-In-Charge.Manufacturer Authorization Form (MAF) to be provided from OEM by the contractor for taking arppoval. Makes: HP/Aruba/Cisco/Xtreme	1,75,290.00	52,58,700.00
1038	60.00	Supply, Installation, Testing and Commissioning of 10 G SFP+ Long Range (Single) Module up to 10KM. Makes: HP/Aruba/Cisco/Xtreme	36,000.00	21,60,000.00
1039	35,213.00	Supply, laying ,testing and commissioning of 4-pair, Cat6 Solid 6 UTP cable (Third party ETL Intertek tested up to 700 MHZ) to support 1Gbps with Cross (+) filler pair separator & PVC sheath 23 AWG, STP/UTP Cable , Meets or exceeds ANSI/TIA-568-C.2 and UL Listed &RoHS Compliant in the existing raceways /PVC conduits including making connections to information outlets and patch panels with ferruling at both ends for identification with necessary tools for punching stripping crimping and testing required etc., complete. Makes: Systimax /Panduit/ Siemond/ Legrand	51.00	17,95,863.00
1040	2,676.00	Supply,laying, testing and commissioning of 3 core 1.5 Sqmm PVC insulated and sheathed FRLS copper round cable for voltage up to 1100V as per IS 694 suitable to run in exisitng pvc/ms conduits/cable trays etc including all labour charges complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. Makes: Finolex / RR kabel / Havells/ Finecab /KEI/Polycab/ Gloster/ Goldmedal/GM// Fortune Arrt/Anchor /Million	123.00	3,29,148.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1041	33.00	Supply, Installation, Testing and Commissioning of 24 ports Rack mounted 19", Cat 6 UTP,1.5-1.6 MM CRS chasis, powder coated Modular Patch Panels (upgradable to intelligent panels with use of sensor strips) with collapsible shutters on jacks to support latest amendments of TIA / EIA Cat 6 Specifications in Existing Communication Rack along with necessary connections of Cat 6 UTP Cables, With Rear Cable management trays and clamps. Makes: Systimax /Panduit/ Siemond/ Legrand	8,915.00	2,94,195.00
1042	1,626.00	Supply installation testing and commissioning of 6 fiber Outdoor, steel tape armoured Single mode [9/125um] glass Fiber Optic Cable as per latest amendments of TIA /EIA 568B.3 , GR 20 CORE/ UEC 794-1/ EN 187000 Standards in existing MSPVC Conduits/ hume pipe including making terminations to active passive equipment with ferruling at both ends for identification with necessary tools for Terminations and testing required. Makes: Systimax /Panduit/ Siemond/ Legrand.	74.00	1,20,324.00
1043	42.00	Supply, Installation and Testing and commissioning of indoor 1 pair Singlemode [9/125um] glass Fiber Optic Patch Cords of One mtr length as per latest ammendments of TIA/EIA 568B.3 and IEC 794 Standard Specifications including ST II / SC/FC/MT/PC connectors at both ends as per requirements.Makes: Systimax /Panduit/ Siemond/ Legrand.	2,034.00	85,428.00
1044	3.00	Supply, Installation Testing and commissioning of 8 Port LIU, 19 " Rack mounted/surface mounted aluminum / CRS powder coated multimode glass Fiber Optic Cable Patch panel/ LIU(upgradable to intelligent panels with use of sensor strips) along with cable tray/ fiber management system , adapters for ST II/ SC/FC/MT/PC/LC connections including making connections to active / passive equipment with ferruling at both ends for identification with necessary tools for Terminations and testing required. Makes: Systimax /Panduit/ Siemond/ Legrand.	8,333.00	24,999.00
1045	27.00	Supply, Installation Testing and commissioning of 12 Port LIU, 19 " Rack mounted/surface mounted aluminum / CRS powder coated multimode glass Fiber Optic Cable Patch panel/ LIU(upgradable to intelligent panels with use of sensor strips) along with cable tray/ fiber management system , adapters for ST II/ SC/FC/MT/PC/LC connections including making connections to active / passive equipment with ferruling at both ends for identification with necessary tools for Terminations and testing required. Makes: Systimax /Panduit/ Siemond/ Legrand.	10,908.00	2,94,516.00
1046	9,810.00	Supply and Fixing of 25mm dia (2-2.20) mm thick PVC pipe (ISI MARK) heavy grade concealed in wall with all required accessories such as junction boxes, conduit , bends, elbows and ceiling rose, including chiseling etc. including all labour charges complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. . Makes: Precision/Universal& Marudhar/VIP / GoldMedal / Million plast / GM / Sudhakar/Polycab/Anchor/ Polyline/ rbit/AKG/Beljin/Vasavi/DEC.	149.00	14,61,690.00
1047	3,075.00	Supply and Fixing of 20mm dia (1.9-2.1) mm thick P.V.C. pipe (ISI MARK) heavy grade concealed in wall with all required accessories such as junction boxes, conduit , bends, elbows and ceiling rose, including chiseling etc. including all labour charges complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make. . Makes: Precision/Universal& Marudhar/VIP / GoldMedal / Million plast / GM / Sudhakar/Polycab/Anchor/ Polyline/ rbit/AKG/Beljin/V	137.00	4,21,275.00
1048	765.00	Supply,Transportation and laying ofOuter dia 50mm and Inner dia 38mm double walled corrugated HDPE duct made as per specification BSEN - 500 86/IS 14930 Part-II. Makes:DURA LINE (Dura Guard)/Precision/CPE or any ISI approved make having ISI mark.	164.00	1,25,460.00
1049	3.00	"Supply, Installation, Testing and Commissioning of 9U Wall mounted Communication rack in one section with glass doors, swing handles, lock, Top and Bottom Cable entries, supports for mounting rack on wall, Cable managers, Fan tray with 2 x 230 Volt fans, Equipment mounting hardware, wire managers, power supply box for supplying power to hubs, fans etc., along with earth continuity kit, MCB, indicator, moulded power supply cable, Blank panels, sliding shelves etc.Makes: APW/HCL/Valrack/Netrack	11,156.00	33,468.00
1050	24.00	"Supply, Installation, Testing and Commissioning of 15U Wall mounted Communication rack in one section with glass doors, swing handles, lock, Top and Bottom Cable entries, supports for mounting rack on wall, Cable managers, Fan tray with 2 x 230 Volt fans, Equipment mounting hardware, wire managers, power supply box for supplying power to hubs, fans etc., along with earth continuity kit, MCB, indicator, moulded power supply cable, Blank panels, sliding shelves etc.Makes: APW/HCL/Valrack/Netrack	12,484.00	2,99,616.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1051	3.00	Supply, Installation, Testing and Commissioning of 42 U (44 mm) Floor Standing Rack 800WX1000D Floor mounted communication rack in on Section with glass doors, swing handles, lock on both doors, Top and Bottom Cable entries with gland plates, Castor with brakes , 7 no Cable managers, 1 no Fan tray with 2 x 230 Volt fans, Equipment mounting hardware, wire managers, power supply box for supplying power to hubs, fans etc., along with earth continuity kit, MCB, indicator, moulded power supply cable, Blank panels of 1u / 2 u, sliding shelves. Frame of communication rack should be made of heavy grade Aluminum profile PS grey painted and panels should be made from CRCA steel 18 SWG RS Beige painted. Makes: APW/HCL/Valrack/Netrack.	69,271.00	2,07,813.00
1052	813.00	Supply installation testing and commissioning of 1 Mtr/3 Ft 4 pair 23AWG Cat-6 UTP, flexible, double ended patch cords along with 2 nos of RJ 45 connectors with strain relief boots Compatible to T568A,T568Bspecifications including making connections to information outlets. Makes: Systimax /Panduit/ Siemond/ Legrand.	287.00	2,33,331.00
1053	3.00	Supply and installation of 4K UHD, 55? LED Display complete with following Specifications: a) Diagonal Size 55" b) Type Edge LED BLU. c) Resolution 3840*2160 (4K UHD) Pixel Pitch(mm)0.105 x 0.315. e) Active Display Area(mm)1209.6(H) x 680.4(V) f) Brightness (Typ.) 350 nit. g) Contrast Ratio 4000:1. h) AC Power supply-170-240V AC as per technical specifications and as directed by engineer in charge and as diretced by Engineer-In-Charge Makes: Samsung/LG/Sony/Panasonic	1,08,196.00	3,24,588.00
1054	18.00	Supply installation testing and commissioning of Screen Size (Inch),55";Panel, Technology,IPS ;Back Light Type,Direct;Aspect Ratio,16:9 Native Resolution:1,920 x 1,080 (FHD)/ 3840 x 2160 (4K); Refresh Rate,60Hz; Brightness,400-700nit (Typ.)Contrast Ratio:1,000/4000:1;Dynamic CR,500,000:1;Color Gamut, NTSC 72-92% Viewing Angle (H x V),178 X 178;Color Depth (Number of Colors),10bit(D), 1.07Billion colors Response Time,6-8ms (G to G);Surface Treatment (Haze),25-28%;Life time,60,000Hrs (Typ.)Operation Hours (Hours/Day),24/7 Portait / Landscape,Yes/Yes Input,HDMI 2 (HDCP 2.2), DP (HDCP 2.2), DVI-D (HDCP 1.4), Audio In, RS-232C In, RJ45 (LAN), IR In, USB 2.0 Type A Output,DP Out (Input : HDMI / DVI / DP), Audio Out, RS-232C Out, RJ45 (LAN), WIFI, Bluetooth compatibility, Bezel Width,B2B : 1.74mm (Panel Bezel to Panel Bezel), HW:Internal Memory 8 GB, Sensor (Temperature Sensor, BLU Sensor, Acceleration(Gyro) Sensor),SW, webOS 4.1, Embedded CMS (Local Contents Scheduling, Group Manager), USB Plug & Play, Fail Over, Background Image (No Signal Image), Sync Mode (RS-232C Sync, Local Network Sync), Video Tag (4), Play via URL, Rotation (Screen Rotation, External Input Rotation), Gapless Playback, Tile Mode Setting (Max. 15 × 15), Setting Data Cloning, SNMP, ISM Method, Auto Set ID, Status Mailing, Control Manager, 3rd Party Compatibility (Crestron Connected®2)), Power (Smart Energy Saving, PM Mode, Wake on LAN, Network Ready), HDMI-CEC3), SI Server Setting, webRTC, Pro:Idiom, W/B Setting by Grey Scale, Scan Inversion Operation Temperature,0 °C to 40 °C;Operation Humidity,10 % to 85 %;Power Supply,AC 100-240V~, 50/60Hz;Power Type,Built-In Power:Typ.,140-160W/Max.,190W BTU (British Thermal Unit),546 BTU/Hr(Typ.), 648 BTU/Hr(Max) Smart Enegy Saving (70%),90W;DPM,0.5W Power off,0.5W Safety,CB / NRTL EMC,FCC Class "B" / CE / KC; ERP / Energy Star,Yes / Energy Star 8.0 IP Rating,IP5X tested ;Conformal Coating (Power Board),Yes: Makes : LG, Samsung,Panasonic, Sony	1,23,750.00	22,27,500.00
1055	18.00	Supply installation testing and commissioning of Push Pull Brackets for fixing up of Video Wall diplay units with all requried accessories and supporting items as direccted by Engineer-In-Charge.	16,200.00	2,91,600.00
1056	3.00	Supplay Installation Testing and commissioning of HDMI Cable and Required Accessories for Video Wall display units for connection between controller / dipaly units of required length as required and as directed by Engineer-In-Charge for finished item of work.	63,000.00	1,89,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1057	3.00	Supply, Installation, Testing and commissioning of central Monitoring Software/VMS installed on the workstation (as mentioned in the specification) should have capability to connect to NVR anytime anywhere (local, remote, global P2P), Multi-NVR management, should support minimum 2000 video channel connections, should support two way audio through NVR with cameras wherever required, Should supports up to 64 live view windows in 1 single screen, should support receiving video analytic events from cameras NVR, should also support Dual monitors to display live view, tour, E-map or event views if required, should also have other features like event management and event trigger, PTZ Control, Fisheye Dewarping, E-Maps (Map Type : Picture). The software should have HTTPS and TLS 1.2 encryption streaming and communication between Cameras and NVRs,. Makes: Honeywell,Panasonic, Matrix, Bosch, PELCO, Axis	2,25,000.00	6,75,000.00
1058	6.00	Supply, Installation, Testing & Commissioning of Automatic Motorised Boom Barrier: Electromechanical Boom Barrier of 5-6 Mtr Boom Length, 3.5s to 4s Opening Closing / Time , IP54/IP 55 Protection etc, with required DC motors, loop sensors/cables/push buttons, 2 nos remote/1200 times per day, LED based suitable housing made with steel, support stand, control PCB etc all complete as required as per specification & inline with MHA Guidelines including all charges complete with Civil & Electrical works as requried and as directed by Engineer Incharge/ departmental authorities. Makes: Godrej/Neptune/Speedgatz/Magtech /Smartpower/Faac or its equivalent make as approved by the competent authority.	2,25,000.00	13,50,000.00
1059	2,660.00	Providing, laying, testing & Commissioning of 150 mm dia 'C' Class MS pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete.as per technical specifications and as directed by engineer in charge Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	3,887.00	1,03,39,420.00
1060	2,431.00	Providing, laying, testing & Commissioning of 100 mm dia 'C' Class MS pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete as per technical specifications and as directed by engineer in charge. Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	2,418.00	58,78,158.00
1061	1,009.00	Providing, laying, testing & Commissioning of 80 mm dia 'C' Class MS pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete as per technical specifications and as directed by engineer in charge.Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	1,605.00	16,19,445.00
1062	198.00	Providing, laying, testing & Commissioning of 65 mm dia 'C' Class MS pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete as per technical specifications and as directed by engineer in charge. Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	1,210.00	2,39,580.00
1063	165.00	Providing, laying, testing & Commissioning of 50 mm dia 'C' Class MS pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete as per technical specifications and as directed by engineer in charge. Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	968.00	1,59,720.00
1064	333.00	Providing, laying, testing & Commissioning of 40 mm dia 'C' Class MS pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete as per technical specifications and as directed by engineer in charge.Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	820.00	2,73,060.00
1065	36.00	Providing, laying, testing & Commissioning of 32 mm dia 'C' Class MS pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete as per technical specifications and as directed by engineer in charge.Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	648.00	23,328.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1066	892.00	Providing, laying, testing & Commissioning of 25 mm dia 'C' Class MS pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete as per technical specifications and as directed by engineer in charge. Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	484.00	4,31,728.00
1067	300.00	Providing, laying, testing & Commissioning of 150 mm dia 'C' Class GI pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete as per technical specifications and as directed by engineer in charge.Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	3,416.00	10,24,800.00
1068	450.00	Providing, laying, testing & Commissioning of 100 mm dia 'C' Class GI pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete as per technical specifications and as directed by engineer in charge .Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	2,258.00	10,16,100.00
1069	150.00	Providing, laying, testing & Commissioning of 80 mm dia 'C' Class GI pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete as per technical specifications and as directed by engineer in charge.Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	1,690.00	2,53,500.00
1070	40.00	Supplying, fixing, testing and commissioning of 150mm dia butterfly valve PN 1.6, with Bronze / Gun metal seat duly ISI marked complete with Nuts, Bolts, Washers, gaskets, conforming to IS 13095 of following sizes as required as per technical specifications and as directed by engineer in charge. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/ Zolotto / SANT/NEU-G/Honeywell//Kartar.	6,064.00	2,42,560.00
1071	3.00	Supplying, fixing, testing and commissioning of 100mm dia butterfly valve PN 1.6, with Bronze / Gun metal seat duly ISI marked complete with Nuts, Bolts, Washers, gaskets, conforming to IS 13095 of following sizes as required as per technical specifications and as directed by engineer in charge. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/ Zolotto / SANT/NEU-G/Honeywell//Kartar.	4,659.00	13,977.00
1072	24.00	Supplying, fixing, testing and commissioning of 80mm dia butterfly valve PN 1.6, with Bronze / Gun metal seat duly ISI marked complete with Nuts, Bolts, Washers, gaskets, conforming to IS 13095 of following sizes as required. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/ Zolotto / SANT/NEU-G/Honeywell//Kartar.	4,289.00	1,02,936.00
1073	24.00	Providing, installation, testing and commissioning of 150mm dia dual Plate non return valve of following sizes confirming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc as required as per technical specifications and as directed by engineer in charge. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/ Zolotto / SANT/NEU-G/Honeywell//Kartar.	9,762.00	2,34,288.00
1074	375.00	Supplying and fixing single headed Internal / External hydrant valve with instantaneous Gun metal couplings of 63mm dia with Cast iron wheel ISI marked conforming to IS 5290 (Type -A) with blank Gun Metal cap and chain as required as per technical specifications and as directed by engineer in charge. Single Headed Gun Metal only. Makes: Newage/ Winco/ Padmini / Safex/Minimax/ Newtech/Honeywell/Kartar.	10,797.00	40,48,875.00
1075	750.00	Supplying and fixing 63mm dia, 15 mtr long RRL hose pipe with 63mm dia Male and Female Gun metal / SS couplings duly binded with GI wire, rivets etc conforming to IS 636 (Type -A) as required as per technical specifications and as directed by engineer in charge. Gun Metal only. Makes: Newage/ Winco/ Padmini / Safex / Minimax/NewTech/Honeywell/Kartar.	8,328.00	62,46,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1076	276.00	Supplying and fixing First -Aid Hose Reel with MS construction spray painted in Post office Red, Conforming to Is 884 with upto date amendments, complete with the following as required. a) 36.6 Mtr Long 20mm (Nominal internal) dia water hose Thermoplastic / Textile reinforced / Rubber braided / Polypropylene Type - 2 as per IS:12585 b) 20mm (Nominal internal) dia gun metal globe valve and nozzle. c) Drum and brackets for fixing the equipments on wall. d) Connections from riser with 25mm dia stop valve (gun metal) & MS pipe. Makes: a) 36.6 Mtr Long 20mm (Nominal internal) dia water hose Thermoplastic / Textile reinforced / Rubber braided / Polypropylene Type - 2 as per IS:12585 Makes: Reliance/ Newage/ Safex / NewTech/ Winco/ Minimax/ Kartar. b) 20mm (Nominal internal) dia gun metal ball/gate valve and nozzle as per technical specifications and as directed by engineer in charge. Makes:Newage/SANT / Safex/Kartar.	9,910.00	27,35,160.00
1077	375.00	Supply and fixing 63mm dia Gun metal branch pipe with 20mm (Nominal internal diameter) size Gun metal / SS nozzle conforming to IS 903, suitable for instantaneous connection to interconnect hose pipe coupling as required. Gun metal only. Makes: Newage/ Winco/ Padmini / Safex / Minimax/NewTech/Kartar.	3,254.00	12,20,250.00
1078	331.00	Supply and fixing of Co2 type Fire Extinguishers 4.5 Kg capacity confirming to IS 2878 made from ISI marked steam less cylinder confirming to IS:7285 & CE certified and fitted with ISI marked controlled valve confirming to IS:3224, high pressure 1 Mtr discharge hose & horn complete with initial gas charged with carrying handle with wheels and wall mounting bracket. Squeeze lever discharge, used un-used indicator, Aphoxy coated paint (Red) with 93% gloss with 2 years warranty Including transportation, all taxes and all labour charges etc complete as per technical specifications and as directed by engineer in charge. Makes: Ceasefire/Minmax Safex / Kenex / Bharat / Reliance/NewTech/Kartar.	12,256.00	40,56,736.00
1079	387.00	Supply and fixing of ABC stored pressure squeeze grip type fire extinguishers, 9 kg capacity, IS:15683 : 2006, filled with ABC Mono Ammonium Phosphate base powder-90 complete with discharge hose and wall mounting bracket, 2mm Mild Steel, EPDM Rubbers, Pressure Gauge, which work effectively on all class of fires (A, B, C & Electrical fires) with 5 years warranty Including transportation, all taxes and all labour charges etc complete as per technical specifications and as directed by engineer in charge. Makes: Ceasefire/Minmax/Safex / Kenex / Bharat / Reliance/NewTech/Kartar.	8,153.00	31,55,211.00
1080	23.00	Supply, installation, testing and commissioning of 25/20 mm dia Air Release Valve as per technical specifications and as directed by engineer in charge. Makes: Zoloto / Leader / SANT/Kartar.	1,627.00	37,421.00
1081	46.00	Supply, installation, testing and commissioning of Dia. 25 mm Gun metal Ball valve for air release valve & pressure gague as per technical specifications and as directed by engineer in charge. Makes: Zoloto / Leader / SANT/Newage/Kartar.	858.00	39,468.00
1082	351.00	Supplying and fixing orifice plate made out of 6 mm thick stainless steel (Grade 304) with orifice of required size to be fitted between flange& landing valve of external and internal hydrants to reduce pressure at the outlet to the level of 3.5 kg/cm2 complete as required.Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/ Zolotto /SANT/NEUG/Honeywell/ Kartar.	1,234.00	4,33,134.00
1083	27.00	Supply and fixing 4 way fire brigade connection of cast iron body with 4 Nos Gun metal Male instantaneous inlet couplings complete with cap and chain as required for 150mm dia MS pipe connection, conforming to IS 904 as required. Makes: Newage/ Winco/ Padmini / Safex / Minimax/NewTech/Honeywell/Kartar.	11,832.00	3,19,464.00
1084	157.00	Supply and fixing of Escape signage boards in Rigid Photo luminescent based glow in Dark rigid sheet with high intensity luminous properties with specification. Makes: Cease Fire or its equivalent make Model-1ES01	1,725.00	2,70,825.00
1085	276.00	Supplying and installing of Fire hydrant & Hosereel - with symbol. Size 8" x 8" in position the following type of sign boards made out of 3mm thick "Opaque" PVC foam board with computer cut, PVC Non-reflective self adhesive vinyle painted foam board, complete with mirror fasteners.The intensity of glow in dark should last not less than 2 hours and the strongest glow shall be produced in the first 30 minutes as per technical specifications and as directed by engineer in charge	447.00	1,23,372.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1086	489.00	Supplying and installing of In case of fire pull down - with Manual call point symbol.Size 6" x 8" in position the following type of sign boards made out of 3mm thick "Opaque" PVC foam board with computer cut, PVC Non-reflective self adhesive vinyle painted foam board, complete with mirror fasteners.The intensity of glow in dark should last not less than 2 hours and the strongest glow shall be produced in the first 30 minutes	425.00	2,07,825.00
1087	406.00	Supplying and installing of Fire extinguisher - with symbol. Size 6" x 6" in position the following type of sign boards made out of 3mm thick "Opaque" PVC foam board with computer cut, PVC Non-reflective self adhesive vinyle painted foam board, complete with mirror fasteners.The intensity of glow in dark should last not less than 2 hours and the strongest glow shall be produced in the first 30 minutes	411.00	1,66,866.00
1088	249.00	Supplying and installing of In case of fire, Do not use Lift,Use Stair - with symbol. Size 8" x 8" in position the following type of sign boards made out of 3mm thick "Opaque" PVC foam board with computer cut, PVC Non-reflective self adhesive vinyle painted foam board, complete with mirror fasteners.The intensity of glow in dark should last not less than 2 hours and the strongest glow shall be produced in the first 30 minutes	447.00	1,11,303.00
1089	24.00	Supplying and installing of Main fire alarm panel.Size 6" x 8" in position the following type of sign boards made out of 3mm thick "Opaque" PVC foam board with computer cut, PVC Non-reflective self adhesive vinyle painted foam board, complete with mirror fasteners.The intensity of glow in dark should last not less than 2 hours and the strongest glow shall be produced in the first 30 minutes	432.00	10,368.00
1090	510.00	Supply and fixing of Egress route map 594x420 (A1 size sticker in foam board)	3,000.00	15,30,000.00
1091	228.00	Supply of round bottom G.I sheet bucket of 9 Ltrs. Capacity as per IS:2546 made out of 24-gauge GI sheet with extra handle at bottom duly painted inside and red outside with printed with FIRE Mark for stand and hook and filled with sand and arranged to existing stand or hook.	372.00	84,816.00
1092	57.00	Providing floor mounting stand for keeping 4 No of fire bucket 1500mm length, 900mm height made out of 40x40x6mm angle iron welded with 4 hooks and duly painted with one coat of red lead and two coats of enamel paint.	1,512.00	86,184.00
1093	111.00	Supply and fixing of Fire stop mortar shall be fire resistant, cement based mortar with thermal insulating properties, providing a minimum of 2 hours fire rating. It shall have good adhesion properties with base materials like concrete, masonry, metal pipes. It shall prevent passage of fire, smoke and water through fire rated wall and floor penetrations, cladding, etc. It shall be used as a permanent fire seal for Fire pipes. It shall be UL classified / FM approved.Makes: HM/Hilti/3M	9,500.00	10,54,500.00
1094	1,030.00	Providing fixing, testing and commissioning of 15mm size quartzoid bulb type sprinklers of rating 68º C pendent / side wall with required accessories. :Makes: HD / TYCO / VIKING / NEWAGE/ SHARP / SAFEX	633.00	6,51,990.00
1095	8.00	Providing and fixing Flow Switches in 150 mm dia MS pipe. Makes : System Sensor / Switzer /Honeywell	9,630.00	77,040.00
1096	2.00	Providing and fixing Flow Switches in 100 mm dia MS pipe. Makes : System Sensor / Switzer /Honeywell	6,899.00	13,798.00
1097	18.00	Providing and fixing Flow Switches in 80 mm dia MS pipe. Makes : System Sensor / Switzer /Honeywell	5,000.00	90,000.00
1098	39.00	Providing, fixing including testing and commissioning 100 mm dia pressure gauge of range 0 - 16 Kg / sqcm conforming to IS - 3624 having bourdon tube of stainless steel 310 in cast aluminium,stove enamelled, black, weather proof case with outer, screwed aluminium bezel and complete with necessary U-type stainless steel siphon tube and cock complete as required. Makes: Hguru/FEBIG	862.00	33,618.00
1099	3.00	Providing, fixing, testing & commissioning of installation control valve of cast iron body, brass/bronze working parts comprising of water motor alarm, bronze seat clapper, clapper arm and hydraulically driven mechanical gong bell to sound continuous alarm when the wet riser/sprinkler system activates, pressure gauges, emergency releases, strainer, pressure switch, cock valve complete with drain valve and bypass, test control box, ball valves, MS pipe of required size, flanges, orifice plate, gasket etc of following sizes as required : Makes: HD/Tyco/Newage	59,162.00	1,77,486.00
1100	18.00	Providing & fixing G.I. Puddle flange fabricated of 750mm long pipe pices to RCC water tank slab/wall. Entire fitting shall be hat dipped galvanised (flanges shall confirm to BS-10 table e) dia. 100mm, flanged end MS plate 6mm thick 200mmx200mm + dia of pipe.	11,446.00	2,06,028.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1101	1.00	Supply, installation, testing and commissioning of electrically driven horizontal, single outlet, centrifugal fire hydrant / sprinkler pump, suitable for automatic operation consisting of the following: a) Horizontal,end suction, centrifugal pump, suitable for operation on 415 volts ± 6%, 3 phase, 50 HZ A.C supply. The installation shall be complete with flexible coupling and coupling guard as required. Fire pump shall have C.I. casing, CS diffusers, bronze impeller (hard finished and dynamically balanced) and S.S. (304) Shaft with mechanical seal, capable for delivering 2280 LPM at outlet head of 120 mts. to ensure a minimum pressure of 3.5 Kg/Sqcm at the farthest or topmost hydrant / sprinkler. Pump shall be capable of furnishing not less than 150% of rated discharge at a head of not less than 65% of the rated head. The shut off head shall not exceed 120% of rated head. b) Squirrel cage induction motor, TEFC type suitable for operation on 415 volts, 3 phase 50 HZ A.C supply, for the above pump with synchronous speed of 2900 RPM, conforming to IP 55 protection & class F insulation. The motor shall conform to IS 325-1978 (up to date) with flexible coupling and coupling guard, complete as required.c) Suitable cement concrete foundation with plaster,complete with antivibration arrangement of cushy foot mountings.MS epoxy painted common base frame for pump complete as required.Flow : 2850LPM Head : 88mwc and as per technical specifications and as directed by engineer in charge	7,98,995.00	7,98,995.00
1102	2.00	Supplying, installation, Testing and commissioning ofdiesel engine driven main fire pump suitable for automatic operation and consisting of following: complete in all respect as required a) Horizontal type, multistage, centrifugal pump of cast iron body & bronze impeller with stainless steel shaft, mechanical seal to ensure a minimum pressure of 3.5 Kg / sq.cm. at highest and farthest outlet at specified flow of 2280 lpm at 120 Mtr head conforming to IS 1520 b) Suitable HP, 1500 RPM water cooled with radiator, diesel engine conforming to relevant BS & IS standard complete with auto starting mechanism, 12 Volts / 24 Volts electric starting equipment, Diesel Tank, exhaust pipe extended upto 1 m. outside pump house duly insulated with50mm thick glass wool with 1.0mm thick aluminum sheet cladding, residential silencer, instruments and protection as per specification, stop solenoid for auto stop in the event of fault with audio indications, painted with post office red colour etc as required. c) M.S. Fabricated common base plate, coupling, coupling guard, foundation bolts etc as required. d) Suitable cement concrete foundation duly plastered with anti-vibration pads.as per technical specifications and as directed by engineer in charge Makes of Engines : Kirloskar / Cummins. Makes of Pumps : Kirloskar / Mather&Platt.	10,34,413.00	20,68,826.00
1103	1.00	Supply, installation, testing and commissioning of jockey pump (pressurisation pump) comprising of the following:a) Vertical centrifugal pump, suitable for operation on 415 volts ± 6%, 3 phase, 50 HZ A.C supply. The installation shall be complete with Flexible coupling and coupling guard, complete as required.The pump casing shall be CI, shaft shall be SS & impeller / shaft sleeve / casing wearing ring shall be bronze.The pump shall be provided with mechanical seal .b) Squirrel cage induction motor TEFC type for operation on 415 V, 3 phase 50 HZ AC supply for the above pump with a synchronous speed of 2900 R.P.M. with flexible coupling and coupling guard etc. as required. Flow : 180 LPM Head : 120mts and as per technical specifications and as directed by engineer in charge	1,56,945.00	1,56,945.00
1104	39.00	Providing, laying, testing & Commissioning of 250 mm dia 'C' Class MS pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete.Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	5,873.00	2,29,047.00
1105	54.00	Providing, laying, testing & Commissioning of 200 mm dia 'C' Class MS pipes conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets including transportaiton and painting with two coats of red oxide paint and one coat of post office red enamel paint and all labour charges and cost of all accessories etc., complete. Makes: Jindal / Hissar / Tata pipes/Prakash Surya.	5,094.00	2,75,076.00
1106	6.00	Providing and fixing 250 mm dia C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertions etc. (the tail pieces if required will be paid separately) : Class II (pn 1.6) for finished item of work and as directed by Engineer-In-Charge. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/Zolotto / SANT/NEWAGE	70,850.00	4,25,100.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1107	9.00	Providing and fixing 200 mm dia C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertions etc. (the tail pieces if required will be paid separately) : Class II (pn 1.6) for finished item of work and as directed by Engineer-In-Charge. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/Zolotto / SANT/NEWAGE	49,985.00	4,49,865.00
1108	9.00	Providing and fixing 150 mm dia C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertions etc. (the tail pieces if required will be paid separately) : Class II (pn 1.6) for finished item of work and as directed by Engineer-In-Charge. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/Zolotto / SANT/NEWAGE	35,945.00	3,23,505.00
1109	9.00	Providing and fixing 100 mm dia C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertions etc. (the tail pieces if required will be paid separately) : Class II (pn 1.6) for finished item of work and as directed by Engineer-In-Charge. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/Zolotto / SANT/NEWAGE	26,650.00	2,39,850.00
1110	3.00	Providing and fixing 65 mm dia C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertions etc. (the tail pieces if required will be paid separately) : Class II (pn 1.6) for finished item of work and as directed by Engineer-In-Charge. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/Zolotto / SANT/NEWAGE	17,550.00	52,650.00
1111	3.00	Providing, installation, testing and commissioning of 200 mm dia dual Plate non - return valve of following sizes confirming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc as required as per technical specifications and as directed by engineer in charge Makes: BDK / NEU-G / Leader/ Zolotto / SANT	13,608.00	40,824.00
1112	9.00	Providing, installation, testing and commissioning of 150 mm dia dual Plate non - return valve of following sizes confirming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc as required.as per technical specifications and as directed by engineer in charge Makes: BDK / NEU-G / Leader/ Zolotto / SANT	9,762.00	87,858.00
1113	3.00	Providing, installation, testing and commissioning of 100 mm dia dual Plate non - return valve of following sizes confirming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc as required. as per technical specifications and as directed by engineer in chargeMakes: BDK / NEU-G / Leader/ Zolotto / SANT	5,176.00	15,528.00
1114	3.00	Providing, installation, testing and commissioning of 65 mm dia dual Plate non - return valve of following sizes confirming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc as required. Makes: BDK / NEU-G / Leader/ Zolotto / SANT	4,661.00	13,983.00
1115	9.00	Providing and fixing of 200 mm dia Expansion Bellow of durable high tensile nylon/polyester cord body, high tensile nylon flanges with positive sealing, NEOPRENE rubber outer Cover & with Leakproof Abrasion resistant seamless lining of Rubber, Metal Retaining Rings embedded in body, including all necessary accessories like nuts, bolts etc. all complete of approved make as directed by the Engineer in charge	5,200.00	46,800.00
1116	9.00	Providing and fixing of 150 mm dia Expansion Bellow of durable high tensile nylon/polyester cord body, high tensile nylon flanges with positive sealing, NEOPRENE rubber outer Cover & with Leakproof Abrasion resistant seamless lining of Rubber, Metal Retaining Rings embedded in body, including all necessary accessories like nuts, bolts etc. all complete of approved make as directed by the Engineer in charge	3,800.00	34,200.00
1117	3.00	Providing and fixing of 100 mm dia Expansion Bellow of durable high tensile nylon/polyester cord body, high tensile nylon flanges with positive sealing, NEOPRENE rubber outer Cover & with Leakproof Abrasion resistant seamless lining of Rubber, Metal Retaining Rings embedded in body, including all necessary accessories like nuts, bolts etc. all complete of approved make as directed by the Engineer in charge	3,000.00	9,000.00
1118	3.00	Providing and fixing of 65 mm dia Expansion Bellow of durable high tensile nylon/polyester cord body, high tensile nylon flanges with positive sealing, NEOPRENE rubber outer Cover & with Leakproof Abrasion resistant seamless lining of Rubber, Metal Retaining Rings embedded in body, including all necessary accessories like nuts, bolts etc. all complete of approved make as directed by the Engineer in	1,800.00	5,400.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1119	6.00	Supply and fixing 2 way fire brigade connection of cast iron body with 2 Nos Gun metal Male instantaneous inlet couplings complete with cap and chain as required for 100mm dia MS pipe connection, conforming to IS 904 as required. Makes: Newage/ Winco/ Padmini / Safex / Minimax/NewTech	8,874.00	53,244.00
1120	12.00	Providing, fixing ,testing and commissioning of Pressure switches in 150 MM DIA pipe line including connection etc as required. Makes: Makes: Danfoss / Indfoss /Systemsensor/Honeywell	3,235.00	38,820.00
1121	9.00	Supply, installation, testing and commissioning of 200mm dia stainless steel Y? strainer fabricated out of 1.6 mm thick SS 304 confirming to IS specifications complete with rubber gasket, GI bolts , nuts, washers etc as required.	25,144.00	2,26,296.00
1122	3.00	Supply, installation, testing and commissioning of 100mm dia stainless steel Y? strainer fabricated out of 1.6 mm thick SS 304 confirming to IS specifications complete with rubber gasket, GI bolts , nuts, washers etc as required.	6,360.00	19,080.00
1123	6.00	Providing and fixing of gun metal fire Brigade suction Hose coupling (Draw-out Connection) with nut for female coupling as per IS:902- 1974 complete with 100 mm dia. G.I. Suction pipe and 100 mm dia. 1No C.I. Foot valve flanged (to be connected to static water tank).Makes: As per list of recommended brands. Makes: Newage/ Winco/ Padmini / Safex / Minimax/NewTech/Honeywell/ Kartar.	8,923.00	53,538.00
1124	3.00	Designing, Supply, Transportation, Installation, Testing and commissioning of system controller to control operation of main electric fire pump, diesel pump, Pressurization pump, Terrace pump in sequence as per specification consisting of relays, timers. Sensors, annunciation window for fault indication, complete as per specification INCOMING : 630A, 50kA 4 Pole MCCB, Ics=100% Icu Rating Digital Voltmeter 0-500V with selector switch Digital Voltmeter 0-500V with selector switch LED type RYB phase indicating lamps, ON, OFF, trip indicating lamps Set of Copper Bus Bar 800Amps OUT GOING : (Note : All outgoing feeders for pumps should have digital Ammeter with selector switches, and LED type ON, OFF, trip indicating lamps) A) MAIN FIRE PUMP: 200 Amp, 50kA TPN MCCB, Ics=100% Icu, with fully automatic Star/Delta starter suitable for 75-100 HP pump with overload protection, current sensing type single phase preventor complete with all acceessories and internal wiring required for automatic operation, selector switch for local/remote, auto/manual/OFF operation. - 2 sets B) JOCKEY PUMP 100 Amp, 50kA TPN MCCB, Ics=100% Icu, with Suitable HP fully automatic Star/Delta starter with overload protection, current sensing type single phase preventor complete with all acceessories and internal wiring required for automatic operation, selector switch for local/remote, auto/manual/OFF operation. - 2 sets C) DIESEL ENGINE CONTROL Control for diesel engine comprising - Automatic/Manual selctor switch & 3 attempts starting device, timers and relays as required, push buttons, start/stop in manual mode Indicating lamp for high/ Low Lub. Oil pressure, High Water Temp and Engine on indication Battery charger suitbale for 12V/24 V DC with boost and trickle selector switch, 0-30 V DC volt meter, and 0-20 A DC Ammeter All standard relays and accessories for automatic operation of diesel engine System Controller. Makes: L&T- D shine / Schneider-NS NSX/Legrand DP X3/ Siemens-3VL / Hager-h3/C&S -Winbreak2 Makes of Meters : Schneider (Conzerve) / L&T / Elmeasure / Siemens.	5,52,638.00	16,57,914.00
1125	65.00	Supply, laying and dressing of 3.5Core 120 Sq.mm 1100 volt grade FRLS XLPE insulated PVC sheathed Aluminium conductor armoured XLPE/PVC cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning. Make: Torrent / Universal / Havells / KEI /Polycab/RR Kabel.	1,008.00	65,520.00
1126	653.00	Supply, laying and dressing of 3.5Core 95 Sq.mm 1100 volt grade FRLS XLPE insulated PVC sheathed Aluminium conductor armoured XLPE/PVC cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning. Make: Torrent / Universal / Havells / KEI /Polycab/RR Kabel.	820.00	5,35,460.00
1127	235.00	Supply, laying and dressing of 3.5Core 35 Sq.mm 1100 volt grade FRLS XLPE insulated PVC sheathed Aluminium conductor armoured XLPE/PVC cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning. Make: Torrent / Universal / Havells / KEI /Polycab/RR Kabel.	377.00	88,595.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1128	45.00	Supply, laying and dressing of 3 Core 6 Sq.mm 1100 volt grade FRLS XLPE insulated PVC sheathed Copper conductor armoured XLPE/PVC cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning. Make: Torrent / Universal / Havells / KEI /Polycab/RR Kabel.	340.00	15,300.00
1129	30.00	Supply, laying and dressing of 6 Core 1.5 Sq.mm 1100 volt grade FRLS XLPE insulated PVC sheathed Copper conductor unarmoured XLPE/PVC cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning. Make: Torrent / Universal / Havells / KEI /Polycab/RR Kabel.	222.00	6,660.00
1130	45.00	Supply, laying and dressing of 4 Core 1.5 Sq.mm 1100 volt grade FRLS XLPE insulated PVC sheathed Copper conductor unarmoured XLPE/PVC cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning. Make: Torrent / Universal / Havells / KEI /Polycab/RR Kabel.	194.00	8,730.00
1131	50.00	Supply, laying and dressing of 2 Core 2.5 Sq.mm 1100 volt grade FRLS XLPE insulated PVC sheathed Copper conductor unarmoured XLPE/PVC cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning. Make: Torrent / Universal / Havells / KEI /Polycab/RR Kabel.	178.00	8,900.00
1132	35.00	Providing and fixing 6 SWG dia GI wire on surface or in recess for loop earthing along with existing cable complete as required.	18.00	630.00
1133	3.00	Providing and fixing double flanged vertical air vessel fabricated from 10mm M.S. plate with dished ends from 10mm M.S. plate, outside with one coat of primer and two coats of synthetic enamel paint of approved shade, complete with approved quality of pressure switches, pressure gauges and all other required accessories to operate commonly main fire pump, sprinkler pump, Diesel Fire pumps and Jockey pumps at drop of pressure automatically at required pressure setting complete as required and as specified . Recommended dia. : 450mm Height of shell : 2000mm Working pressure :18 Kg/Sq.cm Test Pressure : 36 Kg/Sq.cm	22,122.00	66,366.00
1134	35.00	Supply,transporatation & installation of 150mm x 50mm x 1.6mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/BEC/Reco Steel/NSK/Patny/Akshara made up with raw material like Tata/Jindal/JSW	492.00	17,220.00
1135	35.00	Supply,transporatation & installation of 300mm x 62.5mm x 2.0mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees,cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete. Make: Profab/Inidana/legrand/BEC/Reco Steel/NSK/Patny/Akshara made up with raw material like Tata/Jindal/JSW	1,088.00	38,080.00
1136	45.00	Providing and fixing 25 mm x 6 mm G.I strip in 40 mm dia Nominal bore heavy grade GI Pipe of 2.5 Mtrs long connected enclosed in C.C.ring of 450mm dia with R.C.C. Slab cover duly providing staggered holes filling with salt and charcoal from the bottom of the pipe giving earth connection from electrode through G.I strip of 25 x 6mm x 200mm length with all accessories and labour charges complete, as per IS specifications 732/1982 (Part II) with earth electrode including connection with G.I,nut, bolt, spring, washer excavation and re - filling etc. as required	5,898.00	2,65,410.00
1137	70.00	Providing and fixing 25 mm x 6 mm G.I.Strip in on surface or in recess for loop earthing complete etc. as required.	110.00	7,700.00
1138	650.00	Providing & fixing M.S. structural work fabricated from standard section e.g. M.S rounds, angles, channels, plates including cutting to size,drilling,welding fixing and welding to insert plates in RCC structural members as directed by engineer-in-charge including cutting and making good the walls, ceilings and floors (for all fabricated pipe supports as instructed / approved by the Engineer-In-Charge.)	93.00	60,450.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1139	153.00	Supplying and fixing of hose cabinet of size 750mm X600mm x 250mm made of No 16 gauge SWG CRCA sheet with 6mm thick glazed glass door including necessary locking arrangement suitable to accommodate 2 Nos 15 mtr long Hose pipe, 1 No branch pipe, mounted on wall OR raised brick platform and duly painted with Post office red externally and white internally with synthetic enamel paint complete in all respect, for external hydrant as required.Makes:Minimax/Safex/Newage/Winco/Padmini/NewTech/Kartar.	4,289.00	6,56,217.00
1140	597.00	Supplying and wrapping the anticorrosive material for buried pipes with coating of Primer and wrapping with 4 mm thick polymer corrosion resistant tape as per IS : 10221 with 15 mm overlap as per specificatios for 150 mm dia pipe for finished item of work and as directed by Engineer-In-ChargeMakes: IWL(PIPE KOT) or its equivalent	444.00	2,65,068.00
1141	250.00	Supplying and wrapping the anticorrosive material for buried pipes with coating of Primer and wrapping with 4 mm thick polymer corrosion resistant tape as per IS : 10221 with 15 mm overlap as per specificatios for 100 mm dia pipe for finished item of work and as directed by Engineer-In-ChargeMakes: IWL(PIPE KOT) or its equivalent	400.00	1,00,000.00
1142	100.00	Supplying and wrapping the anticorrosive material for buried pipes with coating of Primer and wrapping with 4 mm thick polymer corrosion resistant tape as per IS : 10221 with 15 mm overlap as per specificatios for 80 mm dia pipe for finished item of work and as directed by Engineer-In-ChargeMakes: IWL(PIPE KOT) or its equivalent	341.00	34,100.00
1143	300.00	Supplying, installing, testing and commissioning of 300mm dia R.C.C NP2 class Hume pipe laid to the required level and grade with collars joining in CM 1:3 and filling the excavated trench with approved quality quarry dust on sides, bottom and top surface of pipe with all leads and lifts, making necessary connections as required etc.,complete.	839.00	2,51,700.00
1144	3.00	Supply instalation of 50 ltr. Trolly mounted Mechanical foam type fire extinguisher with required accesaries as per IS-10204. Makes: Ceasefire/Minmax/Safex / Kenex / Bharat / Reliance/NewTech/Kartar	55,250.00	1,65,750.00
1145	17.00	Supply instalation of 9 ltr. Mechanical foam type fire extinguisher with required accesaries as per IS-10204. Makes: Ceasefire/Minmax/Safex / Kenex / Bharat / Reliance/NewTech/Kartar	3,510.00	59,670.00
1146	18.00	Providing and fixing addressable monitor module with existing flow to monitor the water flow in sprinkler system , operating on looped power and install as per site requirement complete as required and as specified omplete as per specifications and as required. Makes: Notifier / Edwards/Bosch only	4,915.00	88,470.00
1147	60.00	Supply and fixing G.I. 4 nos. Fire buckets 9 litre capacity filled with dry sand and fixed on wall hook made out of canopy type 13mm dia MS structure for 4 nos. bucket. conforming IS : 2546 - 1974 complete etc. as directed by Engineer In Charge and as per technical speicifications and of approved make.	2,998.00	1,79,880.00
1148	7,000.00	Supply, laying ,testing and commissioning of 4-pair, Cat6 Solid 6 UTP cable (Third party ETL Intertek tested up to 700 MHZ) to support 1Gbps with Cross (+) filler pair separator & PVC sheath 23 AWG, STP/UTP Cable , Meets or exceeds ANSI/TIA-568-C.2 and UL Listed &RoHS Compliant in the existing raceways /PVC conduits including making connections to information outlets and patch panels with ferruling at both ends for identification with necessary tools for punching stripping crimping and testing required etc., complete. Makes: Systimax /Panduit/ Siemond/ Legrand.	51.00	3,57,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1149	21.00	Supply, install, test and commissioning of addressable peer to peer Networkable analogue addressable type 2 Loop fire alarm control panel with minimum 1500 Character / 240X64 Pixel / 7inch Touchscreen graphic LCD display. The panel should be equipped with sufficient numbers of loop with 20% spare capacity, with each networkable intelligent fire alarm Control Panel having SLC with capacity of min 250 detectors/ devices in any combination (Min 120 Detector) with key pad, dual flash-based microprocessor technology, inbuilt USB Port for upload and down load the configuration tools, RS232 serial port for direct PC or modem connection, inbuilt NAC's, min 20 programmable Zonal LEDs and operates on 240V AC + 10% with 50 Hz with built in charger. The panel shall have fire, fault relays, option of BMS integration MODBUS/ BACKNET, graphical software for provision of TCP/ IP modules, Remote Access, Class 'X' wiring with provision of both class 'A' and class 'B' wiring in the SLC circuit, user friendly with communication facility to monitor & control the FACPs from a single window. The panel shall be suitable for minimum of 5000 event record facility, event fetch from FACP facility and the single panel shall be suitable for min 2000 fire zones and 200 Panels/ Nodes in one network with all other accessories required to successfully run the system. The panel shall be completed as per UL and FM/EN54 & VDS standards (The System cost shall be included of all necessary cards, modules, Panel enclosure, CPU and associated accessories to complete the system design). Makes: Notifier /Edwards/Bosch only	2,87,446.00	60,36,366.00
1150	21.00	Supply, Installation, Testing & Commissioning of Network Active Repeater Panel with 1500 Character / 240X64 Pixel / 7inch Touchscreen. The LCD shall Display all events / detectors, devices status of complete systems in the networked. Makes: Notifier /Edwards/Bosch only	1,50,909.00	31,69,089.00
1151	332.00	Supply, Installation, Testing & Commissioning of Analogue Addressable loop powered Sounder & Beacon with inbuilt isolator and having Min 15 distinct sound patterns/ multitone to indicate Exit doors and direct occupants for safe and fast evacuation and 100dB output with minimum 1Hz Frequency flash rate designed for IP65 requirements and approved to operate in ?10°C to +55°C temperature, complies with the essential requirement of the EMC Directive to be supplied with Junction Box, Glands and other mounting accessories for proper installation. Makes: Notifier /Edwards/Bosch only	6,611.00	21,94,852.00
1152	332.00	Supply, Installation, Testing & Commissioning of Dust and Vermin proof (Resettable) addressable analogue Manual call boxes along with Isolators inbuilt having front reset mechanism with 170° viewable LED and can be viewed from the distance of 7 M. also have inbuilt isolator having operating temperature from -40°C-70°C to initiate audio visual alarm in case of Human detection of fire. The manual call point must be indoor type with IP 44 rating. The call point must be resettable type without break glass.Makes: Notifier /Edwards/Bosch only	6,468.00	21,47,376.00
1153	132.00	Supply, Installation, Testing & Commissioning of Analogue Addressable Multi-sensor (Smoke & Heat) detector with LED with standard base having capacity of min 126 address combination. Operating temperature -40°C to 70°C & Humidity 0-95%. The detector should have polling 360-degree viewable LED with 5 class approved response modes all approved with the relevant standards, drift compensation and transient rejection. The detector should trigger heat alarm as per the A1R class requirement. The detector shall have facility to mount in different comprehensive environment like Hostile environment, Parking Garage, Precious storage, Ware house and normal working environments. The detector should have a self-locking mechanism and requires a special tool to remove this detector. The detector should have a hard address inside the base. The detector should be made of fire-retardant material & should be melt above 100-degree C. The detectors must be open for the cleaning of dust whenever required. The detector must have 4 nonvolatile memories to write the installation date & site codes. Makes: Notifier /Edwards/Bosch only	5,131.00	6,77,292.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1154	592.00	Supply, install, test and commissioning of Optical smoke detector with LED with standard base having capacity of min 126 address combination Operating temperature -40°C to 70°C &Humidity 0 95%. The detector should have polling 360-degree viewable LED with 5 class approved response modes all approved with the relevant standards, drift compensation and transient rejection. The detector shall have facility to mount in differen comprehensive environment like Hostile environment, precious storage, Warehouse and normal working environments. The detector should have a self-locking mechanism and requires a special tool to remove this detector. The detector should have a hard address inside the base. The detector must have nonvolatile memory to write the installation date & site codes. The detector should be made of fire-retardant material & should be mel above 100-degree C. The detectors must be openable for the cleaning of dust whenever required All the other specs should be as per the specification attached. Makes: Notifier /Edwards/Bosch only	4,642.00	27,48,064.00
1155	38.00	Supply, install, test and commissioning of Analogue Addressable Heat detector and LED with standard base having capacity of min 126 address combination. Storage temperature -40°C to 80°C & Humidity 0-95%. The detector shall have facility to mount in different comprehensive environment like Hostile environment, Precious storage, Ware house and normal working environments. The heat detector must trigger the alarm as per the A1R/A2R/A2S/CR/CS requirement. The detector should have self-locking mechanism and requires special tool to remove this detector. The detector must have nonvolatile memory to write the installation date & site codes. Makes: Notifier /Edwards/Bosch only	5,009.00	1,90,342.00
1156	398.00	Supply, install, test and commissioning of Analogue addressable Control (Input/Output) module with inbuilt relay and isolator with LED indicator, approved to operate in ?10°C to +55°C temperature, complies with the essential requirement of the EMC Directive to be supplied with Junction Box and other mounting accessories for proper installation. In case of Manufacturer with single Input or Output module need to supply One quantity of each for line item.Makes: Notifier /Edwards/Bosch only	5,433.00	21,62,334.00
1157	120.00	Supply and Installation of Intalligent analogue addressable monitor modules including the cost of mounting accessories complete as per specifications and as required.Makes: Notifier /Edwards/Bosch only	4,915.00	5,89,800.00
1158	96.00	Supply, Installation, Testing & Commissioning of Loop isolation module which consists of LED. This LED shall be mounted with in a round polycarbonate encloser. Isolator Base for Isolators. Makes: Notifier /Edwards/Bosch only	4,915.00	4,71,840.00
1159	21.00	Supply installation Testing and commissioning of 3.0 KVA, 72/96VDC on line UPS system confirms to IS 16242(Part-I):2014 and IEC 60240-1: 2008 with IGBT technology pure sine wave output, double conversion with auto and manual static by pass switch single phase input / Single phase output. Makes: Numeric/APC/Fuji Electric/ Sakshham /Emerson.	48,625.00	10,21,125.00
1160	21.00	Supply and providing of battery rack for 5 to 10 batteries (42 AH)	3,749.00	78,729.00
1161	168.00	Supply and fixing of 12V 42 AH SMF battery with 3 years warranty including wire leads, connections etc complete. Makes: Quanta / Racket / Exide.	7,124.00	11,96,832.00
1162	432.00	Supply, installation, testing & commissioning of ONT box (300 x 300 x 75 mm) made out of 1.6 mm thick MS powder coated recessed in wall to house. ONT device supplyed by others.	930.00	4,01,760.00
1163	21.00	Supplying, installing,testing and commissioning solid state Amplifier of 500 W RMS out put in rack, including necessory control wires,jacks etc. Talk Back Panel : Talk back system :A suitable zone selector P.A. console and with CRCA sheet housing and control desk(rack) shall be provided for talk back system. Console shall have all call / call back facility complete with battery backup of same duration as of fire alarm system and it should also work on AC single phase Power min. 16 Loop/zone Makes: Notifier / Edwards/Bosch/Agni/	42,435.00	8,91,135.00
1164	332.00	Supplying, installation, testing & commissioning talk back slave station in surface/recess suitable for operation on simplex mode complete with P.T.T. knob & speaker/microphone enclosed in a M.S.(16 SWG)/ ABS box with break glass in front etc. complete as required Talk back unit : (The box of talnk back speaker in staircase shall be of MS duly powder coated in red color with mounting of 6W wall mounted speaker with push to talk facility of approx. size of suitable size of approved make and material with all accessories as required to complete the job, with internal wiring, cable glands etc as required. Solid state Amplifier of suitable wattage shall be provided, RMS out put in rack, including necessary control wires, jacks etc) Makes: Notifier / Edwards/Bosch/Agni/	3,810.00	12,64,920.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1165	332.00	Supply, installation, testing and commissioning of recess/surface mounting Talk Back Jacks with stainless steel face plates for connections of Fireman's handsets including the cost of supplying all mounting accessories and complete as per specifications and as required Makes: Notifier / Edwards/Bosch	4,330.00	14,37,560.00
1166	332.00	Supply installation testing and commissioning of two way Talk Back handsets to initiate audio interface complete etc with required accessories etc as required for finished item of work as directed by Engineer in charge. Makes: Notifier / Edwards/Bosch/Agni/	5,480.00	18,19,360.00
1167	4,980.00	Supply, Laying, Termination of ISI Certified 4C x 1.5 sqmm (for Signal & Field devices, Third Party Integration etc....) ATSC, FRLS PVC insulated, Farmored, Tinned Copper, twisted, shielded, PE insulated, Cable with proper ferrules, lugs, and other necessary accessories. The spec shall meet the system manufacturer specifications including all charges complete etc., as directed by Engineer in Charge/ departmental authorities. Makes: Finolex/RR kabel/ Havells/ KEI/ Polycab/ Gloster/V-Guard/HPL/GM/ Million/Goldmedal/Anchor.	107.00	5,32,860.00
1168	1,401.00	Supply, laying and dressing of 4 Core 1.5 Sq.mm 1100 volt grade XLPE insulated PVC sheathed FRLS Copper conductor unarmoured XLPE/PVC cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning for fire alarm system. Make: Torrent / Universal / Havells / KEI /Polycab/RR Kabel.	194.00	2,71,794.00
1169	7,000.00	Supply, laying and dressing of 2 Core 1.5 Sq.mm 1100 volt grade XLPE insulated PVC sheathed FRLS Copper conductor armoured XLPE/PVC cables as per specification in cable trays, shafts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning for fire alarm system. Make: Torrent / Universal / Havells / KEI /Polycab/RR Kabel.	169.00	11,83,000.00
1170	242.00	Supply & Installation, Testing and commissioning of trolley mounted, electrically operated triplex plunger pumps with 2-H.P, 1-Phase 1450 rpm, 1-phase motor with high pressure triplex pump of 5-0 kg/cmv with nylon hydraulic hose pipe of 3/4" dia, 5mt height for suction and 3/8" dia 30mt length for delivery with all required nozzles has values, high pressure gun, fittings etc with come of 3-core,2.5 Sq mm flexible copper cable with 3-pin 16A top and all required accessories and labour charges for erection, testing including transportation etc complete, Make of motor: crompton, kiroken, texmo,suguna with ISI mark, Pump: Green tech, Kisan, Ultrajet, Pressurejet, Ambica tools, searaa or any ISI	47,292.00	1,14,44,664.00
1171	242.00	Supplying & fixing of 230V, 20-25A Industrial Plug and Socket with 1 No of 20A DP MCB 10KA C/D Curve ISI Mark for control in SS enclosure as per IS 8623; IS 13032; IEC 61439-3 on surface or in recess, and complete with connections, testing and commissioning etc. as required and as directed by Engineer in Charge. Enclosure Makes: Legrand(Ekinox 3) / Schneider-A9/Hager - Novello+/ Seimens/Crabtree Xpro classique-II/L&TNewrange/ Indo Asian-Opti Pro/ HPL (Techno) MCB Makes: Legrand-DX3 / Schneider-A9/Hager-h3/ Siemens-5SX4/ Havells STADx /L&T-AU/Indo Asian-Opti pro/ HPL (Techno)	1,775.00	4,29,550.00
1172	1,450.00	Supply and Fixing of 25mm dia 16 SWG (ISI Mark) MS Surface conduit pipe duly threading at Joints with all required accessories fixing on Separators with chromium plated base saddles and No.18 SWG MS box for light, fan and separate plug points including cost of Cement, all materials, accessories and all labour charges etc., complete as per detailed technical specifications and approved make. Makes: NAI / Bharath / GB / AKG/Precision etc.	318.00	4,61,100.00
1173	9.00	Supply, installation in position, testing and commissioning of semi automative Organic Waste Converter with inbuilt shredder, comprising composting machine in SS 304 grade,inbuilt Heater,Exhaust inclusive of all accessories as complete as required. Total organic waste generate per day : 1500 kg/day Volume reduction:80-90% Heater System- -Electrical Heater, Processing Time -24 Hrs.	19,00,000.00	1,71,00,000.00
1174	36.00	Providing and fixing Wheeled Bins with lids of below material and capacity for solid waste collection within building.HDPE: Capacity: 240 L capacity	5,100.00	1,83,600.00
1175	432.00	Supply & Installation - Centralized Segregated Garbage Collection System---TThroat Piece - Manufactured from SS 304 sheet, rolled and seam welded for watertight joints. TIG welded throat, supported by hot dip galvanised structural steel brackets 40 X 40 X 5mm, and anchor connected to an available RCC structure.	21,650.00	93,52,800.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1176	432.00	Supply & Installation - Centralized Segregated Garbage Collection System---Intake Hopper ? Interlocking - 12X15 Auto closing Bottom pivoted, Top opening, Self Latching, 90 Min Fire rated as per UL (Underwriter's Laboratories, USA, UL 10B Labeled)with Interlocking arrangement for 'One User' at a time. The controllers for Interlocking system is certified by UL- Frame 2mm thick & double skin shutter 1.5mm thick with Rockwool as Infill.)-Intake on 1st to 12th floor	22,963.00	99,20,016.00
1177	756.00	Supply & Installation - Centralized Segregated Garbage Collection System---Intermediate Pieces (In Mtrs.) - All Chutes are manufactured to suit building floor heights & the site conditions to fill the gap between two consecutive intake door pieces. MOC and dia shall remain same as that of total garbage chute system.	10,427.00	78,82,812.00
1178	36.00	Supply & Installation - Centralized Segregated Garbage Collection System---Discharge piece	12,888.00	4,63,968.00
1179	36.00	Supply & Installation - Centralized Segregated Garbage Collection System-Offset Piece - Similar to the Intermediate Piece, but installed as the chute's lowermost section.Designed to meet offset requirements, it is 3mm thick and includes an additional stiffner pad for point load impact. As a result, trolleys are less likely to crack & enhance the life	36,350.00	13,08,600.00
1180	36.00	Supply & Installation - Centralized Segregated Garbage Collection System Discharge end Fire rated Door - Fire Rated Rolling type door is held in place at the top of the slope by a UL-listed fusible connection. In the event of a fire, the temperature exceeds 74 degrees Celsius ,the fusible link fuses and the door within the housing on the slider will block off the heat flow up in the chute.	28,231.00	10,16,316.00
1181	36.00	Supply & Installation - Centralized Segregated Garbage Collection System---Sanitation Unit - Provide a disinfecting and sanitising unit for installation in line with the flushing spray head, including a 35L capacity disinfectant PVC tank, allied piping, ventilation, galvanised sheet enclosure and electric connectors.	30,441.00	10,95,876.00
1182	36.00	Supply & Installation - Centralized Segregated Garbage Collection System---Exhaust Piece with 300mm Vent - We considered a reduced diameter of 300mm vent going above the roof level 1.2 metres with the same MOC as the chute	28,830.00	10,37,880.00
1183	36.00	Supply & Installation - Centralized Segregated Garbage Collection System---Interlocking Control Panel - Designed as per UL stdandard, with digital display, required buttons & indicators. It is provided with potential free contact for fire alarm, thus in case of fire, all intake hoppers get locked. Incase of maintenance or fault in intake hopper, it is isolated from system and Rest of the chute system shall be working.	40,744.00	14,66,784.00
1184	234.00	Supply & Installation - Centralized Segregated Garbage Collection System---Fire sprinklers - HD make fire sprinkler 68 Deg.C, standard response & 1.2"BSPT, K-5.6, Pendent, Crome finish.	501.00	1,17,234.00
1185	36.00	Supply & Installation - Centralized Segregated Garbage Collection System---Trolley (660Ltr)- HDPE trolley standard 660Ltr capacity with lead and 4 wheels,Compatible to municiple compactor For Dry Garbage	35,919.00	12,93,084.00
1186	468.00	Supply & Installation - Centralized Segregated Garbage Collection System--Installation Charges	4,000.00	18,72,000.00
1187	54.00	Supply, fabrication, installation and commissioning of Cylinder manifold for (2 x 70) of 14.2KG(as per stipulation) Cylinders in Two tier) as per drawing including all accessories and components as listed below. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials (The cylinder deposit will be taken care by Builder) 40mm dia MS-Seam Less pipe line schedule 40 seam less of adequate length. Makes: Tata/Jindal/Essar/MSL/ISMT or its equivalent as approved by the competent authority.	1,650.00	89,100.00
1188	210.00	Supply & installation of Cylinder Adaptor - Cast Aluminium MECV thread Type. Makes: UW/Gaso/Globe or its equivalent as approved by the competent authority.	490.00	1,02,900.00
1189	210.00	Supply & installation of flexible Cylinder Pigtail - IS9573:2012 - Type 2 - 3ft long LPG hose for manifold. Makes: UW/Gaso/Globe or its equivalent as approved by the competent authority.	400.00	84,000.00
1190	210.00	Supply & installation of Manifold NRV - Commercial Thread Brass Type-FECVXMECV. Makes: UW/Gaso/Globe or its equivalent as approved by the competent authority.	525.00	1,10,250.00
1191	9.00	Supply, fabrication, installation and commissioning of Cylinder manifold for Fire safe CS Flange-end Type Ball Valve-40MM. Makes: L&T/Hawa/Marck or its equivalent as approved by the competent authority.	8,650.00	77,850.00
1192	6.00	Supply, fabrication, installation and commissioning of Pressure guages 0 - 10 Kg with control valve. Makes:Hguru/FIEBIG/Baumer make SS or its equivalent as approved by the competent authority.	3,500.00	21,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1193	21.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage-1 consisting of the following. Fire safe CS Flange-end Type Ball Valve-25MM. Makes: L&T/Hawa/Marck or its equivalent as approved by the competent authority.	5,765.00	1,21,065.00
1194	6.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage-1 consisting of the following-Pressure guages 0 - 4 Kg with control valve.Makes:Hguru/FIEBIG/Baumer make SS or its equivalent as approved by the competent authority.	3,500.00	21,000.00
1195	3.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage-1 consisting of the following. The system shall be connecting two LPG cylinder manifolds with 25mm dia MS Pipe. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Auto Change Over valve with in built pressure Regulator-ACM4. Makes: UW or its equivalent make as approved by the competent authority.	24,700.00	74,100.00
1196	6.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage-1, 1 " Regulator, P O to 17 Kg/Cm2, O.P.Oto 2 Kg, adjustable flow rate-1 100 Nm3/hr. End conenction flanged end 150	7,500.00	45,000.00
1197	6.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage-1 consisting of the following. The system shall be connecting two LPG cylinder manifolds with 25mm dia MS Pipe. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Gas Filter -F2 without pressure gauge & valve. Makes: UW/Vanaz or its equivalaent make]	5,500.00	33,000.00
1198	3.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage-1 consisting of the following. The system shall be connecting two LPG cylinder manifolds with 25mm dia MS Pipe. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Flame Arrestor flanged end. Makes: UW or its equivalaent make	25,350.00	76,050.00
1199	57.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage ? 2 consisting of the following. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Fire safe CS Flange-end 150 class type ball valve-25mm. Makes: L&T/Hawa/Marck or its equivalent as approved by the competent authority.	5,765.00	3,28,605.00
1200	18.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage ? 2 consisting of the following. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Pressure Regulator with OPSO & UPSO - B25. Makes: Clesses or its equivalent as approved by the competent authority.	31,000.00	5,58,000.00
1201	18.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage ? 2 consisting of the following. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Pressure guages 0 - 4 Kg with control valve. Makes:Hguru/FIEBIG/Baumer make SS or its equivalent as approved by the competent authority.	3,500.00	63,000.00
1202	18.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage ? 2 consisting of the following. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Pressure gauges 0 - 600 milibar with control valve. Makes:Mahavir/gasafe or its equivalent as approved by the competent authority.	1,950.00	35,100.00
1203	432.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage 3 with meter near the kitchen duct of the each floor flats. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Isolation ball valves-15mm Makes:I.TaP/Comap/VGN or its equivalent as approved by the competent authority.	650.00	2,80,800.00
1204	432.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage 3 with meter near the kitchen duct of the each floor flats. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Pressure regulator with UPSO. MakesGreen globe or its equivalent as approved by the competent authority.	575.00	2,48,400.00
1205	432.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage 3 with meter near the kitchen duct of the each floor flats. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Prepaid smart card based Gas Meter. Makes: Quinchuan or its equivalent as approved by the competent authority.	3,900.00	16,84,800.00
1206	432.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage 3 with meter near the kitchen duct of the each floor flats. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Brass/MS fitting Set	850.00	3,67,200.00

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1207	432.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage 3 with meter near the kitchen duct of the each floor flats. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Gas Tap 1/4" (Nozzle Type)	325.00	1,40,400.00
1208	432.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage 3 with meter near the kitchen duct of the each floor flats. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Suraksha Hose pipe-1.5 Mtr	225.00	97,200.00
1209	432.00	Supply, fabrication, installation and commissioning of Pressure Regulation Stage 3 with meter near the kitchen duct of the each floor flats. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials Meter Plate/Supporting plate	160.00	69,120.00
1210	1,500.00	Supply & installation of M.S. ERW C class Pipeline As per IS 1239 which includes all the required fittings. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials A) From PRS 1 to PRS 2 Main Line 25 NB Dia MS ERW Pipe Makes: Tata/Jindal/Essar/MSL/ISMT or its equivalent as approved by the competent authority.	835.00	12,52,500.00
1211	1,800.00	Supply & installation of M.S. ERW C class Pipeline As per IS 1239 which includes all the required fittings. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials B) From PRS 2 to PRS 3 Header (Riser) 25 NB Dia MS ERW Pipe Makes: Tata/Jindal/Essar/MSL/ISMT or its equivalent as approved by the competent authority.	800.00	14,40,000.00
1212	216.00	Supply & installation SS 316 Seamless Sch 40 pipe line for underground from gas bank to Stilt level of ground floor as per approved drawings. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings / makes of materials. B) From PRS1 upto G.floor stilt level size 25 NB dia SS 316 Sch 40 pipe (Sml/Ismt) B) From PRS 2 to PRS 3 Header (Riser) 25 NB Dia MS ERW Pipe Makes: Tata/Jindal/Essar/MSL/ISMT or its equivalent as approved by the competent authority.	3,670.00	7,92,720.00
1213	900.00	Supply & installation of M.S. ERW C class Pipeline As per IS 1239 which includes all the required fittings. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials B) From PRS 2 to PRS 3 Taping 15 NB Dia MS ERW Pipe from tapping to PRS-3 of each flat Makes: Tata/Jindal/Essar/MSL/ISMT or its equivalent as approved by the competent authority.	600.00	5,40,000.00
1214	36.00	Supply & installation of M.S. ERW C class Pipeline As per IS 1239 which includes all the required fittings. The rate shall include supply of all the materials and labour to carry out the job and shall be as per the drawings/ makes of materials B) From PRS 2 to PRS 3- Fire safe CS Flange-end Type 150 Ball Valve-25MM for Riser line (Makes: L&T/Hawa/Marck make)	5,765.00	2,07,540.00
1215	1,728.00	Supply and installation of 12 mm (0.6mm Thickness) dia Copper pipe from Kitchen isolation valve to Kitchen	660.00	11,40,480.00
1216	6.00	Gas Bank Safety equipments - 2 No's Sand Buckets,2 No's Water buckets,Sign Boards & 2 No's ABC power Type 9Kg capacity Fire Exstinguishers	15,000.00	90,000.00
1217	6.00	Supply & installation of Leak detection System at gas bank with 2 sensors & one Control panel along with Alarm	60,000.00	3,60,000.00
1218	18.00	Gas Bank : Hydro Test-Main Line,Header,Riser&Tapping - with nitrogen purging Complete MS Pipe Line Testing as per IS 6044 standards as directed by Engineer-In-Charge.	1,25,000.00	22,50,000.00
1219	18.00	Submission of online applciations and getting approvals from Oil Companies either HPCL/IOCL/BPCL or any other comapanies as per the guidelines issued by ONGC/Petroleum dept, Govt of India and as directed by Engineer-In-charge.	1,00,000.00	18,00,000.00
1220	3.00	Providing necessary civil works like construction/erection of scaffholding and core cutting works in walls for passing of gas pipe lines of approved size and dia in all dwelling units and as directed by Engineer-In-charge..	10,00,000.00	30,00,000.00
1221	210.00	Supply and delivery of 14.2 Kg cylinders of approved company either HPCL/IOCL/BPCL or any other companies by means of paying necessary deposit charges and installing the same at site as per approved plan layout as directed by Engineer-In-Charge.	2,400.00	5,04,000.00

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1222	432.00	Supply, Installation,Testing & Commissioning of Automation switches (with 2/4 channel relay, indicator,etc) compatible to mechanical touch and remote operation (with Wifi dual in wall relay/ RF like Z wave, Zigbee etc, latest technology during supply) for control of light & fan (not less than 20 controls) in specified locations with necessary accessories as complete as required as per latest technology in market and as directed by Engineer-In-Charge. Makes: Legrand/Schneider/Havells/L&T	1,23,000.00	5,31,36,000.00
1223	432.00	Supply, Installation,Testing & Commissioning of Video door phone with touch screen- 7",brightness, contrast & colour settings-adjustable type, screen resolution upto 1024x600, talk back type, door lock release, inbuilt storage capacity up to 100 images, external memory card slot suitable upto 32 GB or above, Built in intercom facility, indoor monitors- to connect master & slave units upto 3/4, call forwarding facilities, automatic voice messages, with WIFI facility, outdoor monitors upto 2 door stations, external CCTV support upto 2 HD CCTV Cameras, adjustable micro-phone & speaker, night vision LED , Viewing angle upto 120 deg or above, suitable for hands free operation, Camera resolution 2 MP, Surface mounted type, suitable for electric lock release support (optional),weather proof type with necessary accessories as complete as required as per latest technology in market with suitable power adoptors, connections etc complete as directed by Engineer-In-Charge. Makes: Legrand/Honeywell/Godrej/Havells/Panasonic.	15,000.00	64,80,000.00
1224	900.00	Supply, Installation, Testing and Commissioning of ongrid Solar Photovoltaic Systems conforming to MNRE specifications as amended, consisting of Mono PERC half cut solar modules, net metering facility, necessary protections, earthing, mounted on Aluminium/GI structure of suitable strength with following components including Operation and maintenance for 3 years , GST, NAC complete as required:- a) Solar Photovoltaic Module of capacity 540 Wp or above, manufactured in India, conforming to IS 14286/IEC 61215, IS/IEC 61730-Part-1, IS/IEC 61730-Part-2. Solar Photovoltaic Module conversion efficiency shall not be less than 20%. PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. b) Power Conditioning Unit (PCU) of 350-800 V DC Input voltage range and 400 VAC, three phase, 4 wire, 50Hz +/- 2.5 Hz, output voltage suitable to generate AC Power with efficiency not less than 97%, total harmonic distortion less than 3% and suitable for ambient temperature from 0 to 50 degree C. The PCU shall adjust the voltage and frequency level to suit the Grid Voltage Frequency. c) Data Monitoring System complete with accessories. d) Fixing of Array junction box & Main junction box with IP 65 protection and termination arrangement for incoming and outgoing cable along with glands, lugs and other accessories etc. as required. e) Lightning and surge voltage protection. f) Connections & Interconnections by supplying & fixing required size XLPE insulated copper conductor 1.1 kV grade armoured power and control cables between solar modules, main power cable to grid supply PCU unit along with supplying & fixing of necessary channel/conduit lugs and other accessories etc. as required and as directed by Engineer-In-Charge.	58,950.00	5,30,55,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1225	10.00	Supply,Installation,Testing and Commissioning of Electric Traction Passenger Lift of makes:Kone/Otis/Schindler/Mitsubishi/Johnson with ? Rated capacity :- 15 Passenger/1020Kg ? Floors :- G+12 floor (13Stops/13 Landings) ? Travel :- 40-42 mtrs ? Location of Lift Machine:- MRL ? Rated speed :- 1.5 to 1.75 mps VS ? Doors type :- COPO/TOPO Doors with frame having clear opening of 1000/1100 mm wide x 2100 mm high made from SS 304 grade sheet of 1.5mm, thick in hairline finish for car and all landing doors with SS architraves/frames ? Lift car enclosure made from SS 304 grade sheet of 1.5mm, thick with hairline finish or on par with exisitng finish look or as approved by Engineer-In-charge , with frame made from MS girders, bracing of adequate size with minimum safety factor of 5, with Toe Guard Apron, with necessary false ceiling with adequate LED lights, blower/fan for ventilation, SS chequered plate flooring or provision for 20-25mm recess in plafform for granite flooring, handrails, mirror, emergency light etc. COP (two panel) with SS face plate having metallic push buttons with Braille Code & luminous indicator around button with FPI, scrolling UP/DN LED indicator & with/without attendant key switch, OWD with audio-visual alarm, VAS in Telugu & English with intercom system with telephone instrument in Lift car, LMR & FCC/ground floor Clear Car size of 1600 mm wide x 1500 mm deep x 2400 mm high. ? CCTV surveillance system comprises of 2nos minimum 2.0MP FHD IP based vandal proof Dome camera in lift car & in LMR/inside lift shaft top aimed on Lift machinery & controller with NVR kept in LMR/FCC with HDR data backup for 60 days with 18" FHD TV monitor, to be kept in FCC/LMR as directed by Engineer In Charge ? LOP with SS face plate having recess/surface push button box for all landings with scrolling UP/DN LED indicator having metallic push buttons with Braille Code & luminous indicator around button with CPI, Lift car arrival & next travel direction audio-visual indication at all landings Lift controller based on microprocessor/ PLC with VVVF Drive having closed loop control system or VF regenerative closed loop, with IBMS compatible having necessary port, control panel duly wired with proper size & strength copper wire for power & control circuit, with provision for addition of floor/control card & allied accessories control panel having enclosure of 1.5mm CRCA sheet with powder coating with IP54 Protection class ? ARD complete with necessary SMF VRLA batteries ? Fireman controller having fireman switch at fire Landing-ground floor, Lift Machine of Gearless PMSM of suitable kW with Traction pulley, OSG, electromagnetic brakes, entire assembly mounted on adequate size girders duly fixed on LMR floor/ shaft walls complete with main/diverter traction sheaves, suspension wire ropes/belts of adequate size & strength ? Other mechanical parts such as 'T' section adequate size guide rails for car & counter weight with brackets fasteners, counter weight frame with necessary blocks, buffers with necessary support arrangement, MS pit ladder etc. erected with necessary steel work Minor civil work for alteration if any and erection of door frames and accessories, erection buffers, erection of lift machinery, adequate size core cuts if required & scaffolding for erecting guide rails fixing of girders for mounting lift machine etc. complete as per specification no. LFT. ?Lift shaft available having clear size of 2425 mm wide x 1925 mm deep 1600 mm Pit depth, 4150 mm Overhead etc as required including for Lift travelling up to eight floors or at a speed of 1.5 to 1.75 mps, for Lift having 1000/1100mm wide x 2100mm high clear entrance in 1.5mm thick SS 304 grade landing door [Two panel-as approved by Engineer-In-Charge], this includes all necessary accessories like LOP's with UP/DN buttons-arrows-indicators, extension of guide rails, shaft wiring with trunking,traveling cables, main hoisting ropes/belts, & OSG rope landing doors with all accessories etc. necessary for the normal safe functioning of lift installation complete. For Full Collective control system.General: - Job includes entire procedure of obtaining all necessary erection permissions & "License to Work the Lift" from Electrical Inspector(Lifts) with submission to the Engineer In Charge.Warrantee: - Job covers three years onsite warrantee for all the Lift parts with Full Comprehensive Annual Maintenance Contract as per the maintenance schedule.	46,04,870.00	4,60,48,700.00
1226	10.00	Supply,Installation,Testing and Commissioning of Electric Traction Passenger Lift of makes:Kone/Otis/Schindler/Mitsubishi/Johnson with ? Rated capacity :- 15 Passenger-Service Elevator /1020Kg ? Floors :- G+12 floors (13Stops/13 Landings) ? Travel :- 40 to 42 mtrs ? Location of Lift Machine:- MRL ? Rated speed :- 1.5 to 1.75 mps VS ? Doors type :- COPO/TOPO Doors with frame having clear opening of 1000 mm wide x 2100 mm high made from SS 304 grade sheet of 1.5mm, thick in hairline finish for car and all landing doors with SS architraves/frames ? Lift car enclosure made from SS 304 grade sheet of 1.5mm, thick with hairline finish or on par with exisitng finish look or as approved by Engineer-In-Charge with frame made from MS girders, bracing of adequate size with minimum safety factor of 5, with Toe Guard Apron, with necessary false ceiling with adequate LED lights, blower/fan for ventilation, SS chequered plate flooring or provision for 25mm recess in plafform for granite flooring, handrails, mirror, emergency light etc. COP (two panel- as apprvoed by Engineer-In-Charge) with SS face plate having metallic push buttons with Braille Code & luminous indicator around button with FPI, scrolling UP/DN LED indicator & with/without attendant key switch, OWD with audio-visual alarm, VAS in Telugu & English with intercom system with telephone instrument in Lift car, LMR & FCC/ground floor Clear Car size of 1100 mm wide x 2200 mm deep x 2400 mm high. ? CCTV surveillance system comprises of 2nos minimum 2.0MP FHD IP based vandal proof Dome camera in lift car & in LMR/inside lift shaft top aimed on Lift machinery & controller with NVR kept in LMR/FCC with HDR data backup for 60 days with 18" FHD TV monitor, to be kept in FCC/LMR as directed by Engineer In Charge ? LOP with SS face plate having recess/surface push button box for all landings with scrolling UP/DN LED indicator having metallic push buttons with Braille Code & luminous indicator around button with CPI, Lift car arrival & next travel direction audio-visual indication at all landings Lift controller based on microprocessor/ PLC with VVVF Drive having closed loop control system or VF regenerative closed loop, with IBMS compatible having necessary port, control panel duly wired with proper size & strength copper wire for power & control circuit, with provision for addition of floor/control card & allied accessories control panel having enclosure of 1.5mm CRCA sheet with powder coating with IP54 Protection class ? ARD complete with necessary SMF VRLA batteries ? Fireman controller having fireman switch at fire Landing-ground floor, Lift Machine of Gearless PMSM of suitable kW with Traction pulley, OSG, electromagnetic brakes, entire assembly mounted on adequate size girders duly fixed on LMR floor/ shaft walls complete with main/diverter traction sheaves, suspension wire ropes/belts of adequate size & strength ? Other mechanical parts such as 'T' section adequate size guide rails for car & counter weight with brackets fasteners, counter weight frame with necessary blocks, buffers with necessary support arrangement, MS pit ladder etc. erected with necessary steel work Minor civil work for alteration if any and erection of door frames and accessories, erection buffers, erection of lift machinery, adequate size core cuts if required & scaffolding for erecting guide rails fixing of girders for mounting lift machine etc. complete as per specification no. LFT. ?Lift shaft available having clear size of 1825 mm wide x 2825 mm deep 1600 mm Pit depth, 4150 mm Overhead etc as required including for Lift travelling up to eight floors or at a speed of 1.5 to 1.75 mps, for Lift having 000mm wide x 2100mm high clear entrance in 1.5mm thick SS 304 grade landing door [Two panel], this includes all necessary accessories like LOP's with UP/DN buttons-arrows-indicators, extension of guide rails, shaft wiring with trunking,traveling cables, main hoisting ropes/belts, & OSG rope landing doors with all accessories etc. necessary for the normal safe functioning of lift installation complete. For Full Collective control system.General: - Job includes entire procedure of obtaining all necessary erection permissions & "License to Work the Lift" from Electrical Inspector(Lifts) with submission to the Engineer In Charge.Warrantee: - Job covers three years onsite warrantee for all the Lift parts with Full Comprehensive Annual Maintenance Contract as per the maintenance schedule.	46,04,870.00	4,60,48,700.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1227	1.00	Supply,Installation,Testing and Commissioning of Electric Traction Passenger Lift of makes:Kone/Otis/Schindler/Mitsubishi/Johnson/Thyssenkrupp with ? Rated capacity :- 10 Passenger/680Kg ? Floors :- G+3 floor (4Stops/4 Landings) ? Travel :- 10-15 mtrs ? Location of Lift Machine:- MRL ? Rated speed :- 1.0 to 1.25 mps VS ? Doors type :- COPO/TOPO Doors with frame having clear opening of 800 mm wide x 2100 mm high made from SS 304 grade sheet of 1.5mm, thick in hairline finish for car and all landing doors with SS architraves/frames ? Lift car enclosure made from SS 304 grade sheet of 1.5mm, thick with hairline finish or on par with exisitng finish look or as approved by Engineer-In-charge , with frame made from MS girders, bracing of adequate size with minimum safety factor of 5, with Toe Guard Apron, with necessary false ceiling with adequate LED lights, blower/fan for ventilation, SS chequered plate flooring or provision for 20-25mm recess in plafform for granite flooring, handrails, mirror, emergency light etc. COP (two panel) with SS face plate having metallic push buttons with Braille Code & luminous indicator around button with FPI, scrolling UP/DN LED indicator & with/without attendant key switch, OWD with audio-visual alarm, VAS in Telugu & English with intercom system with telephone instrument in Lift car, LMR & FCC/ground floor Clear Car size of 1300 mm wide x 1300 mm deep x 2200 mm high. ? LOP with SS face plate having recess/surface push button box for all landings with scrolling UP/DN LED indicator having metallic push buttons with Braille Code & luminous indicator around button with CPI, Lift car arrival & next travel direction audio-visual indication at all landings Lift controller based on microprocessor/ PLC with VVVF Drive having closed loop control system or VF regenerative closed loop, with IBMS compatible having necessary port, control panel duly wired with proper size & strength copper wire for power & control circuit, with provision for addition of floor/control card & allied accessories control panel having enclosure of 1.5mm CRCA sheet with powder coating with IP54 Protection class ? ARD complete with necessary SMF VRLA batteries ? Fireman controller having fireman switch at fire Landing-ground floor, Lift Machine of Gearless PMSM of suitable kW with Traction pulley, OSG, electromagnetic brakes, entire assembly mounted on adequate size girders duly fixed on LMR floor/ shaft walls complete with main/diverter traction sheaves, suspension wire ropes/belts of adequate size & strength ? Other mechanical parts such as 'T' section adequate size guide rails for car & counter weight with brackets fasteners, counter weight frame with necessary blocks, buffers with necessary support arrangement, MS pit ladder etc. erected with necessary steel work Minor civil work for alteration if any and erection of door frames and accessories, erection buffers, erection of lift machinery, adequate size core cuts if required & scaffolding for erecting guide rails fixing of girders for mounting lift machine etc. complete as per specification no. LFT. ?Lift shaft available having clear size of 2000 mm wide x 2000 mm deep 1600 mm Pit depth, 4150 mm Overhead etc as required including for Lift travelling up to eight floors or at a speed of 1.0 to 1.25 mps, for Lift having 800mm wide x 2100mm high clear entrance in 1.5mm thick SS 304 grade landing door [Two panel-as approved by Engineer-In-Charge], this includes all necessary accessories like LOP's with UP/DN buttons-arrows-indicators, extension of guide rails, shaft wiring with trunking,traveling cables, main hoisting ropes/belts, & OSG rope landing doors with all accessories etc. necessary for the normal safe functioning of lift installation complete. For Full Collective control system.General: - Job includes entire procedure of obtaining all necessary erection permissions & "License to Work the Lift" from Electrical Inspector(Lifts) with submission to the Engineer In Charge.Warrantee: - Job covers two years onsite warrantee for all the Lift parts with Full Comprehensive Annual Maintenance Contract as per the maintenance schedule.	21,84,048.00	21,84,048.00
1228	1.00	Supply,Installation,Testing and Commissioning of Electric Traction Passenger Lift of makes:Kone/Otis/Schindler/Mitsubishi/Johnson with ? Rated capacity :- 15 Passenger-Service Elevator /1020Kg ? Floors :- G+3 floors (4Stops/4 Landings) ? Travel :- 10 to 15 mtrs ? Location of Lift Machine:- MRL ? Rated speed :- 1.0 to 1.25 mps VS ? Doors type :- COPO/TOPO Doors with frame having clear opening of 1000 mm wide x 2100 mm high made from SS 304 grade sheet of 1.5mm, thick in hairline finish for car and all landing doors with glass doors to fit with SS architraves/frames ? Lift car enclosure made from SS 304 grade sheet of 1.5mm, thick with hairline finish or on par with exisitng finish look or as approved by Engineer-In-Charge with frame made from MS girders, bracing of adequate size with minimum safety factor of 5, with Toe Guard Apron, with necessary false ceiling with adequate LED lights, blower/fan for ventilation, SS chequered plate flooring or provision for 25mm recess in plafform for granite flooring, handrails, mirror, emergency light etc. COP (two panel- as apprvoed by Engineer-In-Charge) with SS face plate having metallic push buttons with Braille Code & luminous indicator around button with FPI, scrolling UP/DN LED indicator & with/without attendant key switch, OWD with audio-visual alarm, VAS in Telugu & English with intercom system with telephone instrument in Lift car, LMR & FCC/ground floor Clear Car size of 1600 mm wide x 1550 mm deep x 2200 mm high. ? CCTV surveillance system comprises of 2nos minimum 2.0MP FHD IP based vandal proof Dome camera in lift car & in LMR/inside lift shaft top aimed on Lift machinery & controller with NVR kept in LMR/FCC with HDR data backup for 60 days with 18" FHD TV monitor, to be kept in FCC/LMR as directed by Engineer In Charge ? LOP with SS face plate having recess/surface push button box for all landings with scrolling UP/DN LED indicator having metallic push buttons with Braille Code & luminous indicator around button with CPI, Lift car arrival & next travel direction audio-visual indication at all landings Lift controller based on microprocessor/ PLC with VVVF Drive having closed loop control system or VF regenerative closed loop, with IBMS compatible having necessary port, control panel duly wired with proper size & strength copper wire for power & control circuit, with provision for addition of floor/control card & allied accessories control panel having enclosure of 1.5mm CRCA sheet with powder coating with IP54 Protection class ? ARD complete with necessary SMF VRLA batteries ? Fireman controller having fireman switch at fire Landing-ground floor, Lift Machine of Gearless PMSM of suitable kW with Traction pulley, OSG, electromagnetic brakes, entire assembly mounted on adequate size girders duly fixed on LMR floor/ shaft walls complete with main/diverter traction sheaves, suspension wire ropes/belts of adequate size & strength ? Other mechanical parts such as 'T' section adequate size guide rails for car & counter weight with brackets fasteners, counter weight frame with necessary blocks, buffers with necessary support arrangement, MS pit ladder etc. erected with necessary steel work Minor civil work for alteration if any and erection of door frames and accessories, erection buffers, erection of lift machinery, adequate size core cuts if required & scaffolding for erecting guide rails fixing of girders for mounting lift machine etc. complete as per specification no. LFT. ?Lift shaft available having clear size of 3000 mm wide x 2000 mm deep 1600 mm Pit depth, 4150 mm Overhead etc as required including for Lift travelling up to eight floors or at a speed of 1.0 to 1.25 mps, for Lift having 1000mm wide x 2100mm high clear entrance in 1.5mm thick SS 304 grade landing door [Two panel], this includes all necessary accessories like LOP's with UP/DN buttons-arrows-indicators, extension of guide rails, shaft wiring with trunking,traveling cables, main hoisting ropes/belts, & OSG rope landing doors with all accessories etc. necessary for the normal safe functioning of lift installation complete. For Full Collective control system.General: - Job includes entire procedure of obtaining all necessary erection permissions & "License to Work the Lift" from Electrical Inspector(Lifts) with submission to the Engineer In Charge.Warrantee: - Job covers two years onsite warrantee for all the Lift parts with Full Comprehensive Annual Maintenance Contract as per the maintenance schedule.	26,54,487.00	26,54,487.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1229	2.00	Supply,Installation,Testing and Commissioning of Electric Traction Passenger Lift of makes:Kone/Otis/Schindler/Mitsubishi/Johnson with ? Rated capacity :- 15 Passenger-Service Elevator /1020Kg ? Floors :- G+1 floors (2Stops/2 Landings) ? Travel :- 3 to 5 mtrs ? Location of Lift Machine:- MRL ? Rated speed :- 1.0 to 1.25 mps VS ? Doors type :- COPO/TOPO Doors with frame having clear opening of 1000 mm wide x 2100 mm high made from SS 304 grade sheet of 1.5mm, thick in hairline finish for car and all landing doors as directed by Engineer In Charge to fit with SS architraves/frames ? Lift car enclosure made from SS 304 grade sheet of 1.5mm, thick with hairline finish or on par with exisitng finish look or as approved by Engineer-In-Charge with frame made from MS girders, bracing of adequate size with minimum safety factor of 5, with Toe Guard Apron, with necessary false ceiling with adequate LED lights, blower/fan for ventilation, SS chequered plate flooring or provision for 25mm recess in plafform for granite flooring, handrails, mirror, emergency light etc. COP (two panel- as apprvoed by Engineer-In-Charge) with SS face plate having metallic push buttons with Braille Code & luminous indicator around button with FPI, scrolling UP/DN LED indicator & with/without attendant key switch, OWD with audio-visual alarm, VAS in Telugu & English with intercom system with telephone instrument in Lift car, LMR & FCC/ground floor Clear Car size of 1600 mm wide x 1550 mm deep x 2200 mm high. ? CCTV surveillance system comprises of 2nos minimum 2.0MP FHD IP based vandal proof Dome camera in lift car & in LMR/inside lift shaft top aimed on Lift machinery & controller with NVR kept in LMR/FCC with HDR data backup for 60 days with 18" FHD TV monitor, to be kept in FCC/LMR as directed by Engineer In Charge ? LOP with SS face plate having recess/surface push button box for all landings with scrolling UP/DN LED indicator having metallic push buttons with Braille Code & luminous indicator around button with CPI, Lift car arrival & next travel direction audio-visual indication at all landings Lift controller based on microprocessor/ PLC with VVVF Drive having closed loop control system or VF regenerative closed loop, with IBMS compatible having necessary port, control panel duly wired with proper size & strength copper wire for power & control circuit, with provision for addition of floor/control card & allied accessories control panel having enclosure of 1.5mm CRCA sheet with powder coating with IP54 Protection class ? ARD complete with necessary SMF VRLA batteries ? Fireman controller having fireman switch at fire Landing-ground floor, Lift Machine of Gearless PMSM of suitable kW with Traction pulley, OSG, electromagnetic brakes, entire assembly mounted on adequate size girders duly fixed on LMR floor/ shaft walls complete with main/diverter traction sheaves, suspension wire ropes/belts of adequate size & strength ? Other mechanical parts such as 'T' section adequate size guide rails for car & counter weight with brackets fasteners, counter weight frame with necessary blocks, buffers with necessary support arrangement, MS pit ladder etc. erected with necessary steel work Minor civil work for alteration if any and erection of door frames and accessories, erection buffers, erection of lift machinery, adequate size core cuts if required & scaffolding for erecting guide rails fixing of girders for mounting lift machine etc. complete as per specification no. LFT. ?Lift shaft available having clear size of 3000 mm wide x 2000 mm deep 1600 mm Pit depth, 4150 mm Overhead etc as required including for Lift travelling up to eight floors or at a speed of 1.0 to 1.25 mps, for Lift having 1000mm wide x 2100mm high clear entrance in 1.5mm thick SS 304 grade landing door [Two panel], this includes all necessary accessories like LOP's with UP/DN buttons-arrows-indicators, extension of guide rails, shaft wiring with trunking,traveling cables, main hoisting ropes/belts, & OSG rope landing doors with all accessories etc. necessary for the normal safe functioning of lift installation complete. For Full Collective control system.General: - Job includes entire procedure of obtaining all necessary erection permissions & "License to Work the Lift" from Electrical Inspector(Lifts) with submission to the Engineer In Charge.Warrantee: - Job covers two years onsite warrantee for all the Lift parts with Full Comprehensive Annual Maintenance Contract as per the maintenance schedule.	22,53,251.00	45,06,502.00
1230	2,583.00	Providing and fixing factory made Modular Kitchen base cabinets with open able shutter and sufficient number of drawers made of 18mm thick High Moisture Resistant High Density Fibre Board cabinet having back panel of 5.5 mm thick High Density Fibre Board Supertuff of approved brand Pre laminated on both sides and 0.8 mm thick PVC edge banding with factory drilled KD fittings, dowels and 100mm adjustable PVC plinth fitting at base covered with snap fitting removable Aluminium finish PVC skirting etc. complete. The shutter and drawer shall be of 18mm thick High Moisture Resistant High Density Fibre Board having High Gloss PVC membrane Finish of approved quality on outer face , Soft closing hinges Hettich/Blum/hafele make as per requirement, with build in C and J Sections handle (Gola profile - Hettich make or equivalent) fixed with S.S screws etc complete. Modular kitchen accessories (Grass/Blum/Hettich/Hafele or equivalent) to be fixed in the drawer/ cabinet, suitable provision in the same shall be made for its fixing and shall have 18 mm thick High Moisture Resistant High Density Fibre Board material on front & back and bottom 16 mm thick High Density Fibre Board material as per technical requirement. The work shall be executed as per drawing, sample prepared in sample flat at site and direction of Engineer-in-charge. Only face area of open able shutter and drawer shall be measured for payment. Cabinets with depth of 560 mm, and height of 720 mm and length as per drawing.	24,000.00	6,19,92,000.00
1231	1,346.00	Providing and fixing factory made Modular Kitchen wall cabinets with open able shutter and shelves of 18mm thick High Moisture Resistant High Density Fibre Board material having back panel of 5.5 mm thick HMR HDF Board material with Pre laminated on both sides and 0.8mm thick PVC edge banding with factory drilled KD fittings, dowels . The shutter shall be of 18mm thick High Moisture Resistant High Density Fibre Board material finished with High Gloss PVC membrane on outer face and shelves 2 nos shall be both side pre laminated of approved quality with Soft closing hinges Hettich/Blum/Hafele make as per requirement, with build in C and J Sections handle (Gola profile - Hettich make or equivalent) fixed with S.S screws etc complete. The work shall be executed as per drawing, sample prepared in sample flat at site and direction of Engineer-in-charge. Cabinets as per approved Drawing, height & length as per drawing.	21,100.00	2,84,00,600.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1232	11,154.00	Providing and fixing modular factory made Wardrobe with open able shutter and sufficient number of drawer of 18mm thick as per approved drawing of High Moisture Resistant High Density Fibre (HMR HDF) Board Supertuff of approved brand material having back panel of 8 mm thick High Moisture Resistant High Density Fibre Board material with Pre laminated on both sides and 0.8mm thick PVC edge banding with factory drilled KD fittings, dowels . The shutter and drawer front shall be of 18mm thick High Moisture Resistant High Density Fibre Board material finished with High Gloss PVC membrane of approved quality, Soft closing hinges of Blum/Hettich and Soft Close Quadro Slides as per requirement (of approved make) with S.S screws etc complete. Hanger rods, handles and locks Hettich make etc complete as per approved drawings.	23,000.00	25,65,42,000.00
1233	1,600.00	Providing and fixing modular factory made TV unit with open able shutter/glass shutter and sufficient number of drawer of 18mm thick as per approved drawing of High Moisture Resistant High Density Fibre (HMR HDF) Board of approved brand material having back panel of 8 mm thick High Moisture Resistant High Density Fibre Board material with Pre laminated on both sides and 0.8mm thick PVC edge banding with factory drilled KD fittings, dowels . The shutter and drawer front shall be of 18mm thick High Moisture Resistant High Density Fibre Board material finished with High Gloss PVC membrane/glass of approved quality, Soft closing hinges of Blum/Hettich and Soft Close Quadro Slides as per requirement (of approved make) with S.S screws etc complete. Hanger rods, handles and locks Hettich make etc complete as per approved drawings.	23,000.00	3,68,00,000.00
1234	3,850.00	Providing and fixing modular factory made Crockery unit with open able shutter/glass shutter and sufficient number of drawer of 18mm thick as per approved drawing of High Moisture Resistant High Density Fibre (HMR HDF) Board of approved brand material having back panel of 8 mm thick High Moisture Resistant High Density Fibre Board material with Pre laminated on both sides and 0.8mm thick PVC edge banding with factory drilled KD fittings, dowels . The shutter and drawer front shall be of 18mm thick High Moisture Resistant High Density Fibre Board material finished with High Gloss PVC membrane/glass of approved quality, Soft closing hinges of Blum/Hettich and Soft Close Quadro Slides as per requirement (of approved make) with S.S screws etc complete. Hanger rods, handles and locks Hettich make etc complete as per approved drawings.	23,000.00	8,85,50,000.00
1235	414.00	Providing and fixing soft closing bottle pull out of Hettich/Hafele or equivalent make of size 300 mm of SS 304 Grade and Telescopic Slides of Hettich/Hafele/or equivalent make with requirement SS screws for fixing above component of Hettich/Hafele or equivalent make, complete as per drawing in existing space, sample prepared in sample flat at site and as per direction of Engineer-in-charge.	7,800.00	32,29,200.00
1236	414.00	Providing and fixing soft closing bottle pull out of Hettich/Hafele or equivalent make of size 200 mm of SS 304 Grade and Telescopic Slides of Hettich/Hafele/or equivalent make with requirement SS screws for fixing above component of Hettich/Hafele or equivalent make, complete as per drawing in existing space, sample prepared in sample flat at site and as per direction of Engineer-in-charge.	5,600.00	23,18,400.00
1237	1,656.00	Providing and fixing drawers for pot and pan storage with full extension soft closing innotech series of Hettich/Hafele/Grass/Blum and fittings with required S.S. Screw for fixing above component of Hettich/Hafele/Grass/Blum as per drawing in existing space, sample prepared in sample flat at site and direction of Engineer-in-charge.	4,300.00	71,20,800.00
1238	1,656.00	Providing and fixing Kitchen medium drawers for utensils / Pulses storage with full extension soft closing innotech series of Hettich/HAFELE/Grass/Blum and fittings with required S.S. Screw for fixing above component of Hettich/Hafele/Grass/Blum as per drawing in existing space, sample prepared in sample flat at site and direction of Engineer-in-charge.	6,300.00	1,04,32,800.00
1239	1,242.00	Providing and fixing Kitchen large heavy drawers for grains storage with full extension soft closing innotech series of Hettich/HAFELE/Grass/Blum and fittings with required S.S. Screw for fixing above component of Hettich/Hafele/Grass/Blum as per drawing in existing space, sample prepared in sample flat at site and direction of Engineer-in-charge.	7,200.00	89,42,400.00
1240	414.00	Providing and fixing Dish Drainer of (Grass/Blum/Hettich/Hafele) or equivalent make and fittings with required S.S. screw for fixing above component of (Grass/Blum/Hettich/Hafele) or equivalent make, complete as per drawing in existing space, sample prepared in sample flat at site and as per direction of Engineer-in-charge.	3,600.00	14,90,400.00
1241	828.00	Providing and fixing PVC Cutlery Tray & SS 304 gas cylinder trolley in kitchen , complete as per drawing in existing space, sample prepared in sample flat at site and as per direction of Engineer-in-charge.	3,400.00	28,15,200.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1242	994.00	Providing and fixing modular factory made Shoe Rack unit with open able shutter/Louvered shutter and sufficient number of drawer of 18mm thick as per approved drawing of High Moisture Resistant High Density Fibre (HMR HDF) Board of approved brand material having back panel of 8 mm thick High Moisture Resistant High Density Fibre Board material with Pre laminated on both sides and 0.8mm thick PVC edge banding with factory drilled KD fittings, dowels . The shutter and drawer front shall be of 18mm thick High Moisture Resistant High Density Fibre Board material finished with High Gloss PVC membrane/glass of approved quality, Soft closing hinges of Blum/Hettich and Soft Close Quadro Slides as per requirement (of approved make) with S.S screws etc complete. Hanger rods, handles and locks Hettich make etc complete as per approved drawings.	21,500.00	2,13,70,999.00
1243	466.08	Providing and fixing modular factory made Puja unit with open able shutter/Louvered shutter and with Granite Top and sufficient number of drawer of 18mm thick with as per approved drawing of High Moisture Resistant High Density Fibre (HMR HDF) Board of approved brand material having back panel of 8 mm thick High Moisture Resistant High Density Fibre Board material with Pre laminated on both sides and 0.8mm thick PVC edge banding with factory drilled KD fittings, dowels . The shutter and drawer front shall be of 18mm thick High Moisture Resistant High Density Fibre Board material finished with High Gloss PVC membrane/glass of approved quality, Soft closing hinges of Blum/Hettich and Soft Close Quadro Slides as per requirement (of approved make) with S.S screws etc complete. Hanger rods, handles and locks Hettich make etc complete as per approved drawings.	21,500.00	1,00,20,720.00
1244	391.00	Providing and fixing modular factory made Vanity Unit with open able shutter/Louvered shutter and sufficient number of drawer of 18mm thick as per approved drawing of High Moisture Resistant High Density Fibre (HMR HDF) Board of approved brand material having back panel of 8 mm thick High Moisture Resistant High Density Fibre Board material with Pre laminated on both sides and 0.8mm thick PVC edge banding with factory drilled KD fittings, dowels . The shutter and drawer front shall be of 18mm thick High Moisture Resistant High Density Fibre Board material finished with High Gloss PVC membrane/glass of approved quality, Soft closing hinges of Blum/Hettich and Soft Close Quadro Slides as per requirement (of approved make) with S.S screws etc complete. Hanger rods, handles and locks Hettich make etc complete as per approved drawings.	21,300.00	83,28,300.00
1245	2,583.00	Providing and fixing 10mm thick toughened glass partitions (shower partion) with Sliding Door with necessary fittings including complete item of work as directied.	5,465.00	1,41,16,094.00
1246	246.81	Steel Grey Granite (40mm thk) Shotblasted- Providing and fixing Stone as specified in drawings for paving of approved quality, color and uniform shade, with 5 mm wide grooves and to required slope, set on 20mm thick cement mortar 1:4, including fixing of granite stone with cement paste and pointing the joints with approved quality and colour pigmented, Polymer based joint filler grouts (Laticrete , saint gobain grout or equivalent) to match the shade of granite stone, etc., The rate shall include for cost of providing and laying patterns, borders, inlays, cost of materials, wastages, labour, tools & plants, loading and unloading charges, transportation , curing, cleaning, all other incidental charges, etc ., complete with all leads and lifts as per specifications and drawings at the following levels and as per the instructions of Engineer in Charge.	4,100.00	10,11,921.00
1247	1,345.62	Cera Grey Granite (40mm thk) Shotblasted- Providing and fixing Stone as specified in drawings for paving of approved quality, color and uniform shade, with 5 mm wide grooves and to required slope, set on 20mm thick cement mortar 1:4, including fixing of granite stone with cement paste and pointing the joints with approved quality and colour pigmented, Polymer based joint filler grouts (Laticrete , saint gobain grout or equivalent) to match the shade of granite stone, etc., The rate shall include for cost of providing and laying patterns, borders, inlays, cost of materials, wastages, labour, tools & plants, loading and unloading charges, transportation , curing, cleaning, all other incidental charges, etc ., complete with all leads and lifts as per specifications and drawings at the following levels and as per the instructions of Engineer in Charge.	4,100.00	55,17,042.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1248	304.29	Coral Brown Granite (40mm thk) Shotblasted - Providing and fixing Stone as specified in drawings for paving of approved quality, color and uniform shade, with 5 mm wide grooves and to required slope, set on 20mm thick cement mortar 1:4, including fixing of granite stone with cement paste and pointing the joints with approved quality and colour pigmented, Polymer based joint filler grouts (Laticrete , saint gobain grout or equivalent) to match the shade of granite stone, etc., The rate shall include for cost of providing and laying patterns, borders, inlays, cost of materials, wastages, labour, tools & plants, loading and unloading charges, transportation , curing, cleaning, all other incidental charges, etc ., complete with all leads and lifts as per specifications and drawings at the following levels and as per the instructions of Engineer in Charge.	4,000.00	12,17,160.00
1249	200.28	Srikakulam Granite (40mm thk) Shotblasted- Providing and fixing Stone as specified in drawings for paving of approved quality, color and uniform shade, with 5 mm wide grooves and to required slope, set on 20mm thick cement mortar 1:4, including fixing of granite stone with cement paste and pointing the joints with approved quality and colour pigmented, Polymer based joint filler grouts (Laticrete , saint gobain grout or equivalent) to match the shade of granite stone, etc., The rate shall include for cost of providing and laying patterns, borders, inlays, cost of materials, wastages, labour, tools & plants, loading and unloading charges, transportation , curing, cleaning, all other incidental charges, etc ., complete with all leads and lifts as per specifications and drawings at the following levels and as per the instructions of Engineer in Charge.	3,650.00	7,31,022.00
1250	518.15	Coral Brown Granite (40mm thk) Sandblasted-Providing and fixing Stone of mentioned thickness, in Coping/Cladding of approved quality, color and uniform shade, with 5 mm wide grooves and to required slope,set on 20mm thick cement mortar 1:4, including fixing of granite stone with cement paste and pointing the joints with approved quality and colour pigmented, cement based joint filler grouts (Fosroc - Nitotile grout or equivalent) to match the shade of granite stone, etc., The rate shall include for cost of providing and laying patterns, borders, inlays, cost of materials, wastages, labour, tools & plants, loading and unloading charges, transportation , curing, cleaning, all other incidental charges, etc ., complete with all leads and lifts as per specifications and drawings at the following levels and as per the instructions of Engineer in Charge.	4,100.00	21,24,415.00
1251	1,059.60	Coral Brown Granite (20mm thk) Shotblasted - Providing and fixing Stone of mentioned thickness, in Coping/Cladding of approved quality, color and uniform shade, with 5 mm wide grooves and to required slope,set on 20mm thick cement mortar 1:4, including fixing of granite stone with cement paste and pointing the joints with approved quality and colour pigmented, cement based joint filler grouts (Fosroc - Nitotile grout or equivalent) to match the shade of granite stone, etc., The rate shall include for cost of providing and laying patterns, borders, inlays, cost of materials, wastages, labour, tools & plants, loading and unloading charges, transportation , curing, cleaning, all other incidental charges, etc ., complete with all leads and lifts as per specifications and drawings at the following levels and as per the instructions of Engineer in Charge.	3,600.00	38,14,560.00
1252	56.61	Srikakulam Granite (40mm thk) Shotblasted- Providing and fixing Stone of mentioned thickness, in Coping/Cladding of approved quality, color and uniform shade, with 5 mm wide grooves and to required slope,set on 20mm thick cement mortar 1:4, including fixing of granite stone with cement paste and pointing the joints with approved quality and colour pigmented, cement based joint filler grouts (Fosroc - Nitotile grout or equivalent) to match the shade of granite stone, etc., The rate shall include for cost of providing and laying patterns, borders, inlays, cost of materials, wastages, labour, tools & plants, loading and unloading charges, transportation , curing, cleaning, all other incidental charges, etc ., complete with all leads and lifts as per specifications and drawings at the following levels and as per the instructions of Engineer in Charge.	3,600.00	2,03,796.00
1253	12.15	Steel Grey Granite (20mm thk) Polished - Providing and fixing Stone of mentioned thickness, in Coping/Cladding of approved quality, color and uniform shade, with 5 mm wide grooves and to required slope,set on 20mm thick cement mortar 1:4, including fixing of granite stone with cement paste and pointing the joints with approved quality and colour pigmented, cement based joint filler grouts (Fosroc -Nitotile grout or equivalent) to match the shade of granite stone, etc., The rate shall include for cost of providing and laying patterns, borders, inlays, cost of materials, wastages, labour, tools & plants, loading and unloading charges, transportation , curing, cleaning, all other incidental charges, etc ., complete with all leads and lifts as per specifications and drawings at the following levels and as per the instructions of Engineer in Charge.	3,600.00	43,740.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1254	152.67	Coral Brown Granite (40mm thk) Polished-Providing and fixing Stone as per mentioned colour in Seater Coping / cladding of approved quality, color and uniform shade, with paper thin joint and to required slope, set on 20mm thick cement mortar 1:4, including fixing of stone with cement paste and pointing the joints with approved quality and colour pigmented, cement based joint filler grouts (Fosroc -Nitotile grout or equivalent) to match the shade of granite stone, etc., The rate shall include for cost of providing and laying patterns, borders, inlays, cost of materials, wastages, labour, tools & plants, loading and unloading charges, transportation , curing, cleaning, all other incidental charges, etc ., complete with all leads and lifts as per specifications and drawings at the following levels and as per the instructions of Engineer in Charge.	4,150.00	6,33,581.00
1255	155.87	Coral Brown Granite (20mm thk) Polished - Providing and fixing Stone as per mentioned colour in Seater Coping / cladding of approved quality, color and uniform shade, with paper thin joint and to required slope, set on 20mm thick cement mortar 1:4, including fixing of stone with cement paste and pointing the joints with approved quality and colour pigmented, cement based joint filler grouts (Fosroc -Nitotile grout or equivalent) to match the shade of granite stone, etc., The rate shall include for cost of providing and laying patterns, borders, inlays, cost of materials, wastages, labour, tools & plants, loading and unloading charges, transportation , curing, cleaning, all other incidental charges, etc ., complete with all leads and lifts as per specifications and drawings at the following levels and as per the instructions of Engineer in Charge.	3,500.00	5,45,549.00
1256	229.68	Srikakulam Granite (20mm thk) Shotblasted- Providing and fixing Stone as per mentioned colour in Seater Coping / cladding of approved quality, color and uniform shade, with paper thin joint and to required slope, set on 20mm thick cement mortar 1:4, including fixing of stone with cement paste and pointing the joints with approved quality and colour pigmented, cement based joint filler grouts (Fosroc -Nitotile grout or equivalent) to match the shade of granite stone, etc., The rate shall include for cost of providing and laying patterns, borders, inlays, cost of materials, wastages, labour, tools & plants, loading and unloading charges, transportation , curing, cleaning, all other incidental charges, etc ., complete with all leads and lifts as per specifications and drawings at the following levels and as per the instructions of Engineer in Charge.	3,500.00	8,03,880.00
1257	51.00	Supply, Transportation and fixing of 40W LED Post top lantern made with cast Aluminum with decorative opal polycarbonate diffuser with IP 65 protection etc., complete with all accessories with not less than two years warranty. Makes: Philips/Wipro/Havells/Crompton/Bajaj/Jaquar/K-lite/Reytek	9,324.00	4,75,524.00
1258	51.00	Supply and transportation of 4.00 Mtrs height, Bottom dia 143mm, Top 76mm, AV thickness 6mm and to withstand maximum wind velocity 180Km/Hr glass reinforced polymer (GRP) composite type Conical pole with single arm bracket of length 1Mtr and internal junction box including labour charges etc., complete.Makes:Bajaj / Kemrock / Valmont/Sumip/Helipole/K-lite/Reytek	14,443.00	7,36,593.00
1259	51.00	Supply, transportation and fixing of base bracket suitable For 4.00 Mtrs Pole glass reinforced polymer (GRP) composite type pole including labour charges etc., complete.Makes:Bajaj / Kemrock / Valmont/Sumip/Helipole/K-lite/Reytek	2,072.00	1,05,672.00
1260	675.00	Supply, installation, testing and commissioning of 10W Garden Step Light. IP65 Water Resistant and Adjustable Garden Spike Light, 230V AC supply, CCT-3000K.Makes: Philips/Wipro/Havells/Crompton/Bajaj/Jaquar/K-lite/Reytek	1,950.00	13,16,250.00
1261	138.00	Supply, installation, testing and commissioning of 12W Garden Spike Light. IP66 Water Resistant and Adjustable Garden Spike Light, 230V AC supply, CCT-3000K, Semi flush mount type, Fluoroscent/LED type light source.Makes: Philips/Wipro/Havells/Crompton/Bajaj/Jaquar/K-lite/Reytek	2,200.00	3,03,600.00
1262	60.00	Supply and Fixing of LED profile strip energy efficient, corded electric, plastic material, CCT-3000K, 5mtrs length with 12V DC, 5A, 60W driver and required accesoories etc complete.Makes: Philips/Wipro/Havells/Crompton/Bajaj/Jaquar/K-lite/Reytek	2,200.00	1,32,000.00
1263	54.00	Ceiling bracket down lighter -Supply, and delivery of Surface Mounted 1'x1' luminaire,16/20W LED ,with integrated driver,options of White and grey housing,CRI>70 with rating IP 20, operating voltage range of 140-270V, System power factor >0.9, efficiency 85%, THD <10%, Colour temeprature-6500k etc complete.Make:PhilipsWipro/Havells/Crompton/Jaquar/K-Lite/Reytek	2,100.00	1,13,400.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1264	6.00	Fabrication, Transportation and supply of hot-dip galvanized Octagonal Pole with BSEN - 10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, including the supply of suitable boards with bakelite sheet and MCB's as per IS specification suitable to withstand the wind speed of 180KMPH for 9 Mtrs mounting height Pole having dimensions bottom 185 mm,. Top 70mm with 3mm thick, base plate 275 x 275 x 20mm and 4 Nos of M24 x 1000 long 'J' bolts along with templates. Including Supply of 1.5M Dragon type decorative galvanized Single arm with PU Painted bracket. Makes: As per list of recommended brands. Makes: Bajaj/Valmont/Laasma /Transrail/Utkarsh/ Skipper/Consoul/Surya/Vakrangee/Lysaght Pole/K-lite/Reytek.	30,490.00	1,82,940.00
1265	6.00	Foundation and erection charges with special T&P, for 9.00Mtrs / 10Mtrs long Octagonal / Conical pole duly erecting on base plate duly providing 4 Nos foundation bolts with nuts with providing of 0.60Mtr x 0.60Mtrs x 1.40 Mtr size M20 cc work vibrated concreting mixing with necessary steel (15kgs) reinforcement and curing for 7 days as directed by the field engineers during execution including excavation of Earth/BT all labour charges and cost and conveyance of materials etc., complete.	8,909.00	53,454.00
1266	6.00	Supply and transportation of 400W LED Flood light Luminaire made of pressure diecast aluminum housing with powder coated, having protective toughened glass, supply Input voltage 120 - 270 V AC, P.F > 0.90, high power LEDs, with a System Efficacy >=120 lumens/watt and junction temperature < 70°C, with ingress protection IP66, Luminaire performance complies to IS 10322 (Part 5 / Sec-3), IK05, driver surge protection 4KV, In-house additional surge protection = 10KV with wide/ narrow beam optics, THD<10% at 110 Volts AC, driver efficiency >90%, , CCT: 3000K - 5700K, minimum CRI>70, etc., complete with earth connection and not less than two years warranty.Makes: Philips/Wipro/Havells/Crompton/Bajaj/Jaquar/K-lite/Reytek	26,816.00	1,60,896.00
1267	39.00	Supply and fixing of All weather IP67 In Ground 5w -Water Fountain light, with SPD up to 2 KV, LED hilder type, Average Lumen output 250 lm,.Makes: Philips/Wipro/Havells/Crompton/Bajaj/Jaquar/K-lite/Reytek	2,800.00	1,09,200.00
1268	930.00	PVC pipe 75mm-6 kg/cm² Pipes Work: Supply, laying & commissioning in position PVC pipe conforming to IS:4985:2000 and suitable for the respective working pressures without all fittings and accessories e.g. couplings, tees, bends, reducers, screwed adapters, flanged tail pieces etc. jointing as per manufacturers' instruction Finolex/Supreme or Equivalent. Finolex/Supreme or Equivalent	265.00	2,46,450.00
1269	660.00	PVC pipe 63mm-6 kg/cm² Pipes Work: Supply, laying & commissioning in position PVC pipe conforming to IS:4985:2000 and suitable for the respective working pressures without all fittings and accessories e.g. couplings, tees, bends, reducers, screwed adapters, flanged tail pieces etc. jointing as per manufacturers' instruction Finolex/Supreme or Equivalent	145.00	95,700.00
1270	1,471.45	PVC pipe 50mm-6 kg/cm² Pipes Work: Supply, laying & commissioning in position PVC pipe conforming to IS:4985:2000 and suitable for the respective working pressures without all fittings and accessories e.g. couplings, tees, bends, reducers, screwed adapters, flanged tail pieces etc. jointing as per manufacturers' instruction. Finolex/Supreme or Equivalent	95.00	1,39,788.00
1271	1,620.00	PVC pipe 40mm-6 kg/cm² Pipes Work: Supply, laying & commissioning in position PVC pipe conforming to IS:4985:2000 and suitable for the respective working pressures without all fittings and accessories e.g. couplings, tees, bends, reducers, screwed adapters, flanged tail pieces etc. jointing as per manufacturers' instruction. Finolex/Supreme or Equivalent	90.00	1,45,800.00
1272	1.00	PVC fittings Finolex/Supreme or Equivalent	1,88,280.00	1,88,280.00
1273	3,510.00	Earth work excavation and refilling 300x450mm	90.00	3,15,900.00
1274	30.00	Supply,Fixing & commissioning of 10mm Anchor fasteners, 10mm Threaded Rod, Universal Clamp, Channel, Threaded U Clamp, for below podium work. ISI Certified	375.00	11,250.00
1275	30.00	Supply,Fixing & commissioning of MS Bracket fabricated from L-Angle with Anchor Bolts as wall/floor clamping ISI Certified	520.00	15,600.00
1276	10,800.00	Supply,Fixing & commissioning of flexible,kink resistant 16mm inline tubing with pressure compensating, self flushing mechanism , Flat emitter and resistance to UV damage, algae growth brown in colour, Longer lateral run lengh with flow rate 3.5 lph, pressure rating 0.58 to 4.1 bar wall thickness 1.2mm XFD. RAINBIRD XFD or Equivalent	45.00	4,86,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1277	18.00	Supply,Fixing & commissioning of 2" Large Capacity Y Filters for submain filteration Have High Flow & Low Maintenance With a Solid Build,Maximum Flow Up to 110 gpm (25m³/hr), Maximum Pressure 116 psi (8 bar),Maximum Temperature Up to 140ºF (60ºC). LCRBY200D. RAINBIRD or Equivalent	2,500.00	45,000.00
1278	18.00	Supply,Fixing & commissioning of 63mm dia self-closing flushing valves that are installed at the end of the irrigation line for effecting flushing of the line at the beginning of every irrigation cycle, thus avoiding the clogging of the emitters /sprinklers through removal of particles, sediments and other impurities from the water. NETAFIM/AQVASTAR or Equivalent	300.00	5,400.00
1279	1,800.00	Supply,Fixing & commissioning of 12- Gauge Galvanized Steal Rod Comes Pre -Bent to Staple Distribution Tubing , XF Drip Line or XBS Tubing to Finished Grade. Notched Sides. Corrosion -Resistant of TIE DOWN STAKE TDSO50BEND / RAINBIRD or Equivalent	18.00	32,400.00
1280	750.00	Supply,Fixing & commissioning of Gromatetake off Connects XF Series Drip Line and Blank Tubing to PVC Mainlines at Low Pressures. 17mm GTO. RAINBIRD/ ISI or Equivalent	20.00	15,000.00
1281	600.00	Supply,Fixing & commissioning of High Quality Barbs Grab Tubing for a Secure Fit. Unique Barb Design to Reduce Insertion Force. Non - Obtrusive Brown Colored Fittings of 17mm BARBX BARB TEE. RAINBIRD/ XFF -TEE or Equivalent	45.00	27,000.00
1282	750.00	Supply,Fixing & commissioning of High Quality Barbs Grab Tubing for a Secure Fit. Unique Barb Design to Reduce Insertion Force. Non - Obtrusive Brown Colored Fittings of 17mm BARBX BARB COUPLING RAINBIRD/XFF-COUP or Equivalent	25.00	18,750.00
1283	600.00	Supply,Fixing & commissioning of High Quality Barbs Grab Tubing for a Secure Fit. Unique Barb Design to Reduce Insertion Force. Non - Obtrusive Brown Colored Fittings of 17mm BARBX BARB ELBOW. RAINBIRD/XFF-ELBOW or Equivalent	21.00	12,600.00
1284	75.00	Supply,Fixing & commissioning of High Quality Barbs Grab Tubing for a Secure Fit. Unique Barb Design to Reduce Insertion Force. Non - Obtrusive Brown Colored Fittings of 17mm BARBX 1/2" MPT ADAPT.RAINBIRD/XFF-MA050 or Equivalent	32.00	2,400.00
1285	45.00	Supply,Fixing & commissioning of High Quality Barbs Grab Tubing for a Secure Fit. Unique Barb Design to Reduce Insertion Force. Non - Obtrusive Brown Colored Fittings of 17mm BARBX 3/4" MPT ADAPT RAINBIRD/XFF-MA075 or Equivalent	36.00	1,620.00
1286	1,350.00	Supply,Fixing & commissioning of 17mm End cap S Type for dripline closure at the end of the dripline. RAINBIRD/ISI or Equivalent	14.00	18,900.00
1287	645.00	Supply,Fixing & commissioning of Pop up spray head1804 Series Spray bodies, with Rotary nozzle having mutilple stream MPR sprayhaving Co-moulded wiper seal is molded into the cap and features an encased plastic 'cage' to provide unmatched resitence to grit, nozzle capable of covering 4.0-7.3m at 1.4 - 3.8 Bars pressure, and the enviroment. Rotary nozzles shall have hand adjustable (without tools) radius and arc-45 to 270 degree or full circle,True flushing mechanism,Thick streams and large water droplet & Low precipitation rate Additionally, the pressure-activated, multi-function seal design assures a positive seal without excess'flow-by'which enables more heads to be installed on the same valve, Two-piece ratchet mechanism, Features is Precision controlled flush at pop-down clears debris from unit, Construction of time-proven UV_resitant plastic.Pop spray body shall with stand upto 4.8 bar. 1804 R1724. RAINBIRD/1804 R1724	750.00	4,83,750.00
1288	645.00	Supply,Fixing & commissioning of 1/2" Pop up Connecting Swing joint Assembly. The tubing shall be made of polyetylene having wall thickness of 2.3mm ,a working pressure of 5.5 kg/cm2 at 43oC and a surge pressure of 16.6 kg/cm2. Flex pipe textured for wet conditions.The fittings shall be made of UV resistant thermo plastic.SA Series. RAINBIRD /SA	500.00	3,22,500.00
1289	645.00	Supply,Fixing & commissioning of Imported HDPE service saddle of varying size upto 63mm dia with pressure rating of PN 10.	260.00	1,67,700.00
1290	33.00	Supply,Fixing & commissioning of PVC Single Union Ball Valve,security pivot to maintain lever in space,double water tight joint,direct injection stem,Stem O-Ring, non mechanical ,ball Seals with backing seals and with a base which permits maximum penetration into the valve of size 63mm with pressure rating PN 10. PIMTAS/VARIOS	1,400.00	46,200.00
1291	3.00	Supply,Fixing & commissioning of PVC Single Union Ball Valve,security pivot to maintain lever in space,double water tight joint,direct injection stem,Stem O-Ring, non mechanical ,ball Seals with backing seals and with a base which permits maximum penetration into the valve of size 40mm. with pressure rating PN 10. PIMTAS/VARIOS	899.00	2,697.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1292	18.00	Supply,Fixing & commissioning of a double acting air and vaccum release 1/2 " Air release valve . The Air release valve shall be capable of both releasing and admitting air from and into the line. The working pressure shall be 5 bar. RAIN BIRD/AQVASTAR	750.00	13,500.00
1293	9.00	Supply of a double acting air and vaccum release 2 " Air release valve . The Air release valve shall be capable of both releasing and admitting air from and into the line. The working pressure shall be 10 KSC . RAIN BIRD/HT	1,250.00	11,250.00
1294	51.00	Supply,Fixing & commissioning of 6"Round box with greenlid and corrugated structure with unique shovel access slot and bolt hole knockout & Having Dimensions @ Top Opening :6 1/8" Dia & Bottom Opening 8 5/8" Dia. RAINBIRD/PVB/VB	450.00	22,950.00
1295	18.00	Supply,Fixing & commissioning of 10" Round Valve Box with greenlid and corrugated structure with unique shovel access slot and bolt hole knockout & Having Dimensions @ Top Opening 10" Dia & Bottom Opening 12 13/16" Dia. RAINBIRD/PVB/VB	1,300.00	23,400.00
1296	24.00	Supply,Fixing & commissioning of 12" Rectangular Standard Valve Box with greenlid and corrugated structure with unique shovel access slot and bolt hole knockout & having Dimensions @ Top Opening:18 1/4" L X 13" W & bottom opening :21 1/4" L X 15 15/16"W X 12" H RAINBIRD/PVB/VB	2,200.00	52,800.00
1297	18.00	Supply,Fixing & commissioning of 18" Jumbo Rectangular Standard Valve Box with greenlid and corrugated structure with unique shovel access slot and bolt hole knockout & having Dimensions @ Top Opening:18 1/4" L X 13" W & bottom opening :21 1/4" L X 15 15/16"W X 12" H RAINBIRD/VB	3,300.00	59,400.00
1298	24.00	Supply,Fixing & commissioning of 3/4th Quick coupling valve made up of solid brass with locking cover corrosion resistant and stainless steel spring . RAINBIRD/3RC	3,900.00	93,600.00
1299	6.00	Supply,Fixing & commissioning of 3/4th Key threads into top of QCV to provide water access 33DK	2,600.00	15,600.00
1300	6.00	Supply,Fixing & commissioning of 3/4th Hose Swivel Made up of Solid Brass Swivels up to 360 degrees to allows hose to be pulled in any direction & Also to prevent Hose Damage. SH-0. RAINBIRD/33DK	4,300.00	25,800.00
1301	3.00	Supply,Fixing & commissioning of 2" Disc Filter with capacity 30m3/Hr having an suitable inlet connections , to create a helical effect in the incoming water ,spinning particulate in suspension away from the filtering element and so minimizing cleanings frequency ,3/4" outlet for flushing at bottom of filter & maximum working pressure of 12 Bars AQVASTAR/ARMAS	11,000.00	33,000.00
1302	3.00	Supply,Fixing & commissioning of Monobloc or openwell submercible pumpset of having discharge and head of design flow with pressure gauge, UPVC sch 80 - suction & delivery manifold and mounted on a baseframe with proper supports. TEXMO/KIRLOSKER	56,000.00	1,68,000.00
1303	3.00	Supply,Fixing & commissioning of control panel suitable for pumpset having panel box made of CRCA sheet of 2 mm thickness and fixed alongwith following accessories DOL starter (L&T make),start / stop push buttons (L&T make), Ammeter (AE make), Single phase preventor (Minilec make), Voltmeter (AE make) , Indicating lamps (L & T make), MCB (L & T make), Dry level guard sensor (Minilec make) with control cable, etc. L & T	15,000.00	45,000.00
1304	3.00	Supply,Fixing & commissioning of control Valve, Butterfly Valve in mainline for bypass and flow diversion of approved quality with pressure rating of PN 10. PIMTAS/VARIOS	4,800.00	14,400.00
1305	3.00	Supply,Fixing & commissioning of Non Return Valve to prevent back flow have flap type or spring type with pressure rating of PN 10. PIMTAS/VARIOS	3,900.00	11,700.00
1306	3.00	Supply,Fixing & commissioning of Pressure release valve 2" with pressure setting from 0 to 7 Bar. PIMTAS/ARMAS	19,000.00	57,000.00
1307	1.00	Supervision & Transportation Charges all accessories of Filteration and Pumping Unit	3,49,394.70	3,49,395.00
1308	600.00	Supply,Fixing & Commissioning of Direct burial14 Awg x 2 Maxi cable with PVC insulated UL stndard 493 with impregnated polyethene jacket and soft annealed tin coated copper confirming to ASTM B-33 for two way communication between decoder controller and decoders complete. RAINBIRD/PAIGE	150.00	90,000.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1309	3.00	Supply,Fixing & Commissioning of decoder control system outdoor rated, UV resistant,wall mount case, to support sensor decoder,turf decoders and line surgeprotectors (LSP) with options of program BACK UP AND RESTORE , cycle +soak,Raindelay,ET managers ,weather station, controlling upto 5 master valve(5water source)with diagnostic feature in wire shorttest ,voltage test at stations,ping test and with option to upgradable to IQ central control including , standard accessories complete RAINBIRD - ESP LXD	75,000.00	2,25,000.00
1310	3.00	Supply,Fixing & commissioning Of IQ NCC network Communication Cartrige shall be enabled to access controller through mobile and tab for full operation of irrigation system and Cloud shall have Global weather feature and pin enabled access for user and dry run to budget available water. RAINBIRD/IQ NCC	75,000.00	2,25,000.00
1311	45.00	Supply,Fixing & Commissioning of Field Decodertor support 1 station ,fully water proof encapsulation,power draw 0.5mA at idle and 18mA at active ,working range 0 deg to 50 degree centigrade as per specifications and with different station capacities as given below Field Decoder 1 station. RAINBIRD - FD101	6,200.00	2,79,000.00
1312	9.00	Supply,Fixing & commisioning of Line Surge Protection device as required with copper grounding rod, clamps, charcoal and all requisite accessories complete. RAINBIRD - LSP1	9,000.00	81,000.00
1313	3.00	Supply,Fixing & commissioning of 1" Solenoid globe angle inlet Valves with fabric reinforced Nitrile diaphram Material and rugged PVC construction ,compatible and slow closing to prevent water hammer,pressure rating upto 10.4 KSC and maximum flow of 40GPM ,max water temp. upto 42degree centigrade, with 24AC solenoid,current rating 0.41A @60Hz,coil resistance 30ohm with provision to attach PRS-Dial PGA Pressure Regulation Optional PRS-D. RAINBIRD/PGA	2,200.00	6,600.00
1314	30.00	Supply,Fixing & commissioning of 2" Solenoid globe angle inlet Valves with fabric reinforced Nitrile diaphram Material and rugged PVC durable glass -filled nylon construction ,compatible with and slow closing to prevent water hammer,pressure rating upto 10.4 KSC and maximum flow of 150GPM ,max water temp. upto 42degree centigrade, with 24AC solenoid,current rating 0.41A @60Hz,coil resistance 30ohm with provision to attach PRS-Dial PGA Pressure Regulation Optional PRS-D. RAINBIRD/PGA	4,900.00	1,47,000.00
1315	3.00	Supply,Fixing & commissioning of 3" Solenoid globe Valves as central shut off valve with fabric reinforced diaphram and rugged PVC construction ,compatible and slow closing to prevent water hammer,pressure rating upto 0,7 to 10 KSC and maximum flow of 10 to 100 m3/h ,max water temp. upto 60°C with 24 VAC - 50 Hz,coil resistance 30ohm with provision to attach PRS-Dial. RAINBIRD/AQVASTAR	22,500.00	67,500.00
1316	42.00	Supply,Fixing & commissioning of PRS-DIAL to Maintain constant outlet pressure between 1.04 to6.9 KSC. RAINBIRD PRS	3,200.00	1,34,400.00
1317	158.00	Supply,Fixing & commissioning of direct bury -on wire connector with strain relief ,UL486 D certified ,with waterproof silicon sealant ,fits wire from 22ga to6 ga as per specifications complete DBRY. RAINBIRD DBRY	140.00	22,120.00
1318	3.00	Supply,Fixing & commissioning of automatic rain shut off device ,latching hinge with multiple rainfall settings 5mm to 20mm UL CUL listed and CE approved complete. RAINBIRD RSD BEX	4,000.00	12,000.00
1319	3.00	Supply,Fixing & commissioning of Pump relay 24 AC PLA relay ,stabilizer 300watts. PSA	6,500.00	19,500.00
1320	1.00	Supervision &Transportation Charges of all Automation Equipments	1,30,912.00	1,30,912.00
1321	745.50	Removal of earth by mechanical transport i.e. loading unloading etc. with all leads and lifts	82.50	61,504.00
1322	1,013.23	Supplying and stacking of good earth at site including royalty and carriage with all leads and lifts (earth measured in stacks will be reduced by 20% for payment)	203.50	2,06,193.00
1323	342.14	Supplying and stacking cow dung at site including royalty and carriage with all leads and lifts (sludge measured in stacks will be reduced by 8% for payment)	154.00	52,689.00
1324	1,000.08	Flooding the ground with water including making kiaries and dismantling the same	16.50	16,501.00
1325	2,191.80	Spreading of sludge, dump manure or/and good earth in required thickness (cost of sludge dump manure or/and good earth to be paid separately)	16.50	36,165.00
1326	4,735.82	Fine dressing the ground	99.00	4,68,846.00
1327	386.17	Digging holes in ordinary soil and refilling the same with the excavated earth mixed with manure or sludge in the ratio of 2:1 by volume (2 parts of stacked volume of earth after reduction by 8%) flooding with water, dressing including removal of rubbish and surplus earth, if any with all leads and lifts (cost of manure sludge or extra good earth if needed to be paid for separately) (a) Holes 90 cm dia and 90 cm deep	165.00	63,718.00

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1328	174.05	Digging holes in ordinary soil and refilling the same with the excavated earth mixed with manure or sludge in the ratio of 2:1 by volume (2 parts of stacked volume of earth after reduction by 8%) flooding with water, dressing including removal of rubbish and surplus earth, if any with all leads and lifts (cost of manure sludge or extra good earth if needed to be paid for separately) (b) Holes 75 cm dia and 75 cm deep	66.00	11,487.00
1329	376.07	Digging holes in ordinary soil and refilling the same with the excavated earth mixed with manure or sludge in the ratio of 2:1 by volume (2 parts of stacked volume of earth after reduction by 8%) flooding with water, dressing including removal of rubbish and surplus earth, if any with all leads and lifts (cost of manure sludge or extra good earth if needed to be paid for separately) (c) Holes 60 m dia and 90 m deep	44.00	16,547.00
1330	23.00	Bauhinia blakeana - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	4,000.00	92,000.00
1331	19.00	Brassaia actinophylla - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	1,500.00	28,500.00
1332	37.00	Bucida molineti - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	4,500.00	1,66,500.00
1333	35.00	Cassia fistula - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	2,500.00	87,500.00
1334	43.00	Ceiba pentandra- Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	900.00	38,700.00
1335	31.00	Cordia sebestana - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	1,750.00	54,250.00
1336	19.00	Conocarpus erectus - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	2,000.00	38,000.00

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1337	7.00	Delonix regia - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	1,200.00	8,400.00
1338	68.00	Ficus benjamina - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	1,200.00	81,600.00
1339	73.00	Lagerstroemia speciosa - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	1,500.00	1,09,500.00
1340	14.00	Plumeria obtusa - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	3,500.00	49,000.00
1341	90.00	Plumeria acutifolia- Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	3,000.00	2,70,000.00
1342	48.00	Plumeria rubra - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	3,500.00	1,68,000.00
1343	20.00	Saraca asoca - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	2,500.00	50,000.00
1344	15.00	Spathodea campanulata - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	1,500.00	22,500.00
1345	33.00	Tabebuia impetiginosa - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	1,600.00	52,800.00

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1346	65.00	Tecoma gaudichaudi - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	450.00	29,250.00
1347	24.00	Chrysalidocarpus lutescens - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	600.00	14,400.00
1348	81.00	Ptychosperma microcarpum - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	6,000.00	4,86,000.00
1349	15.00	Roystonia regia - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	7,200.00	1,08,000.00
1350	7.00	Washingtonia robusta- Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	6,000.00	42,000.00
1351	13.00	Wodyetia bifurcata - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	6,000.00	78,000.00
1352	2.00	Licuala grandis - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	6,000.00	12,000.00
1353	124.00	Bambusa ventricosa - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	1,000.00	1,24,000.00
1354	77.00	Phyllostachys nigra - Cost of supplying and planting Tree plants and there after maintenance for 180 days.(with replacement guarantee) The height should not be less than 1.2m or mentioning against the name of Tree. These should be supplied in polybag or earthen pot of min. 300mm dia. or as per size of trunk. Cost to include stacking and storing in temporary nursery and then after preparing the mimium planting pit 0.9 x 0.9 x 0.9 m deep or as per requirement with antifungal & anti termite medicine & appropriate manure, the plant to be planted as per site engineers instruction.	1,500.00	1,15,500.00

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1355	267.00	Alocassia Odora - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	450.00	1,20,150.00
1356	115.00	Alocasia caladium - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	250.00	28,750.00
1357	314.00	Alpinia purpurata - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	200.00	62,800.00
1358	2,786.00	Alpinia zerumbet variegata - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	200.00	5,57,200.00
1359	430.00	Canna indica - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	50.00	21,500.00
1360	307.00	Codiaeum variegatum - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	250.00	76,750.00
1361	83.00	Dracaena Marginata - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	75.00	6,225.00
1362	299.00	Ficus Longisland - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	50.00	14,950.00
1363	27.00	Ficus Panda - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	40.00	1,080.00

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1364	107.00	Ficus reginald - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	100.00	10,700.00
1365	250.00	Hamelia patens - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	60.00	15,000.00
1366	3,747.00	Hymenocallis littoralis - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	50.00	1,87,350.00
1367	320.00	Pandanaus sanderi - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	300.00	96,000.00
1368	99.00	Raphis chinensis - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	550.00	54,450.00
1369	416.00	Raphis excelsa - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	600.00	2,49,600.00
1370	1,978.00	Schefflera arboricola - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	150.00	2,96,700.00
1371	830.00	Strelitzia juncea - Supplying and Shrub plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	175.00	1,45,250.00
1372	94.00	Asparagus plumosus - Supplying and Groundcover plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	450.00	42,300.00

S.No	Estimate Quantity	Item Detailed Specification Description	Rate (INR) (Upto 2 Decimals)	Amount (INR) (Upto 2 Decimals)
1373	243.00	Chlorophytum comosum - Supplying and Groundcover plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	350.00	85,050.00
1374	598.00	Paspalum notatum - Supplying and Groundcover plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	350.00	2,09,300.00
1375	289.00	Pennisetum setaceum - Supplying and Groundcover plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	500.00	1,44,500.00
1376	289.00	Tradescantia spathacea - Supplying and Groundcover plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	200.00	57,800.00
1377	302.00	Wadelia trilobata - Supplying and Groundcover plantation and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	400.00	1,20,800.00
1378	544.00	Vernonia elaeagnifolia - Supplying and plantation of Climbers and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	210.00	1,14,240.00
1379	118.00	Quisqualis indica - Supplying and plantation of Climbers and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	150.00	17,700.00
1380	280.00	Ficus repens - Supplying and plantation of Climbers and there after maintenance for 180 days.(with replacement guarantee) with digging of hole of size 45 cm dia and 45 cm deep, refilling with imported earth mixed with cow dung manure or sludge in the ratio of 2: 1 by volume (2 part of stacked volume of earth after deduction by 20% : 1 part of stacked volume manure after deduction by 8%) including cost of plant, plantation, watering and removal of rubbish and surplus earth, for all leads and lifts.	210.00	58,800.00
1381	1.00	Design charges for Pending/ Non Approved Items including Finishes, Interiors, Landscape and others	2,00,00,000.00	2,00,00,000.00
1382	1.00	ES &P Provision	4,30,02,300.00	4,30,02,300.00
				4,34,32,32,389.00
				17,98,09,820.90
				4,52,30,42,209.90

Contractor

Chief Engineer(H and B-H)
APCRDA , Vijayawada

TATA CONSULTING ENGINEERS LIMITED

TATA ARCADIS

GOVERNMENT OF ANDHRA PRADESH,

Amaravati Development Corporation Limited, Vijayawada,

Andhra Pradesh

BLUE CONSULTANT

For

Preparing DPR for Waterways, River Training and Water Bodies for Amaravati Capital City

DPR FOR FLOOD MANAGEMENT FOR AMAVARATI CAPITAL CITY (Volume 1 of 2)

June 2017

DOCUMENT NO. TCE.10244A-CV-155-PJ-01

LIST OF ABBREVIATIONS

ADCL	Amaravati Development Corporation Limited
APCRDA	Andhra Pradesh Capital Region Development Authority
CAPEX	Capital Expenditures
DEM	Digital Elevation Model
FRL	Final Road level / Full Reservoir Level
FSL	Full Supply Level
GIS	Geographical Information System
ID	Irrigation Department
IWAI	Inland Waterway Authority of India
MFL	Maximum Flood Level
MLD	Million liters of water per day.
NW-4	National Waterway 4
OPEX	Operating Expenses
RFP	Request for Proposal
ROI	Return on Investment
TMC	Thousand million cubic feet
WMS	Weather Monitoring Station
LT	Level Transmitter
WQM	Weather Quality Monitor

EXECUTIVE SUMMARY

Blue Consultant, a consortium of Tata Consulting Engineers Limited (TCE) and Arcadis Netherlands B V have been assigned by the Amaravati Development Corporation (ADC), Government of Andhra Pradesh for the preparation of Detailed Project Reports (DPRs) for Flood Management, Urban Waterways and Strengthening of Right Flood banks of River Krishna.

This DPR presents the details of the Flood management for the Capital City of Amravati. Flood management concerns the seasonal flooding of the Kondaveeti Vagu and it's in falling drains. Numerical hydrological modeling shows the flood hazard is at its peak after the construction of the build area of Amaravati. The expected peak flow increased due to the effect of the increased rainfall runoff rate from the paved areas.

The water system within the capital city is designed in such a way that a 1/100 year event, defined as 222 mm precipitation in one day, will not lead to inundations of the new to be build capital city. This however requires substantial dimensions of the canals in width as well as in depth and the necessity of pumping capacity. Canal dimensions as proposed are designed to handle a 1/100 year peak precipitation event under the presumption of sufficient pumping capacity in the eastern part of the city, near Undavalli outlet, i.e., confluence point of Kondaveeti Vagu, Krishna River and Buckingham Canal.

Numerical hydraulic modeling shows the most hazardous situations occur after the realization of the city. The introduction of paved areas, even with the proposed density of around 60% paved and 40% green areas, leads to peak discharges which are larger than the peak discharges in the current situation. This includes a future situation where the discharge upstream of Lam reservoir is redirected into a proposed gravity canal which discharges into Krishna River in the western part of the city at Vykuntapuram.

The protection against flooding from the Kondaveeti Vagu and its in falling drains can be mitigated by a combination of measures, which comprises both gravity drainage (part diversion of flood to Krishna Western Delta canal and part diversion to River Krishna through a flood canal from upper catchment areas connecting Lam-Pedaparimi-Vykuntapuram reservoirs) and pumping at Undavalli outlet. Pumping capacity is needed under all circumstances to lower and maintain the water level in the Kondaveeti Vagu to 14m which reduces the flood hazard. The lowering of HFL to 14m is to ensure gravity flow of storm water including the treated sewage from the adjoining areas of the capital city.

Active water level management for the reservoirs in the capital city is essential. This shall be carried out in combination with emptying of reservoirs and / or reducing water levels when extreme precipitation events are expected which eventually reduces the flood hazard. The preemptive emptying of reservoirs seems in disagreement with the water conservation goals. However as this only is needed to prevent flooding under extreme precipitation events and the amount of water available in such an event is very large, the net effect of preemptive emptying with regard to water conservation goals will be negligible.

All the spatial constraints relative to the waterways earmarked in the Master plan Version 4 have been adhered to. This includes the total allocated water way width and maintaining the necessary flat width of green area on either side of the canals. Optimization of canal size to achieve this has taken place both in terms of cross-sectional areas and the material of lining for the canal based on its use for cargo, commuting and recreational purposes.

The total cost for Flood Management of the Capital city works out to **Rs**. **2162.49 Crore**. Furthermore, it is to be noted that this cost is exclusive of Canal Lining works which is proposed to be taken up two years hence, after assessing the results from the seepage observation wells proposed along the canals.

TABLE OF CONTENTS

List of Abbreviations ii
Executive Summary iii
Table of Contents v
List of Tables ix
List of Figures x
LIST OF DRAWINGS (volume 2) xi
Appendices xvii
CHAPTER-1 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 Scope of work 1
1.3 Choices to be made 2
CHAPTER-2 HYDROLOGY 6
2.1 GENERAL 6
2.2 RAINFALL DATA 6
2.3 VAILDATION OF THE AVAILABLE RAINFALL DATA 7
2.4 CONCLUSIONS 9
2.5 CLARIFICATIONS ON SIMULTANEOUS OCCURRENCE OF FLOODS IN KONDAVEETI VAGU CATCHMENT AND KRISHNA RIVER AT PRAKASAM BARRAGE IN VIJAYAWADA 10
2.6 OBJECTIVES OF FLOOD MODELLING 12
2.7 METHODOLOGY 12
2.8 MODEL SETUP 14
2.8.1 Current Situation 14
2.8.2 Cross-Sections 14
2.8.3 Rainfall Runoff 15
2.8.4 Downstream Boundaries 15
2.8.5 Meteorological Input 16
2.8.6 Calibration 16
2.8.7 2-Dimensional Modeling 16
2.8.8 Channels 17

2.9 RESULTS OF ANALYSIS 18
CHAPTER-3 FEASIBILITY STUDY 19
3.1 Details of Study 19
3.2 SCOPE OF WORK 19
3.3 FLOOD PROTECTION 19
3.4 OPTIONS FOR FLOOD DISCHARGE 20
3.5 CONCLSIONS & RECOMMENDATIONS 21
3.6 FINISHED ROAD LEVELS (FRLS) 22
3.7 FLOOD MITIGATION MEASURES 24
CHAPTER-4 CONCEPTUAL DESIGN 25
4.1 BACKGROUND 25
4.2 STORM WATER DISCHARGE INTO CANALS 25
4.3 SELECTED OPTION FOR FLOOD DISCHARGE 25
4.4 NOTABLE CHANGES IN THE CONCEPTUAL DESIGN STAGE 26
4.5 MEETINGS WITH TECHNICAL EXPERT COMMITTEE (TEC) 26
4.6 CONCLUSIONS 27
CHAPTER-5 OPTIONS FOR FLOOD DISPOSAL FROM CAPITAL CITY 28
5.1 GENERAL 28
5.2 OPTION-1 28
5.3 OPTION-2 30
5.4 OPTION-3 31
5.5 SELECTION OF OPTION 32
CHAPTER-6 FLOOD MITIGATION MEASURES 33
6.1 BACKGROUND 33
6.2 FLOOD MITIGATION MEASURES. 33
CHAPTER-7 DESIGN OF CANAL SYSTEM IN THE CAPITAL CITY 36
7.1 BACKGROUND 36
7.2 WIDENING AND SEEPENING OF KONDAVEETI VAGU 36
7.3 SELECTION OF CANAL LINING 36
7.4 SELECTION OF CANAL PROFILE 36

7.5 CANAL DESIGN 37
7.6 CONCLUSIONS 37
CHAPTER-8 RESERVOIRS IN THECAPITAL CITY 38
8.1 GENERAL 38
8.2 RESERVOIR DETAILS 38
8.3 RESERVOIRS OUTSIDE THE CAPITAL CITY 39
8.4 RESERVOIRS INSIDE THE CAPITAL CITY 39
8.5 NEERUKONDA RESERVOIR 39
8.6 KRISHNAYAPALEM RESERVOIR 41
8.7 Sakhamuru Reservoir 42
CHAPTER-9 FLOOD PUMPING STATIONS 43
9.1 General 43
9.2 Location and Capacity of Pumping Stations 43
9.3 Pump Configuration 44
9.4 Proposed Gravity Diversion Scheme and Pumping Capacity at Undavalli 45
9.5 Operation Philosophy 46
CHAPTER-10 INSTRUMENTATION AND CONTROL SYSTEM 48
10.1 GENERAL 48
10.2 CONTROL SYSTEM REQUIREMENTS 49
10.3 FEATURES OF THE I & C SYSTEM 50
10.3.1 Sequence of Events Recording System 50
10.3.2 Annunciation System 50
10.3.3 Water Quality Monitoring System (WQMS) 50
10.3.4 Vibration Monitoring & Analysis System 50
10.3.5 Local Instruments 51
10.3.6 Weather Monitoring Station 51
10.3.7 Instrument Erection & Enclosures 51
10.3.8 Power Supply 51
10.3.9 Cables 51

10.3.10 Testing and Calibration Instrument 52
10.3.11 Miscellaneous systems 52
10.3.12 Earthing 52
CHAPTER-11 COST ESTIMATES 54
11.1 GENERAL 54
11.2 SUMMARY OF COSTS 54
11.3 COST OF FUTURE WORKS 55
CHAPTER-12 PROJECT IMPLEMENTATION SCHEDULE AND CONTRACT PACKAGING 81
12.1 GENERAL 81
12.2 BASE COST OF THE PROJECT 81
12.3 CONTRACT PACKAGING 81
12.4 CONTRACT APPROACH 82
12.5 IMPLEMENTATION SCHEDULE 82
CHAPTER-13 CONCLUSIONS AND RECOMMENDATIONS 83
13.1 CONCLUSIONS AND RECOMMENDATIONS 83

LIST OF TABLES

Table 2.1 Historical Occurrence of Floods in Krishna River and Corresponding Rainfall Recorded in Kondaveeti Vagu Catchment..... 11
Table 6.1 Flood Risks and Mitigation Measures..... 34
Table 8.1 Details of the Reservoirs planned for Flood Management..... 38
Table 8.2 Details of Neerukonda Reservoir..... 40
Table 8.3 Details of Krishnayapalem Reservoir..... 41
Table 8.4 Sakhamuru Reservoir..... 42
Table 9.1 Design Water Levels at Pumping Stations..... 44
Table 9.2 Configuration and Type of Pumps..... 45
Table 11.1 Summary of costs..... 54
Table 11.2 Construction of Kondaveeti Vagu Canal Between Undavalli and Neerukonda for a Length of 11.0 km..... 55
Table 11.3 Construction of Pala Vagu Canal Between Dondapadu and Kondamarajupalem for a Length of 7.4 km..... 57
Table 11.4 Construction of Pala Vagu Canal Between Kondamarajupalem and Krishnayapalem for a Length of 9.3 km..... 59
Table 11.5 Construction of Gravity/Diversion Canal Between Nekkallu and Pichikalapalem for a Length of 7.843 km..... 61
Table 11.6 Cost Estimate for Neerukonda Reservoir..... 64
Table 11.7 Cost Estimate for Krishnayapalem Reservoir..... 72
Table 11.8 Cost Estimate for Sakhamuru Reservoir..... 74
Table 11.9 Instrumentation & Control Cost - Flood Management System..... 77
Table 11.10 Cost Estimate for Canal Lining (Future Work)..... 77
Table 12.1 Tender Packaging..... 81

LIST OF FIGURES

Figure 1.1 Location of Amaravati within Andhra Pradesh with the course of the Krishna River shown in red 2
Figure 1.2 Location and Connection to the Capital City (Capital City Master Plan) 4
Figure 1.3 Amaravati City Plan in the Kondaveeti Vagu Catchment Area 4
Figure 2.1 Rain gauge Stations in the Kondaveeti Vagu Catchment 6
Figure 2.2 Location of influencing Rain gauge Stations in the Kondaveeti Vagu Catchment Area 7
Figure 2.3 Isopluvial Maps (Ref: IMD, Sept 2007) 8
Figure 2.4 IMD Rainfall Data for various Return Periods 9
Figure 2.5 Conversion Factor for hydrologically similar catchment in The Netherlands 9
Figure 2.6 Model Design of Kondaveeti Vagu Catchment 13
Figure 2.7 Model Discretization using SOBEK 14
Figure 2.8 Maximum Inundation Levels resulting from 2D Model 17
Figure 3.1 Finished Road Levels along the Seed Access Road of the Capital City 23
Figure 3.2 Finished Road Levels along the Main Priority Roads of the Capital City 23
Figure 5.1 Option-1 for Flood Disposal 28
Figure 5.2 Option-2 for Flood Disposal 30
Figure 5.3 Option-3 for Flood Disposal 31
Figure 10.1 Schematic Drawing of Online based Flood and Water Quality Monitoring System 53

LIST OF DRAWINGS (VOLUME 2)

Sl. No.	Drawing Number	Title
1	TCE.10244A-CV-LM-30001	Index map of project area
2	TCE.10244A-CV- LM-30002	Location map of Capital city
3	TCE.10244A-CV- MP-30003	Blue master plan for the Capital city
KONDAVEETI VAGU CANAL		
4	TCE.10244A-CV-3023-SI-30004	Proposed Canal works from Undavalli (ch:0.00m) to Krishnayapalem reservoir (ch:3750.00m)
5	TCE.10244A-CV-3023-SI-30005	Layout plan indicating UTM co-ordinate system for Kondaveeti vagu canal
6	TCE.10244A-CV-3023-SI-30006	Plan and longitudinal section of Kondaveeti vagu canal from Undavalli (ch:0.00m) to Krishnayapalem reservoir (ch:3750.00m)
7	TCE.10244A-CV-3023-SI-30007	Cross section of Kondaveeti vagu canal from Undavalli to Krishnayapalem reservoir (Sh 01 of 03)
8	TCE.10244A-CV-3023-SI-30008	Cross section of Kondaveeti vagu canal from Undavalli to Krishnayapalem reservoir (Sh 02 of 03)
9	TCE.10244A-CV-3023-SI-30009	Cross section of Kondaveeti vagu canal from Undavalli to Krishnayapalem reservoir (Sh 03 of 03)
10	TCE.10244A-CV-3023-SI-30010	Plan and longitudinal section of Kondaveeti vagu canal from Krishnayapalem reservoir (ch:4611.00m) to Neerukonda reservoir (ch:11860.00m)
11	TCE.10244A-CV-3023-SI-30011	Cross section of kondaveeti vagu canal from Krishnayapalem reservoir to Neerukonda reservoir (sh 01 of 06)
12	TCE.10244A-CV-3023-SI-30012	Cross section of Kondaveeti vagu canal from Krishnayapalem reservoir to Neerukonda reservoir (sh 02 of 06)

Sl. No.	Drawing Number	Title
13	TCE.10244A-CV-3023-SI-30013	Cross section of Kondaveeti vagu canal from Krishnayapalem reservoir to Neerukonda reservoir (sh 03 of 06)
14	TCE.10244A-CV-3023-SI-30014	Cross section of Kondaveeti vagu canal from Krishnayapalem reservoir to Neerukonda reservoir (sh 04 of 06)
15	TCE.10244A-CV-3023-SI-30015	Cross section of Kondaveeti vagu canal from Krishnayapalem reservoir to Neerukonda reservoir (sh 05 of 06)
16	TCE.10244A-CV-3023-SI-30016	Cross section of Kondaveeti vagu canal from Krishnayapalem reservoir to Neerukonda reservoir (sh 06 of 06)
17	TCE.10244A-CV-3023-SI-30017	Typical details of seepage observation well for Kondaveeti vagu canal
18	TCE.10244A-CV-3023-SI-30018	Typical details of Bench mark and chainage pillars for Kondaveeti vagu canal
19	TCE.10244A-CV-3023-SI-30019	Definition sketch and profile details for Kondaveeti vagu canal
PALA VAGU CANAL (KONDAMARAJUPALEM TO KRISHNAYYAPALEM RSERVOIR)		
20	TCE.10244A-CV-3023-SI-30020	Proposed Canal works from Kondamarajupalem (Ch:9300.00m) to Krishnayapalem Reservoir (Ch:0.00m)
21	TCE.10244A-CV-3023-SI-30021	Layout plan indicating UTM co-ordinate system for Pala vagu canal from Kondamarajupalem to Krishnayapalem Reservoir (Sh 01 of 02)
22	TCE.10244A-CV-3023-SI-30022	Layout plan indicating UTM co-ordinate system for Pala vagu canal from Kondamarajupalem to Krishnayapalem Reservoir (Sh 02 of 02)
23	TCE.10244A-CV-3023-SI-30023	Plan and Longitudinal Section of Pala Vagu Canal from Kondamarajupalem (Ch:9300.00m) to Krishnayyapalem Reservoir (Ch:0.00m)
24	TCE.10244A-CV-3023-SI-30024	Cross Section of Pala Vagu Canal from Kondamarajupalem to Krishnayyapalem

Sl. No.	Drawing Number	Title
		Reservoir (Sh 01 Of 03)
25	TCE.10244A-CV-3023-SI-30025	Cross Section of Pala Vagu Canal from Kondamarajupalem to Krishnayyapalem Reservoir (Sh 02 Of 03)
26	TCE.10244A-CV-3023-SI-30026	Cross Section of Pala Vagu Canal from Kondamarajupalem to Krishnayyapalem Reservoir (Sh 03 Of 03)
27	TCE.10244A-CV-3023-SI-30027	Typical details of seepage Observation well for Pala vagu canal from Kondamarajupalem to Krishnayapalem Reservoir
28	TCE.10244A-CV-3023-SI-30028	Typical details of Bench mark and chainage pillars for Pala vagu canal from Kondamarajupalem to Krishnayapalem Reservoir
29	TCE.10244A-CV-3023-SI-30029	Definition sketch and profile details for Pala vagu canal from Kondamarajupalem to Krishnayapalem Reservoir
PALA VAGU CANAL (KONDAMARAJUPALEM TO KRISHNAYYAPALEM RSERVOIR)		
30	TCE.10244A-CV-3023-SI-30030	Proposed Canal works from Dondapadu (Ch:16750.00m) to Kondamarajupalem (Ch:9300.00m)
31	TCE.10244A-CV-3023-SI-30031	Layout plan indicating UTM co-ordinate system for Pala vagu canal from Dondapadu to Kondamarajupalem (Sh 01 of 02)
32	TCE.10244A-CV-3023-SI-30032	Layout plan indicating UTM co-ordinate system for Pala vagu canal from Dondapadu to Kondamarajupalem (Sh 02 of 02)
33	TCE.10244A-CV-3023-SI-30033	Plan and Longitudinal Section of Pala Vagu Canal from Dondapadu (Ch:16750.00m) to Kondamarajupalem (Ch:9300.00m)
34	TCE.10244A-CV-3023-SI-30034	Cross Section of Pala Vagu Canal from Dondapadu to Kondamarajupalem (Sh 01 Of 03)
35	TCE.10244A-CV-3023-SI-30035	Cross Section of Pala Vagu Canal from Dondapadu to Kondamarajupalem (Sh 02 Of 03)

Sl. No.	Drawing Number	Title
36	TCE.10244A-CV-3023-SI-30036	Cross Section of Pala Vagu Canal from Dondapadu to Kondamarajupalem (Sh 03 Of 03)
37	TCE.10244A-CV-3023-SI-30037	Details of Detention Pond at Kondamarajupalem
38	TCE.10244A-CV-3023-SI-30038	Typical details of seepage Observation well for Pala vagu canal from Dondapadu to Kondamarajupalem
39	TCE.10244A-CV-3023-SI-30039	Typical details of Bench mark and chainage pillars for Pala vagu canal from Dondapadu to Kondamarajupalem
40	TCE.10244A-CV-3023-SI-30040	Definition sketch and profile details for Pala vagu canal from Dondapadu to Kondamarajupalem
GRAVITY / DIVERSION CANAL		
41	TCE.10244A-CV-3023-SI-30041	Proposed Canal works from Nekkallu (Ch:0.00m) To Pichikalapalem (Ch:7843.00m)
42	TCE.10244A-CV-3023-SI-30042	Layout plan indicating UTM co-ordinate system for Gravity / Diversion canal (Sh 01 of 02)
43	TCE.10244A-CV-3023-SI-30043	Layout plan indicating UTM co-ordinate system for Gravity / Diversion canal (Sh 02 of 02)
44	TCE.10244A-CV-3023-SI-30044	Plan and Longitudinal Section of Gravity/Diversion Canal from Nekkallu (Ch:0.00m) To Pichikalapalem (Ch:7843.00m)
45	TCE.10244A-CV-3023-SI-30045	Cross Section of Gravity/Diversion Canal from Nekkallu to Pichikalapalem (Sh 01 of 03)
46	TCE.10244A-CV-3023-SI-30046	Cross Section of Gravity/Diversion Canal from Nekkallu to Pichikalapalem (Sh 02 of 03)
47	TCE.10244A-CV-3023-SI-30047	Cross Section of Gravity/Diversion Canal from Nekkallu to Pichikalapalem (Sh 03 of 03)
48	TCE.10244A-CV-3023-RC-30048	Location Plan of Aqueduct
49	TCE.10244A-CV-3023-RC-30049	General Arrangement of Aqueduct-Plan (Sh 01 of 04)
50	TCE.10244A-CV-3023-RC-30050	General Arrangement of Aqueduct- Foundation Plan (Sh 02 of 04)

Sl. No.	Drawing Number	Title
51	TCE.10244A-CV-3023-RC-30051	General Arrangement of Aqueduct-Longitudinal and Cross section (Sh 03 of 04)
52	TCE.10244A-CV-3023-RC-30052	General Arrangement of Aqueduct- Wing wall (Sh 04 of 04)
53	TCE.10244A-CV-3023-SI-30053	Typical details of seepage Observation well for Gravity / Diversion canal
54	TCE.10244A-CV-3023-SI-30054	Typical details of Bench mark and chainage pillars for Gravity / Diversion canal
55	TCE.10244A-CV-3023-SI-30055	Definition sketch and profile details for Gravity / Diversion canal
RESERVOIRS		
56	TCE.10244A-CV-3025-SK-30056	Neerukonda Reservoir - Location Map & UTM Co-ordinates
57	TCE.10244A-CV-3025-SK-30057	Neerukonda Reservoir - Plan
58	TCE.10244A-CV-3025-SK-30058	Neerukonda Reservoir - Typical Sections in Cutting and Embankment
59	TCE.10244A-CV-3027-SK-30059	General Arrangement of Spillway and Ship lock at Neerukonda Reservoir
60	TCE.10244A-CV-3027-RC-30060	Plan and section details of Gated Spillway at Neerukonda Reservoir
61	TCE.10244A-CV-3027-RC-30061	Plan and section details of Un-gated Spillway at Neerukonda Reservoir
62	TCE.10244A-CV-3025-SK-30062	Krishnayapalem Reservoir – Location Map & UTM Co-ordinates
63	TCE.10244A-CV-3025-SK-30063	Krishnayapalem Reservoir - Plan
64	TCE.10244A-CV-3025-SK-30064	Krishnayapalem Reservoir – Typical section in Cutting and Embankment
65	TCE.10244A-CV-3025-SK-30065	Sakhamuru Reservoir – Location map & UTM Co-ordinates
66	TCE.10244A-CV-3025-SK-30066	Sakhamuru Reservoir - Plan
67	TCE.10244A-CV-3025-SK-30067	Sakhamuru Reservoir – Typical section in Cutting

Sl. No.	Drawing Number	Title
68	TCE.10244A-CV-3025-SK-30068	Terminal Points & Exclusions
UNDAVALLI PUMPING STATION		
69	TCE.10244A-CV-SK-30069	Location Map of Pumping Station at Undavalli
70	TCE.10244A-ME-6173-GA-30070	General Arrangement Drawing – Plan
71	TCE.10244A-ME-6173-GA-30071	General Arrangement Drawing – Sections
72	TCE.10244A-CV-3025-RC-30072	Forebay – Plan and Section
73	TCE.10244A-CV-3074-RC-30073	Pumping Station – Longitudinal Section
74	TCE.10244A-CV-3074-RC-30074	Pumping Station – Sections
75	TCE.10244A-EL-4001-AU-40075	Key one line Diagram
76	TCE.10244A-IC-5031-CC-50076	System Configuration Block Diagram
VYKUNTAPURAM PUMPING STATION		
77	TCE.10244A-CV-SK-30077	Location Map of Pumping Station at Vykuntapuram
78	TCE.10244A-ME-6173-GA-30078	General Arrangement Drawing – Plan
79	TCE.10244A-ME-6173-GA-30079	General Arrangement Drawing – Sections
80	TCE.10244A-CV-3025-RC-30080	Forebay – Plan and Section
81	TCE.10244A-CV-3074-RC-30081	Pumping Station – Longitudinal Section
82	TCE.10244A-CV-3074-RC-30082	Pumping Station – Sections
83	TCE.10244A-IC-5031-CC-50083	System Configuration Block Diagram
I&C		
84	TCE.10244A-IC-5031-CC-50084	Capital City I&C System Block Diagram

APPENDICES

Appendix-1: Summary of Inputs, Assumptions and Constraints

Appendix-2: Results of Sobek Modelling Carried out During Feasibility Study

Appendix -3: Results of SOBEK Modeling Carried out During Concept Study

Appendix-4: Technical Expert Committee (TEC) - Third Meeting For Flood Management of Kondaveeti Vagu -Draft Minutes of Meeting

Appendix -5 Note on Canal Lining

Appendix -6 Note on Selection of Canal Profile

Appendix -7 Design Information of Canals

Appendix-8 Design Calculations of Reservoir

Appendix-9 Design Calculations of Pumping Station

Appendix-10: Project Implementation Schedule for Blue Consultant Project

Appendix-11 Geotechnical Investigation Report for Blue Consultant Project

CHAPTER-1
INTRODUCTION

1.1 BACKGROUND

Government of Andhra Pradesh (GoAP) proposes to establish 'Amaravati', a world class capital city for the newly formed State. The Amaravati capital city is proposed to be located on the right bank of perennial River Krishna in Guntur district of Andhra Pradesh. The capital city development is proposed to be over an area of about 217 km^2. The capital city area is bestowed with rich natural features including hillocks, river islands, abundant water, fertile soil and greenery. While abundance of water is a boon for the capital city, seasonal flooding driven by Kondaveeti Vagu and river Krishna poses a threat to the city. Figure 1.1 presents the location of the proposed capital city. The details of location and Blue Master Plan are presented in drawing no.TCE.10244A-CV-LM-30001, TCE.10244A-CV-LM-30002 and TCE.10244A-CV- MP-30003.

Under the vision of developing a sustainable and green Capital city, the GoAP intends to leverage these natural advantages to the best and deal with the challenges posed. As part of this, the GoAP plans to develop comprehensive network of brown field and green field urban waterways, robust flood management systems and develop its riverfront. Blue Consultant, a consortium of M/s. TATA Consulting Engineers Limited, India and M/s. ARCADIS, Netherlands was entrusted the task of preparing Detailed Project Report (DPR) including preparation of bid documents for the following three tasks for Amaravati capital city:

(i) Flood management system for the capital city
(ii) Development of Urban waterways in Amaravati
(iii) River training works for Krishna river including strengthening of right flood bank

1.2 SCOPE OF WORK

The scope of work as mentioned by the RFP is summarized here for reference purposes:

1. Undertake feasibility study
    a. Flood management measures in the capital by improving Kondaveeti Vagu and its in-falling drains to required standards for safe disposal of flood discharge, and prevent to inundation
    b. Leverage flood management studies to identify locations for developing multi-purpose reservoirs

c. Contribute to plan for road network duly fixing the top levels in consideration of the floods for avoiding inundation or breaches

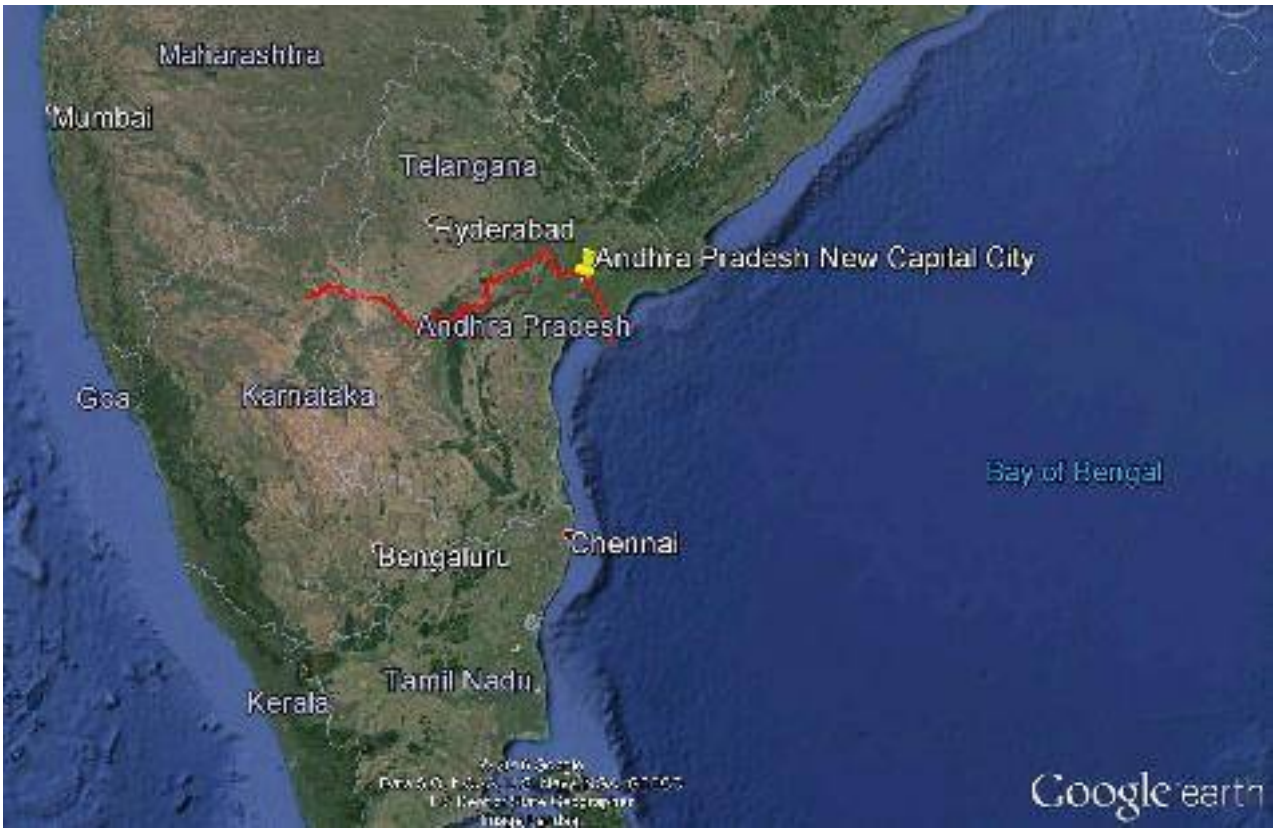

Figure 1.1 Location of Amaravati within Andhra Pradesh with the course of the Krishna River shown in red

2. Concept plan
3. Standards & Design
   a. Reservoir design should include structuring and capacity tables for arriving at gross, net storage and all salient features
   b. CPHEEO manual, BIS standards or applicable British/American standards
   c. System should be durable and easy to implement, operate and maintain

1.3 CHOICES TO BE MADE

The feasibility of having a flood management for the capital city Amaravati holds a number of options or choices. These choices include, but are not limited to, the water level to be maintained in the urban water system, the maximum allowable size of vessels able to enter the urban water system, the geometry of the bund, the height of roads, the use of bunds along the future course of the Kondaveeti Vagu and Pala Vagu, the number of embankment / dis-embarkment sites etc.

Flood management concerns the seasonal flooding of the Kondaveeti Vagu and its in-falling drains. Numerical hydrological modeling shows the flood hazard is at its peak after the

construction of the build area of Amaravati. The expected peak flow increased due to the effect of the increased rainfall runoff rate from the paved areas. Analysis of rainfall shows the normative event for the 1/100 year situation is 222 mm of rain during 24 hours. The hydraulic numerical modeling indicates the normative event for flooding could as well be two consecutive days with a lesser rainfall of approximately 180 mm of rainfall or comparable. To compensate for the uncertainty in translating rainfall events and rainfall statistics we recommend a slightly over dimensioned design of the waterways themselves.

For the present study, the normative conditions are considered to exist after finalizing the construction of the city. As the canals are proposed to be constructed as soon as possible, these canals will seem to be over dimensioned during the build phase.

The management of water levels in the reservoirs determines the absolute height of the water levels during normative conditions. Fully filled reservoirs result in a substantial higher flood level than reservoirs which are emptied in anticipation of a torrential rain event. For the feasibility we assume a normative water level based on flood predictions. Assuming fully filled reservoirs without preemptive emptying of the reservoirs would result in substantial higher road levels and thus a significantly higher CAPEX.

After finalizing the constructions phase of the city the canal system will be slightly over dimensioned as compensation for numerical and statistical uncertainties. This final design will still “fit” within the spatial constraints as given by the master plan. Therefore we deem the management of seasonal flooding feasible.

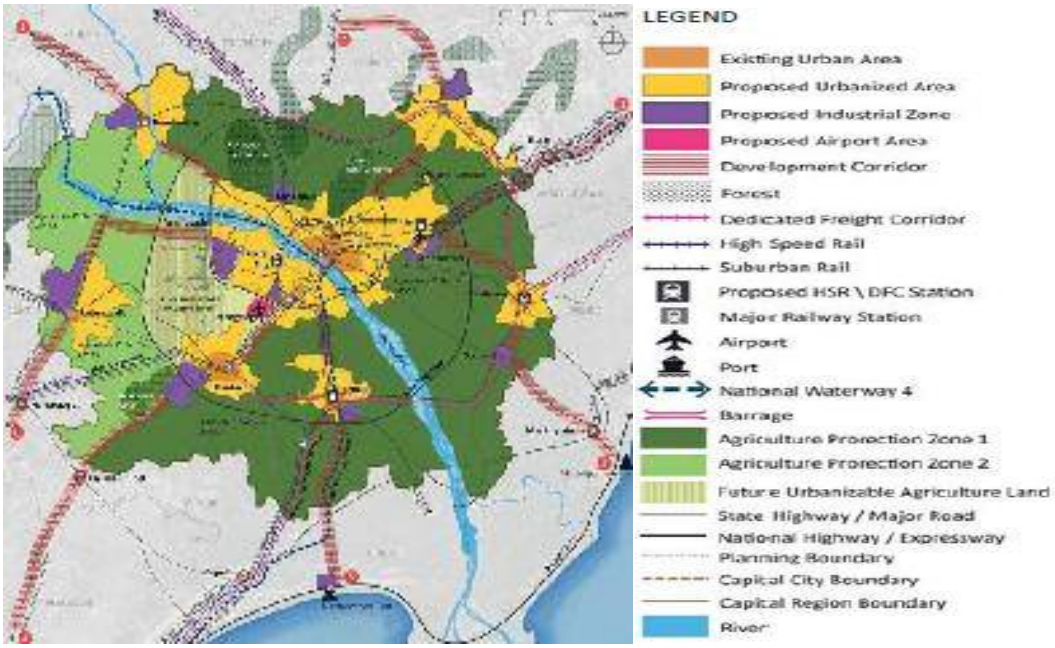

Figure 1.2 Location and Connection to the Capital City (Capital City Master Plan)

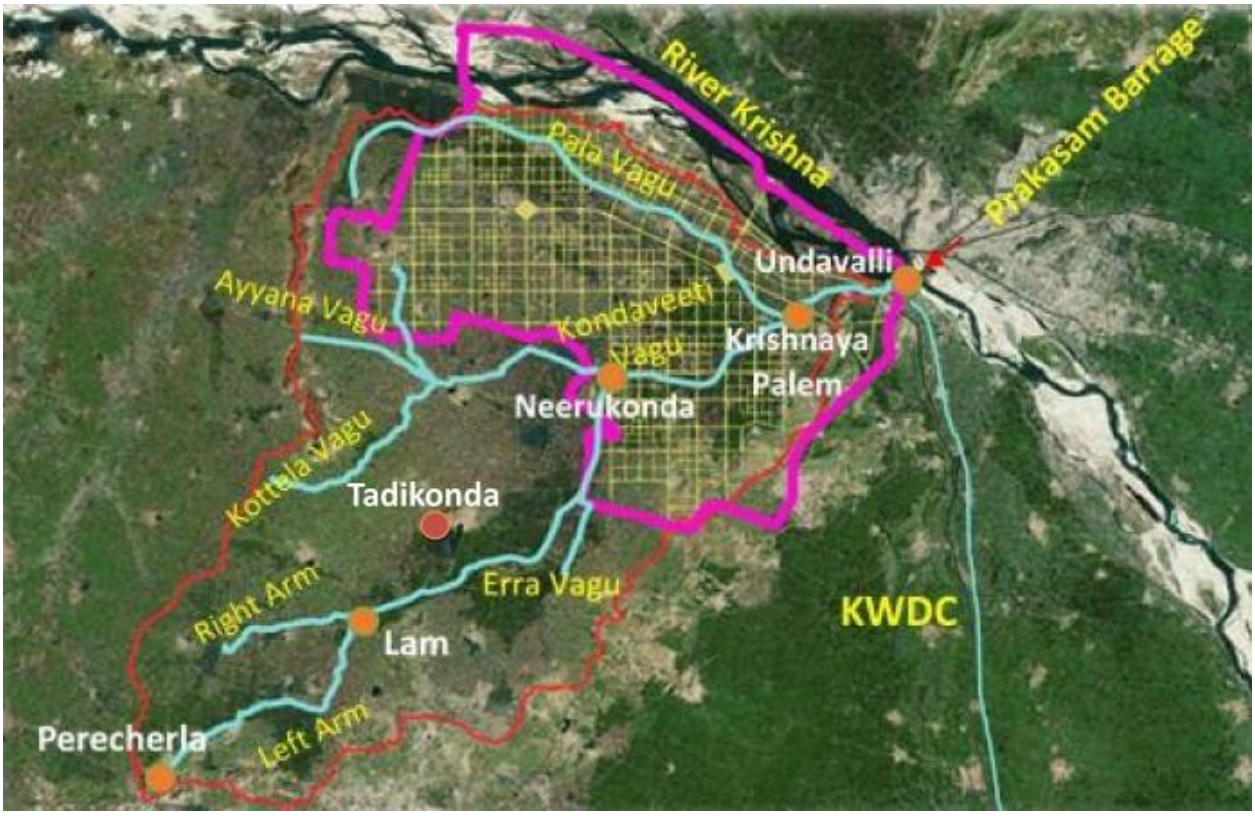

Figure 1.3 Amaravati City Plan in the Kondaveeti Vagu Catchment Area

Figure 1.2 shows the location and connection to the Capital City as per the Master plan. Figure 1.3 presents the Amaravati Capital City Plan inserted in the Kondaveeti Vagu catchment area. Technically all the measures needed for flood protection, stabilization of the right bank and island

in the Krishna River and the creation of a navigable urban water system are feasible. The investigations and studies which underpin this conclusion made it clear the urban water system will be a fairly technical system. The combination of flood protection and navigability requires regulating works such as weirs and ship locks which have to be maintained and operated. This is of course nothing out of the ordinary, but is does require attention from the responsible authorities as the consequences of systems failure will be severe and large parts of the future city can suffer from pluvial rain flooding as well as flooding from the surface water as a result of partial or total system failure.

From a water management point of view the location for Amaravati is not optimal. Under current conditions flooding during the monsoon already occurs. Natural discharge from regional water systems as the Kondaveeti Vagu is hindered by the existing bund and its regulating works as well as the regime of the Prakasam Barrage. Change of land use from agriculture to urban environment increases peak runoff resulting in a faster discharge of pluvial water and subsequent higher water levels downstream. As a result the normative condition, i.e. the conditions determining the maximum flood levels, is determined by the future situation in which the city is fully developed. This also implies that the water system has to be defined according to this fully developed situation.

The spatial restrictions implied by the city design do limit optimization of the water system design. More space for water reservoirs and storage areas has been emphasized in earlier studies. Even with the added room for green areas and water storage areas the need for pumping stations remains. This also has to do with the natural characteristics of the area. The need for permanent pumping capacity is clear and cannot be avoided. The needed capacity can be optimized, this requires the active control of water levels in the reservoirs and a flood early warning system. A conflict of functions occurs as the reservoirs are also designed for water storage / water conservation. By allowing active water level management during the monsoon with restrictions near the end of the monsoon period a functioning system with optimized pumping capacity can be realized. Preliminary optimization has taken place in this feasibility phase and will be fine-tuned during the conceptual and final design phases. The Blue Master Plan

CHAPTER-2
HYDROLOGY

2.1 GENERAL

The modeling of the Kondaveeti Vagu (KV) catchment is a necessity in the process of flood management measurements and urban waterway design. With the hydraulic model water levels in the Kondaveeti Vagu catchment can be predicted in different design scenarios. For the model design conditions are defined as a once in a hundred years precipitation event.

2.2 RAINFALL DATA

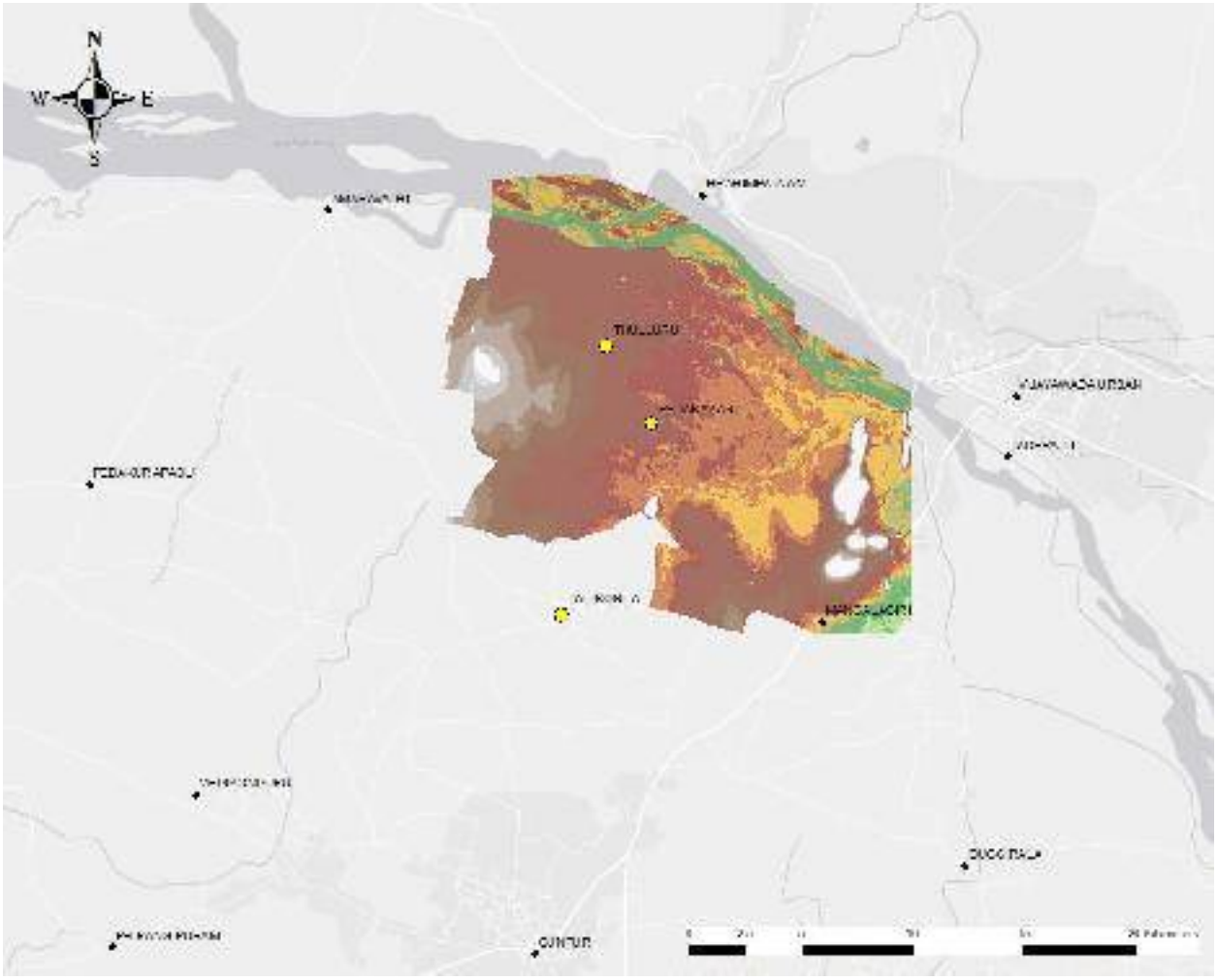

Figure 2.1 Rain gauge Stations in the Kondaveeti Vagu Catchment

Figure 2.1 presents the location of the Rain gauge stations in the Kondaveeti Vagu catchment area. Rainfall data from these stations are examined for consideration in the studies.

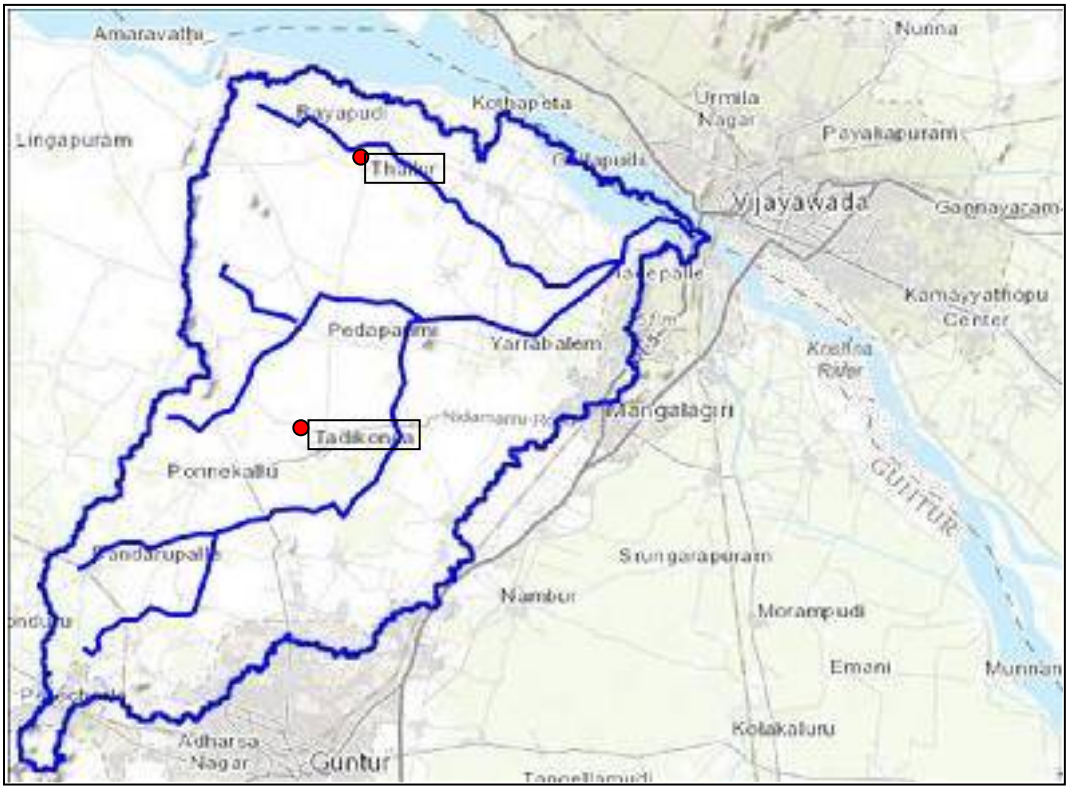

Figure 2.2 Location of influencing Rain gauge Stations in the Kondaveeti Vagu Catchment Area

Figure 2.2 above presents the location of the two Rain gauge stations at Thalluru and Tadikonda within the Kondaveeti catchment area that influences the hydrological characteristics and the runoff from the said catchment.

On a careful review of the available data at these rain gauge stations it is inferred that the following three rain gauge stations at Thulluru, Pedakakani and Tadikonda influence the rainfall characteristics of the catchment area under study and hence 25 years of rainfall data from these are utilized for the calculation of flood flow from the catchment area.

Furthermore, the presence of Mountain ranges, causes s different rainfall pattern and regime on to places like Guntur and Mangalagiri though they are located in the vicinity of the proposed capital city.

2.3 VAILDATION OF THE AVAILABLE RAINFALL DATA

Available rainfall data from the rain gauge stations in the Kondaveeti Vagu catchment is further validated for its authenticity by making a comparison of the same with the available

meteorological data from the Indian Meteorological Department (IMD). Figure 2.3 presents the Isopluvial Map from the IMD dataset for 100 years. On a review of the data it is observed that the daily rainfall intensity lies between 260 and 280mm for the area under consideration.

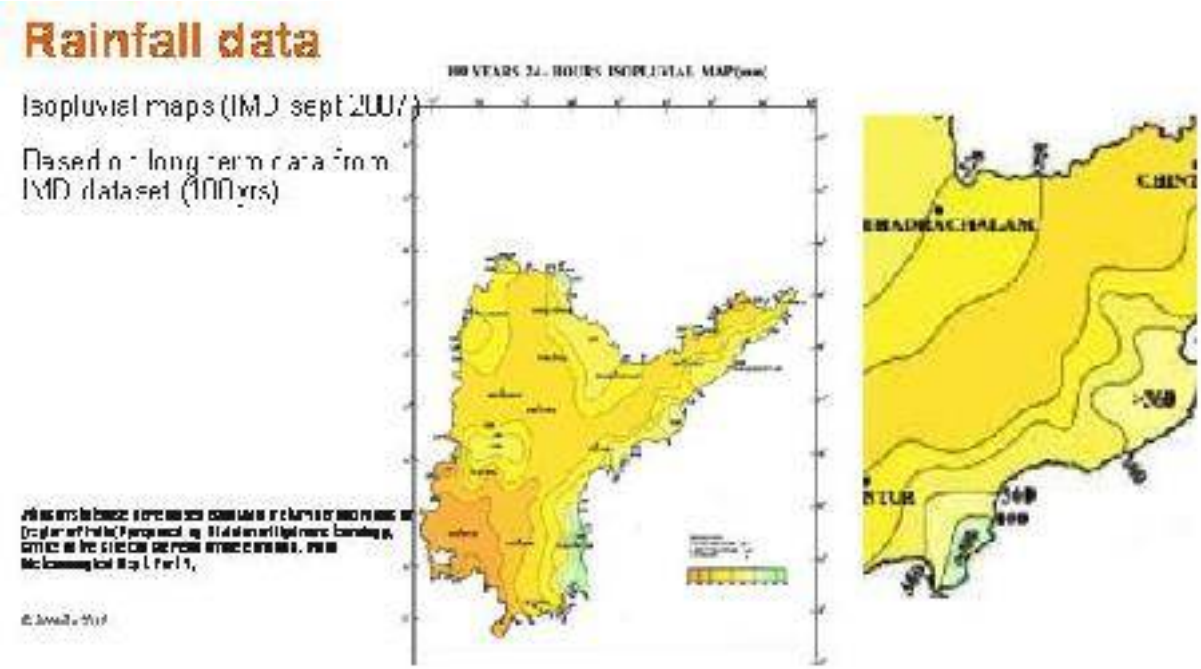

Figure 2.3 Isopluvial Maps (Ref: IMD, Sept 2007)

Figure 2.4 presents the comparison of the rainfall data from the Iso-pluvial maps of IMD corresponding to various Return Periods. As observed, for a Return Period of 100 years considered for the present study, the rainfall data is provided to be less than 280mm. Furthermore, the figure also indicates that the factor to be used for extrapolating the 5 year return period rainfall data to 100 year rainfall data is 1.75.

A comparison of this factor from a hydrologically similar catchment in The Netherlands is made. It is observed that the conversion factor is 1.68 (Refer Figure 2.5). This is therefore comparable with the conversion factor of 1.75 as in Figure 2.4.

Thus the Daily Design Rainfall data to be used for the catchment under study which is 222 mm is well within the available data and return period factor and therefore stands validated.

Figure 2.4 IMD Rainfall Data for various Return Periods

Rainfall return period

- Rainfall data from the Netherlands, intensities and duration
- From T5 to T100 factor 1.60

	1	2	3	4	6	8	12	24	36	48	72	
1	14.00	17.00	19.00	21.00	22.50	24.00	27.00	33.00	37.00	41.00	48.00	
2	18.00	21.00	23.00	25.00	27.00	29.00	32.00	38.00	43.50	48.00	54.00	
5	23.00	28.00	30.50	31.00	33.50	36.00	40.00	47.00	52.50	58.00	64.00	
10	27.00	31.00	34.00	36.00	38.50	41.00	46.00	54.00	60.00	65.00	72.00	
20	30.00	35.00	38.00	41.00	44.00	47.00	52.00	61.00	68.00	73.00	80.00	
25	34.00	38.00	41.00	43.00	46.00	49.00	54.00	63.00	70.00	75.00	83.00	
50	38.00	42.00	45.00	49.00	52.50	56.00	61.00	71.00	78.00	84.00	91.00	
100	43.00	48.00	52.00	55.00	58.50	62.00	68.00	79.00	85.50	92.00	100.00	
200	48.00	54.00	58.00	61.00	65.00	69.00	75.00	87.00	94.00	101.00	109.00	
250	51.00	58.00	61.00	65.00	70.00	74.00	80.00	93.00	100.00	107.00	117.00	

www.knmi.nl
www.stowa.nl

Figure 2.5 Conversion Factor for hydrologically similar catchment in The Netherlands

2.4 CONCLUSIONS

Based on the existing 25 year rainfall data in the Kondaveeti Vagu catchment and the important effective rain gauge data among them and comparison of the factor to be used for extrapolation of the current available 25 year rainfall data to 100 year return period and the subsequent comparison of the conversion factor with a similar hydrological catchment from The Netherlands as detailed in the previous sections, following conclusions can be drawn:

a) A 24h T100 rainfall event does not show intensities over 30mm/hour
b) A 24h T100 rainfall event does have a 90% upper limit of 175 to 180mm based on Gumbell Distribution
c) Raw rainfall data at Guntur results in an isolated rainfall event of 240mm

Considering the above conclusions a rainfall event of 222mm in 24 hours is used for all calculations of flood flow.

2.5 CLARIFICATIONS ON SIMULTANEOUS OCCURRENCE OF FLOODS IN KONDAVEETI VAGU CATCHMENT AND KRISHNA RIVER AT PRAKASAM BARRAGE IN VIJAYAWADA

The flood discharge of Kondaveeti Vagu is entirely dependent on the magnitude of rainfall occurring over the catchment area. Hence, a review of observed rainfall data in the catchment vis-a-visa peak annual flood discharge of Krishna River recorded at Prakasam Barrage, Vijayawada is made considering the recent 25 years period (i.e., 1990-91 to 2014-15).

The observed rainfall data at Thullur and Tadikonda rain gauge stations which represent significantly the catchment and which are located within the catchment of Kondaveeti Vagu (Refer Figure 2.2) is considered for the above stated purpose.

Based on review of historical flood records of Krishna River at Prakasam Barrage at Vijayawada for the recent 25 years period, a maximum flood discharge of 31,447 m^3/s (which corresponds to 100 year peak flood of Krishna River) was observed on 05th October 2009. The corresponding rainfall recorded at Thullur and Tadikonda rain gauge stations on the above date is nil (i.e., 0 mm).

In order to make a realistic assessment of probability of simultaneous occurrence of peak floods in both the river basins, rainfall and flood records of Kondaveeti Vagu catchment and Krishna River are reviewed with the available data for recent 25 years period. The observed peak annual flood of Krishna River for each year along with date of occurrence is extracted from flood records. Further, the corresponding rainfall observed at Thullur and Tadikonda rain gauge stations for the above date is extracted from rainfall data. The summary of above data is shown in Table 2.1.

Table 2.1 Historical Occurrence of Floods in Krishna River and Corresponding Rainfall Recorded in Kondaveeti Vagu Catchment

Sl. No.	Year	Peak Annual Flood (m^3/s)	Date of Occurrence	Corresponding Rainfall (mm) observed at	
				Tadikonda	Thullur
1.	1990-91	12239	23-Aug-90	0	0
2.	1991-92	11306	6-Aug-91	2	2
3.	1992-93	4072	12-Sep-92	0	0
4.	1993-94	8724	22-Oct-93	0	0
5.	1994-95	12366	24-Jul-94	35	34
6.	1995-96	3764	21-Oct-95	34	10
7.	1996-97	12323	4-Oct-96	9	15
8.	1997-98	13120	31-Aug-97	0	0
9.	1998-99	25082	16-Oct-98	0	0
10.	1999-00	5864	15-Aug-99	0	0
11.	2000-01	8135	24-Aug-00	16	20
12.	2001-02	4486	1-Oct-01	0	9
13.	2002-03	165	26-Aug-02	0	0
14.	2003-04	578	8-Aug-03	20	29
15.	2004-05	1481	5-Aug-04	0	32
16.	2005-06	20545	20-Sep-05	140	183
17.	2006-07	14636	17-Aug-06	3	12
18.	2007-08	14590	21-Sep-07	20	54
19.	2008-09	10580	11-Aug-08	0	0
20.	2009-10	31,447	5-Oct-09	0	0
21.	2010-11	6954	6-Sep-10	5	17
22.	2011-12	11812	10-Sep-11	0	0
23.	2012-13	10899	4-Sep-12	5	38
24.	2013-14	13227	26-Oct-13	9	13
25.	2014-15	3670	17-Sep-14	18	30

From Table 2.1, it can be seen that the rainfall in Kondaveeti Vagu catchment is either nil or marginal when there is peak flood in Krishna river for all years, except for 2005-06. During 2005-06, the peak flood observed in Krishna river is about 20,545 m^3/s (which is about 65% of 100

year flood of Krishna river) and the corresponding average rainfall in Kondaveeti Vagu catchment is about 162 mm (which is less than the 100 year rainfall of 222 mm considered in the design).

From the above, it can be concluded that simultaneous occurrence of peak floods in Krishna River and Kondaveeti Vagu catchment (capital city) has a low probability. Since, flood management of capital city is regulated with pumping stations; its relevance is only in design of pumping stations. The pumping station will be designed to cater to the above condition.

Based on points discussed above, it is to be noted that the joint probability of simultaneous occurrence of 100 year peak floods in both river basins and pump/power failure is expected to be low (i.e. return period of occurrence of such a scenario will be greater than 100 years). Hence, the risk associated with power/pump failure during the occurrence of a 100 year flood can be categorized as "**Low Probability High Risk**" event. It would be uneconomical to design the entire flood management system of capital city to cater to such an event. However, to avoid any loss of life or damage to critical infrastructure, risk mitigation measures (preventive and backup) are recommended to be adopted for the capital city.

2.6 OBJECTIVES OF FLOOD MODELLING

With the hydraulic model the following objectives are to be achieved:

- Provide minimal dimensions of an urban waterway system with which a safe disposal of flood discharge is possible;
- Provide minimum road levels for the principal roads which provide free access of the capital during flood discharge;
- Identify the effect of multipurpose reservoirs on flood discharge;
- Provide a navigable connected water system within the City boundaries;
- Provide recommendations to maintain good water quality;
- Provide recommendations for further analysis in flood control measurements and urban drainage design.

2.7 METHODOLOGY

Modeling the Kondaveeti Vagu catchment is done using the SOBEK1 2.14.001 rural package. From this modeling package the Rainfall Runoff (RR) and 1 dimensional flow (1D-FLOW) modules are used to model this catchment. Initially, the current situation is modeled to determine the competence of the model. After a successful reproduction and analysis of the T100 flood

a. [1]https://www.deltares.nl/en/software/sobek/

discharge the model can be adapted to simulate the functioning of the water system in the Amaravati Capital City Master Plan.

SOBEK is a modeling suite developed by Dutch national knowledge institute Deltares, Standard software for all Dutch water authorities and used internationally in many countries.

Designed for:

- flood forecasting,
- optimization of drainage systems,
- control of irrigation systems,
- sewer overflow design,
- river morphology

The modules within the SOBEK modeling suite simulate the complex flows and the water related processes in almost any system. The modules represent phenomena and physical processes in an accurate way in one-dimensional (1D) network systems and on two-dimensional (2D) horizontal grids. It is the ideal tool for guiding the designer in making optimum use of resources.

Figure 2.6 presents the way in which the Kondaveeti Vagu catchment model under study is designed to cater to two basic divisions of the entire catchment (421 sq km) into upper catchment (190 sq km) and lower catchment (231 sq km).

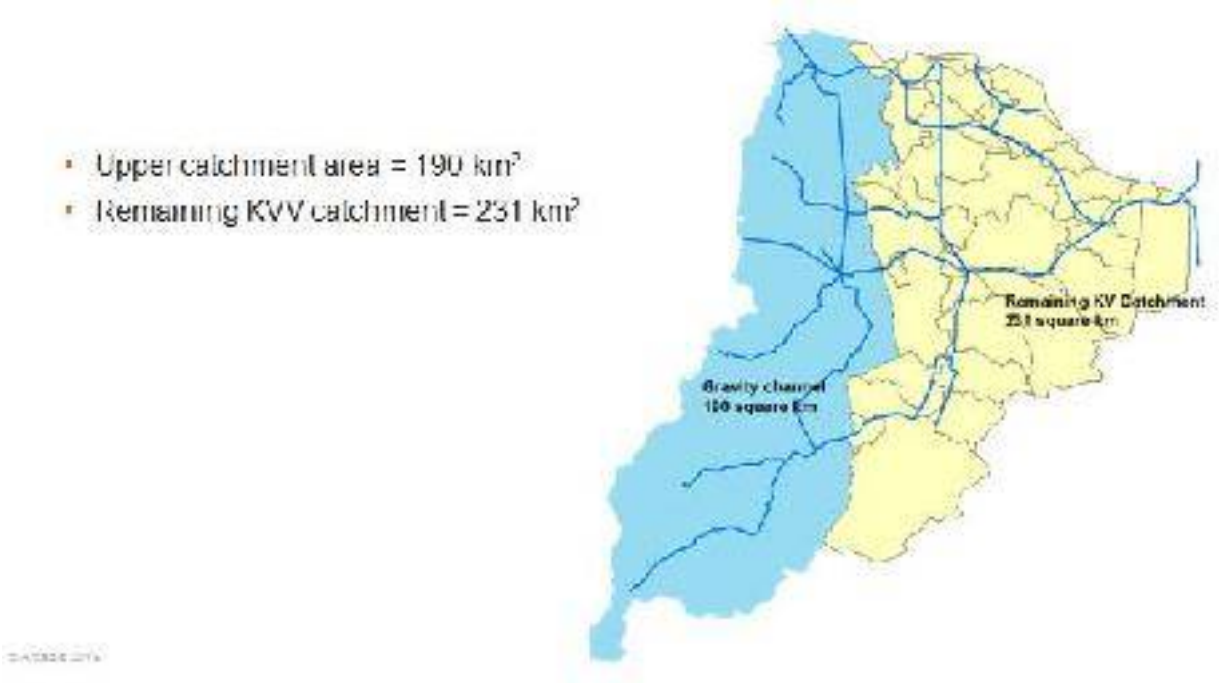

Figure 2.6 Model Design of Kondaveeti Vagu Catchment

Figure 2.7 Model Discretization using SOBEK

Both the upper catchment and the lower catchment of the Kondaveeti Vagu and its in-falling drains is discretized into various elements as indicated in Figure 2.7 above.

2.8 MODEL SETUP

2.8.1 Current Situation

The model is based on the available GIS data. Using the DEM the Kondaveeti Vagu catchment is calculated with ArcGIS software. The Catchment area of Kondaveeti Vagu is about 421 km^2 with elevations between 17m and 30m above mean sea level.

2.8.2 Cross-Sections

The cross-sections of all channels in the current situation are based on the DEM. For all channels, approximately every 500 m. apart, a transverse line 400 m. long is created. All these lines are then converted to points, 10 m. apart. These points are then assigned the elevation of the DEM pixel on which they lay. The center 2 points are lowered 2.0 m. artificially creating a 20 m. wide channel with a bottom level 2 m. below ground level. All cross-sections are imported to

SOBEK (with the tool Turtle2) and checked. Irregular cross-sections are deleted. The model contains 172 cross sections.

2.8.3 Rainfall Runoff

To accurately include the surface runoff of precipitation the Kondaveeti Vagu catchment is divided in sub-catchments. All channels are cut into segments of approximately 2000 m resulting in 61 segments. For each segment a sub-catchment is calculated based on the DEM using the DTM2CAT tool. For each channel segment a point is imported to SOBEK. On this point rainfall runoff flows into the channel from unpaved and paved nodes. For each sub-catchment the area and the mean elevation are calculated. In the current situation 95% of a sub-catchment area is appointed to unpaved nodes and 5% to the paved nodes. The model contains 61 unpaved area nodes and 61 paved area nodes.

Due to land use change from agricultural use to urban area there will be an increased paved surface. To include this change in the model the areas represented by paved and unpaved areas are changed.

Based on the city design the city area is reconnected to the channel. Within city boundaries the paved area is set to 64% and unpaved set to 36%. Default parameters for drainage and subsoil processes are used.

During discussions with urban design consultant the option for reduction of drain discharge to current discharge was mentioned. This will be included in design considerations.

2.8.4 Downstream Boundaries

At the downstream end of the Kondaveeti Vagu, the Undavalli outfall and the Krishna Western Delta Canal are the downstream boundaries of this hydrological model. The water level at the Undavalli outfall can be modified to represent low (17.1 m RL) or high (21 m RL) in the Krishna River just upstream of the Prakasam barrage. In case the water levels are high a pump with capacity of 300 cumecs is used to discharge the water from the Kondaveeti Vagu. Water can also discharge to the Krishna Western Delta Canal which has a water level of 17 m RL. A sluice which represents the escape regulator 3 limits the discharge to 170 m3/s. although a maximum of 85m3/s (115 m3/s in the dry season) was mentioned in a meeting with the client.

[2] http://www.modelwalhalla.nl/cgi-bin/wiki/view/Tools/TurtleRural

[3] Report on Flood modeling & management measures of Kondaveeti Vagu, M/s. Aarvee Associates, May 2016

2.8.5 Meteorological Input

Modeling is done using daily measurements from the stations in KV catchment, stations Thullur and Tadikonda. To simulate a T100 event a rainfall event is created using the data of a wet monsoon combined with the T100 values (212 and 183 mm/day respectively) as defined in the Aarvee3 report.

Further analysis of the effect of rainfall data includes the use of the Gannavaram hourly rainfall data. These are normalized for daily totals to obtain hourly distributed rainfall. Analysis shows that hourly rainfall distribution at T100 reaches a simulated peak intensity of 36mm / hour 3 thus causing minimal differences with daily values.

2.8.6 Calibration

With SOBEK it is possible to include evapotranspiration in the model as daily evaporation values. Also soil processes are used in the modeling process. In order to obtain a valid simulation result the parameters in the model need to be adjusted to match model outcome with measured water levels and volumes.

In the KV catchment no water levels or discharge measurements are available. The only calibration value is a maximum discharge of 460 cumecs at the confluence point of KV with River Krishna.

2.8.7 2-Dimensional Modeling

Since the model of the current situation predicts discharge like there would be no inundations a coupled 1D/2D model was made using a 100 by 100 m grid based on the DEM. The results show large inundated areas and low peak discharge due to the huge amount of water that is stored at surface level.

For the construction of the design model, the Amaravati Master Plan V4 is used. Within city boundaries, the existing channels are removed and the waterways from the master plan are included in the model. The simulated situation is the T100 design flood.

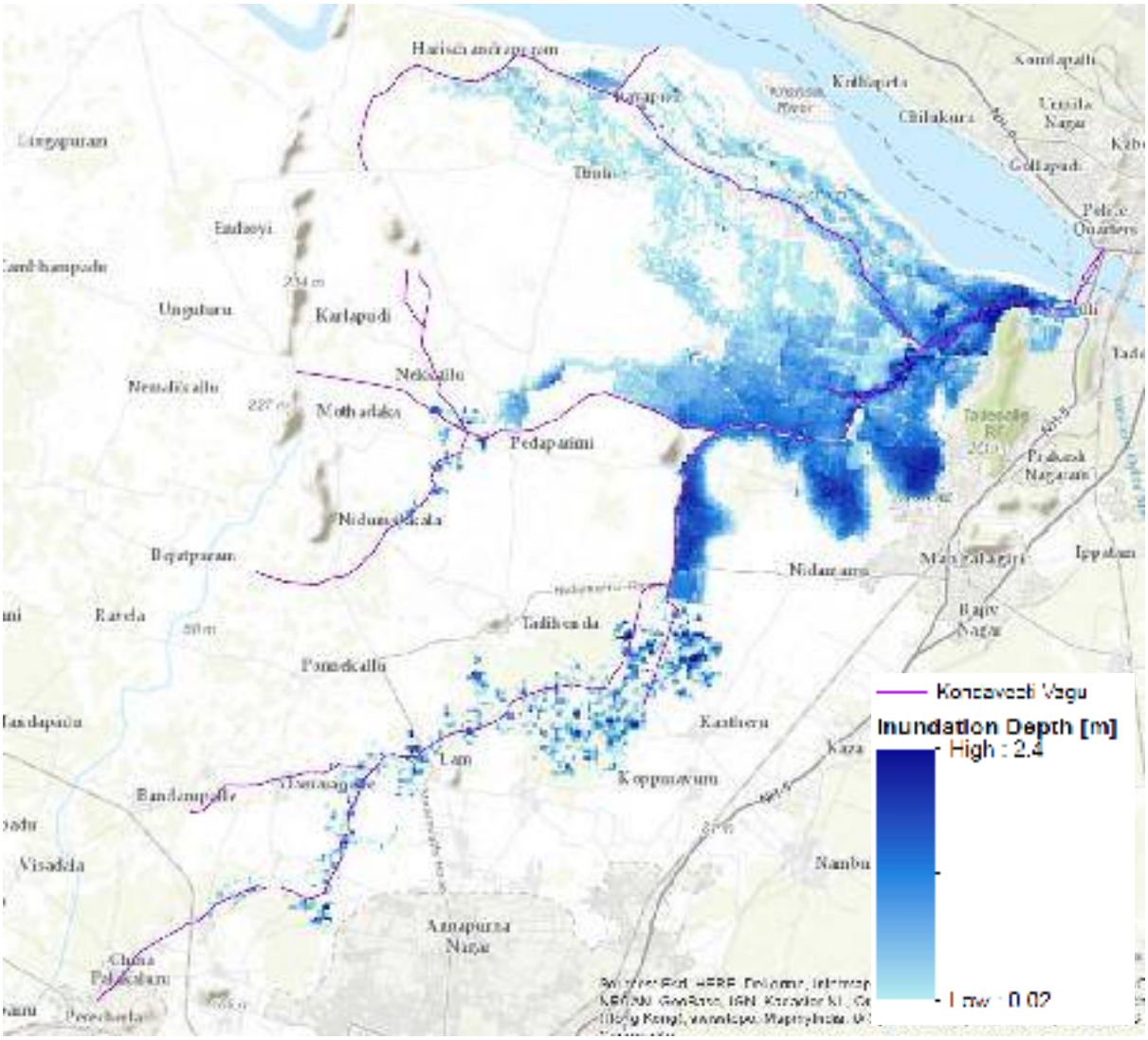

Figure 2.8 shows maximum inundation levels.

2.8.8 Channels

Based on the Master Plan V4 the new water network is imported into the model. Two versions are distinguished, a version in which a diversion of the upstream catchment area is included and a version without bypass.

Cross sections of channels are made based on the discussed profiles during site visits and meeting with client and further optimized for navigation and lowering of T100 flood levels during design.

Navigable channels are defined as waterways with minimal dimensions as per the Indian Standards and Indian Water Authority of India (IWWA). As flood protection dimensions are larger than the minimal navigable dimensions the navigable dimensions are easily met.

2.9 RESULTS OF ANALYSIS

The Results of Analysis using SOBEK software carried out during the Feasibility Study are presented in Appendix-2.

CHAPTER-3
FEASIBILITY STUDY

3.1 DETAILS OF STUDY

A Feasibility Report highlighting the feasibility of disposal of peak floods along with the buffer for green development was submitted to ADC in August 2016. Available choices for having flood discharge from the capital city for a storm equivalent to 1 in 100 year return period was carried out. The Report suggested that the proposed capital city can be technically protected against a flood event of 1 in 100 year storm. This report was submitted in August 2016.

3.2 SCOPE OF WORK

The scope of works for Feasibility Report for Flood Management as per the RFP for the project is as follows:

i) Undertake feasibility study
- Flood management measures in the capital by improving Kondaveeti Vagu and its infalling drains to required standards for safe disposal of flood discharge, and prevent to inundation
- Leverage flood management studies to identify locations for developing multi-purpose reservoirs
- Contribute to plan for road network duly fixing the top levels in consideration of the floods for avoiding inundation or breaches

ii) Concept plan

iii) Standards & Design
- Reservoir design should include structuring and capacity tables for arriving at gross, net storage and all salient features
- CPHEEO manual, BIS standards or applicable British/American standards
- System should be durable and easy to implement, operate and maintain

3.3 FLOOD PROTECTION

The water system can be designed in such a way that a 1/100 year event, defined as 222 mm precipitation in one day, will not lead to inundations of the new to be build capital city. This however requires substantial dimensions of the canals in width as well as in depth and the necessity of pumping capacity.

Numerical hydraulic modeling shows the most hazardous situations occur after the realization of the city. The introduction of paved areas, even with the proposed density of around 60% paved and 40% green areas, leads to peak discharges which are larger than the peak discharges in the current situation. This includes a future situation where the discharge upstream of Lam reservoir is redirected into a new to be build canal which discharges into Krishna River in the western part of the city.

Canal dimensions as proposed are designed to handle a 1/100 year peak precipitation event under the presumption of sufficient pumping capacity in the eastern part of the city, near Undavalli outlet, i.e., confluence point of Kondaveeti Vagu, Krishna River and Buckingham Canal.

The active management of water levels in the reservoirs determines the absolute height of the water levels during normative conditions. Fully filled reservoirs result in a substantial higher flood level than reservoirs which are emptied in anticipation of a torrential rain event. For design purposes we will assume a controlled water level based on flood predictions preliminary optimization has taken place by assuming active water level control in the water reservoir. The numerical model shows a significant reduction in expected water levels during peak discharges if the reservoirs are actively managed.

3.4 OPTIONS FOR FLOOD DISCHARGE

Following Three (3) options of flood discharge from the capital city to River Krishna as identified by the Technical Expert Committee (TEC) appointed by the Government of Andhra Pradesh in discussion with the then appointed Consultant (M/s. Aarvee Associates for flood study prior to the advent of Blue Consultant) were concurred upon by the Blue Consultant as the possibilities for flood discharge from the Capital city. These three options are:

Option-1: Flood Discharge by gravity through a) existing Kondaveeti Vagu and Pala Vagu and their infalling drains from the lower catchment through Neerukonda and Krishnayapalem Reservoirs within the Capital city; b) discharge through proposed gravity canal from Lam Reservoir to Vykuntapuram Reservoir via Pedaparimi Reservoir, all lying outside the capital city Amaravati in the upper catchment; and c) Pumping of excess water from Undavalli to River Krishna in the lower catchment and from Vykuntapuram in the upper catchment.

Option-2: Flood Discharge by gravity through a) existing Kondaveeti Vagu and Pala Vagu and their infalling drains from the lower catchment through Neerukonda and Krishnayapalem Reservoirs within the capital city; b) discharge from Lam Reservoir till

Neerukonda Reservoir and further to River Krishna through the proposed Central Vista Canal passing through the Secretariat Complex catering the upper catchment; and c) Pumping of excess water from Undavalli to River Krishna in the lower catchment and from Vykuntapuram in the upper catchment.

Option-3: Flood Discharge by gravity through a) Kondaveeti and Pala Vagu and its in-falling drains and b) Pumping all the flows from both upper catchment and lower catchment at Undavalli.

It is to be noted that the flood modeling was carried out based on the Digital Elevation Model (DEM) obtained from Amaravati Development Corporation (ADC) and Andhra Pradesh Capital Region Development Authority (APCRDA) and post discussions with various Stake holders apart from various Governmental bodies and Departments that concluded that Option-2 for flood discharge to be the optimum though earlier studies including the TEC recommendation was for Option-1 which delineated the entire catchment into upper and lower catchment and the flood discharge from the upper catchment was through the proposed gravity canal. Including this pumping of flood waters included at two places – one from Undavalli and the other one from Vykuntapuram as against pumping only at Undavalli that was suggested by earlier studies.

The main reasons that were responsible for the changes proposed compared to the earlier studies were as follows:

1. Option-1 was not considered in view of the land acquisitions that would result for three reservoirs Lam, Pedaparimi and Vykuntapuram that lie outside the capital city and were expensive and time consuming.
2. Option-2 involved the flood discharge through the Central Vista in the Secretariat Area that was aesthetically not acceptable.
3. Extra Pumping Station at Vykuntapuram in the western part of the capital city was recommended in view of the river modeling that was carried out indicated water levels of the order of 25m

Flood Modeling was carried out using SOBEK software. Results obtained for Flood modeling of the catchment during the Feasibility Stage is presented in Appendix-2.

3.5 CONCLSIONS & RECOMMENDATIONS

The protection against flooding from the Kondaveeti Vagu and its in falling drains can be mitigated by a combination of measures, which comprises both gravity drainage (part diversion of flood to Krishna Western Delta canal and part diversion to Krishna River through

a flood canal from upper catchment areas connecting Lam-Pedaparimi-Vykuntapuram reservoirs) and pumping at Undavalli outlet. Pumping capacity is needed under all circumstances, lowering and maintaining the water level in the Kondaveeti Vagu to 17.1 m will reduce the flood hazard. Active water level management for the reservoirs in combination with emptying the reservoir or at least reducing water levels when extreme precipitation events are expected will reduce flood hazard. The preemptive emptying of reservoirs seems in disagreement with the water conservation goals. However as this only is needed to prevent flooding under extreme precipitation events and the amount of water available in such an event is very large the net effect of preemptive emptying with regard to water conservation goals will be negligible.

3.6 FINISHED ROAD LEVELS (FRLS)

One of the parameters that depend on the road levels in the capital city are the HFLs. Suitable free board above the HFL as per the IS Code is provided to arrive at the Finished Road Levels at several locations along the proposed road network. These levels become pertinent at the location of bridges and culvert crossings in the city. Depending on the type of traffic for the Class of vehicles that are proposed to cross the bridge in the navigable stretch of the waterways and the HFLs at the particular location, FRLs of the Road at the location is hence decided. Figure 3.1 and Figure 3.2 below present the corresponding FRLs.

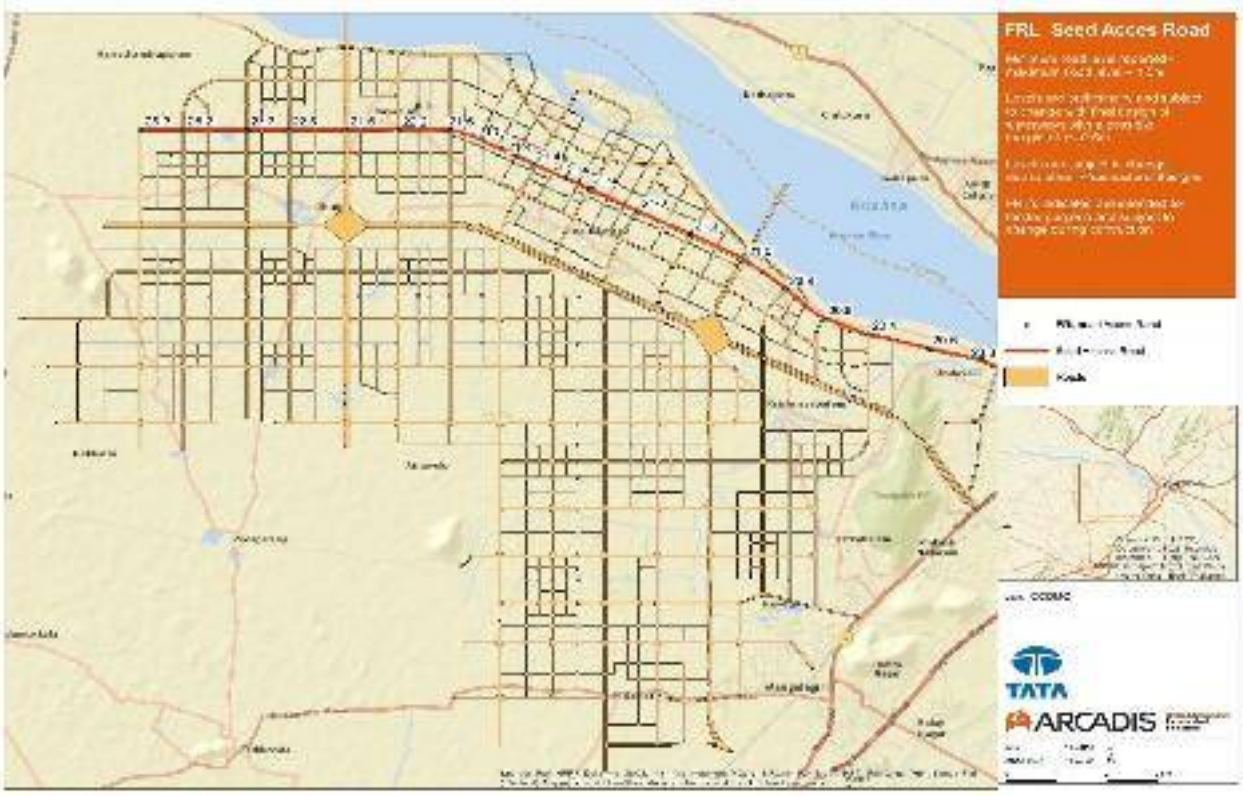

Figure 3.1 Finished Road Levels along the Seed Access Road of the Capital City

Figure 3.2 Finished Road Levels along the Main Priority Roads of the Capital City

3.7 FLOOD MITIGATION MEASURES

The Feasibility Report concluded the following flood mitigation measures that are technically feasible to counter the 1 in 100 year storm event:

a) Widening and deepening of the existing Kondaveeti Vagu and Pala Vagu; b) Construction of 2 numbers of Reservoirs – Neerukonda and Krishnayapalem within the capital city and 3 numbers of Reservoirs – Lam, Pedaparimi and Vykuntapuram outside the capital city; and c) Provision of 2 numbers of Flood Pumping Stations one at Undavalli and another at Vykuntapuram.

CHAPTER-4
CONCEPTUAL DESIGN

4.1 BACKGROUND

On the submission of the Feasibility Report in August 2016, there were several discussions with ADC, APCRDA, Government Departments and other stake holders. These discussions mainly centered around the option for flood discharge, having the aesthetics of the flood canal in the capital city and the possibility of usage of the suggested large flood canals for urban navigation, possibility of discharge of storm water by gravity from the surrounding urban areas into the Kondaveeti Vagu and Pala Vagu and the cost for each items thereof. Details regarding the mentioned aspects are given in the following sections.

4.2 STORM WATER DISCHARGE INTO CANALS

One of the main constraints that was encountered in designing the flood management system was the storm water drains in the capital city. Several discussions took place with the Infrastructure Consultant responsible for the design of the same. As per the results of the High Flood levels (HFLs) obtained from the model studies were reduced from RL 17.0m to RL 15.0m, especially in the lower reaches at Undavalli. This also resulted in the constraint of having the pumping at Undavalli necessary not only during floods but also at times where the water level in Kondaveeti and Pala Vagu and their in-falling drains need to be brought down to RL 15.0m to facilitate the discharge of storm water from the city surroundings to the canals by gravity.

4.3 SELECTED OPTION FOR FLOOD DISCHARGE

Of the three options of flood discharge from the capital city described in the previous Chapter, Option-1 of delineating the catchment area into upper and lower catchment and discharging the upper catchment flood through a gravity canal starting from Lam Reservoir and ending at Vykuntapuram Reservoir and pumping the excess flow at Vykuntapuram in the upper catchment and at Undavalli in the lower catchment was finally agreed upon and finalized as the mode of discharge of 1 in 100 year storm event. This decision was taken after a detailed discussion with ADC, APCRDA and relevant Government Departments and all the stakeholders. This option was selected mainly due to the following reasons:

1. Option-2 mainly involved discharge of flood water through the Central Vista and passing through the Secretariat Area which was questionable and not aesthetic;

2. Option-3 which involved pumping all the flood water from the capital city at one single place at Undavalli mainly was redundant; and

3. Option-1 had the advantage of delineating the entire Kondaveeti Vagu into upper and lower catchments and the fact that the works comprising gravity canal from Lam to Vykuntapuram that falls outside the capital city could be taken up at a later stage when the capital city has developed or is in the stage of development.

4.4 NOTABLE CHANGES IN THE CONCEPTUAL DESIGN STAGE

After submittal of final conceptual design report, version November 2016, it was clear that the terrain grading as proposed by the Infrastructure Consultant was meeting a lot of resistance from the local communities. The graded terrain model used in the water system analysis, as required by the client, became herewith obsolete.

During discussions with stakeholders, the client and consultants, a number of notable changes were made to the assumptions and constraints on flood protection, navigability and geometries. As far as the water system and flood protection is concerned the most notable changes are:

1. The Central Vista Canal is not to be used for navigation purposes,
2. The Central Vista Canal is not to be used for flood protection and peak discharges, only discharge of rainfall – runoff water from the direct vicinity of the canal is allowed,
3. For flood protection purposes the graded terrain model is deprecated and the current terrain elevations need to be assumed as future terrain levels. I.e. no terrain grading is foreseen,
4. Option-2 for flood protection as reported earlier during the feasibility stage became obsolete due to these constraints;
5. Option-1 therefore became the preferred solution for flood protection;
6. The reservoir at Neerukonda has to be reduced to approximately half its original surface;
7. Pumping becomes inevitable at two locations – one at Vykuntapuram and second at Undavalli.

4.5 MEETINGS WITH TECHNICAL EXPERT COMMITTEE (TEC)

A series of Technical Expert Committee Meetings were held with Blue Consultant. These were mainly to understand the modeling efforts carried out by Blue Consultant and the discussions with other Government Departments as well. This resulted in the TEC deciding

upon the Flood Flow of 470 m3/sec with an allowance of 100 to 120 m3/sec allowance. Based on this all the detailed design carried out is with respect to the agreed upon flow.

Appendix- 4 presents the Minutes of the Meetings of the TEC Meetings held in this regard for ready reference.

4.6 CONCLUSIONS

Studies during the Conceptual stages of the project that are relevant to the Flood management alone resulted in the following:

- Digital Elevation Model (DEM) to be followed for flood modeling was corresponding to non-graded option. This was obtained from the Infrastructural Consultant and utilized in all flood modeling studies.

- Technical Expert Committee (TEC) finalized the flood flow from the capital city that needs to be discharged for a 1 in 100 year storm event was 470 m3/sec with a margin of 100 to 120 m3/sec exigencies to be considered for designing all the canals and water ways planned within the capital city.

- Option-1 of flood discharge through gravity canal outside the capital city was decided upon as the mode of flood discharge for a 1 in 100 year storm event.

CHAPTER-5
OPTIONS FOR FLOOD DISPOSAL FROM CAPITAL CITY

5.1 GENERAL

There are 3 main options available for disposal of flood water from the Kondaveeti Vagu catchment including its in-falling drains that falls in nearly 2/3rds of the total area of the proposed Amaravati Capital city. These three options are studied apart from the other options of flood discharge that include inter-basin transfer of water. In view of the high cost and large land acquisitions resulting in huge costs, this alternative is further not considered for study. This Chapter provides the details of each of the three options in detail in the following sections.

5.2 OPTION-1

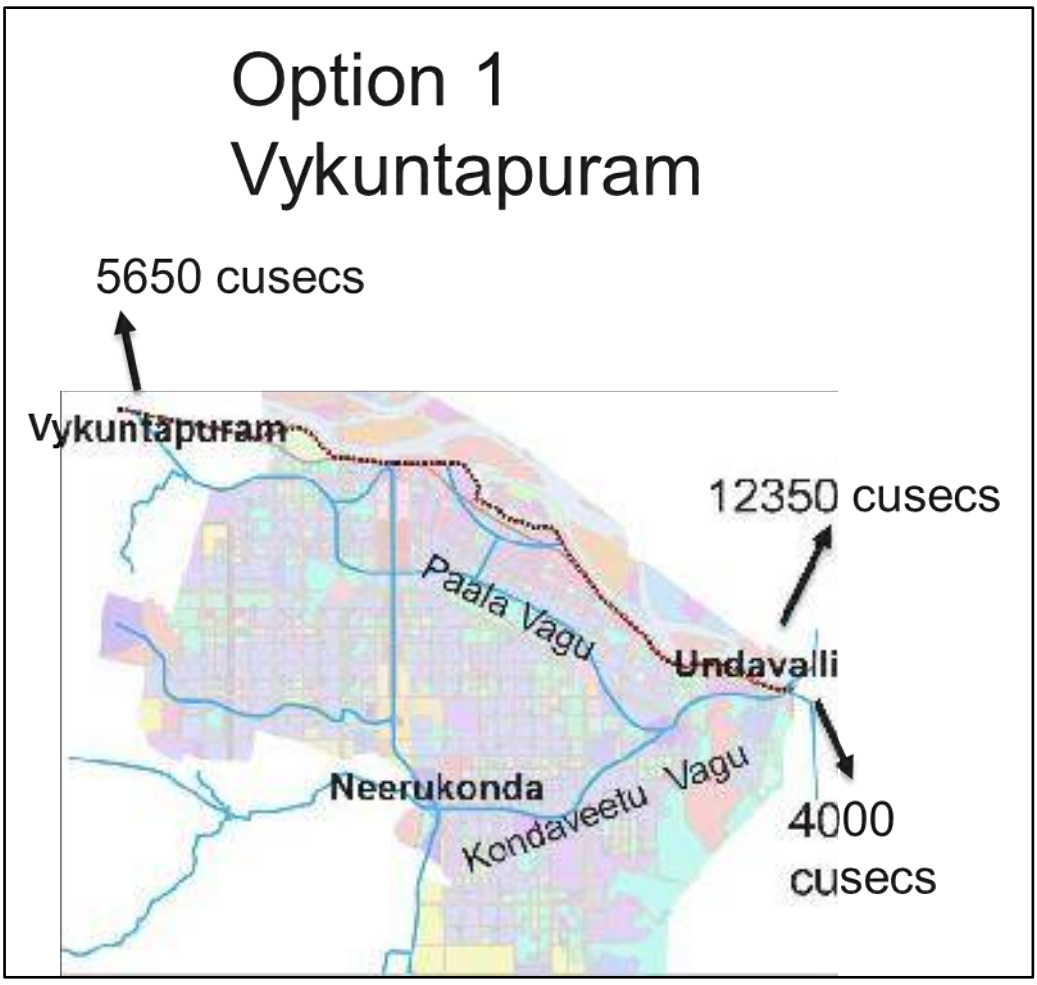

Figure 5.1 Option-1 for Flood Disposal

As indicated in Figure 5.1 above, based on the flood discharges computed, this option involves flood discharge of 5650 cusecs being disposed at Vykuntapuram and a flood discharge of 12350 cusecs (350 m3/sec) at Undavalli and 4000 cusecs (113 m3/sec) being discharged through Krishna Western Delta (KWD) Canal. The discharge from the upper catchment is realized through a gravity canal taking off from Lam Reservoir upto the Vykuntapuram Reservoir via another Reservoir located at Pedaparimi. Thus the upper catchment area of Kondaveeti Vagu is catered to by a gravity canal of total length of …….km and construction of three new reservoirs, namely Lam, Pedaparimi and Vykuntapuram Reservoirs.

The lower catchment of the Kondaveeti Vagu catchment in this option is catered to by Kondaveeti Vagu and Pala Vagu and its in-falling drains draining in to Undavalli where the flood water is pumped at Undavalli Pumping Station.

The advantages of this option are as follows:

1 The entire catchment is delineated into two sections – upper catchment and lower catchment, easing the burden of works involved;
2 The chances of the capital city getting flooded for a 1 in 00 year storm event gets reduced since the upper catchment flood flow is disposed off by means of the gravity canal proposed for this purpose that incidentally lies outside the capital city.
3 The pumping capacity for a 1 in 100 year storm event estimated as 470 m3/sec gets distributed as two pumping stations – one at Vykuntapuram corresponding to a flow of 160 m3/sec and the other at Undavalli corresponding to 350 m3/sec is planned. This lessens the burden of having a pumping station of large capacity at one location.

A flood pumping station at Undavalli is already planned by the Irrigation Department and the work for a total pumping capacity of150 m3/sec is already underway. It is proposed that the balance of flood flow corresponding to 200 m3/sec is planned at the same location.

5.3 OPTION-2

Figure 5.2 presents the details of this option. As indicated in the figure, this option describes disposing flood through the proposed

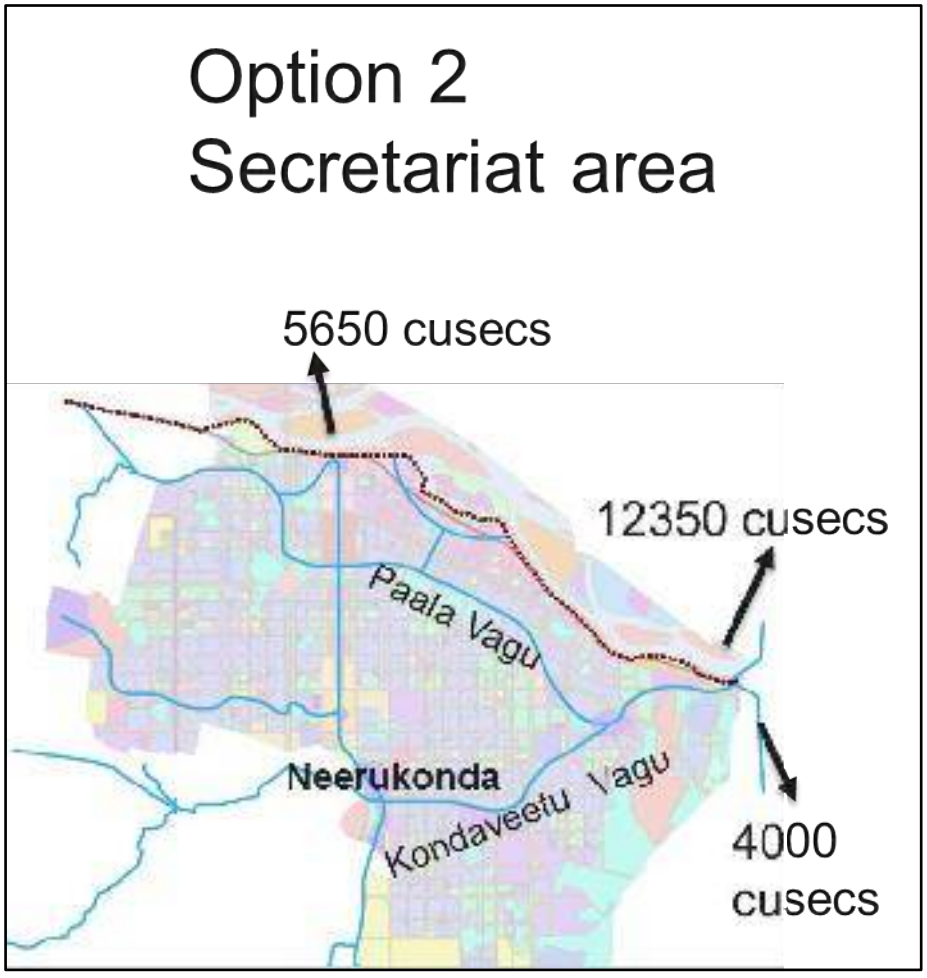

Figure 5.2 Option-2 for Flood Disposal

As indicated, in this Option, there is no gravity canal planned outside the capital city as in Option-1 but instead the flood flow corresponding to 5650 cusecs is planned to be disposed off through the proposed Central Vista canal starting from Neerukonda Reservoir till the Secretariat Area before disposing to River Krishna. This Option does not involve any new land acquisition for the gravity canal as in Option-1 but since the same is planned through the capital city and that too through the Government Complex of the city, the same is uncalled for.

This option also involves pumping at two locations – one at Vykuntapuram and the other at Undavalli.

5.4 OPTION-3

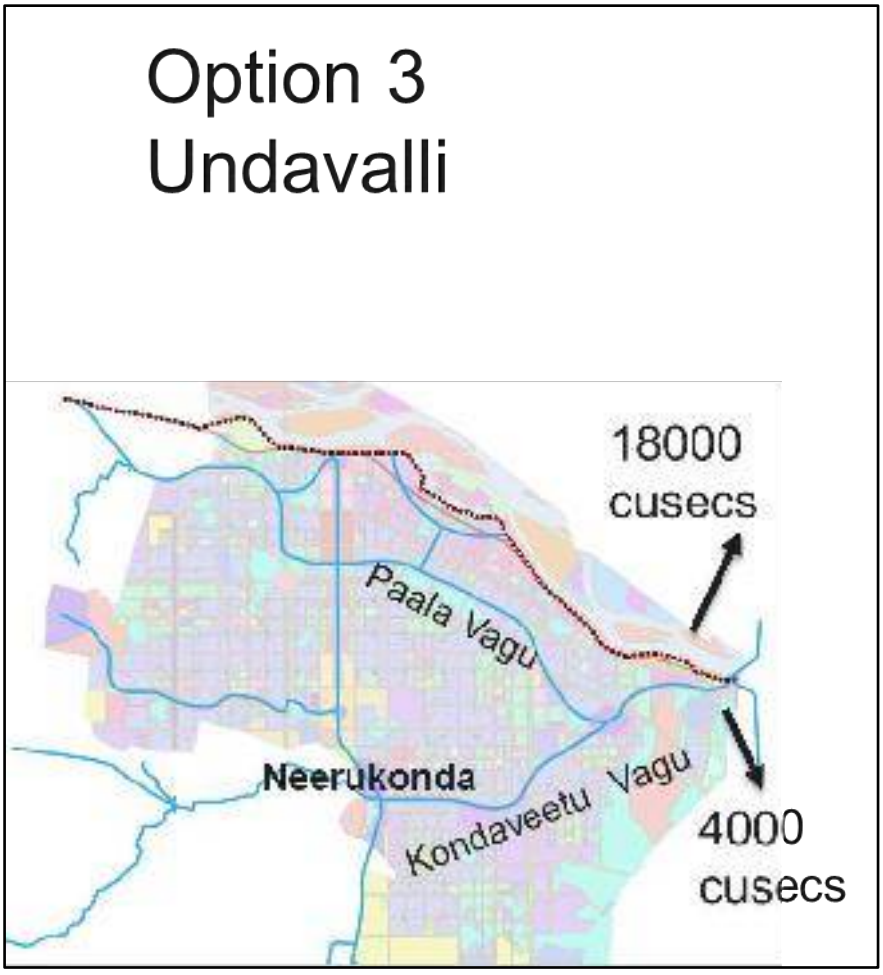

Figure 5.3 Option-3 for Flood Disposal

This Option for flood disposal involves pumping the entire flood flow of 1 in 100 year storm event corresponding to 18,000 cusecs at a single location at Undavalli. Though this option does not involve any new canal and the land acquisition required there-off, the pumping station required at a single location would require large land acquisition and the redundancy of pumps not working and the dependency of pumping of large flows at one location is very high and therefore the risk involved in this Option is too high and therefore this Option is not considered for the study.

Since this Option requires a substantial pumping station and pumping capacity the modeling of this option was difficult to fit the canals leading to the pumping station within the spatial constraints of the city Master plan. The space requirement for the pumping station is also substantial.

As the average water level in the canals had to drop from the earlier proposed 17m to 14m to accommodate the storm water discharge into the canal by gravity, this option becomes technically challenging. The main issue with this option however is the vulnerability and future extension capability. No redundancy exists if anything unforeseen happens and future capacity enlargement is not possible due to geometric constraints.

5.5 SELECTION OF OPTION

The choice of options for flood disposal of the capital city is crucial. Keeping the development of the capital city over the years and also the Land Pooling Scheme (LPS) that is being adopted for the same, selection of proper choice needs to be made.

Technical Expert Committee (TEC) in a series of its deliberations prior to the appointment of Blue Consultant had suggested Option-1. With the advent of Blue Consultant and after a series of deliberations with various stakeholders and also considering the merits and de-merits of each of them, Option-1 was found to be the preferred one. Accordingly, post this decision taken by the Government, all the design work carried out by Blue Consultant is for Option-1.

CHAPTER-6
FLOOD MITIGATION MEASURES

6.1 BACKGROUND

Considering the geographical location of the proposed capital city on the right banks of River Krishna and around 2km upstream of the Prakasam Barrage at Vijayawada and the prevailing regional hydrology the capital city needs to be protected from the T100 or 1 in 100 year storm event.

6.2 FLOOD MITIGATION MEASURES.

Based on the hydrological study to establish the flood flow and considering the various options for flood disposal from the proposed capital city and discussions with various stake holders, it has been established that following flood mitigation measures can encounter a 1 in 100 year storm event and avoid flooding of the capital city:

1. Widening and deepening of existing Kondaveeti Vagu (for widened and deepened canal cross-sections please refer drawing no.TCE.10244A-CV-3023-SI-30004 to TCE.10244A-CV-3023-SI-30019).

2. Widening and deepening of existing Pala Vagu (for widened and deepened canal cross-sections please refer drawing no.TCE.10244A-CV-3023-SI-30020 to TCE.10244A-CV-3023-SI-30040).

3. Construction of the Gravity Canal from Nekkalu to Vykuntapuram (please refer drawing no.TCE.10244A-CV-3023-SI-30041 to TCE.10244A-CV-3023-SI-30055).

2. Construction of 3 numbers of Reservoirs within the capital city – Neerukonda, Krishnayapalem and Sakhamuru (for Reservoir Details refer drawing no.TCE.10244A-CV-3025-SK-30056 to TCE.10244A-CV-3025-SK-30068).

3. Construction of 3 numbers of Reservoirs outside the capital city – Lam, Pedaparimi and Vykuntapuram (this part of the flood mitigation works is planned in the next phase of works)

4. Construction of Flood Pumping Station at Undavalli (for General Arrangement of the pumping station refer drawing no.TCE.10244A-ME-6173-GA-30070 and TCE.10244A-ME-6173-GA-30071).

5. Construction of Flood Pumping Station at Vykuntapuram (for General Arrangement of the pumping station refer Drawing no.TCE.10244A-ME-6173-GA-30078 and TCE.10244A-ME-6173-GA-30079).

The following Chapters of the Report provide the details of each of the above mentioned Flood Mitigation Works proposed for the Capital City. The details of Flood Risks and Mitigation Measures are presented in Table 6.1.

Table 6.1 Flood Risks and Mitigation Measures

Sl. No.	Cause	Effect	Risk	Suggested Mitigation Measure(s)
1.	Increase in paved area due to development of capital city	Increase in peak flood discharge	Inundation of low lying areas in the eastern boundary of capital city during occurrence of peak flood event	a) Improvement of Kondaveeti Vagu, Pala Vagu and other infalling drains b) Management of reservoirs c) Construction of flood pumping stations d) Diversion of flows from upper catchment area along the western boundary of capital city
2.	Gravity canal not available	Excess water cannot be diverted	Flooding near Undavalli and along the course of the Pala Vagu and Kondaveeti Vagu between Undavalli and Neerukonda - *See report for expected area to be flooded.*	Augmentation of KWD escape regulator to divert flows by gravity.
3.	Reservoir at Neerukonda not constructed or smaller than design assumptions	Peak flow cannot be stored and will cause flooding upstream and or downstream of Neerukonda	Flooding near Undavalli and along the course of the Pala Vagu and Kondaveeti Vagu between Undavalli and Neerukonda. *See report for expected area to be flooded*	a) Dimension reservoir (capacity) at correct measures, as given in designs b) Construct additional reservoirs upstream of Neerukonda *(may be difficult due to land acquisition issues)*
4.	Reservoir at Neerukonda is filled before the peak flow arrives	Peak flow will cause overflow of reservoir	Flooding near Undavalli and along the course of the Pala Vagu and Kondaveeti Vagu between Undavalli and Neerukonda. See report for expected area to be flooded	a) Empty reservoir before peak event is occurring (pre-emptive) as described in conceptual design report b) Reservoir management plan should be available c) Flood early warning system based on weather predictions should be available
5.	Pump failure	Pump capacity	Partial flooding near	a) Maintenance of pumps

Sl. No.	Cause	Effect	Risk	Suggested Mitigation Measure(s)
	(mechanical)	is insufficient to remove excess water	Undavalli and along the course of the Pala Vagu and Kondaveeti Vagu between Undavalli and Neerukonda. Extent of flooding depends on loss of pumping capacity.	according to severe standards b) Provision of standby pumps *(see recommendations in design notes)*
6.	Pump failure (Electrical failure or power outage)	Pump capacity is unavailable	Flooding near Undavalli and along the course of the Pala Vagu and Kondaveeti Vagu between Undavalli and Neerukonda. *See report for expected area to be flooded*	a) Install backup power (for example diesel generator) atleast for a few pumps. b) Install emergency electrical network or c) install a dedicated electrical network with direct connection to power plant(s). d) Augmentation of KWD escape regulator to divert flows by gravity

CHAPTER-7
DESIGN OF CANAL SYSTEM IN THE CAPITAL CITY

7.1 BACKGROUND

As mentioned in the previous chapter, one of the important flood mitigation measures is to convert the existing Vagus (canals) flowing in the capital city to retain the 1 in 100 year return period storm (470 m3/sec). The following sections provide the details of the same.

7.2 WIDENING AND SEEPENING OF KONDAVEETI VAGU

The existing canal section of Kondaveeti Vagu from Undavalli to Neerukonda Reservoir via Krishnayapalem Reservoir for a total length of 10.3 km shall be widened and deepened to accommodate the 1 in 100 year return period storm that has been computed from SOBEK modeling. The flood flow at Undavalli from the catchment area works out to 470 cumecs. The flows that are predicted in various locations along the Kondaveeti Vagu and its in-falling drain are considered for the respective canal stretches. A summary of the design information of canals is indicated in Table-6.1 below.

7.3 SELECTION OF CANAL LINING

In order that the predicted canal sections to cater to 1 in 100 year storm event carried the requisite flow in a safe manner and also to facilitate Navigation and Cargo movement in the specified canal stretches, a Technical Note on ‘Selection of Canal Lining’ was submitted to ADC and the same was approved. This Note basically discusses the merits and de-merits of different types of lining suggested. A comparison of different types of lining with respect to their properties is made and techno-economic study for the same is carried out.

Considering the type of soil, flow velocities in the canal, aesthetics, maintainability of canals, availability of material, protection against waves and currents due to ship movement, construction costs and time, Gabion mattresses was recommended to be adopted for canals within capital city. Some of the advantages offered by double twisted mesh gabion mattresses are flexibility, durability, strength, permeability, ecology, reliability, longevity, low cost, and an aesthetic appearance. This note is provided in Appendix-5 for reference.

7.4 SELECTION OF CANAL PROFILE

Subsequent to the Not on Canal Lining, constraints regarding the flat green area to be provided on either side of the canal and the utility of the same canal section in the capital city for navigation, commutation and recreation purposes, the canal sizes proposed to suffice the

predicted flood flow had to be matched to fit into the total width allocated in the Master plan for the water way. This brought in a need to look into the canal profile aspect along with the canal lining note that was already submitted. A Technical Note was already submitted to ADC in this regard and the same is presented in Appendix-6.

7.5 CANAL DESIGN

The design information of canals is described in Appendix-7.

7.6 CONCLUSIONS

Based on the deliberations that took place with ADC and various other stake holders and subsequent to submission of the two notes – one on Canal Lining and the other on Canal Profile, following are the type of canal lining and canal profile details that were agreed upon and considered in all future designs:

Cement Concrete lining (150thk) over Cohesive Non-swelling Soil (CNS) layer was selected as the lining material for all the canal sections in the capital city that will be utilized for cargo navigation, passenger commutation and recreation purposes.

Reduced canal sizes conforming to the required flat green area on either side of the canal and to fit into the total width provided for the respective water way as per the Master Plan was adopted for various canals in the capital city.

CHAPTER-8
RESERVOIRS IN THECAPITAL CITY

8.1 GENERAL

Reservoirs planned in the Kondaveeti Vagu catchment under study are mainly from the point of view of attenuation of a 1 in 100 year storm that is likely to be encountered. The concept of flood management using these reservoirs is the concept of pre-emptying them before the monsoons. The sizes of these reservoirs are stipulated in the Master Plan Version-IV and the same is used for flood management purposes.

8.2 RESERVOIR DETAILS

Table 8.1 Details of the Reservoirs planned for Flood Management

Sl. No.	Reservoir	Storage Capacity (TMC)	Full Reservoir Level (RL in m)	Location	Remarks
1.	Lam	0.3	27.50	Upper catchment	Existing (It is suggested to be increase the reservoir capacity)
2.	Pedaparimi	0.3	26.00	Upper catchment	Proposed
3.	Vykuntapuram	0.2	24.00	Upper catchment	Proposed
4.	Neerukonda	0.4	19.00	Lower catchment	Proposed
5.	Krishnayapalem	0.1	15.00	Lower catchment	Proposed
6.	Sakhamuru	0.03	17.00	Lower catchment	Proposed
Total Storage Capacity		**1.33**			

The above Table 8.1 presents details of five numbers of Reservoirs planned from flood management point of view. These include reservoirs at Lam, Pedaparimi, Vykuntapuram, Neerukonda and Krishnayapalem. Apart from these five there also exists a small reservoir at Sakhamuru which is virtually an ornamental confluence point. As indicated in the table, these reservoirs are small and the total volume of all these reservoirs put together works out to 1.3 TMC. The Full Reservoir Levels of each of these reservoirs is as indicated with the highest

being for Lam Reservoir that is located in the higher reaches of the upper catchment of Kondaveeti Vagu.

8.3 RESERVOIRS OUTSIDE THE CAPITAL CITY

Out of the 5 reservoirs proposed for flood management, three numbers of reservoirs are located outside the capital city. These reservoirs include a) Lam; b) Pedaparimi; and c) Vykuntapuram. All these three reservoirs are planned to be interconnected by means of a gravity canal before discharging into River Krishna at Vykuntapuram.

This set of reservoirs outside the capital city is planned to be taken in the second phase after the development of the capital city is achieved pace since the process of land acquisition for these reservoirs and portion of the gravity canal connecting Lam reservoir lying outside the capital city have to commence afresh and would be time consuming. All works related to these reservoirs are planned to be taken up in the second phase of flood management works.

8.4 RESERVOIRS INSIDE THE CAPITAL CITY

Two main reservoirs out of the total five, namely, Neerukonda and Krishnayapalem reservoirs are to be constructed within the capital city. The construction of these reservoirs shall be in parallel with the widening and deepening of the interconnecting canal Kondaveeti Vagu. The said works will be taken up in the first phase since the LPS scheme for land acquisition in the capital city is in process and therefore will not be time consuming as compared to the reservoirs outside the capital city. From the point of view of flood management also the reservoirs inside the capital city area proves crucial for flood attenuation even of normal storm intensities.

The details of each of the reservoirs planned inside the capital city is provided in the following paragraphs.

8.5 NEERUKONDA RESERVOIR

The details of Neerukonda Reservoir is presented in drawing no.TCE.10244A-CV-3025-SK-30057 and 30058. The total area of this reservoir is around 455 acres. The depth of the reservoir is planned at 8 m. The topography of the area is even without major undulations. The entire reservoir needs to be evolved from excavation alone. Therefore, the embankment portion of the reservoir is the depth to which the necessary freeboard needs to be provided of the order of 2 m.

Neerukonda reservoir has interconnections from the southern side with the Kondaveeti Vagu bringing cargo movement from Undavalli via Krishnayapalem. This reservoir therefore serves as an important boarding point of ship movement and therefore the southern part of the reservoir with two portions, one for the Ship lock aiding the movement of the ship and the other portion facilitating the reservoir outlet.

Reservoir outlet portion consists of overflow section and the other non-overflow section. While the overflow section has an Ogee spillway proposed, the non-overflow section is facilitated by Stop logs and Gates. The details of this reservoir control and non-control sections is provided in the respective reservoir drawing and the design calculations for the same is presented in Appendix-8.

From the flood management point of view, Neerukonda Reservoir has to be pre-emptied before the monsoon rains so that it is effective in flood attenuation and flooding of the canal portion till the Krishnayapalem reservoir downstream. For this purpose Neerukonda reservoir therefore has to be pre-emptied till its MDDL allowing for its filling. The pumps at Undavalli will be signaled to start once the water level in Neerukonda reservoir reaches its Full Reservoir level (FRL) of RL 19.0m. This is achieved by instrumentation and Control (I&C) system between Undavalli Flood pumping station and Neerukonda reservoir as detailed in the Chapter 10. The details of Neerukonda Reservoir is presented in Table 8.2.

Table 8.2 Details of Neerukonda Reservoir

Sl. No.	Description	Value
I	**General**	
a)	Location	Refer Bid Drawings
b)	Nearest Village	Neerukonda
c)	Tehsil	Mangalagiri
d)	District	Guntur
e)	Purpose	Flood Control, Water Supply & Navigation
f)	River/Vagu	Kondaveeti Vagu
g)	Area of Reservoir	440 Acres
II	**Reservoir**	
a)	Full Reservoir Level	RL 19.00 m
b)	Reservoir Bed Level	RL 11.00 m
c)	High Flood Level	RL 19.60 m
d)	Top Bund Level	RL 21.50 m

Sl. No.	Description	Value	
e)	Gross Storage	0.43 TMC (12.2 Mm^3)	
III	**Spillway/Outlet Arrangements**		
a)	Design Discharge	230 m^3/s	
b)	Type of spillway	Gated	Un-gated
c)	Length of overflow	25.4	24.6 m
d)	Sill Level	RL 14.00 m	RL 19.00 m
e)	No. of openings	Four (4)	-
f)	Width of each opening	5.0 m	-
g)	Height of each opening	3.0 m	-
IV	**Scouring Sluices**		
a)	Location	Un-gated spillway (Refer Bid Drawings)	
b)	No. of sluices	2	
c)	Diameter of sluice	0.6 m	
d)	Bottom level of sluice	RL 11.30 m	

8.6 KRISHNAYAPALEM RESERVOIR

This reservoir is basically a confluence point of Kondaveeti Vagu and Pala Vagu. This reservoir basically forms a meeting junction of the two vagus and therefore no control structure for this reservoir is necessary. All the cargo moving from Undavalli to Neerukonda reservoir essentially passes through this reservoir. The Full Reservoir Level is maintained at RL 15.0 m which incidentally is the HFL of the Kondaveeti Vagu. The details of Krishnayapalem Reservoir is shown in drawing no.TCE.10244A-CV-3025-SK-30063 and 30064. Table 8.3 shows the details of this reservoir.

Table 8.3 Details of Krishnayapalem Reservoir

Sl. No.	Description	Value
I	**General**	
a)	Location	Refer Bid Drawings
b)	Nearest Village	Krishnayapalem
c)	Tehsil	Mangalagiri
d)	District	Guntur
e)	Purpose	Navigation & Recreation

Sl. No.	Description	Value
f)	River/Vagu	Kondaveeti Vagu
g)	Area of Reservoir	190 Acres
II	**Reservoir**	
a)	Full Reservoir Level	RL 15.00 m
b)	Reservoir Bed Level	RL 11.00 m
c)	High Flood Level	RL 15.40 m
d)	Top Bund/Bank Level	RL 17.20 m
e)	Gross Storage	0.09 TMC (2.6 Mm^3)

8.7 SAKHAMURU RESERVOIR

This reservoir is a confluence point of Kondaveeti Vagu and Secretariat canal. This reservoir proposed for ornamental purpose without any control structure. The Full Reservoir Level is maintained at RL 17.0 m. The details of reservoir is shown in drawing no.TCE.10244A-CV-3025-SK-30065 to TCE.10244A-CV-3025-SK-30068. Table 8.4 shows the details of this reservoir.

Table 8.4 Sakhamuru Reservoir

Sl. No.	Description	Value
I	**General**	
a)	Location	Refer Bid Drawings
b)	Nearest Village	Sakhamuru
c)	Tehsil	Thullur
d)	District	Guntur
e)	Purpose	Ornamental/Recreation
f)	River/Vagu	Kondaveeti Vagu
g)	Area of Reservoir	50 Acres
II	**Reservoir**	
a)	Full Reservoir Level	RL 17.00 m
b)	Reservoir Bed Level	RL 11.00 m
c)	High Flood Level	RL 17.50 m
d)	Ground Level	RL 21.50 m
e)	Gross Storage	0.03 TMC (0.8 Mm^3)

CHAPTER-9
FLOOD PUMPING STATIONS

9.1 GENERAL

As explained in the relevant sections of the report, removal of flood water from the capital city by gravity is not technically feasible due to the prevailing hydraulic and topographical constraints. Flood pumping stations are suggested to be constructed to facilitate removal of flood discharges from the capital city. Based on the detailed hydrological modelling studies carried out for the Kondaveeti Vagu catchment, the 100 year peak flood discharges have been estimated for both (i) pre-development (existing conditions) scenario and (ii) post-development (development of capital city) scenario.

9.2 LOCATION AND CAPACITY OF PUMPING STATIONS

The location and number of flood pumping stations required along with quantum of flood discharge required to be pumped at each of the selected locations has been fixed based on the estimated peak flood discharge and considering the Client's requirement of restricting the maximum high flood level at Undavalli outlet to RL 15.00 m in order to facilitate gravity drainage of storm water runoff from existing villages. Accordingly, two (2) numbers of flood pumping stations have been proposed for the capital city, viz., Undavalli and Vykuntapuram. The magnitude of flood discharges to be pumped at Undavalli and Vykuntapuram pumping stations has been estimated to be about 463 m^3/s and 160 m^3/s respectively. Thus, the total magnitude of flood discharge to be pumped out from the capital city works out to 623 m^3/s. The Location Map of Pumping Station at Undavalli and Vykuntapuram is presented in drawing no.TCE.10244A-CV-SK-30069 and TCE.10244A-CV-SK-30077 respectively.

Irrigation Department (ID), Government of Andhra Pradesh has recently taken-up the execution of flood pumping station with a capacity of 150 m^3/s, to prevent flooding of the capital city in the immediate future. Based on discussions with Client and Irrigation Department, it is learnt that pumping station has been located near the existing KWD escape regulator. The contract for construction of above pumping station has been awarded and the works are ongoing. 17 nos. (15 working + 2 standby) of Vertical Turbine pumps have been considered for the pumping station. The pumping station being implemented by the Irrigation Department is near the Undavalli outlet (i.e., close to the pumping station of 463 m^3/s proposed). Considering the pumping capacity of 150 m^3/s (by ID), the balance magnitude of flood to be pumped at Undavalli works out to 313 m^3/s (say 320 m^3/s).

Considering the pumping station (under implementation) by Irrigation Department, the total number of flood pumping stations for the capital city will be three (3). The summary of flood pumping capacity for each of the stations is given below:

- Pumping station at Vykuntapuram = 160 m^3/s
- Pumping station at Undavalli = 320 m^3/s
- Pumping station (by ID) = 150 m^3/s

Total Capacity = 630 m^3/s

9.3 PUMP CONFIGURATION

The pumping capacity indicated above is the net requirement and does not include the spare capacity for pumps. The tentative general arrangement of flood pumping stations at Undavalli drawing no.TCE.10244A-ME-6173-GA-30070 and TCE.10244A-ME-6173-GA-30071 and the same for and Vykuntapuram is shown in the drawing no.TCE.10244A-ME-6173-GA-30078 and TCE.10244A-ME-6173-GA-30079.

Table 9.1 Design Water Levels at Pumping Stations

Sl No.	Pumping Station	Water Level Considered for Pumping Station
1	Undavalli	Suction Level Normal water level: 14 Minimum water level: 13 Maximum Water Level: 15 Discharge Level Normal water level: 19 Minimum water level: 17 Maximum Water Level: 21.5
2	Vykuntapuram	Suction Level Normal water level: 21.5 Minimum water level: 21 Maximum Water Level: 22 Discharge Level Normal water level: 24 Minimum water level: 17 Maximum Water Level: 27

The details of configuration and type of pumps suggested is given in Table 9.2.

Table 9.2 Configuration and Type of Pumps

Sl. No.	Location	Capacity (m^3/s)	Pump Configuration	Remarks
1	Undavalli	320 m^3/s	a) 17 x 20 m^3/s (Volute pumps) b) 3 x 3 m^3/s (VT pumps)	Spare capacity of about 10% capacity has been considered in finalizing the pump configuration.
2	Vykuntapuram	160 m^3/s	a) 9 x 20 m^3/s (Volute pumps) b) 3 x 3 m^3/s (VT pumps)	

As seen from above table, Three (3) nos. of Vertical Turbine pumps, each of 3 m^3/s capacity have been proposed for both pumping stations. Smaller capacity pumps have been suggested for the following reasons:

- Facilitate removal of lower magnitude discharges (Undavalli & Vykuntapuram stations) from the capital city during storms of low intensity during monsoon season, and
- Facilitate re-circulation of stagnant water in the navigable canals periodically during the post-monsoon season.

The design calculations of Pumping Station is presented in Appendix-9.

9.4 PROPOSED GRAVITY DIVERSION SCHEME AND PUMPING CAPACITY AT UNDAVALLI

The storm water network of entire capital city has been designed (by storm water design consultant) to convey the storm runoff by gravity into Kondaveeti Vagu and Pala Vagu. Based on discussion with Storm water consultants, it is learnt that the outfalls of storm water drains have been kept above the estimated 100 year flood level in Kondaveeti and Pala Vagu to facilitate the same. The flood discharges are then removed by operation of pumps at Undavalli and Vykuntapuram flood pumping stations. In view of the hydraulic and topographical constraints prevailing at the project site, the option of diverting flows by gravity is not feasible.

Complete dependency on pumping for removal of flood discharges by pumping involves a considerable risk for the capital city, in case of power failure during severe cyclonic storms or mechanical failure of pumps. Hence, an alternative option involving diversion of flood discharges (partly) by gravity is suggested as a risk mitigation measure. This option involves re-modelling of existing KWD escape regulator or construction of new escape regulator to enable diversion of flood discharges from the capital city by gravity. However, as the water

level in the Krishna Western Delta (KWD) canal is higher than the design HFL of Kondaveeti Vagu at the Undavalli outlet, it is essential to close the head regulator gates of KWD canal and stop the releases from Prakasam Barrage.

In view of demolition of existing KWD escape regulator (to facilitate construction of pumping station proposed by Irrigation Department), it is learnt that a proposal for construction of a new escape regulator is under active consideration by ADC/ID. The details of the proposed escape regulator are not known and hence the same has not been considered in the present study. However, the possibility of any reduction in pumping capacity at Undavalli pumping station may be reviewed by ADC, subsequent to availability of details on capacity of proposed escape regulator. With the construction of proposed escape regulator and part diversion of flood discharges by gravity, the dependence on costly pumping option can be reduced. The extent of reduction in pumping capacity will depend on the discharge capacity of proposed escape regulator and this aspect shall be looked into in the future.

However, it is important to note that diversion of flows by gravity using proposed escape regulator can only be used during occurrence of extremely rare eventualities (but not on a regular basis), since water supply to command area of KWD canal (5.7 Lakh Acres) will be affected, as it requires closure of supply from Prakasam Barrage.

9.5 OPERATION PHILOSOPHY

The flood mitigation measures recommended for the capital city have been designed considering the estimated 100 year peak flood discharge. In order to minimize the overall cost (capital and operation) of flood management works, within the spatial limitations of Master Plan and other technical constraints (as described elsewhere in the report), proper management of entire network of canals, reservoirs and pumping stations has been considered. The capacities of flood pumping stations at Undavalli and Vykuntapuram have been optimized with the assumption that canals and reservoirs will be pre-emptied before the onset of major storm events in order to accommodate the incoming flood volume (i.e., contribution of storage in reservoirs and canals is considered for reduction of flood peaks), thereby reducing the flood discharge that needs pumping.

A 24/7 online based flood and water quality monitoring system has been suggested to be implemented for the entire Kondaveeti Vagu catchment to manage the available infrastructure to prevent flooding of capital city. The schematic drawing showing the online based flood and water quality monitoring system proposed for Kondaveeti Vagu catchment is given below.

The monitoring system will involve installation of weather monitoring stations, level transmitters and water quality sensors at major locations along the canals, reservoirs and pump sumps. All the individual systems are interconnected and relayed to the master control room (proposed to be set up at Undavalli Pumping Station) through optical fiber cable network and wireless communication system. Water levels and quality will be measured along the canal, reservoirs and pump sumps, whereas discharge will be measured at reservoirs.

The flood management system for the entire capital city will be monitored and operated from master control room at Undavalli. The data collected from other locations will be relayed and displayed at the master control room. Based on the weather forecast/warnings issued by the local meteorological station (IMD Gannavaram) and data observed within the catchment area (from Automatic Weather Monitoring Station), reservoirs and canals will be pre-emptied by operation of pumps at any of the three or all the pumping stations.

For this purpose, control of entire system is proposed to be automated with manual back-up system as fail-safe measure. Detailed studies are recommended to carried out to integrate the entire system of canals, reservoirs and pumping stations in the future, before implementation.

CHAPTER-10
INSTRUMENTATION AND CONTROL SYSTEM

10.1 GENERAL

A State of the Art Instrumentation and Control system is envisaged for Flood Management in the Amaravati Capital City.

Operation of the Undavalli Pumping station, water canal network along with the reservoirs (LAM reservoir, Neerukonda reservoir ad Krishnayapalem reservoir) is envisaged from the Main Control Room located in the Undavalli Pumping station. This control room shall be a State of the Art control room.

Similarly, operation of the Vykuntapuram Pumping station and the water canal network with the Vykuntapuram reservoir and Pedaparimi reservoir is envisaged from a Control Room located in the Vykuntapuram Pumping station. However, the Vykuntapuram Control Room is envisaged to be interfaced with the Main Control room at Undavalli Pumping station for Central monitoring of both the Pumping stations.

Independent PLC based control systems are envisaged in the two control rooms for the operation of the pumping stations and near the reservoirs for monitoring the water levels at various points in the canals and reservoirs, operation of the gates at the reservoirs, etc.

Electronic Cubicles for the Control system will be located in the respective Control Equipment Room (CER) located in the Pumping station. Operator Workstations will be located in the Control Room.

Each reservoir will be monitored locally for the water level, water quality, etc. This data will be communicated to the control room in the Pumping stations.

Three (3) nos. of Weather monitoring stations will be located each near LAM Reservoir, Undavalli Pumping station and Vykuntapuram Pumping station.

CCR is envisaged to have consoles with operator workstations for the pump monitoring, electrical systems, vibration monitoring, remote monitoring of the reservoir water levels and quality.

Large Video Screen (LVS) display (1 no. of 80” size cube) would be provided in the Control Room to display the various parameters. The LVS shall be housed in the Undavalli pumping

station Main Control Room for projecting the important parameters /alarm conditions on a larger screen visible to any personnel inside the control room.

Hard wired back up console is not envisaged.

Emergency push buttons (shrouded and two in tandem) for HT pump trip would be provided on the console.

Emergency local stop push button operation would be provided for all motorized drives except for motorized valves and solenoid valves. For motorized valves open/close functions are made available in the integral starter of the actuators.

Provision will be made for availability of all the required information regarding flood management system at various departments/administration officials in the city via wireless / satellite communication.

10.2 CONTROL SYSTEM REQUIREMENTS

A PLC based Control System is envisaged for the Capital city for Control and monitoring of the Pumping stations, canals and reservoirs level, water quality, etc.

The PLC hardware will be located in the Control Equipment Room (CER). Operation of the plant through Operator Workstations will be carried out from the respective Control rooms in the Pumping stations at Undavalli and Vykuntapuram. However, central monitoring of the capital city shall be possible from the Main control room in the Undavalli Pumping station.

The PLC will have set of Redundant controllers with redundant power supply and redundant communication modules.

Microprocessor based controller/PLC is envisaged at each reservoir to collect the information pertaining to the water level, water quality, etc. at that reservoir and the nearby canal network.

These controllers at the all the reservoirs will communicate with the PLC in the Main Control Room at Undavalli Pumping station for centrally monitoring the conditions in the capital city through FO cable network.

Weather Monitoring stations will be located at three different locations in the city to obtain the real time weather conditions and the same will be communicated to the Main control room through FO cable communication network.

All requirements for the Instrumentation and control of the major equipment shall be as per the OEM recommendations.

10.3 FEATURES OF THE I & C SYSTEM

10.3.1 Sequence of Events Recording System

Sequence of Events (SOE) Recording is envisaged as integral to the PLC system.

10.3.2 Annunciation System

Annunciation System will be integral to the PLC system. The alarms shall be displayed in the respective control system and all the alarms shall be made available centrally in the Main Control room at Undavalli Pumping station.

10.3.3 Water Quality Monitoring System (WQMS)

Online, continuous water quality monitoring is envisaged at each reservoir to prevent water pollution and also provide necessary water refreshment. Following parameters will be continuously monitored locally in the local PLC and also communicated to the Main Control room at Undavalli Pumping station.

a) Temperature
b) Turbidity
c) Biological Oxygen Demand
d) Chemical Oxygen Demand
e) Total Dissolved Solids
f) Dissolved Oxygen
g) Chlorine
h) Oil content

The complete hardware associated with this system along with the analyzers will be located in a panel near the reservoir with necessary shelter.

10.3.4 Vibration Monitoring & Analysis System

A vibration monitoring system complete with transducers and remote monitors is envisaged for monitoring the bearing vibrations of all drives at both the Pumping stations. The bearing vibrations would be measured and monitored in both X and Y directions for each bearing at both DE and NDE sides. These shall have local monitors and also hardwired connection with the PLC system.

10.3.5 Local Instruments

The proposed local instruments are as follows:

i. Adequate number of Non contact type Level instruments would be provided in every reservoir and at designated locations in the canal network to enable operators to supervise and monitor the water level across the city.
ii. Indicating type smart transmitters are envisaged for better accuracy and response.
iii. All the thermocouples and RTDs would be duplex type. Temperature transmitters will be provided for the temperature elements.

10.3.6 Weather Monitoring Station

Weather Monitoring stations will be located at three different locations in the city (Undavalli Pumping station, LAM reservoir, Vykuntapuram Pumping station) to obtain the real time weather conditions and the same will be communicated to the nearby PLC and also the Main control room through FO cable communication network. Following parameters will be measured:

a) Wind speed and direction
b) Rain
c) Temperature
d) Humidity
e) Barometric pressure

10.3.7 Instrument Erection & Enclosures

(i) All field instruments shall be of SS316 and if not than shall be mounted in SS 316 enclosure and suitable for the design temperature and humidity.
(ii) Junction Boxes (JB) shall be of complete SS316.
(iii) Outdoor local control panels shall have SS316 enclosure with IP65, whereas indoor panels will be as per IP 54.

10.3.8 Power Supply

Independent UPS shall be located at both the Pumping stations and reservoirs to cater to 110V AC, single phase, 50 Hz, 2 wire power supply requirements of instrumentation and control systems. Power supply arrangement using batteries shall be made for items like level instruments, CCTV, etc. that are at a distance from the UPS.

10.3.9 Cables

I. Instrumentation Cables: Individual / pair shielded and overall shielded twisted pair copper cables would be used for analog signals and overall shielded cables would be

used for digital signals. All these cables will be of 600V AC grade and are armoured. All the insulation including overall sheath would be PVC FRLS quality. The size of the conductor would be 0.5 Sq.mm.

II. Control cables: For control cables carrying 230 V AC, 1.5 sq.mm size stranded copper cable will be used.

III. The interconnecting and communication bus of the PLC and other control systems as well as other special cables will be as per the manufacturer's standard.

IV. Fiber Optic cables are envisaged for communication between the main PLC and remotely located PLC systems.

10.3.10 Testing and Calibration Instrument

Necessary testing and calibration instruments required for the complete C&I system will be provided if required.

10.3.11 Miscellaneous systems

An optic fiber network is envisaged to be laid across the city covering the two pumping stations and the reservoirs and canal network. Utilities that can be benefitted by this FO network are as follows:

a) IP based CCTV network can be installed along the canals and the reservoirs to facilitate surveillance from the Main Control Room.
b) IP based telephone system
c) IP base Public address system

LAN infrastructure at pumping stations and reservoirs, if required.

10.3.12 Earthing

Dedicated Electronic earthing system, in addition to Electrical safety earthing would be provided to take care of requirement of the control system.

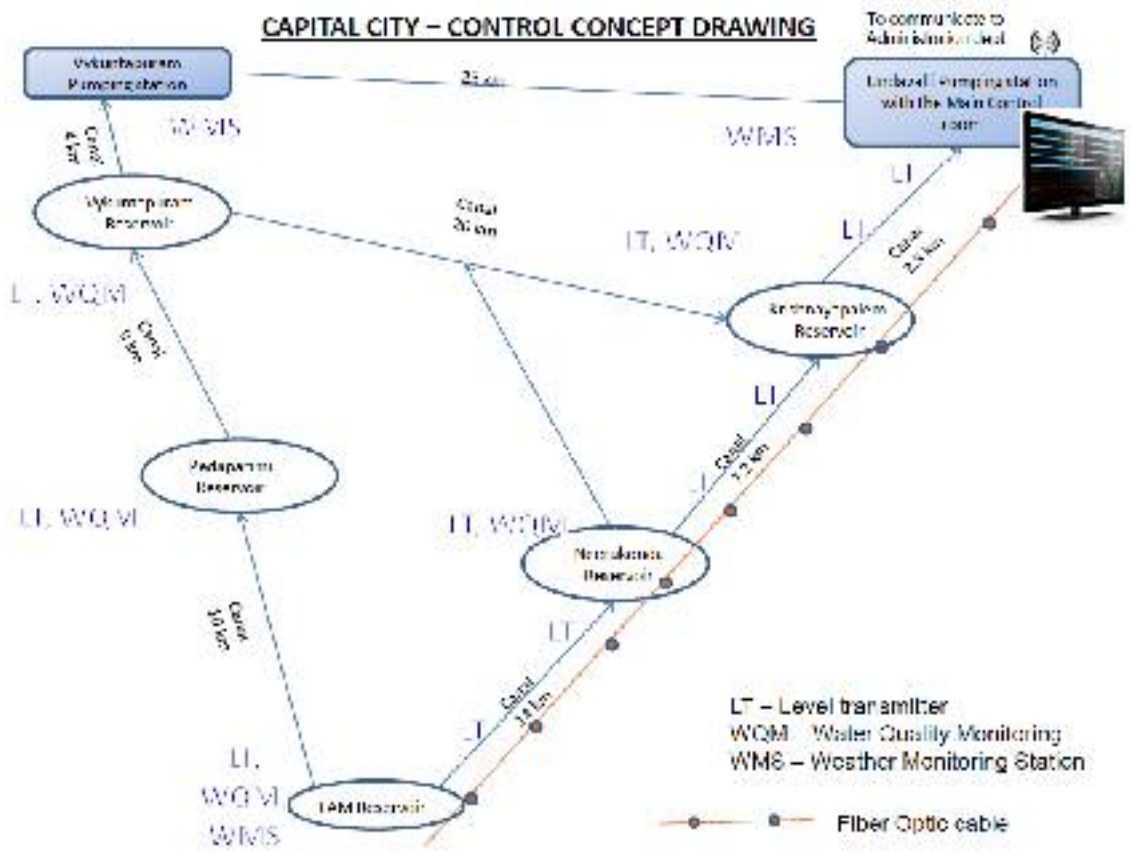

Figure 10.1 Schematic Drawing of Online based Flood and Water Quality Monitoring System

CHAPTER-11
COST ESTIMATES

11.1 GENERAL

The Cost Estimates for each of the component has been prepared based on the standard available rates under the Schedule of Rates (SoR) 2016-17 for Andhra Pradesh State. For certain items where Unit Rates are not available in AP SoR, suitable unit rates as available in Karnataka SoR are utilized in consultation with the Procurement Engineers of ADC as well as with the CDO Engineers. Furthermore, Item rates for certain quantities like De-watering, etc have been discussed in detail with ADC Engineers and suitably adopted.

11.2 SUMMARY OF COSTS

Based on the Bill of Quantities for various items of work under Flood Management of the capital city, summary of costs is tabulated as under:

Table 11.1 Summary of costs

Sl No.	Description	Amount (Rs. In Crores)
1	Construction of Kondaveeti Vagu canal between Undavalli and Neerukonda for a length of 11.0 km in Amaravati capital city	193.47
2	Construction of pale Vagu canal between Dandapadu and Kondamarajupalem for a length of 7.4 km in Amaravati capital city	55.96
3	Construction of pale Vagu canal between Kondamarajupalem and Krishnayapalem for a length of 9.3 km in Amaravati capital city	87.27
4	Construction of gravity/diversion canal between Nekkalu and Pichikalapalem for a length of 7.843 km in Amaravati capital city	153.16
Sub-total for Canals / Vagus		**489.87**
6	Construction of Reservoirs at Neerukonda, Krishnayapalem and Sakhamuru	**666.89**
7	Construction of Pumping Station at Undavalli including Electro-Mechanical works	650
8	Construction of Pumping Station at Vykuntapuram including Electro-Mechanical works	350
Sub-total for Pumping Stations		**1000**
9.	Instrumentation & Control	**5.73**
Total Cost		**2162.49**

11.3 COST OF FUTURE WORKS

The cost of future works as a part of Flood Management of the capital city includes the cost of lining of the canals. This basically includes the cost of proposed 150 mm thick CC lining over the 750 mm thick CNS material. The total cost of the future works is worked out to Rs. 260.13 Crore.

Table 11.2 Construction of Kondaveeti Vagu Canal Between Undavalli and Neerukonda for a Length of 11.0 km

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs.)
A. SITE CLEARANCE & ALLIED WORKS					
A1.	Clearing thin jungle growth (more than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	632,500	m^2	1.40	885,500.00
A2.	Clearing thick jungle growth (less than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	632,500	m^2	2.20	1,391,500.00
B. EXCAVATION & ALLIED WORKS					
B1.	Excavation in all kinds of soil including boulders upto 0.3 m diameter for canal, seating of embankment, filter drains / catch water drains etc., including dressing bed and sides to required level and profile, cost of all materials, machinery, labour, placing the excavated soil neatly in dump area or for the formation of service road / embankment as directed etc., complete with initial lead upto 1 km.				
B1.1	For initial depth of excavation upto 3 m below existing ground level	2,743,000	m^3	95.60	262,230,800.00
B1.2	For depth of excavation beyond initial depth of 3 m (including dewatering)	5,398,000	m^3	98.86	533,638,065.32
B2.	Extra over Item B1 for disposal of excavated soil beyond the initial lead of 1 km				
B2.1	Lead beyond 1 km and upto 2 km	407,050	m^3	12.60	5,128,830.00
B2.2	Lead beyond 2 km and upto 3 km	407,050	m^3	27.30	11,112,465.00
B2.3	Lead beyond 3 km and upto 4 km	407,050	m^3	39.90	16,241,295.00
B2.4	Lead beyond 4 km and upto 5 km	407,050	m^3	52.50	21,370,125.00
B2.5	Lead beyond 5 km and upto 10 km	1,628,200	m^3	115.50	188,057,100.00

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs.)
B2.6	Lead beyond 10 km and upto 15 km	814,100	m^3	178.50	145,316,850.00
B2.7	Lead beyond 15 km and upto 20 km	814,100	m^3	241.50	196,605,150.00
B2.8	Lead beyond 20 km and upto 25 km	814,100	m^3	304.50	247,893,450.00
B2.9	Lead beyond 25 km and upto 30 km	814,100	m^3	367.50	299,181,750.00
C MISCELLANEOUS WORKS					
C1.	Providing and fixing 20 x 20 x 75 cm size roughly dressed chainage stones along the length of canal at 200 m intervals including cost of all materials, labour, engraving marks, fixing in position, murum filling etc., complete with all lead and lifts.	56	Nos.	177.28	9,927.69
C2.	Providing and fixing 20 x 20 x 75 cm size permanent bench mark stone along the length of canal at 500 m interval in CC 1 :3 : 6 block of size 90 x 90 x 120 cm using 40 mm down size graded coarse aggregate and providing 35 cm thick 30 cm high UCR masonry in CM 1 : 5 proportion protective wall alround the BM stone, including cost of all materials, labour, dressing top surface of stone, engraving BM data on top surface, excavation, finishing, curing etc., complete with all lead and lifts.	22	Nos.	6636.26	145,997.66
C3.	Providing and constructing seepage inspection/observation wells along the canal bank at 500 m interval with 150 dia perforated UPVC pipe as per drawing including cement-Bentonite grouting, sand filters, geo textile member, aggregate filling, all materials, labours etc., Construction of inspection chamber 0.6mx0.6x0.6m deep with concrete M20 grade concrete with 20 mm down graded coarse aggregates with medium duty rectangular manhole cover and frame with locking arrangement, complete instrumentation arrangements with water level digital sensor cum recorder, transducer, mounting arrangements, power supply cable, etc as approved by the Engineer), complete as indicated in the drawing or as directed by the Engineer.	22	Nos.	251776.31	5,539,078.74
Total					**1934747884.41**
Total in Crores					**193.47**

Table 11.3 Construction of Pala Vagu Canal Between Dondapadu and Kondamarajupalem for a Length of 7.4 km

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs.)
A. SITE CLEARANCE & ALLIED WORKS					
A1.	Clearing thin jungle growth (more than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	186,500	m^2	1.40	261,100.00
A2.	Clearing thick jungle growth (less than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	186,500	m^2	2.20	410,300.00
B. EXCAVATION & ALLIED WORKS					
B1.	Excavation in all kinds of soil including boulders upto 0.3 m diameter for canal, seating of embankment, filter drains / catch water drains etc., including dressing bed and sides to required level and profile, cost of all materials, machinery, labour, placing the excavated soil neatly in dump area or for the formation of service road / embankment as directed etc., complete with initial lead upto 1 km.				
B1.1	For initial depth of excavation upto 3 m below existing ground level	982,684	m^3	95.60	93,944,599.48
B1.2	For depth of excavation beyond initial depth of 3 m (including dewatering)	1,365,316	m^3	98.86	134,973,052.63
B2.	Extra over Item B1 for disposal of excavated soil beyond the initial lead of 1 km				
B2.1	Lead beyond 1 km and upto 2 km	117,400	m^3	12.60	1,479,240.00
B2.2	Lead beyond 2 km and upto 3 km	117,400	m^3	27.30	3,205,020.00
B2.3	Lead beyond 3 km and upto 4 km	117,400	m^3	39.90	4,684,260.00
B2.4	Lead beyond 4 km and upto 5 km	117,400	m^3	52.50	6,163,500.00
B2.5	Lead beyond 5 km and upto 10 km	469,600	m^3	115.50	54,238,800.00
B2.6	Lead beyond 10 km and upto 15 km	234,800	m^3	178.50	41,911,800.00
B2.7	Lead beyond 15 km and upto 20 km	234,800	m^3	241.50	56,704,200.00
B2.8	Lead beyond 20 km and upto 25 km	234,800	m^3	304.50	71,496,600.00
B2.9	Lead beyond 25 km and upto 30 km	234,800	m^3	367.50	86,289,000.00
C MISCELLANEOUS WORKS					

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs.)
C1.	Providing and fixing 20 x 20 x 75 cm size roughly dressed chainage stones along the length of canal at 200 m intervals including cost of all materials, labour, engraving marks, fixing in position, murum filling etc., complete with all lead and lifts.	38	Nos.	171.89	6,531.83
C2.	Providing and fixing 20 x 20 x 75 cm size permanent bench mark stone along the length of canal at 500 m intervals in CC 1 :3 : 6 block of size 90 x 90 x 120 cm using 40 mm down size graded coarse aggregate and providing 35 cm thick 30 cm high UCR masonry in CM 1 : 5 proportion protective wall alround the BM stone, including cost of all materials, labour, dressing top surface of stone, engraving BM data on top surface, excavation, finishing, curing etc., complete with all lead and lifts.	15	Nos.	6553.10	98,296.46
C3.	Providing and constructing seepage inspection/observation wells along the canal bank at 500 m interval with 150 dia perforated UPVC pipe as per drawing including cement-Bentonite grouting, sand filters, geo textile member, aggregate filling, all materials, labours etc., Construction of inspection chamber 0.6mx0.6x0.6m deep with concrete M20 grade concrete with 20 mm down graded coarse aggregates with medium duty rectangular manhole cover and frame with locking arrangement, complete instrumentation arrangements with water level digital sensor cum recorder, transducer, mounting arrangements, power supply cable, etc as approved by the Engineer), complete as indicated in the drawing or as directed by the Engineer.	15	Nos.	251752.64	3,776,289.63
Total					**559642590.02**
Total in Crores					**55.96**

Table 11.4 Construction of Pala Vagu Canal Between Kondamarajupalem and Krishnayapalem for a Length of 9.3 km

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs.)
A. SITE CLEARANCE & ALLIED WORKS					
A1.	Clearing thin jungle growth (more than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	302,250	m^2	1.40	423,150.00
A2.	Clearing thick jungle growth (less than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	302,250	m^2	2.20	664,950.00
B. EXCAVATION & ALLIED WORKS					
B1.	Excavation in all kinds of soil including boulders upto 0.3 m diameter for canal, seating of embankment, filter drains / catch water drains etc., including dressing bed and sides to required level and profile, cost of all materials, machinery, labour, placing the excavated soil neatly in dump area or for the formation of service road / embankment as directed etc., complete with initial lead upto 1 km.				
B1.1	For initial depth of excavation upto 3 m below existing ground level	1,460,847	m^3	95.60	139,656,958.86
B1.2	For depth of excavation beyond initial depth of 3 m (including dewatering)	2,204,153	m^3	98.86	217,899,226.13
B2.	Extra over Item B1 for disposal of excavated soil beyond the initial lead of 1 km				
B2.1	Lead beyond 1 km and upto 2 km	183,250	m^3	12.60	2,308,950.00
B2.2	Lead beyond 2 km and upto 3 km	183,250	m^3	27.30	5,002,725.00
B2.3	Lead beyond 3 km and upto 4 km	183,250	m^3	39.90	7,311,675.00
B2.4	Lead beyond 4 km and upto 5 km	183,250	m^3	52.50	9,620,625.00
B2.5	Lead beyond 5 km and upto 10 km	733,000	m^3	115.50	84,661,500.00
B2.6	Lead beyond 10 km and upto 15 km	366,500	m^3	178.50	65,420,250.00
B2.7	Lead beyond 15 km and upto 20 km	366,500	m^3	241.50	88,509,750.00
B2.8	Lead beyond 20 km and upto 25 km	366,500	m^3	304.50	111,599,250.00
B2.9	Lead beyond 25 km and upto 30 km	366,500	m^3	367.50	134,688,750.00
C MISCELLANEOUS WORKS					

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs.)
C1.	Providing and fixing 20 x 20 x 75 cm size roughly dressed chainage stones along the length of canal at 200 m intervals including cost of all materials, labour, engraving marks, fixing in position, murum filling etc., complete with all lead and lifts.	48	Nos.	177.28	8,509.45
C2.	Providing and fixing 20 x 20 x 75 cm size permanent bench mark stone along the canal at 500 m interval in CC 1 :3 : 6 block of size 90 x 90 x 120 cm using 40 mm down size graded coarse aggregate and providing 35 cm thick 30 cm high UCR masonry in CM 1 : 5 proportion protective wall alround the BM stone, including cost of all materials, labour, dressing top surface of stone, engraving BM data on top surface, excavation, finishing, curing etc., complete with all lead and lifts.	19	Nos.	6613.58	125,657.96
C3.	Providing and constructing seepage inspection/observation wells along the canal bank at 500 m interval with 150 dia perforated UPVC pipe as per drawing including cement-Bentonite grouting, sand filters, geo textile member, aggregate filling, all materials, labours etc., Construction of inspection chamber 0.6mx0.6x0.6m deep with concrete M20 grade concrete with 20 mm down graded coarse aggregates with medium duty rectangular manhole cover and frame with locking arrangement, complete instrumentation arrangements with water level digital sensor cum recorder, transducer, mounting arrangements, power supply cable, etc as approved by the Engineer), complete as indicated in the drawing or as directed by the Engineer.	19	Nos.	251760.30	4,783,445.77
Total					**872685373.17**
Total in Crores					**87.27**

Table 11.5 Construction of Gravity/Diversion Canal Between Nekkallu and Pichikalapalem for a Length of 7.843 km

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs.)
A. SITE CLEARANCE & ALLIED WORKS					
A1.	Clearing thin jungle growth (more than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	352,935	m^2	1.40	494,109.00
A2.	Clearing thick jungle growth (less than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	352,935	m^2	2.20	776,457.00
B. EXCAVATION & ALLIED WORKS					
B1.	Excavation in all kinds of soil including boulders upto 0.3 m diameter for canal, seating of embankment, filter drains / catch water drains etc., including dressing bed and sides to required level and profile, cost of all materials, machinery, labour, placing the excavated soil neatly in dump area or for the formation of service road / embankment as directed etc., complete with initial lead upto 1 km.				
B1.1	For initial depth of excavation upto 3 m below existing ground level	2,011,730	m^3	95.60	192,321,340.20
B1.2	For depth of excavation beyond initial depth of 3 m (including dewatering)	4,271,271	m^3	98.86	422,251,301.61
B2.	Extra over Item B1 for disposal of excavated soil beyond the initial lead of 1 km				
B2.1	Lead beyond 1 km and upto 2 km	314,150	m^3	12.60	3,958,290.00
B2.2	Lead beyond 2 km and upto 3 km	314,150	m^3	27.30	8,576,295.00
B2.3	Lead beyond 3 km and upto 4 km	314,150	m^3	39.90	12,534,585.00
B2.4	Lead beyond 4 km and upto 5 km	314,150	m^3	52.50	16,492,875.00
B2.5	Lead beyond 5 km and upto 10 km	1,256,600	m^3	115.50	145,137,300.00
B2.6	Lead beyond 10 km and upto 15 km	628,300	m^3	178.50	112,151,550.00
B2.7	Lead beyond 15 km and upto 20 km	628,300	m^3	241.50	151,734,450.00
B2.8	Lead beyond 20 km and upto 25 km	628,300	m^3	304.50	191,317,350.00
B2.9	Lead beyond 25 km and upto 30 km	628,300	m^3	367.50	230,900,250.00
C CONCRETE AND ALLIED WORKS					

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs.)
C1.	Providing and laying insitu vibrated M-10 (28 days cube compressive strength not less than 10 N/sq mm) grade cement concrete using 20 mm down size approved, clean, hard, graded aggregates for sub-structure / super-structure works including cost of all materials, machinery, labour, formwork, scaffolding, cleaning, batching, mixing, placing in position, levelling, vibrating, finishing, curing etc., complete for all lead and lifts. (Cement content: 220 kg / cum with use of super plasticiser(0.4% by wt. of cement), CA : 0.80cum, Blending Ratio of CA--65:35, FA : 0.45 cum)	70	m^3	4735.09	331,456.01
C2.	Providing and laying insitu vibrated M-25 (28 days cube compressive strength not less than 25 N/sq mm) grade cement concrete using 20 mm down size approved, clean, hard, graded aggregates including cost of all materials, machinery, labour, formwork, centering, scaffolding, cleaning, batching, mixing, placing in position, levelling, vibrating, finishing, curing etc.,complete for RCC works of bottom raft, piers, abutments, side walls and such other locations for all lead and lifts. (Cement content : 380 kg / cum with use of super plasticiser,CA : 0.90 cum, blending ratio of CA--65:35, FA : 0.40 cum)	2900	m^3	5454.28	15,817,412.09
C3.	Providing, fabricating and placing in position reinforcement steel bars for RCC works including cleaning, straightening, cutting, bending, hooking, lapping, welding wherever required,tying with 1.25 mm dia soft annealed steel wire, including cost of all materials, machinery, labour etc., complete with initial lead upto 50 and all lifts.	410	MT	49876.99	20,449,563.85
C4.	Providing rubble / boulder and sand filling behind abutment and return walls in layers including cost of all materials, machinery, labour, watering, ramming etc., complete with all lead and lifts.	2000	m^3	774.82	1,549,639.55

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs.)
C5.	Providing and filling murum / gravely soil (CNS soil) for foundation including breaking clods, spreading in layers of 10 to 15 cm, watering, compaction by power roller to achieve density control of not less than 98 percent etc., complete with all lead and lifts.	200	m^3	444.02	88,803.89
C6.	Providing and laying insitu vibrated M-15 (28 days cube compressive strength not less than 15 N /sq mm) grade cement concrete using 20 mm down size approved, clean, hard, graded aggregates for bed and side lining(of thickness 100 mm) of canal including finishing the junction of bed and sides to required curveture, cost of all materials, machinery, labour, formwork including supports, cleaning, batching, mixing, placing in position, levelling, vibrating, finishing, curing etc., complete with all lead and lifts. (Cement content: 300 kg / cum for use of super plasticiser(0.4% by wt. of cement),CA : 0.80 cum, Blending Ratio of CA--65:35, FA : 0.45 cum)	120	m^3	5144.11	617,292.94
D MISCELLANEOUS WORKS					
D1.	Providing and fixing 20 x 20 x 75 cm size roughly dressed chainage stones along the length of canal at 200 m intervals including cost of all materials, labour, engraving marks, fixing in position, murum filling etc., complete with all lead and lifts.	41	Nos.	165.42	6,782.31
D2.	Providing and fixing 20 x 20 x 75 cm size permanent bench mark stone at 500 m interval in CC 1 :3 : 6 block of size 90 x 90 x 120 cm using 40 mm down size graded coarse aggregate and providing 35 cm thick 30 cm high UCR masonry in CM 1 : 5 proportion protective wall alround the BM stone, including cost of all materials, labour, dressing top surface of stone, engraving BM data on top surface, excavation, finishing, curing etc., complete with all lead ans lifts.	16	Nos.	6483.55	103,736.72

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs.)
D3.	Providing and constructing seepage inspection/observation wells all along the canal bank at 500 m interval with 150 dia perforated UPVC pipe as per drawing including cement-Bentonite grouting, sand filters, geo textile member, aggregate filling, all materials, labours etc., Construction of inspection chamber 0.6mx0.6x0.6m deep with M20 grade concrete with 20 mm down graded coarse aggregates with medium duty rectangular manhole cover and frame with locking arrangement, complete instrumentation arrangements with water level digital sensor cum recorder, transducer, mounting arrangements, power supply cable, etc as approved by the Engineer), complete as indicated in the drawing or as directed by the Engineer.	16	Nos.	25174 5.58	4,027,929.29
Total					**1531638769.46**
Total in Crores					**153.16**

Table 11.6 Cost Estimate for Neerukonda Reservoir

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
A. SITE CLEARANCE & ALLIED WORKS					
A1.	Clearing thin jungle growth (more than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	890,500	m^2	1.40	1,246,700.00
A2.	Clearing thick jungle growth (less than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	890,500	m^2	2.20	1,959,100.00
B. EXCAVATION & ALLIED WORKS					
B1.	Excavation in all kinds of soil including boulders upto 0.30 m diameter for reservoir, foundation of spillway and other appurtenant works and placing the excavated soil neatly in dump area or disposing off the same as directed etc., complete with initial lead upto 1 km.				

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
B1.1	For initial depth of excavation upto 3 m below existing ground level	4,751,000	m^3	121.30	576,296,300.00
B1.2	For depth of excavation beyond initial depth of 3 m (including dewatering)	8,343,000	m^3	125.43	1,046,499,615.10
B2.	Extra over Item B1 for disposal of excavated soil beyond the initial lead of 1 km				
B2.1	Lead beyond 1 km and upto 2 km	654,700	m^3	12.60	8,249,220.00
B2.2	Lead beyond 2 km and upto 3 km	654,700	m^3	27.30	17,873,310.00
B2.3	Lead beyond 3 km and upto 4 km	654,700	m^3	39.90	26,122,530.00
B2.4	Lead beyond 4 km and upto 5 km	654,700	m^3	52.50	34,371,750.00
B2.5	Lead beyond 5 km and upto 10 km	2,618,800	m^3	115.50	302,471,400.00
B2.6	Lead beyond 10 km and upto 15 km	1,309,400	m^3	178.50	233,727,900.00
B2.7	Lead beyond 15 km and upto 20 km	1,309,400	m^3	241.50	316,220,100.00
B2.8	Lead beyond 20 km and upto 25 km	1,309,400	m^3	304.50	398,712,300.00
B2.9	Lead beyond 25 km and upto 30 km	1,309,400	m^3	367.50	481,204,500.00
C. EMBANKMENT WORKS					
C1	Providing homogeneous embankment using excavated soil in layers of 25 to 30 cm before compaction including cost of all materials, machinery, labour, all operations such as excavation, sorting out, transportation, spreading soil in layer of specified thickness, breaking clods, sectioning, watering, compacting to density control of not less than 95 percent or as stipulated using Sheep foot roller / Vibratory roller/ 8 to 10 tonne power roller etc., complete with initial lead upto 1 km and all lifts.	442,200	m^3	140.90	62,305,980.00
D. LINING & ALLIED WORKS					
D1	Providing and laying 2.5 mm thick, 275 gsm poly-propeline non-woven geo-textile (filter fabric) for reservoir, including cost of materials, transportation, laying, etc., complete with all leads and lifts, as shown in the drawing or as directed by the Project Manager.	275,000	m^2	202.80	55,770,763.13

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
D2	Providing & laying Gabion mattress with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh as per IS 16014:2012, Mesh Type 6x8 (D=60 mm), Zinc coated steel wire and coated with extruded and bonded PVC material, Mesh wire diameter 2.7/3.7mm (ID/OD), mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2/3.2mm(ID/OD), as per drawing or as directed by the Project Manager.	880,000	m^2	942.44	829,344,054.00
D3	Providing and filling (with a maximum lift of 300 mm) 75 mm to 150 mm size hard stones free from dust, including cost of all materials, machinery, labour, all operations such as machine filling, hand placing, compaction, etc as per drawing or as directed by the Project Manager.	82,500	m^3	739.20	60,984,000.00
D4	Excavation of 1 m thick sandy soil and backfilling with impervious soil collected in reservoir area in heaps as part of disposal of excavated soil from reservoir including cost of all materials,machinery, labour, all operations such as sortingout, spreading in layer of 25 cm before compaction, breaking clods,sectioning, watering and compacting each layer to density control of not less than 98 percent or as stipulated by Sheep foot roller / Vibratory roller/ 8 to 10 tonne power roller etc., complete with all leads and lifts.	16,700	m^3	192.43	3,213,655.31
E. CONCRETE AND ALLIED WOKRS					
E1	Providing and laying insitu vibrated M-10 (28 days cube compressive strength not less than 10 N / sq mm) grade cement concrete using 40 mm down size approved, clean, hard, graded aggregates including cost of all materials, machinery, labour, formwork, centering, scaffolding, cleaning, batching, mixing, placing in position, levelling, vibrating, finishing, curing etc.,complete for plain concrete works with all lead and lifts. (Cement content 220 kg /cum with use of super	400	m^3	4415.30	1,766,120.00

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
	plasticiser,CA : 0.90 cum, Blending Ratio of CA:50:30:20, FA:0.40 cum)				
E2	Providing and laying insitu vibrated M-15 (28 days cube compressive strength not less than 15 N / sq mm) grade cement concrete using 40 mm down size approved, clean, hard, graded aggregates with placing and sinking plums of size 150 to 80 mm upto 15 percent for gravity type structures including cost of all materials, machinery, labour, formwork, scaffolding, cleaning, batching, mixing, placing in position, levelling, vibrating, finishing, curing etc.,complete with all lead and lifts. (Cement content : 260 kg / cum of concrete with use of plums and super plasticiser,, CA : 0.77 cum, Blending Ratio of CA : 50:30:20,FA : 0.34 cum, plums of size 150 to 80 mm : 0.25 cum)	1600	m^3	4708.10	7,532,960.00
E3	Providing and laying insitu vibrated M-25 (28 days cube compressive strength not less than 25 N / sq mm) grade cement concrete using 20 mm down size approved, clean, hard, graded aggregates including cost of all materials, machinery, labour, formwork, centering, scaffolding, cleaning, batching, mixing, placing in position, levelling, vibrating, finishing, curing etc.,complete for RCC works of sluice, spillway crest, spillway d / s face, energy dissipating structures, training walls, piers, abutments and such other locations with all lead and lifts. (Cement content : 380 kg / cum with use of super plasticiser,CA : 0.90 cum, blending ratio of CA--65:35, FA : 0.40 cum)	6200	m^3	5568.90	34,527,180.00
E4	Providing, fabricating and placing in position reinforcement steel for RCC,below 36 dia rods overlaps and wastages wherever required, tying with 1.25 mm diameter soft annealed steel wire, including cost of all materials, machinery, labour etc., complete with initial lead upto 1 km and all lifts.	500	MT	45332.18	22,666,090.00
E5	Expansion/Contraction Joints				

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
E5.1	Providing and constructing contraction joints by fixing 310 mm wide central bulb type approved quality PVC water stop in two lines with 8 mm diameter steel dowel rods on either side at 1m interval, forming 125 x 125 mm size groove in between two water stops, providing & fixing 15 mm dia two legged G.I pipe with U-bend at bottom for circulation steam at interval, forming 150 mm diameter formed drain behind water seals including filling groove with asphalt, circulation of steam at intervals, cost of all materials, machinery, labour etc., complete with all leads and lifts.	15	RM	2453.20	36,798.00
E5.2	Providing and constructing contraction joints by fixing 23 cm wide central bulb type PVC water stop in single line supported by 10 mm dia steel dowel rods on either side at 1 metre interval including cost of all materials, machinery, labour, valcunising joints etc., complete with all leads and lifts.	146	RM	222.00	32,412.00
F. HYDRO-MECHANICAL WORKS					
F1	Coarse Screen				
F1.1	Design, fabrication, supply, erection, testing and commissioning of coarse screen consisting of mild steel flats, stiffeners, bronze padded slide blocks/bearings, guide shoes, rubber seals, clamps etc., with all accessories including cost of all materials, machinery, labour, seal fixing etc.,complete as per specifications and approved drawings (excluding painting on sand-blasted or mechanical cleaning surfaces)	15	MT	130832.90	1,962,493.50
F1.2	Design, fabrication, supply, erection and commissioning of embedded parts consisting of sill beam, slide tracks, seal seats, guide rails, with all accessories for coarse screen including cost of all materials, machinery, labour, etc., complete as per specifications and approved drawings (excluding painting on sand-blasted or mechanical cleaning surfaces).	3	MT	159095.50	477,286.50

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
F1.3	Cleaning gates / hoists / embedded parts/lifting beams etc, to expose fresh metal surface for painting by sand blasting method as per specifications and painting of embedded metal parts and all types of gates, stoplogs,etc, on sand blasted surfaces with one coat of inorganic zinc silicate (airless spray preferred)70+/- 5 and two super coats with a total thickness of 300 microns (each 150+/- 5) of solventless coaltar epoxy paint each coat 150 microns (total 300 microns) cost of all materials, labour, scaffolding etc., complete with all leads and all lifts.	260	m^2	777.00	202,020.00
F2	Spillway Stoplog Gates				
F2.1	Design, fabrication, supply, erection, testing and commissioning of stoplog gate elements, consisting of skin plate, horizontal and vertical girders, stiffeners, lifting pins, bronze padded slide blocks/bearings, guide shoes, rubber seals, clamps etc., with all accessories including cost of all materials, machinery, labour, seal fixing etc.,complete as per specifications and approved drawings (excluding painting on sand-blasted or mechanical cleaning surfaces).	7	MT	130832.90	915,830.30
F2.2	Design, fabrication, supply, erection and commissioning of embedded parts consisting of sill beam, slide tracks, seal seats, guide rails, dogging sets for storage of stoplog elements etc., with all accessories for spillway stop log gates and other vertical lift elements including cost of all materials, machinery, labour, etc., complete as per specifications and approved drawings (excluding painting on sand-blasted or mechanical cleaning surfaces).	4	MT	159095.50	636,382.00
F2.3	Design, fabrication, supply, erection, testing and commissioning of automatic lifting beam with all accessories for handling, lowering and lifting of spillway stop log gate elements including cost of all materials, machinery, labour, cutting, aligning, welding, finishing, etc., complete as per specifications and drawings with all leads and lifts (excluding painting on sand-blasted or	8	MT	112246.20	897,969.60

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
	mechanical cleaning surfaces).				
F2.4	Cleaning gates / hoists / embedded parts/lifting beams etc, to expose fresh metal surface for painting by sand blasting method as per specifications and painting of embedded metal parts and all types of gates, stoplogs,etc, on sand blasted surfaces with one coat of inorganic zinc silicate (airless spray preferred)70+/- 5 and two super coats with a total thickness of 300 microns (each 150+/- 5) of solventless coaltar epoxy paint each coat 150 microns (total 300 microns) cost of all materials, labour, scaffolding etc., complete with all leads and all lifts.	85	m^2	777.00	66,045.00
F3	Spillway Gates				
F3.1	Design, fabrication, supply, erection, testing and commissioning of fixed wheel type vertical lift service gate consisting of skin plate, vertical and horizontal girders, wheels, stiffeners, lifting brackets, guide rollers, ballast blocks, teflon cladded rubber seals etc., with all accessories for orifice spillway including cost of all materials, machinery, labour,welding ,aligning finishing seal fixing etc.with all leads and lifts, complete as per specifications and approved drawings (excluding painting on sand-blasted or mechanical cleaning surfaces).	20	MT	131572.10	2,631,442.00
F3.2	Design, fabrication, supply, erection and commissioning of embedded parts consisting of sill beam, slide tracks, seal seats, guide rails, etc., with all accessories for orifice spillway gates and other vertical lift elements including cost of all materials, machinery, labour, etc., complete as per specifications and approved drawings (excluding painting on sand-blasted or mechanical cleaning surfaces).	6	MT	159095.50	954,573.00
F3.3	Design, fabrication, supply, erection, testing and commissioning of adequate capacity rope drum hoist consisting of hoist platform, rope drum, gear system, electric motor, electro-magnetic brake system, hand operation assembly, control panel, wire rope, pulleys, ladder etc., with all accessories for operating	20	MT	72473.10	1,449,462.00

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
	spillway gate including cost of all materials, machinery, labour, , complete as per specifications and drawings with all leads and lifts (excluding painting on sand-blasted or mechanical cleaning surfaces).				
F3.4	Cleaning gates / hoists / embedded parts/lifting beams etc, to expose fresh metal surface for painting by sand blasting method as per specifications and painting of embedded metal parts and all types of gates, stoplogs,etc, on sand blasted surfaces with one coat of inorganic zinc silicate (airless spray preferred)70+/- 5 and two super coats with a total thickness of 300 microns (each 150+/- 5) of solventless coaltar epoxy paint each coat 150 microns (total 300 microns) cost of all materials, labour, scaffolding etc., complete with all leads and all lifts.	145	m^2	777.00	112,665.00
F4	Sluices				
F4.1	Supply, transportation to site, laying, testing and commissioning of two scouring sluices of size 610 mm (OD) and 5.8 mm thick mild steel pipes including cost of all materials, labour, fabrication, welding, machinery, etc complete as per specifications/drawings or as directed by the Project Manager.	2	MT	69759.61	139,519.22
F4.2	Painting of steel pipes with one coat of inorganic zinc silicate (airless spray preferred) 70+/- 5 and two super coats with a total thickness of 300 microns (each 150+/- 5) of solventless coaltar epoxy paint each coat 150 microns (total 300 microns) cost of all materials, labour, scaffolding etc., complete with all leads and all lifts.	85	m^2	507.60	43,146.00
F4.3	Supply, transportation to site, fixing of D.I double flanged Sluice Valves conforming to IS- 14846 including gear arrangements for 600 mm dia. pipe suitable for a test pressure of PN 1.6 having Body, Bonnet, Dome, Stool cover, Wedge, Stufffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ;	2	Nos.	429370.97	858,741.94

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
	Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel including cost of materials, machinery, laboure, etc, complete as per specification/drawing or as directed by the Project Manager.				
Total in Rs					**4,534,482,313.59**
Total in Rs Cr.					**453.45**

Table 11.7 Cost Estimate for Krishnayapalem Reservoir

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
A. SITE CLEARANCE & ALLIED WORKS					
A1.	Clearing thin jungle growth (more than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	384,500	m^2	1.40	538,300.00
A2.	Clearing thick jungle growth (less than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	384,500	m^2	2.20	845,900.00
B. EXCAVATION & ALLIED WORKS					
B1.	Excavation in all kinds of soil including boulders upto 0.30 m diameter for reservoir and placing the excavated soil neatly in dump area or disposing off the same as directed etc., complete with initial lead upto 1 km.				
B1.1	For initial depth of excavation upto 3 m below existing ground level	2,135,000	m^3	121.30	258,975,500.00
B1.2	For depth of excavation beyond initial depth of 3 m (including dewatering)	2,980,000	m^3	125.43	373,794,660.55
B2.	Extra over Item B1 for disposal of excavated soil beyond the initial lead of 1 km				
B2.1	Lead beyond 1 km and upto 2 km	255,750	m^3	12.60	3,222,450.00
B2.2	Lead beyond 2 km and upto 3 km	255,75	m^3	27.30	6,981,975.00

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
		0			
B2.3	Lead beyond 3 km and upto 4 km	255,750	m^3	39.90	10,204,425.00
B2.4	Lead beyond 4 km and upto 5 km	255,750	m^3	52.50	13,426,875.00
B2.5	Lead beyond 5 km and upto 10 km	1,023,000	m^3	115.50	118,156,500.00
B2.6	Lead beyond 10 km and upto 15 km	511,500	m^3	178.50	91,302,750.00
B2.7	Lead beyond 15 km and upto 20 km	511,500	m^3	241.50	123,527,250.00
B2.8	Lead beyond 20 km and upto 25 km	511,500	m^3	304.50	155,751,750.00
B2.9	Lead beyond 25 km and upto 30 km	511,500	m^3	367.50	187,976,250.00
C. EMBANKMENT WORKS					
C1	Providing homogeneous embankment using excavated soil in layers of 25 to 30 cm before compaction including cost of all materials, machinery, labour, all operations such as excavation, sorting out, transportation, spreading soil in layer of specified thickness, breaking clods, sectioning, watering, compacting to density control of not less than 95 percent or as stipulated using Sheep foot roller / Vibratory roller/ 8 to 10 tonne power roller etc., complete with initial lead upto 1 km and all lifts.	3,400	m^3	140.90	479,060.00
D. LINING & ALLIED WORKS					
D1	Providing and laying 2.5 mm thick, 275 gsm poly-propeline non-woven geo-textile (filter fabric) for reservoir, including cost of materials, transportation, laying, etc., complete with all leads and lifts, as shown in the drawing or as directed by the Project Manager.	71,800	m^2	202.80	14,561,239.25
D2	Providing & laying Gabion mattress with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh as per IS 16014:2012, Mesh Type 6x8 (D=60 mm), Zinc coated steel wire and coated with extruded and bonded PVC material, Mesh wire diameter 2.7/3.7mm (ID/OD), mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist,	230,400	m^2	942.44	217,137,352.32

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
	tying with lacing wire of diameter 2.2/3.2mm(ID/OD), as per drawing or as directed by the Project Manager.				
D3	Providing and filling (with a maximum lift of 300 mm) 75 mm to 150 mm size hard stones free from dust, including cost of all materials, machinery, labour, all operations such as machine filling, hand placing, compaction, etc as per drawing or as directed by the Project Manager.	21,600	m^3	802.20	17,327,520.00
D4	Excavation of 1 m thick sandy soil and backfilling with impervious soil collected in reservoir area in heaps as part of disposal of excavated soil from reservoir including cost of all materials,machinery, labour, all operations such as sortingout, spreading in layer of 25 cm before compaction, breaking clods,sectioning, watering and compacting each layer to density control of not less than 98 percent or as stipulated by Sheep foot roller / Vibratory roller/ 8 to 10 tonne power roller etc., complete with all leads and lifts.	1,000	m^3	192.43	192,434.45
Total in Rs					**1,594,402,191.57**
Total in Rs Cr.					**159.44**

Table 11.8 Cost Estimate for Sakhamuru Reservoir

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
A. SITE CLEARANCE & ALLIED WORKS					
A1.	Clearing thin jungle growth (more than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	101,500	m^2	1.40	142,100.00
A2.	Clearing thick jungle growth (less than 50 percent open space) including bushes upto 30 cm / parthenium and other weeds including burning or disposing off the same as directed etc., complete.	101,500	m^2	2.20	223,300.00

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
B. EXCAVATION & ALLIED WORKS					
B1.	Excavation in all kinds of soil including boulders upto 0.30 m diameter for reservoir and placing the excavated soil neatly in dump area or disposing off the same as directed etc., complete with initial lead upto 1 km.				
B1.1	For initial depth of excavation upto 3 m below existing ground level	474,000	m^3	121.30	57,496,200.00
B1.2	For depth of excavation beyond initial depth of 3 m (including dewatering)	983,000	m^3	125.43	123,302,064.20
B2.	Extra over Item B1 for disposal of excavated soil beyond the initial lead of 1 km				
B2.1	Lead beyond 1 km and upto 2 km	72,850	m^3	12.60	917,910.00
B2.2	Lead beyond 2 km and upto 3 km	72,850	m^3	27.30	1,988,805.00
B2.3	Lead beyond 3 km and upto 4 km	72,850	m^3	39.90	2,906,715.00
B2.4	Lead beyond 4 km and upto 5 km	72,850	m^3	52.50	3,824,625.00
B2.5	Lead beyond 5 km and upto 10 km	291,400	m^3	115.50	33,656,700.00
B2.6	Lead beyond 10 km and upto 15 km	145,700	m^3	178.50	26,007,450.00
B2.7	Lead beyond 15 km and upto 20 km	145,700	m^3	241.50	35,186,550.00
B2.8	Lead beyond 20 km and upto 25 km	145,700	m^3	304.50	44,365,650.00
B2.9	Lead beyond 25 km and upto 30 km	145,700	m^3	367.50	53,544,750.00
C. LINING & ALLIED WORKS					
C1	Providing and laying 2.5 mm thick, 275 gsm poly-propeline non-woven geo-textile (filter fabric) for reservoir, including cost of materials, transportation, laying, etc., complete with all leads and lifts, as shown in the drawing or as directed by the Project Manager.	45,700	m^2	202.80	9,268,086.82
C2	Providing & laying Gabion mattress with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh as per IS 16014:2012, Mesh Type 6x8 (D=60 mm), Zinc coated steel wire and coated with extruded and bonded PVC material, Mesh wire diameter 2.7/3.7mm (ID/OD), mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of	146,133	m^2	942.44	137,721,376.24

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount in Rs.
	openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2/3.2mm(ID/OD), as per drawing or as directed by the Project Manager.				
C3	Providing and filling (with a maximum lift of 300 mm) 75 mm to 150 mm size hard stones free from dust, including cost of all materials, machinery, labour, all operations such as machine filling, hand placing, compaction, etc as per drawing or as directed by the Project Manager.	13,700	m^3	676.20	9,263,940.00
C4	Excavation of 1 m thick sandy soil and backfilling with impervious soil collected in reservoir area in heaps as part of disposal of excavated soil from reservoir including cost of all materials,machinery, labour, all operations such as sortingout, spreading in layer of 25 cm before compaction, breaking clods,sectioning, watering and compacting each layer to density control of not less than 98 percent or as stipulated by Sheep foot roller / Vibratory roller/ 8 to 10 tonne power roller etc., complete with all leads and lifts.	1,000	m^3	192.43	192,434.45
Total in Rs					**540,008,656.71**
Total in Rs Cr.					**54.00**

Table 11.9 Instrumentation & Control Cost - Flood Management System

Sl No.	Item Description	Cost (Rs.)
1	PLC system with workstations, field instruments for pumping stations - One PLC at each Pumping station and one PLC at each reservoir	13000000
2	Field instruments for Canal and reservoirs - 50 nos.	3000000
3	Water Quality measuring system for Canal and reservoirs - 4 nos.	16000000
4	Weather monitoring station - 3 nos.	100000
5	Fiber optic cable network with associated hardware (approx length - 80km)	15000000
6	Miscellaneous (Control room consoles, Containers, LVS, CCTV, Cables, etc..)	5000000
7	Erection cost	5200000
	TOTAL	**57300000**
	Total Cost in Crores	**5.73**

Table 11.10 Cost Estimate for Canal Lining (Future Work)

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs. In Crores)
A. Kondaveeti Vagu- between Undavalli & Neerukonda					
A1.	Providing cohesive non-swelling (CNS) soil lining to canals using soil from approved borrow area including spreading soil in layers of thickness not more than 15 cm, breaking clods, watering, compacting to density control of not less than 98 percent or as stipulated, dressing to required profile etc., complete with all lead and lifts.	808,500	m^3	395.26	31.96
A2.	Providing and laying 150mm thick insitu vibrated M-15 (28 days cube compressive strength-not less than 15.00 N / sq mm) grade cement concrete using 20 mm down size approved, clean, hard, graded aggregates for bed and side lining of canal lining using vibrating cylindertype mechanical paver including cost of all materials machinery labour batching mixing placing in position forming contraction joints fixing PVC joint seiling strips shifting of paver from one side of canal to other side etc.complete with all leads & lifts. (Cement content: 300 kg / cum for use of super plasticiser(0.4% by	1,078,000	m^2	709.19	76.45

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs. In Crores)
	wt. of cement),CA : 0.80 cum, Blending Ratio of CA--65:35, FA : 0.44 cum)				
A3.	Providing, fabricating and placing in position reinforcement steel bars for temperature reinforcement of CC lining for canal including cleaning, straightening, cutting, bending, hooking, lapping, tying with 1.25 mm dia. soft annealed steel wire, welding wherever required including cost of all materials, machinery, labour etc., complete with initial lead upto 50 and all lifts.(1.05 tonne/tonne of steel)	4,050	MT	49604.31	20.09
				TOTAL	**128.50**
B. Pala Vagu- between Dondapadu & Kondamarajupalem					
B1.	Providing cohesive non-swelling (CNS) soil lining to canals using soil from approved borrow area including spreading soil in layers of thickness not more than 15 cm, breaking clods, watering, compacting to density control of not less than 98 percent or as stipulated, dressing to required profile etc., complete with all lead and lifts.	183,200	m^3	332.26	6.09
B2.	Providing and laying 150mm thick insitu vibrated M-15 (28 days cube compressive strength-not less than 15.00 N / sq mm) grade cement concrete using 20 mm down size approved, clean, hard, graded aggregates for bed and side lining of canal lining using vibrating cylinder type mechanical paver including cost of all materials machinery labour batching mixing placing in position forming contraction joints fixing PVC joint seiling strips shifting of paver from one side of canal to other side etc.complete with all leads & lifts. (Cement content: 300 kg / cum for use of super plasticiser(0.4% by wt. of cement),CA : 0.80 cum, Blending Ratio of CA--65:35, FA : 0.44 cum)	244,200	m^2	700.88	17.12
B3.	Providing, fabricating and placing in position reinforcement steel bars for temperature reinforcement of CC lining for canal including cleaning, straightening, cutting, bending, hooking, lapping, tying with 1.25 mm dia. soft annealed steel wire, welding wherever required including cost of all materials, machinery, labour etc., complete with initial lead upto 50 and	920	MT	49604.31	4.56

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs. In Crores)
	all lifts.(1.05 tonne/tonne of steel)				
				TOTAL	**27.77**
C. Pala Vagu- between Kondamarajupalem & Krishnayapalem					
C1.	Providing cohesive non-swelling (CNS) soil lining to canals using soil from approved borrow area including spreading soil in layers of thickness not more than 15 cm, breaking clods, watering, compacting to density control of not less than 98 percent or as stipulated, dressing to required profile etc., complete with all lead and lifts.	341,800	m^3	395.26	13.51
C2.	Providing and laying 150mm thick insitu vibrated M-15 (28 days cube compressive strength-not less than 15.00 N / sq mm) grade cement concrete using 20 mm down size approved, clean, hard, graded aggregates for bed and side lining of canal lining using vibrating cylindertype mechanical paver including cost of all materials machinery labour batching mixing placing in position forming contraction joints fixing PVC joint seiling strips shifting of paver from one side of canal to other side etc.complete with all leads & lifts. (Cement content: 300 kg / cum for use of super plasticiser(0.4% by wt. of cement),CA : 0.80 cum, Blending Ratio of CA--65:35, FA : 0.44 cum)	455,700	m^2	706.45	32.19
C3.	Providing, fabricating and placing in position reinforcement steel bars for temperature reinforcement of CC lining for canal including cleaning, straightening, cutting, bending, hooking, lapping, tying with 1.25 mm dia. soft annealed steel wire, welding wherever required including cost of all materials, machinery, labour etc., complete with initial lead upto 50 and all lifts.(1.05 tonne/tonne of steel)	1,710	MT	49604.31	8.48
				TOTAL	**54.19**
D. Gravity/Diversion Canal- between Nekkallu & Pichikalapalem					
D1.	Providing cohesive non-swelling (CNS) soil lining to canals using soil from approved borrow area including spreading soil in layers of thickness not more than 15 cm, breaking clods, watering, compacting to density control of not less than 98 percent or as stipulated, dressing	347,100	m^3	256.66	8.91

Item No.	Description of Item	Qty	Unit	Rate (Rs.)	Amount (Rs. In Crores)
	to required profile etc., complete with all lead and lifts.				
D2.	Providing and laying 150mm thick insitu vibrated M-15 (28 days cube compressive strength-not less than 15.00 N / sq mm) grade cement concrete using 20 mm down size approved, clean, hard, graded aggregates for bed and side lining of canal lining using vibrating cylindertype mechanical paver including cost of all materials machinery labour batching mixing placing in position forming contraction joints fixing PVC joint seiling strips shifting of paver from one side of canal to other side etc.complete with all leads & lifts. (Cement content: 300 kg / cum for use of super plasticiser(0.4% by wt. of cement),CA : 0.80 cum, Blending Ratio of CA--65:35, FA : 0.44 cum)	462,737	m^2	694.56	32.14
D3.	Providing, fabricating and placing in position reinforcement steel bars for temperature reinforcement of CC lining for canal including cleaning, straightening, cutting, bending, hooking, lapping, tying with 1.25 mm dia. soft annealed steel wire, welding wherever required including cost of all materials, machinery, labour etc., complete with initial lead upto 50 and all lifts.(1.05 tonne/tonne of steel)	1,740	MT	49604.31	8.63
				TOTAL	**49.68**

CHAPTER-12

PROJECT IMPLEMENTATION SCHEDULE AND CONTRACT PACKAGING

12.1 GENERAL

The proposed Flood Management System in Amaravati Capital City shall be developed in the following phases (a) Earth works of all Canals within the capital city including the three Reservoirs at Neerukonda, Krishnayapalem and Sakhamuru including their Control Structures; (b) Canal Lining Works for all the navigable stretches of Kondaveeti and Pala Vagu; c) Construction of Flood Pumping Station at Undavalli; and d) Construction of Flood Pumping Station at Vykuntapuram..

12.2 BASE COST OF THE PROJECT

For estimating the cost of the various components of the project, Schedule of Rates (SoR) 2016-17 for Andhra Pradesh State has been adopted. The base cost of the project is **Rs. 2162.49 Crore.**

12.3 CONTRACT PACKAGING

The whole works will be divided into the following Contract Packages as indicated below.

Table 12.1 Tender Packaging

Tender - 1: Canals within Capital City	
Package 1	Construction of Kondaveeti Vagu Canal Between Undavalli and Neerukonda for a Length Of 11.0 Km in Amaravati Capital City
Package 2	Canal between Anantavaram and Sakhamuru – *not part of Flood Management*
Package 3	Construction of Pala Vagu Canal between Dondapadu and Kondamarajupalem for a Length of 7.4 Km in Amaravati Capital City
Package 4	Construction Of Pala Vagu Canal Between Kondamarajupalem and Krishnayapalem For A Length Of 9.3 Km In Amaravati Capital City
Package 5	Construction of Gravity/Diversion Canal between Nekkallu and Pichikalapalem for a Length of 7.843 Km in Amaravati Capital City
Tender – 2: Reservoirs Within Capital City	
Package 6	Construction of Neerukonda, Krishnayapalem and Sakhamuru Reservoirs in Amaravati Capital City
Tender – 3: Reservoirs Within Capital City	
Package 7	Construction of Flood Pumping Stations at Undavalli and Vykuntapuram

12.4 CONTRACT APPROACH

The procurement procedure for canal works shall be Item Rate Contract with two (2) envelope system as per the guideline stipulated by World Bank. Bidder will be selected based on National Competitive Bidding (NCB) or International Competitive Bidding (ICB) based on the project cost.

The procurement procedure adopted for reservoir will be Engineering Procurement and Construction (EPC) with two (2) envelope system as per the guideline stipulated by World Bank. Bidder will be selected based on either National Competitive Bidding (NCB) or International Competitive Bidding (ICB) based on the project cost.

The Contractor will be responsible for preparation of detailed design and construction drawings, execution of work, testing and commissioning including quality control, safety and timely completion of work. If required, review of drawings and clearing of designs shall be done by ADC.

12.5 IMPLEMENTATION SCHEDULE

The implementation schedule for the project is presented in Appendix-10. It is expected to start the construction works for canal by February 2018 and with 9 months construction periods the work will be commissioned by end of October 2018.

The construction of reservoir works is also expected to start by February 2018 and the work will be commissioned by end of April 2019 with 15 months construction periods.

CHAPTER-13
CONCLUSIONS AND RECOMMENDATIONS

13.1 CONCLUSIONS AND RECOMMENDATIONS

Following conclusions and recommendations are made for effective Flood Management of the proposed Capital City Amaravati. These are also based on several inferences made during various meetings with ADC, APCRDA, ID and all stakeholders and the directives from Amaravati Development Corporation Ltd. (ADCL).

I. In view of the topography of the location of the proposed capital city Amaravati on the right banks of River Krishna and upstream of existing Prakasam Barrage at Vijayawada, the capital city needs to be protected for a 1 in 100 year storm event in the catchment area of Kondaveeti Vagu.

II. Using SOBEK software, flood modeling of the Kondaveeti Vagu catchment (221 sq km) including its in-falling drains is carried out for a 1 in 100 year storm event. A flood flow of 470 m3/sec is estimated using this software. This is used in estimating the various canals and reservoirs in the capital city.

III. Duly considering the magnitude of flood flow for the 1 in 100 year storm event in the catchment area and design considerations including the Risk factors, Flood Mitigation Measures to be adopted to protect the capital city includes: a) Widening and Deepening of Kondaveeti Vagu and its in-falling drains; b) Construction of 5 Reservoirs – 3 outside the capital city – Lam, Pedaparimi and Vykuntapuram; 2 inside the capital city – Neerukonda and Krishnayapalem; and c) Construction of Flood Pumping Stations at Vykuntapuram and Undavalli.

IV. As per the discussions with ADC and relevant Government Departments, the Flood Mitigation measures to be adopted for the capital city for the canals in the catchment area shall be as follows: a) All Earthwork Excavation for Kondaveeti Vagu and its in-falling drains in the first phase followed by b) Canal lining works and associated works including the construction of reservoirs outside the capital city at Lam, Pedaparimi and Vykuntapuram in the second phase.

Based on the Standard Guidelines available of design of various components in the waterways system for the Capital City and the Schedule of Rates (SoR) of Andhra Pradesh State, the total cost of the Urban Waterways works out to **Rs. 2162.49 Crores.**

ZONING REGULATIONS

February 2016

AMARAVATI CAPITAL CITY

ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY
(APCRDA)

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CONTENTS

I PRELIMINARY 8

101 General 8

102 Definitions 8

II PERMIT PROCEDURE 20

201 Compliance with the Regulations 20

202 Chief City Planner 20

203 Commissioner 21

204 Executive Committee (EC) 21

205 Hearings, Appeals and Amendments 22

206 Violations 23

207 Development Permits 23

208 Application for development 24

209 Application details 25

210 Fees, Deposits and Charges 29

211 Environmentally sensitive developments 29

212 Decision on application 29

213 Procedure during development 30

214 Conditional Uses 32

215 TDR / Concessions in road widening cases 33

III ZONING DISTRICTS AND USE GROUPS 39

301 Classification of Zoning Districts 39

302 Zoning Map 39

303 Annexed territory 40

304 Classification of Uses 40

305 Classification of Regulations 40

IV ZONES DEFINED 41

401 Residential zone 41

402 Commercial Zone 43

403 Industrial Zone 43

404 Parks and Open Spaces Zone 44

405 Institutional Zone 44

406 Infrastructure Zone 45

V OTHER REGULATIONS 46

501 Off-Street Parking 46

502 Fencing 47

503 Location of ancillary buildings 47

504 Allowable Projections into setbacks 47

505 Green Strip Requirements 48

506 Loading Spaces 48

507 Passageways 48

508 Approval for and availability of essential services 48

509 Grading and Excavation Regulations 49

VI NON STANDARD APPLICATIONS 51

601 General 51

602 Non-conforming existing use 51

603 Zoning lots divided by administrative boundaries 52

604 Provision for home-office 52

605 Non-conforming and irregular shaped lots 54

606 Other conditions 55

607 Planned Unit Development 55

VII REGULATIONS FOR SPECIAL FACILITIES 59

701 Public facilities 59

702 Educational institutes 59

703 Hospitals and health institutions 60

704 Civic and community facilities 60

VIII Appendix I 61

IX Appendix II 63

X Appendix III 65

1001 R1: Village Planning Zone 65

1002 R2: Low Density Zone 71

1003 R3: Medium to High density zone 79

1004 R4: High density zone 86

1005 C1: Mixed use zone 91

1006 C2: General Commercial Zone 97

1007 C3: Neighbourhood Centre Zone 105

1008 C4: Town Centre Zone 113

1009 C5: Regional Centre Zone 118

1010 C6: Central Business District Zone 124

1011 I1: Business Park Zone 129

1012 I2: Logistics Zone 134

1013 I3: Non-polluting industry zone 139

1014 P1: Passive zone 144

1015 P2: Active Zone 148

1016 P3: Protected zone 151

1017 S1: Government Zone 154

1018 S2: Education Zone 155

1019 S3: Special Zone 156

1020 U1: Reserve Zone 157

1021 U2: Road Reserve Zone 158

XI Appendix IV 159

1101 Public Facilities 159

1102 Kindergarten / Child care centre 160

1103 Education Institutes 161

1104 Special Education schools 163

1105 Hospitals and Health centres 164

1106 Civic and Community institutes 167

1107 Evaluation for Special Institutional Buildings 169

1108 Religious Institutes 170

1109 Petrol / Fuel station 173

1110 Golf Course 175

XII Appendix V 177

1201 Method of calculating Building coverage 177

1202 Method of calculating Landscape Coverage 178

1203 Method of calculating Lot Coverage 179

1204 Basement Setback Illustration 180

1205 Screening for Mechanical and electrical equipments 181

1206 Car Parking Dimensions 182

1207 Fencing 184

1208 Slopes 185

XIII Appendix VI 186

LIST OF FIGURES

1 Provision for home office 53
- Illustrative diagrams for various zoning districts 65
2 Building coverage 177
3 Landscape coverage 178
4 Lot coverage 179
5 Basement setbacks 180
6 Basement setbacks 180
7 Screening for Mechanical and Electrical equipment plan 181
8 Illustration of Light Industrial (I1) - Flatted factory 181
9 Car parking stall dimensions 182
10 Car parking stall dimensions for the disabled 183
11 Fencing boundary 184

LIST OF TABLES

1 Drawing sheet sizes 25
3 Colour notation for plans 25
5 Zoning Districts 39
6 Minimum setbacks for Ancillary structures 42
- Zoning table - R1: Village Planning Zone 65
- Zoning table - R2: Low Density Zone 71
- Zoning table - R3: Medium to High density zone 79
- Zoning table - R4: High density zone 86
- Zoning table - C1: Mixed Use Zone 91
- Zoning table - C2: General Commercial Zone 97
- Zoning table - C3: Neighbourhood Centre Zone 105
- Zoning table - C4: Town Centre Zone 113
- Zoning table - C5: Regional Centre Zone 118
- Zoning table - C6: Central Business District Zone 124
- Zoning table - I1: Business Park Zone 129
- Zoning table - I2: Logistics Zone 134
- Zoning table - I3: Non-polluting industry zone 139
- Zoning table - P1: Passive Zone 144
- Zoning table - P2: Active Zone 148
- Zoning table - P3: Protected Zone 151
- Zoning table - S1: Government Zone 154
- Zoning table - S2: Education Zone 155
- Zoning table - S3: Special Zone 156
- Zoning table - U1: Reserve Zone 157
- Zoning table - U2: Road Reserve Zone 158
- Zoning table - Public Facilities 159
- Zoning table - Kindergarten / Child care centre 160
- Zoning table - Education Institutes 161
- Zoning table - Special Education schools 163

- Zoning table - Hospitals and Health centres 164
- Zoning table - Civic and Community institutes 167
- Evaluation for Special Institutional Buildings 169
- Zoning table - Religious Institutes 170
- Zoning table - Petrol / Fuel station 173
- Zoning table - Golf Course 175

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CHAPTER I

PRELIMINARY

101 GENERAL

101.1 Short Title. These regulations shall be known as the Zoning Regulations of Amaravati Capital City Area, hereinafter referred to as 'these regulations'.

101.2 Intent. The purpose of these regulations is to safeguard the health, property and public welfare by controlling the design, location, use or occupancy of all buildings and structures through the regulated and orderly development of land and land uses within this jurisdiction.

101.3 Applicability. The provisions of these regulations shall apply to the construction, addition, alteration, moving, repair and use of any building, structure, parcel of land or sign within a jurisdiction, except work located primarily in a public way, public utility towers and poles, and public utilities unless specifically mentioned in these regulations.

Where, in any specific case, different sections of these regulations specify different requirements, the more restrictive shall govern. Where there is conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.

In fulfilling these purposes, this plan is intended to benefit the public as a whole and not any specific person or class of persons. Although, through the implementation, administration and enforcement of these regulations, benefits and detriments will be enjoyed or suffered by specific individuals, such is merely a byproduct of the overall benefit to the whole community. Therefore, unintentional breaches of the obligations of administration and enforcement imposed on the jurisdiction hereby shall not be enforceable in tort.

If any portion of these regulations is held invalid for any reason, the remaining herein shall not be affected.

Exception: Existing buildings undergoing repair, alteration or additions and change of occupancy shall be permitted to comply with the National Building Code.

101.4 Scope. Unless otherwise expressly stated, the following words and terms shall, for the purposes of these regulations, have the meanings shown in this chapter.

101.5 Interchangeability. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neutral gender; the singular number includes the plural and the plural, the singular.

101.6 Terms defined elsewhere. Where terms are not defined in these regulations and are defined in the National Building Code or the Andhra Pradesh Capital Region Devlopment Authority Act, such terms shall have the meanings ascribed to them therein. It is not required that all the terms defined in these regulations are used.

101.7 Terms not defined. Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.

102 DEFINITIONS

Act means Andhra Pradesh Capital Region Development Authority Act, 2014.

ancillary building means any building erected on a plot that is incidental to a primary building on the same plot and the use of which is in connection with that primary building such as a detached garage.

ancillary living quarters means ancillary building used solely as the temporary dwelling of guests of the occupants of the premises; such dwelling having no kitchen facilities and not rented or otherwise used as a separate dwelling unit.

ancillary use means a use conducted on the same lot as the primary use of the structure to which it is related; a use that is clearly incidental to, and customarily found in connection with, such primary use.

alteration means any change, addition or modification in construction, occupancy or use.

amusement centre means an establishment offering five or more amusement devices, including, but not limited to, coin-operated electronic games, shooting galleries, table games and similar recreational diversions within an enclosed building.

apartments means a building having five or more dwelling units and common services on a given site or plot in a single or multiple blocks, without customary sub-division of land by way of individual plots.

automotive workshop, major An establishment primarily engaged in the repair or maintenance of motor vehicles, trailers and similar large mechanical equipment, including paint, body and fender, and major engine and engine part overhaul, which is conducted within a completely enclosed building.

automotive workshop, minor means an establishment primarily engaged in the repair or maintenance of motor vehicles, trailers and similar mechanical equipment, including brake, muffler, upholstery work, tire repair and change, lubrication, tune ups, and transmission work, which is conducted within a completely enclosed building.

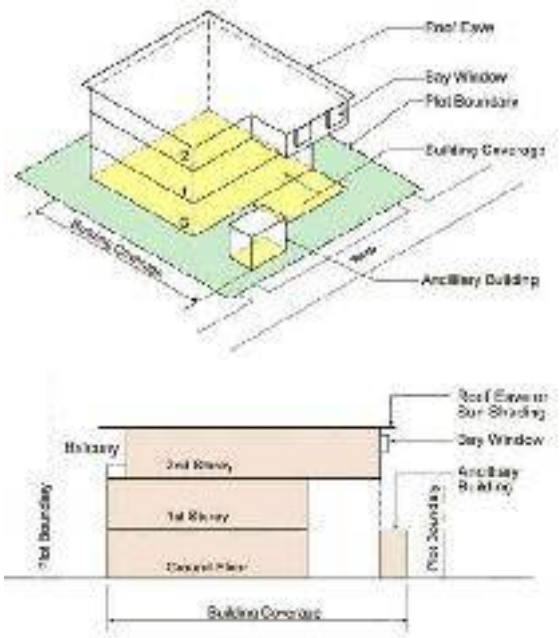
basement Any floor level below the ground level story in a building.

Big Box store means a physically large retail establishment usually a large free standing, rectangular, generally a single floor structure built on a concrete slab. The flat roof and ceiling trusses are generally made of steel and walls are concrete block clad in metal or masonry building. Such structures are generally more than 50,000 square feet in area.

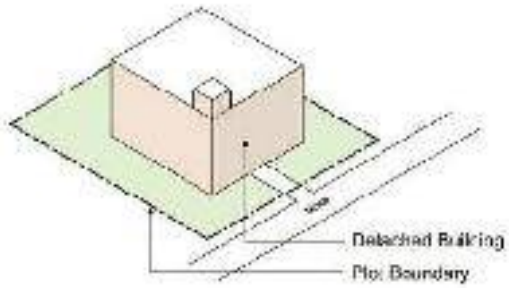
building means as defined in the Act.

building, attached means a building that abuts another building on the side plot line without any side setback.

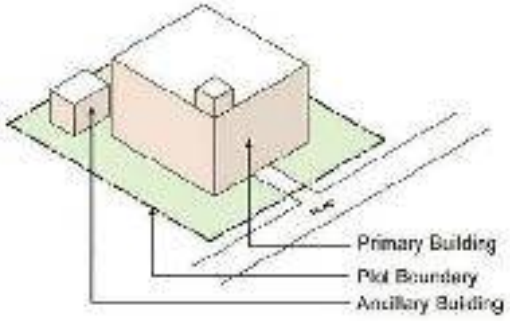
building, coverage means the percentage of the plot area occupied by the ground area of the primary and all ancillary buildings on such plot, inclusive of the shadow area created by cantilevered building projections, but do not include the following: . Bay windows with a projection of 0.5m or less.
. Roof eaves and sun shading projections.
. The shadow area of a building that is from the 3rd storey and above (to encourage viable landscaping at the ground level and shaded communal spaces, and promote building articulation and a variety of architectural designs).
Computation of building coverage shall include all existing developments within the plot.



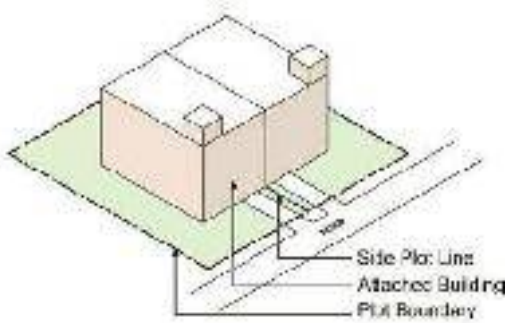
building, detached means a freestanding building that does not abut any other building on any side and open space is provided around all sides of the building and plot lines.



building, main or primary building means a building in which the principal use of the site is conducted for which the plot has been zoned.



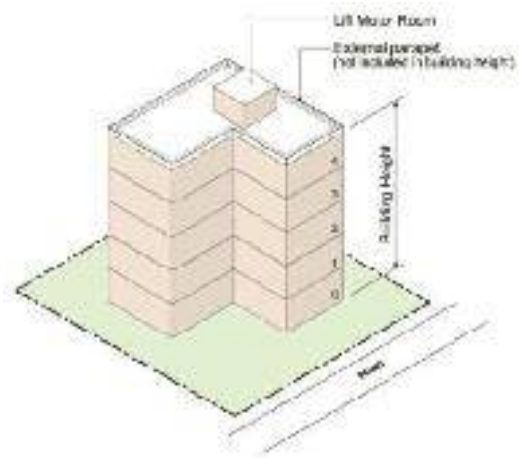
building, semi-detached means a building that abuts another building on one side of the plot line and side setback on the other side.

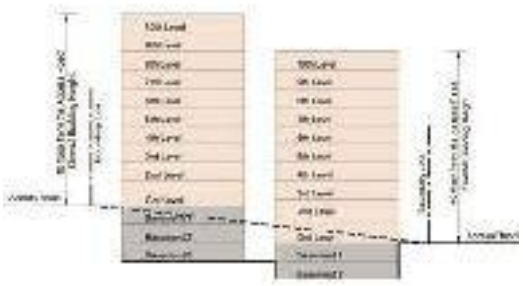


building, temporary means a building used temporarily for the storage of construction materials and equipment incidental and necessary to on-site permitted construction of utilities, or other community facilities, or used temporarily in conjunction with the sale of property within a subdivision under construction.

building code means the National Building Code.

building, height means the overall height of a building measured from grade or access road to the top of the last storey or the highest point of the building including stilt parking, but does not include: external parapets not exceeding 1.5m, lift overruns, antennae, rooftop mechanical and electrical service rooms and structures, and any other permitted structures as may be allowed by the sanctioning Authority from time to time. Along the slopes or along contoured topography the building height is measured as illustrated in the figure below.





building line means the perimeter of that portion of a building or structure nearest a property line, but excluding open steps, terraces, cornices and other ornamental features projecting from the walls of the building or structure.

business or financial services means an establishment intended for the conduct or service or administration by a commercial enterprise, or offices for the conduct of professional or business service.

canopy means a roofed structure constructed of fabric or other material supported by the building or by support extending to the ground directly under the canopy placed so as to extend outward from the building providing a protective shield for doors, windows and other openings.

commercial, heavy means an establishment or business that generally uses open sales yards, outside equipment storage or outside activities that generate noise or other impacts considered incompatible with less intense uses. Typical businesses in this definition are timber yards, construction specialty services, heavy equipment suppliers or building contractors.

commercial, light means an establishment or business that generally has retail or wholesale sales, office uses, or services, which do not generate noise or other impacts considered incompatible with less intense uses. Typical businesses in this definition are retail stores, offices, catering services or restaurants.

commercial centre, neighbourhood means a completely planned and designed commercial development providing for the sale of general merchandise and/or convenience goods and services. A community commercial center shall provide for the sale of general merchandise, and may include a variety store, discount store or supermarket.

commercial centre, convenience means a completely planned and designed commercial development providing for the sale of general merchandise and/or convenience goods and services. A convenience commercial center shall provide a small cluster of convenience shops or services.

commercial centre, township means a completely planned and designed commercial development providing for the sale of general merchandise and/or convenience goods and services. A neighborhood commercial center shall provide for the sales of convenience goods and services, with a supermarket as the principal tenant.

commercial centre, regional means a completely planned and designed commercial development providing for the sale of general merchandise and/or convenience goods and services. A regional center shall provide for

the sale of general merchandise, apparel, furniture, home furnishings, and other retail sales and services, in full depth and variety.

commercial retail means establishments that engage in the sale of general retail goods and services. Businesses within this definition include those that conduct sales and storage entirely within an enclosed structure (with the exception of occasional outdoor footpath promotions); businesses specializing in the sale of either general merchandise or convenience goods.

congregage residence means any building or portion thereof that contains facilities for living, sleeping and sanitation as required by these regulations, and may include facilities for eating and cooking for occupancy by other than a family. A congregate residence shall be permitted to be a shelter, convent, dormitory, or dharmashala, but does not include jails, hospitals, nursing homes, hotels or lodging houses.

court means a space, open and unobstructed to the sky, located at or above grade level on a lot and bounded on three or more sides by walls of a building.

day care means the keeping for care and/or instruction, whether or not for compensation, of two or more children at any one time. Child nurseries, preschools and adult care facilities are included in this definition.

dwelling unit density means the number of dwelling units that are allowed on an area of land, which area of land shall be permitted to include dedicated streets contained within the development.

driveway means a private access road, the use of that is limited to persons residing, employed, or otherwise using or visiting the parcel in which it is located.

dwelling, multiple unit means a building or portion thereof designed for occupancy upto four families living independently in which they may or may not share common entrances and/or other spaces. Individual dwelling units may be owned or offered for rent.

dwelling, single famly means a detached dwelling unit with a single kitchen and sleeping facilities, designed for occupancy by one family.

face of building, primary means the wall of a building fronting on a street or right-of-way, excluding any appurtenances such as projecting fins, columns, pilasters, canopies, marquees, showcases or decorations.

floor area, gross or GFA means the sum of the gross horizontal areas of all the floors of a building, measured from the exterior face of exterior walls or mid-point of common or party walls. The "floor area" of a building shall include basement floor area (except Parking), staircase blocks, planter boxes and ledges, public areas such as landings, and common lobbies. It shall exclude floor area used for parking facilities. Basements not utilized for any habitable or commercial purposes shall be exempt from gross floor area calculations. M&E floors with 1.5m or less headroom can be excluded from gross floor area computation.

Bay Window areas are excluded from the GFA Calculation, subject to the condition that all the Balcony and Bay Window area does not exceed 10% of overall GFA quantum of the building

Lift shafts and service ducts including the thickness of the walls are counted as GFA once at the ground storey level.

Any existing building not affected by the new development should clearly be stated in the existing gross floor area. Calculations of gross floor area for any development shall include the GFA of all existing developments within the plot.

floor area, net means the gross floor area exclu-

sive of vents, shafts, courts, elevators, stairways, exterior walls and similar facilities.

frontage means the width of a lot or parcel abutting a public right-of-way measured at the front property line.

fuel station means that portion of property where flammable or combustible liquids or gases used as fuel are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles. Ancillary activities shall be permitted to include automotive repair and maintenance, car wash service, and food sales. Such an establishment shall be permitted to offer for sale at retail other convenience items as a clearly secondary activity and shall be permitted also to include a free-standing automatic car wash.

garage, private means a building or a portion of a building not more than 100 m2 in area, in which only private or pleasure-type motor vehicles used by the tenants of the building or buildings on the premises are stored or kept.

Global Floor Space Index means the quotient of the ratio of the combined gross covered area (plinth area) on all floors, excepting areas specifically exempted under these Regulations, i.e. "Free of Built-Up Area", to the total area of the respective zoning block.

grade or Adjancent Ground Elevation(AGE) means the lowest point of elevation of the existing surface of the ground, within the area between the building and a line 1.5 m from the building.

group care facility means a facility, required to be permitted by the Government, which provides training, care, supervision, treatment and/or rehabilitation to the aged, disabled, those convicted of crimes, or those suffering the effects of drugs or alcohol; this does not include day care centers, schools, hospitals, jails or prisons.

group development means development of residential buildings in a campus or site of 4000 m^2 and above in area, and could be row-houses, semi-detached, detached houses, apartment blocks or mix or combination of the above with customary sub-division of plots and internal roads as required.

guest house A premise providing temporary accommodation for short durations containing less than 6 rooms.

habitable space or room means a space in a structure for living, sleeping, eating or cooking. Bathrooms, toilet compartments, closets, halls, storage or utility space, and similar areas are not considered habitable space.

high-rise buildings means a building with 18m or more in height. However, chimneys, cooling towers, boiling towers, lift machine rooms and other non-working areas in case of industrial buildings and water-tanks and architectural features in respect of other buildings are excluded.

home occupation means the partial use of a dwelling unit for commercial or nonresidential uses by a resident thereof, which is subordinate and incidental to the use of the dwelling for residential purposes.

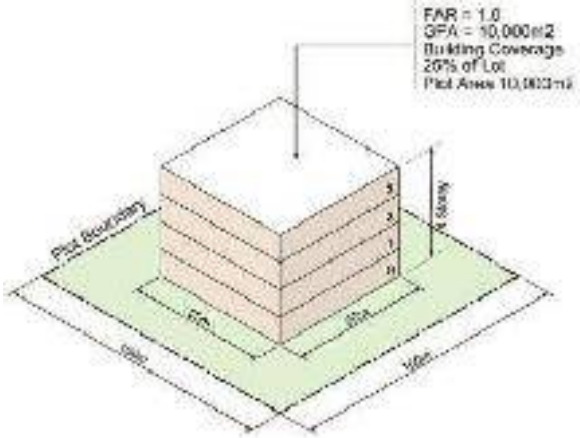
hospital means an institution designed for the diagnosis, treatment and care of human illness or infirmity and providing health services, primarily for inpatients, and including related facilities, laboratories, outpatient departments, training facilities and staff offices.

industrial or research park means a tract of land developed according to a development plan for the use of a family of industries and their related commercial uses, and that is of sufficient size and physical improvement to protect surrounding areas and the general community and to ensure a harmonious integration into the neighborhood.

jurisdiction as used in these regulations means the Amaravati Capital City Area notified under the Act.

kitchen means any room or portion of a room within a building designed and intended to be used for the cooking or preparation of food.

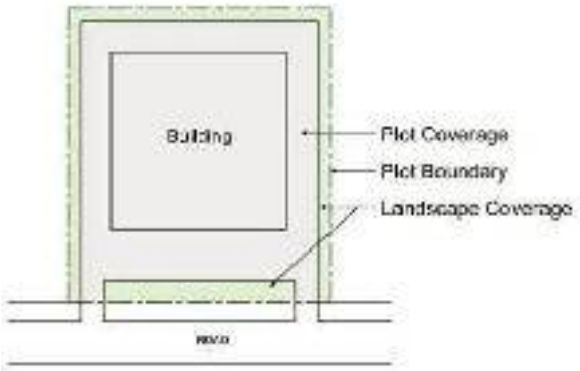
green coverage means the percentage of plot area covered by permeable surfaces and meant for aesthetic landscaping and the planting of grass & shrubbery.



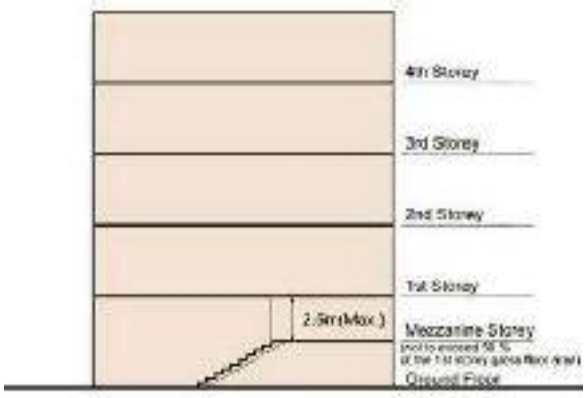
landscaping means the finishing and adornment of unpaved yard areas. Materials and treatment generally include naturally growing elements such as grass, trees, shrubs and flowers. This treatment shall be permitted also to include the use of logs, rocks, fountains, water features and contouring of the earth.

livestock includes, but is not limited to, bovine animals, sheep, goats and any other hoofed animals.

lot means a numbered, single parcel of land with predetermined boundaries used for the purpose of identifying the ownership.



mezzanine storey means an intermediate storey between 2 storeys but that is connected only by the storey below it, and which does not occupy more than 50% of the gross floor area of the storey below.



multiplex or multiplex complex shall mean an integrated entertainment and shopping center / complex or a shopping mall and having at least 3 (three) cinema halls / screens. Apart from Cinema halls, the entertainment area may have restaurants, cafeteria, fast food outlets, video games parlours, pubs, bowling alleys, health spa / centers, convention centers and other recreational activities. However, habitable area like hotels, service apartments shall not be allowed in the same block where the multiplexes are set-up and shall be allowed only as a separate block. Such a complex maybe spread

over the site or be in one or more blocks, which maybe highrise buildings or normal buildings.

industry, light means the manufacturing, compounding, processing, assembling, packaging or testing of goods or equipment, including research activities, conducted entirely within an enclosed structure, with no outside storage, serviced by a modest volume of trucks or vans and imposing a negligible impact on the surrounding environment by noise, vibration, smoke, dust or pollutants.

mortuary means an establishment in which the dead are prepared for burial or cremation.

hotel means any building containing six or more guest rooms intended or designed to be used, or which are used, rented or hired out to be occupied, or which are occupied for sleeping purposes by guests.

nonconforming lot means a lot whose width, area or other dimension did not conform to the regulations when these regulations became effective.

nonconforming sign means a sign or sign structure or portion thereof lawfully existing at the time these regulations became effective, which does not now conform.

nonconforming structure means a building or structure or portion thereof lawfully existing at the time these regulations became effective, which was designed, erected or structurally altered for a use that does not conform to the zoning regulations of the zone in which it is located.

nonconforming use See "use, nonconforming"

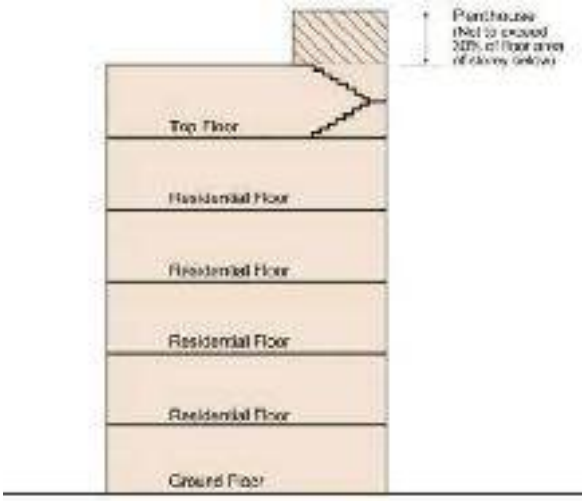
open space means land areas that are not occupied by buildings, structures, parking areas, streets, alleys or required yards. Open space shall be permitted to be devoted to landscaping, preservation of natural features, patios, and recreational areas and facilities.

park means a public or private area of land, with or without buildings, intended for outdoor active or passive recreational uses.

parking lot means an open area, other than a street, used for the parking of automobiles.

parking space, automobile means a space within a building or private or public parking lot, exclusive of driveways, ramps, columns, office and work areas, for the parking of an automobile.

penthouse means the uppermost storey of a building that is directly connected to, and associated with the use of the storey immediately below it, and which does not occupy more than 30% of the gross floor area of the storey below.



person means a natural person, heirs, executors, administrators or assigns, and includes a firm, partnership or corporation, its or their successors or assigns, or the agent of any of the aforesaid.

Planned Unit Development(PUD) means a residential or commercial development guided by a total design plan in which one or more of the zoning or subdivision regulations, other than use regulations, shall be permitted to be waived or varied to allow flexibility and creativity in site and building design and location, in accordance with

general guidelines. Minimum area required for PUD is 4 Ha.

plot area means the total horizontal area (in square metres) included within the plot boundary lines.

plot coverage means the percentage of a plot area occupied by the ground area of primary and all ancillary buildings, structures and driveways, aisles and parking spaces.

plot plan means a plot of a lot, drawn to scale, showing the actual measurements, the size and location of any existing buildings or buildings to be erected, the location of the lot in relation to abutting streets, and other such information.

pools, swimming, spas :

Above-ground/ on-ground pool See "private swimming pool"

in-ground pool or spa See "private swimming pool"

barrier means a fence, a wall, a building wall, the wall of an above-ground swimming pool or a combination thereof, which completely surrounds the swimming pool and obstructs access to the swimming pool.

power safety cover means a pool cover that is placed over the water area, and is opened and closed with a motorized mechanism activated by a control switch.

private swimming pool means any structure that contains water over 61 cm in depth and which is used, or intended to be used, for swimming or recreational bathing in connection with an occupancy in residential zone and which is available only to the family and guests of the householder. This includes in-ground, above-ground, and on-ground swimming pools and spas.

private swimming pool, indoor means any private swimming pool that is totally contained within a private structure and surrounded on all four sides by walls of said structure.

private swimming pool, outdoor means any private swimming pool that is not an indoor pool.

public swimming pool means any swimming pool other than a private swimming pool.

public facilities means all the publicly accessible uses like recreational spaces, religious, cultural, social, educational and health-related uses.

public services means uses operated by a unit of government to serve public needs, such as police, jail, fire service, ambulance, judicial court or government offices, but not including public utility stations or maintenance facilities.

public utility station means a structure or facility used by a public or quasi-public utility agency to store, distribute, generate electricity, gas, telecommunications, and related equipment, or to pump chemically treated water. This does not include storage or treatment of sewage, solid waste or hazardous waste.

public works/ municipal works means any drainage ditch, storm sewer or drainage facility, sanitary sewer, water main, roadway, parkway, sidewalk, pedestrian way, tree, lawn, off-street parking area, lot improvement, or other facility for which the local government may ultimately assume the responsibility for maintenance and operation, or for which the local government responsibility is established.

public way means any street, alley or similar parcel of land essentially unobstructed from

the ground to the sky, which is deeded, dedicated or otherwise permanently appropriated to the public for public use.

quasi public means essentially a public use, although under private ownership or control.

recreation, indoor means an establishment providing completely enclosed recreation activities. Ancillary uses shall be permitted to include the preparation and serving of food and/or the sale of equipment related to the enclosed uses. Included in this definition shall be roller skating or ice skating, billiards, and related amusements.

recreation, outdoor means an area free of buildings except for restrooms, dressing rooms, equipment storage, maintenance buildings, open-air pavilions and similar structures used primarily for recreational activities.

recycling facility means any location whose primary use is where waste or scrap materials are stored, bought, sold, accumulated, exchanged, packaged, disassembled or handled, including, but not limited to, scrap metals, paper, rags, tires and bottles, and other such materials.

licenced professional means an architect or engineer licensed to practice professional architecture or engineering as defined by statutory requirements of the professional registration laws.

rehabilitation centre means an establishment whose primary purpose is the rehabilitation of per- sons. Such services include drug and alcohol rehabilitation, assistance to emotionally and mentally disturbed persons, and houses for prison parolees and juveniles.

religious and cultural activity means a use or building owned or maintained by organized religious organizations or nonprofit associations for social, civic or philanthropic purposes, or the purpose for which persons regularly assemble for worship.

rennovation means interior or exterior remodeling of a structure, other than ordinary repair.

restaurant means an establishment that sells prepared food for consumption. Restaurants shall be classified as follows:

restaurant, fast food means an establishment that sells food already prepared for consumption, packaged in paper, styrofoam or similar materials, and may include drive-in or drive-up facilities for ordering.

restaurant, general means an establishment that sells food for consumption on or off the premises.

restaurant, take-out means an establishment that sells food only for consumption off the premises.

sanctioning authority means Commissioner, APCRDA or any officer to whom sanctioning powers have been delegated.

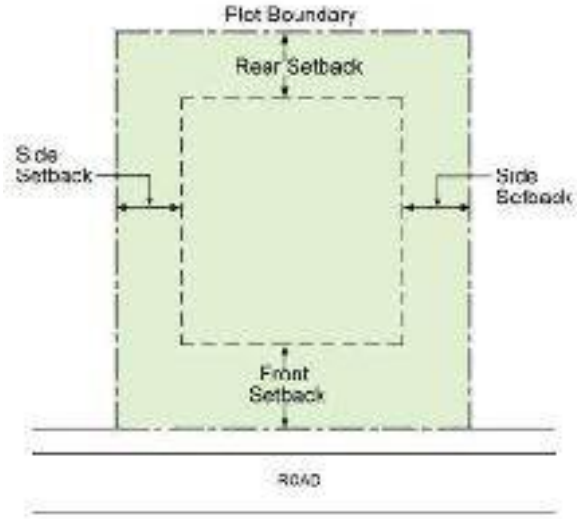
school, commercial means a school establishment to provide for the teaching of industrial, clerical, managerial or artistic skills. This definition applies to schools that are owned and operated privately for profit and that do not offer a complete educational curriculum (e.g., beauty school or modeling school).

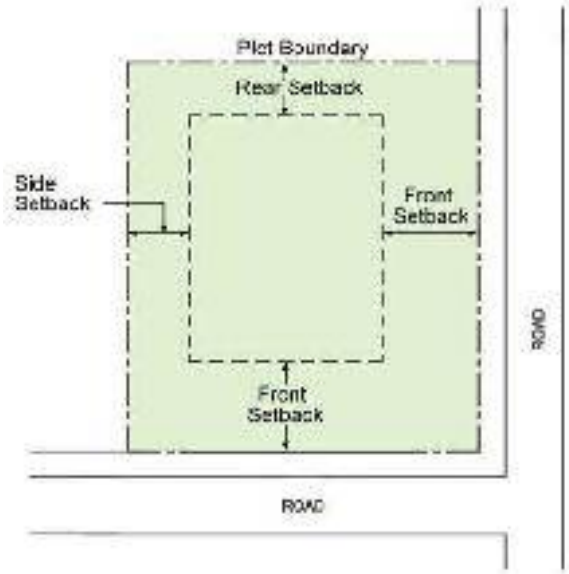
setback means the minimum required distance between the property line and the building line. It is an open, unoccupied space on a lot, other than a court, which is unobstructed from the ground upward by buildings or structures, except as otherwise provided in these regulations.

setback, front means a setback extending across the full width of the lot, the depth of which is the minimum horizontal distance between the front lot line and a line parallel thereto.

setback, rear means a setback extending across the full width of the lot, the depth of which is the minimum horizontal distance between the rear lot line or ordinary high water line and a line parallel thereto.

setback, side means an open, unoccupied space on the same lot with the building and between the building line and the side lot line, or to the ordinary high water line.





service apartment means a fully furnished apartment available for both short-term as well as long-term stays, providing all the hotel-like amenities. Serviced apartments typically include soft-furnishings and cooking utensils so that long term tenants need not bring their own, and have all the services like housekeeping, front office, parking & others included in the rent. Service Apartments will be applicable to Commercial tax regulations prevailing in Amaravati.

site plan means a plan that outlines the use and development of any tract of land.

storey means that portion of building included between the upper surface of any floor and the upper surface of the floor next above, except that the topmost storey shall be that portion of a building included between the upper surface of the topmost floor and the ceiling or roof above. If the finished floor level directly above a usable or unused under-floor space is more than 1.8 m above grade as defined herein for more than 50 percent of the total perimeter or is more than 3.7 m above grade as defined herein at any point, such usable or unused under-floor space shall be considered as a story.

street means any thoroughfare or public way not less than 6 m in width which has been dedicated.

street, private means a right-of-way or easement in private ownership, not dedicated or maintained as a public street, which affords the principal means of access to two or more sites.

structure means that which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

subdivision means the division of a tract, lot or parcel of land into two or more lots, plats, sites or other divisions of land.

theatre or cinema hall means a building used primarily for the presentation of live stage productions, performances or motion pictures.

Transferable Development Rights (TDR) means an award specifying the built up area an owner of a site or plot can sell or dispose or utilize elsewhere, in lieu of surrounding land free of cost which is required to be set apart or affected for public purpose as per the Master Plan or in road widening or covered in recreational use zone, etc. The award is in the form of a TDR Certificate issued by the Commissioner.

use means the activity occurring on a lot or parcel for which land or a building is arranged, designed or intended, or for which land or a building is or may be occupied, including all accessory uses.

use, change of means the change within the classified use of a structure or premise.

use, nonconforming means a use that lawfully occupied a building or land at the time these regulations became effective, which has been lawfully continued and which does not now conform with the use regulations.

use, principal means a use that fulfills a primary function of a household, establishment, institution or other entity.

use, temporary means a use that is authorized by these regulations to be conducted for a fixed period of time. Temporary uses are characterized by such activities as the sale of agricultural products, contractor's offices and equipment sheds, fireworks, carnivals, flea markets, and garage sales.

variance means a deviation from the height, bulk, setback, parking or other dimensional requirements established by these regulations.

warehouse, wholesale or storage means a building or premises in which goods, merchandise or equipment are stored for eventual distribution.

use, permitted means uses that comply with the intended use for the particular zone and can be permitted outright within any particular zoning district. However, the development may have to comply with other context specific additional regulatory restrictions e.g. Urban Design Guidelines, Heritage & Conservation etc.

use, conditional means a use that would become harmonious or compatible with neighbouring uses through the application and maintenance of qualifying conditions.

use, prohibited means uses that are deemed prohibited, and include activities that have been found to be incompatible with the particular zoning district. For example, industrial uses are prohibited within the residential zones.

zoning plan means a combination of (i) zoning map which identifies specific zoning districts within the planning area based on the predominant land use, and (ii) zoning regulations which describe the permitted, prohibited and conditional uses in each zoning district along with the desired intensity, building height, physical layout of buildings, parking, sign regulation, or other physical structures and elements on the land for that zone.

Terms and Expressions which are not defined in these rules shall have the same meaning as in the respective local authorities / APCRDA and as defined in the National Building Code as the case may be, unless the context otherwise requires.

CHAPTER II

PERMIT PROCEDURE

201 COMPLIANCE WITH THE REGULATIONS

201.1 General. Upon adoption of these regulations by the APCRDA, no use, building or structure, whether publicly or privately owned, shall be constructed or authorized until the location and extent thereof conform to said plan.

201.2 Developments prior to these regulations. Lawfully established buildings and uses in existence at the time of the adoption of these regulations shall be permitted to have their existing use or occupancy continued, provided such continued use is not dangerous to life.

201.3 Additions, alterations or repairs. Additions, alterations or repairs shall be permitted to be made to any building or use without requiring the existing building or use to comply with the requirements of these regulations, provided the addition, alteration or repair conforms to that required for a new building or use.

201.4 Maintenance. All buildings or uses, both existing and new, and all parts thereof, shall be maintained. The owner shall be responsible for the maintenance of buildings and parcels of land. To determine compliance with this section, the Commissioner shall be permitted to cause any structure or use to be inspected.

201.5 Moved and temporary buildings, structures, and uses. Buildings or structures moved into or within the jurisdictions shall comply with the provisions of these regulations for new buildings and structures. Temporary buildings, structures and uses such as reviewing stands and other miscellaneous structures, sheds, canopies or fences used for the protection of the public shall be permitted to be erected, provided a special approval is received from the Chief City Planner for a limited period of time. Temporary buildings or structures shall be completely removed upon the expiration of the time limit stated in the permit.

201.6 Illegal uses. Uses that were illegally established prior to the adoption of these regulations shall remain illegal.

202 CHIEF CITY PLANNER

202.1 General. This section establishes the duties and responsibilities of the Chief City Planner and/or designee who shall be referred to hereafter as "Chief City Planner".

202.2 Deputies. The Commissioner may appoint the Chief City Planner and such number of technical officers and other employees from time to time under the Chief City Planner, as may be necessary to carry out the functions of these regulations.

202.3 Issue of permits The Commissioner may from time to time delegate his powers to Chief City Planner and other officials as may be necessary to carry out the functions of these regulations.

202.4 Conditional use permits and variances. The Chief City Planner shall receive all applications for conditional uses and variances or other plans as shall be permitted or approved as required by these regulations, review for completeness and prepare submittals for review by the Commissioner.

202.5 Amendments. All requests for amendments or changes to the master plan or these regulations or zoning map shall be submitted to the Chief City Planner for processing.

202.6 Interpretations. The interpretation and application of the provisions of these regulations shall be by the Chief City Planner. An appeal of an interpretation by the Chief City Planner shall be submitted to the Commissioner who is authorized to interpret these regulations, and

such interpretation shall be considered final.
Uses are permitted within the various zones as described in these regulations and as otherwise provided herein.
It is recognized that all possible uses and variations of uses that might arise cannot reasonably be listed or categorized. Mixed uses/sites or any use not specifically mentioned or about which there is any question shall be administratively classified by comparison with other uses identified in the zones described in these regulations. If the proposed use resembles identified uses in terms of intensity and character, and is consistent with the purpose of these regulations and the individual zone's classification, it shall be considered as a permitted/prohibited use within a general zone classification, subject to the regulations for the use it most nearly resembles. If a use does not resemble other identified allowable uses within a zone, it may be permitted as determined by the Executive Committee as an amendment to these regulations pursuant to Section 205.3

202.7 Liability. The Chief City Planner, or designee, charged with the enforcement of these regulations, acting in good faith and without malice in the discharge of the duties described in these regulations, shall not be personally liable for any damage that may accrue to persons or property as a result of an act or by reason of an act or omission in the discharge of such duties. A suit brought against the Chief City Planner or employee because such act or omission performed by the Chief City Planner or employee in the enforcement of any provision of such regulations or other pertinent laws or rules or standing orders implemented through the enforcement of these regulations or enforced by the enforcement agency shall be defended by the jurisdiction until final termination of such proceedings, and any judgment resulting therefrom shall be assumed by the jurisdiction.
These regulations shall not be construed to relieve from or lessen the responsibility of any person owning, operating or controlling any building or parcel of land for any damages to persons or property caused by defects, nor shall the enforcement agency or its jurisdiction be held as assuming any such liability by reason of the reviews or permits issued under these regulations.

202.8 Cooperation of other officials. The Chief City Planner shall be authorized to request, and shall receive so far as is required in the discharge of the duties described in these regulations, the assistance and cooperation of other officials of the jurisdiction.

203 COMMISSIONER

203.1 General. This section addresses the duties and responsibilities of Commissioner.

203.2 Division of land regulations. It shall be the duty of the Commissioner to develop and adopt regulations governing the division of land. All divisions of land shall be in accordance with the adopted regulations.

203.3 Conditional use permits. It shall be the duty of the commissioner to review conditional use permit applications. The application shall be accompanied by maps, drawings or other documentation in support of the request. The granting of a conditional use permit shall not exempt the applicant from compliance with other relevant provisions of related regulations.

203.4 Official zoning map. APCRDA shall adopt an official zoning map for all areas included within the jurisdiction.

204 EXECUTIVE COMMITTEE (EC)

204.1 General. This section addresses the duties and responsibilities of EC.

204.2 Variances. The EC shall have the power to hear and decide on cases wherein a variance to the terms of these regulations is proposed. Limitations as to the EC's authorization shall be as set forth in these regulations.

204.3 Variance review criteria. The EC shall be permitted to approve, approve with conditions or deny a request for a variance. Each request for a variance shall be consistent with the following criteria:

1. Limitations on the use of the property due to physical, topographical and geologic features.
2. The grant of the variance will not grant any special privilege to the property owner.
3. The applicant can demonstrate that without a variance there can be no reasonable use of the property.
4. The grant of the variance is not based solely on economic reasons.
5. The necessity for the variance was not created by the property owner.
6. The variance requested is the minimum variance necessary to allow reasonable use of the property.
7. The grant of the variance will not be injurious to the public health, safety or welfare.
8. The property subject to the variance request possesses one or more unique characteristics generally not applicable to similarly situated properties.

204.4 Use variance. The EC shall not grant a variance to allow the establishment of a use in a zoning district when such use is prohibited by the provisions of these regulations.

204.5 Decisions. The EC shall be permitted to decide in any manner it sees fit; however, it shall not have the authority to alter or change these regulations or zoning map or allow as a use that which would be inconsistent with the requirements of these regulations. Provided, however, that in interpreting and applying the provisions of these regulations, the requirements shall be deemed to be the spirit and intent of these regulations and do not constitute the granting of a special privilege.

205 HEARINGS, APPEALS AND AMENDMENTS

205.1 Hearings. Upon receipt of an application of appeal or vairance in proper form, the Chief City Planner shall arrange serve a notice stating the nature of the request, the location of the property, and the time and place of hearing. Reasonable effort shall also be made to give notice by regular mail of the time and place of hearing to each surrounding property owner; the extent of the area to be notified shall be set by the Chief City Planner. A notice of such hearing shall be posted in a conspicuous manner on the subject property.

205.2 Appeals. An appeal against a decision by the Chief City Planner shall lie to the Commissioner.

1. Filing. Any person with standing, aggrieved or affected by any decision of the Chief City Planner or Commissioner shall be permitted to appeal to the EC by written request with the Chief City Planner. Upon furnishing the proper information, the Chief City Planner shall transmit all papers and pertinent data related to the appeal.

2. Time limit. An appeal shall only be considered if filed within 10 working days after the cause arises or the appeal shall not be considered. If such an appeal is not made, the decision of Chief City Planner or Commissioner shall be considered final.

3. Stays of proceedings. An appeal stays all proceedings from further action unless there is immediate danger to public health and safety.

205.3 Amendments. These regulations shall be permitted to be amended, but all proposed amendments shall be submitted by the Commissioner for a decision by the Authority.

206 VIOLATIONS

206.1 Unlawful acts. It shall be unlawful for any person to erect, construct, enlarge, alter, repair, move, improve, remove, convert or demolish, equip, use, occupy, or maintain any building or land or cause or permit the same to be done in violation of these regulations. When any building or parcel of land regulated by these regulations is being used contrary to these regulations, the Chief City Planner shall order such use discontinued and the structure, parcel of land, or portion thereof, vacated by notice served on any person causing such use to be continued. Such person shall discontinue the use within the time prescribed by the Chief City Planner after receipt of such notice to make the structure, parcel of land, or portion thereof, comply with the requirements of these regulations.

207 DEVELOPMENT PERMITS

207.1 General. All departments, officials and employees which are charged with the duty or authority to issue permits or approvals shall issue no permit or approval for uses or purposes where the same would be in conflict with these regulations. Any permit or approval, if issued in conflict with these regulations, shall be null and void.

207.2 Development Permission Order. Development Permission Order(DPO) issued by the Commissioner under section 108(1) & 110 of the Act shall be mandatory for any development. No such order shall be necessary for activities exempted under section 108(3).

1. The Commissioner shall, within 60 days from the date of application or from the date of applicant making compliances, by an order in writing, either
   (i) Grant the permission, unconditionally or subject to certain general and special conditions, in the form of a CC and approve the plans or
   (ii) Refuse the permission if the proposal in not in conformity with these Regulations and / or any other Law / Regulations as may be applicable.
2. The DPO shall be issued only after all fees, deposits and charges on the application are paid.
3. The DPO shall remain valid as stipulated under section 111 of the Act and any application for the revalidation shall be accompanied with the fees prescribed.
4. For the purposes of this Regulation, commencement shall mean as under-
   (a) For a building work including additions and alterations: upto plinth level;
   (b) For bridges and overhead tanks: foundation and construction work upto the basement floor;
   (c) For underground works: foundation and construction work up to under-ground floor;
   (d) For lay-out, sub-division and amalgamation proposals: final demarcation and provision of infrastructure and services upto the following stages-
   (i) Roads: Water bound macadam
   (ii) Walkways: Excavation and base layer completed
   (iii) Sewerage: Excavation done and sewer pipe lines brought on site
   (iv) Storm water drainage: Excavation done and pipe lines brought on site
   (v) Water supply: Excavation done and pipe lines brought on site.

207.3 Validity Period. Each permit or approval issued shall expire after the period specified under section 111 of the Act if no work is undertaken or such use or activity is not established, unless a different time of issuance of the permit is allowed in these regulations, or unless an extension is granted by the issuing agency prior to expiration.
Failure to comply fully with the terms of any permit or approval shall be permitted to be grounds for cancellation or revocation. Action to cancel

any license, permit or approval shall be taken on proper grounds by the Chief City Planner. Cancellation of a permit or approval shall be permitted to be appealed in the same manner as its original action.

207.4 Permissions prior to these Regulations. In cases where development permissions were issued before the date of commencement of these Regulations, but the development has not started within a year from the date of such permission, the said development permission shall be deemed to have lapsed.

207.5 Developments started prior to these Regulations. For partially completed works, started with due permission before these Regulation have come into force, the Commissioner may not for reasons to be recorded in writing, necessarily insist on compliance with the provisions of these Regulations for extending the period of the development permission, which shall not exceed the period specified in said permit.

207.6 Unauthorized Development or Use. Any person who contravenes any of the provisions of these Regulations or any requirements or obligations imposed on him by virtue of these Regulations including the maintenance of fire protection services and appliances and lifts in working order or who interferes with or obstructs any person in the discharge of his duties shall be liable to be prosecuted for an offence under section 114, 116, 139 and 207.6 of the Act or any other provisions of the Act.
The Commissioner or an officer authorized by him may further -

(i) Take suitable actions including stoppage, demolition, removal, sealing and recovery of expenses of unauthorized development under sections 115, 116 and 117 of the Act;

(ii) Take suitable action against the licensed technical personnel which may include cancellation of the license and debarring such personnel from further practice for a specified period; and

(iii) Prosecute the owner and/or persons engaged in such act of unauthorized development under sections 114, 116 and 139 of the Act or any other provision of the Act.

207.7 Validity of licenses, permits and approvals. For the issuance of any permit or approval for which the Commissioner is responsible, the Chief City Planner shall require that the development or use in question proceed only in accordance with the terms of such permit or approval, including any requirements or conditions established as a condition of issuance. Except as specifically provided for in these regulations and conditions of approval, the securing of one required review or approval shall not exempt the recipient from the necessity of securing any other required review or approval.

208 APPLICATION FOR DEVELOPMENT

208.1 Application. Every person who intends to carry out development or erect, re-erect or make alterations in any place in a building or demolish any building shall make an application in prescribed form along with fees, documents, excluding for proposals of amalgamation or subdivision of holding, giving full details of the proposed development, by engaging the services of licenced personnel. One set of such plans shall be retained with Chief City Planner for record after the issue development permission order or its refusal.

208.2 Size, Colour and Dimensions. The size of drawing sheets shall be any of those specified in Table 1.
The plan shall be coloured as specified in table 3 and prints of plan shall be on one side of paper only. Existing work should be hatched black and for land development / sub-division / lay-out suitable colour notation shall be used with indexing.
All dimensions in drawings shall be in metric system. In addition to above applicants shall submit the above information in computer readable form or as prescribed by Commissioner from time to time.

Table 1: Drawing sheet sizes

Sno	Designation	Trimmed size (mm)
1	AO	841 x 1189
2	A1	594 x 841
3	A2	420 x 594
4	A3	297 x 420
5	A4	210 x 297
6	A5	148 x 210

Table 3: Colour notation for plans

Sno	Item	Site plan	Building Plan
1	Plot lines	Thick black	Thick black
2	Existing street	Green	
3	Future street	Green dotted	
4	Permissible building	Thick dotted black	
5	Open space	No colour	No colour
6	Work proposed to be demolished	Yellow hatched	Yellow hatched
7	Proposed work	Red filled in	Red filled in
8	Drainage and sewerage work	Red dotted	Red dotted
9	Water supply work	Blue dotted thin	Blue dotted thin
10	Deviations	Red hatched	Red hatched
11	Recreation ground	Green wash	Green wash
12	Roads and setbacks	Burnt sienna	Burnt sienna
13	Reservation	Appropriate colour code	Appropriate colour code

209 APPLICATION DETAILS

209.1 General. The application shall be accompanied by the information as prescribed below in the manner prescribed by the Commissioner.
(i) Copies of plans and statements ;
(ii) The key (location) plan;
(iii) The site plan;
(iv) Sub-division layout plan/plan for amalgamation where the property comprises of two or more different lands belonging to the owner or different owners;
(v) Building plan;
(vi) Service plan;
(vii) Specification and certificate of supervision;
(viii) Documents for proving ownership title;

(ix) An attested copy of clearance certificate from APCRDA for payment of tax arrears where applicable;
(x) Appointment of licenced professional in the prescribed Performa; (xi) Latest surveyed plan of the land showing all details of structures, shrubs, trees etc. as per actual survey carried out by the licenced professional, mentioning dimensions of all sides of land under project;
(xii) In the case of land leased by the APCRDA or allotted by the APCRDA conditionally, clearance of APCRDA regarding observance of the conditions shall be obtained and attached to the application for development permission in respect of such land;
(xiii) Clearances from agencies such as Railways, Civil Aviation, Electricity Distribution Company, EIA as required under EIA notification, the District Magistrate, Special Officer (ULC), Fire Authority and such other agencies, if required, as may be specified from time to time; (xii) Clearance from Airports Authority of India if required; and
(xiii) Challan of payment of development permission fee as prescribed.
The plans to be sent with the application may be ordinary prints on ferro paper or of any other type as prescribed.

209.2 Plans and statements. Normally four sets / copies of plans and statements shall be submitted along with the application.

209.3 Key plan/location plan. A key plan drawn to a scale of not less that 1:10000 shall be submitted along with the application for development permission showing the boundary location of the site with respect to neighbourhood landmarks.

209.4 Site plan. The site plan to be attached with the application shall be drawn to a scale of 1:500 and shall show:

(a) The boundaries of the site and of any contiguous land belonging to the owner thereof;

(b) The position of the site in relation to neighboring street;

(c) The name of the street in which the building is proposed to be situated, if any;

(d) All existing buildings standing on over or under the site;

(e) The position of the building and of all other buildings (if any) which the applicant intends to erect upon his contiguous land referred to at 'a' above in relation to -
i. The boundaries of the site and where the site has been partitioned the boundaries of the portion owned by the applicant and of the portions owned by others,
ii. All adjacent streets buildings (with number of storeys, height and use) and premises within a distance of 12 m of the site and of the contiguous land (if any) referred to in 'a' above, and
iii. If there is no street within a distance of 12 m of the site the nearest existing street;

(f) The means of access from the street to the building (if any) which the applicant intends to erect upon his contiguous land referred to in 'a' above;

(g) Space to be left around the building to secure a free circulation of air, admission of light and access for scavenging purposes;

(h) The width of the street (if any) in front and of the street (if any) at the side or near the building;

(i) The direction of north line relative to the plan of the buildings;

(j) Any existing physical features, such as wells, drains, and trees;

(k) The ground area of the whole property and the breakup of covered area on each floor with the calculations for percentage covered in each floor in terms of the total area of the plot as required under these Regulations governing the coverage of area;

(l) Overhead, electric supply line, water supply and drainage line;

(m) Such other particulars as may be prescribed time to time by the Commissioner.

209.5 Site development and/or sub-division. (1) The application shall be accompanied by the sub-division, layout or amalgamation plan if any, which shall be drawn to a scale of 1:500, containing the following-
(a) Measurement plan/City Survey Map;
(b) Scale used and the North point;
(c) The location of all proposed and existing roads with their names, existing / proposed / prescribed width within the land;
(d) The location of drains, sewers, public facilities and services such as electric lines and so on;
(e) location and areas of reservations, proposed in the development plan, if any, the regular lines of street prescribed under the relevant sets, if any, the public amenity sites prescribed, if any, and the recreational open spaces prescribed if any.
(f) A statement indicating the total area of the holding, the plot wise areas of various uses / occupancies, total area under roads and various reservations proposed in the development plan, if any, the regular lines of street prescribed under the relevant Act, if any, the public amenity sites and the recreational open spaces prescribed if any along with their percentage with reference to the total area of the site proposed to be subdivided.
(g) Dimensions of all plots sub-plots, if any, proposed to be carved out broad use / occupancy proposed therein, along with building lines, the setbacks with dimensions within each plot. In the case of composite development involving no sub-division of the property, dimensions of all buildings showing setbacks and distances between the buildings, light receiving planes and height of various parts of the buildings and the open marginal spaces ;
(h) The FSI if any, assigned to each sub plot; and
(i) In the case of plots in built-up areas, in addition to the above, the means of access to the holding from existing streets.
(j) No plotted development shall be permitted if the road widths are less than 12m.

209.6 Building plans. The plans of the building, its elevations and section to be sent with the application shall be drawn to a scale of 1:100. The building plan shall -
(a) include floor plans of all floors together with the covered areas clearly indicating the sizes of rooms, the position and width of staircases, ramps and other exit ways, which shall show :-
(i) Lift wells, lift machine room and lift pit details;
(ii) Ground and all other floor plan details including those of basement;
(iii) Electric sub-station and meter room details (if any);
(iv) Details of parking spaces, loading and unloading spaces provided around and within building, access ways and appurtenant open spaces with projections in dotted lines;
(v) Distance from any building existing on the plot in figured dimensions along with accessory building; and
(vi) Such other details as prescribed from time to time by the Commissioner;
(b) show the use or occupancy of all parts of the building;
(c) show exact location of essential services such water closet, sink, bath and the like;
(d) include sectional drawings showing clearly the size of the footings, thickness of basement wall, wall constructed size and spacing of framing members, floors slabs, roof slabs with the materials. The section shall indicate the height of building, rooms and the height of the parapet; and the drainage and the slope of the roof. At least one section should be taken through the staircase provided further that the structural plan giving details of all structural elements and materials used along with structural calculations shall be submitted separately but under any circumstances before the issue of the building permit or commencement certificate;
(e) show all street elevations;
(f) indicate details of basket privy (served privy) if any;
(g) give dimensions of the projected portion beyond the permissible building line;
(h) include terrace plan indicating the drainage

and the slope of the roof;
(i) give indication of the north line relative to the plan;
(j) give dimensions and details of doors, windows and ventilators;
(k) give such other particulars as may be prescribed by the Commissioner.

209.7 Plans for multi-storied / special buildings. For buildings of more than 15m height for commercial business purpose, 18m and above height for residential height and buildings of public congregation like schools, cinema halls, function halls, religious place which are more than $500m^2$ in plot area or 6m and above in height shall submit no objection certificate issued by sanctioning authority under the relevant law. The following additional information shall be furnished in the building plans in addition to the items (a) to (k) of Regulation 209.6 namely:
(a) Access to fire appliances/vehicles with details of vehicular turning circle and clear motorable access way around the building;
(b) Size (width) of main and alternate staircases along with balcony approach, corridor ventilated lobby approach;
(c) Location and details of lift enclosures;
(d) Location and size of fire lift;
(e) Smoke stop lobby/door where provided;
(f) Refuse chutes refuse chamber and service duct,
(g) Vehicular parking spaces and loading and unloading spaces;
(h) Refuse area, if any;
(i) details of building services i.e. air-conditioning system with position of fire dampers, mechanical ventilation system, electrical services, boilers, gas pipes and such other devices;
(j) Details of exits including provision of ramps for hospitals and special risks;
(k) Location of generator, transformer and switch gear room;
(l) Smoke exhauster system, if any;
(m) Details of fire alarm system net work;
(n) Location of centralized control connecting all fire alarm systems built in fire protection arrangements and public address systems;
(o) Location and dimensions of static water storage tank and pump room along with fire service inlets for mobile pump and water storage tank;
(p) Location and details of fixed fire protections installations such as sprinklers, wet risers hose cells, drenches and CO2 installation and;
(q) Location and details of first aid firefighting equipment/installations.

209.8 Design brief. Development proposals of lands exceeding 2000 m^2 in residential zone, commercial zone and industrial zone envisaging development of not less than 1/5th portion of the plot shall be accompanied by a design brief formulated in accordance with the guidelines issued by Commissioner.

209.9 Specifications. The specifications of the proposed construction, giving the type and grade of materials to be used, to be sent with the application shall be duly signed by a licenced professional.

209.10 Service plan. Plans and sectional elevations of private water supply, sewage disposal system and details of building services, where required by the Commissioner, shall be made available on a scale not less than 1:100 before undertaking development.

209.11 Certificate of supervision. The certificate of supervision to be sent with the application shall be in the form prescribed by the Commissioner and shall be duly signed by the licensed professional. In the event of the said licensed professional ceasing to be employed for the development work, further development work shall stand suspended till a new licensed technical personnel is appointed and his certificate of supervision along with a certificate for the previous work erected is accepted by the Commissioner.

209.12 Ownership details. The documents for proving ownership title to be attached with the application shall be the following:

(i) attested copy of the Land Pooling Ownership Certificate issued by APCRDA or in case of land outside land pooling equivalent document in support of ownership.

(ii) Statement of area of the holding by triangulation method from licensed professional with an affidavit from the owner in regard to the area in prescribed form; and

(iii) Any other document prescribed.

209.13 Fire clearance. Plans of buildings requiring fire clearance shall be accompanied by a clearance from the Competent Fire Authority.

209.14 Signing the application. All the plans shall be duly signed by the owner or constituted attorney of the owner and the licenced professionals and shall indicate their names, addresses and license numbers if any, allotted by the Commissioner.

210 FEES, DEPOSITS AND CHARGES

210.1 Application fee. The application shall be accompanied by an attested copy of receipt of payment of development permission application fee. The rate of fees for scrutiny of development proposal shall be as notified from time to time by APCRDA. The gross floor area shall be taken as the basis for calculation of fees including the basement floor and accessory buildings but excluding parting area.

210.2 Exemption from development permission fee. For special housing schemes for economically weaker sections, low income group and slum clearance redevelopment schemes undertaken by public agencies or subsidized by State Government with carpet area of a tenement of not more than 50 m^2 no development permission fee is chargeable.

210.3 Fee refund. In case a proposal is rejected, the initial fee paid for scrutiny of application shall be forfeited.

210.4 Mortgage. To ensure compliance with these Regulations and the directions given in the sanctioned plan and other conditions, ten percentage of the gross floor area shall be mortgaged to APCRDA through a registered mortgage deed. Mortgage shall be released upon issue of occupancy certificate by the Commissioner.

210.5 Development charges. The applicant shall pay fee and charges for obtaining development permissions. In addition to this, wherever FSI exceeds 1.75, applicant has to pay Impact fee as levied by APCRDA from time to time.

211 ENVIRONMENTALLY SENSITIVE DEVELOPMENTS

211.1 Environmental Clearance. Any person who intends to carry out any development which requires Environmental Clearance from the appropriate authority shall submit the same along with the application.

211.2 Quarrying. In case of application for quarrying, an excavation and restoration plan prepared in accordance with the prescribed guidelines as amended from time to time by the Sanctioning Authority shall be submitted along with an undertaking to observe all necessary care and precaution during quarrying operation.

212 DECISION ON APPLICATION

212.1 Sanction or refusal. The Commissioner may either sanction or refuse to sanction the plans and specifications or may sanction them with such modifications or directions as he may deem necessary. The sanction or refusal shall be communicated to the applicant in the prescribed form.

212.2 Service Level Agreement. If the Commissioner does not communicate its decision either to grant or to refuse permission to the applicant within 60 days from the date of receipt of his application or from the date of receipt of the reply from the applicant in respect of any requisition made by the Commissioner, whichever is later, a penalty of Rs.10,000 shall be levied on each of the staff of APCRDA responsible for the delay and such amount be paid to the applicant.

212.3 Modification of plans. A plan shall be scrutinized and all objections thereof shall be pointed out to the applicant at one go. After the applicant complies with the objections raised and submits a modified plan no new objection shall generally be raised after compliance of earlier objections. The re-submitted application shall be scrutinized and if there be further objections, the plan shall be rejected.

212.4 Extension of period. Any extension of the period of permission sought for under section 111 of the Act shall be subject to development plan provisions and these Regulations as in force on the date on which such extension is applied for.

212.5 Revoking of development permission. Without prejudice to the power of revocation conferred by section 113 of the Act, the Commissioner may revoke any development permission issued under the provisions of these Regulations, wherever there has been any false statement or any misrepresentation of material fact in the application on which the development permission was based, and in such cases the development shall be treated as unauthorised. In the case of revocation of permission based on false statements or any material misrepresentation of fact in the application, no compensation shall be payable and fee paid shall be forfeited.

212.6 Responsiblity of applicants and licenced professionals. Neither the granting of the development permission or the approval of the drawings and specifications, nor the inspections made by the Sanctioning Authority during development shall, in any way, relieve the licenced professional or developer from full responsibility for carrying out the development in accordance with these Regulations.

213 PROCEDURE DURING DEVELOPMENT

213.1 Intimation of commencement. (i) The owner shall within one year from the date of issue of development permission order commence the development. The owner shall mark on building site the line-out of the proposed development work i.e. centre lines of all external walls / columns proposed on ground floor of the structure. He shall then give notice to Commissioner of the intention to start work on the building site in the prescribed form. The Commissioner within 7 days of the receipt of such notice shall check the lineout. The owner may anytime after seven days have elapsed from the date of service of such notice to the Commissioner or earlier if permitted by the Commissioner commence the work.
(ii) Neither the granting of permission nor approval of the drawings and specifications, nor inspections made by the Commissioner during erection of the building, shall in any way relieve the owner of such building from full responsibility of carrying out the work in accordance with the requirements of these Regulations.

213.2 Documents at site.

1. Results of tests of materials. Where tests of any materials are made to ensure conformity with the requirements of these Regulations, records of the test data shall be kept available for inspection during the construction of the building and for such a period thereafter as required by the Sanctioning Authority.

2. Approved plans. The person to whom development permission is issued shall, during construction, keep in a conspicuous place on the site in respect of which the permission has been issued, a copy of the commencement certificate along with copies or the approved plans and specifications.

213.3 Safety measures at site. Proper care to avoid risk and injury to persons working on site and passers-by shall be taken by owner / applicant.

213.4 Deviations during construction If during the construction of a building any departure from the sanctioned plan is intended to be

made by way of internal alternations or external additions which violate any provisions regarding general building requirements, structural stability or fire safety requirements of these Regulations, sanction of the Commissioner shall be obtained. Any work carried out in contravention of the sanctioned plan, without prior approval of the Commissioner shall be deemed to be unauthorized. The Commissioner shall take appropriate action as per the Act in such cases.

213.5 Completion certificate (i) The owner through the licensed professional who has supervised the construction shall give notice to the Commissioner regarding completion of work described in the development permission. The completion certificate shall be submitted in the prescribed form and shall be accompanied by six sets of completion plan, one of which shall be cloth mounted.
The three sets mentioned above are for following purposes:
(a) Office record;
(b) Owner;
(ii) The licenced professional shall issue a certificate that there is no deviation from the zoning regulations in the prescribed form.
(iii) Issue of completion certificate misrepresenting the facts shall be an offence punishable under section 114 under the Act and such licenced professional shall be black listed permanently.

213.6 Occupancy certificate The Commissioner, on acceptance of the completion certificate, shall sanction an occupation certificate, in the prescribed form within fifteen (15) days from the date of receipt of the completion certificate, after which period it shall be deemed to have been approved for occupation, provided the building has been constructed as per the sanctioned plans. Where the occupation certificate is refused, the reasons for such refusal shall be communicated to the owner.

213.7 Part occupancy certificate. Upon the request of the holder of the development permission, the Commissioner may issue a part occupation certificate for a building or part thereof, before completion of the entire work as per development permission provided sufficient precautionary measures are taken by the holder of the development permission to ensure public safety and health safety. The part occupation certificate shall be given by the Commissioner subject to the Owner indemnifying APCRDA by giving an indemnity in the prescribed form.

213.8 Special buildings. The work of construction of a building having more than 18 m height and other building for which prior clearance is prerequisite, such buildings shall be subject to inspection of the Commissioner or the authorized officer; and unless a clearance regarding completion of the work from the fire protection point of view is given, no occupation certificate shall be issued in respect of such building.

213.9 Mortgage Mortgage through registered deed by the applicant while obtaining development permit shall be released after the applicant obtains occupancy certificate for the entire development work.

213.10 Demolition of dilapidated structures All unsafe buildings shall be considered to constitute a danger to public safety, hygiene and sanitation and shall be restored by repairs or demolished or dealt with as otherwise directed by the Commissioner.

213.11 Repairs to structures affected by reservations In case of permission for carrying out repairs only for the maintenance of the authorised structures affected by road reservations, the Commissioner may grant such repair permission on specified conditions on case to case basis as deemed fit.

213.12 Inspection

1. Inspection at various stages. The Commissioner may at any time during erection of a building or the execution of any work or development make an inspection thereof without giving previous notice of his intention so to do.

2. Clearance by fire department. For high-rise and special buildings, the sanctioning authority shall issue the occupancy certificate only after fire clearance.

213.13 Permission for temporary structures (i) The Commissioner may grant permission for temporary construction for the following purposes for a period not exceeding six months at a time but not exceeding a period of three years in the aggregate:
(a) Structures for protection from the rain or covering of the terraces during the monsoons only;
(b) Pandals for fairs, ceremonies, religious functions, sale of crackers, seasonal goods etc.;
(c) Structures for exhibitions/circuses etc. ;
(d) Structures for ancillary works for quarrying operations in conforming zones;
(e) Structures for godowns/storage of construction materials within the site;
(f) Temporary site office and watchmen chowkies within the site only during the phase of construction of the main building;
(g) Structures for storage of machinery, before installation, for factories in Industrial lands within the site ;
(h) Transit accommodation for persons to be rehabilitated in the new construction;
(i) Structures for educational and medical facilities within the site of the proposed building during the phase of planning and constructing the said permanent buildings;
(j) Structures for Ready Mix Concrete in or adjacent to building site;
(k) Asphalt mixing plant for a period not exceeding 15 days at a stretch subject to a maximum limit of 60 days in a calendar year;
(l) Milk booths and telephone booths within building site.
(ii) Provided that temporary constructions for structures mentioned in (e) to (j) may be permitted to be continued temporarily but in any case not beyond completion of construction of the main structure or building.
(iii) Applications of permissions for temporary constructions need not be submitted through a licenced professional. A scrutiny fee shall be paid as specified by APCRDA from time to time along with the application.

214 CONDITIONAL USES

214.1 Conditional-use permit. A conditional-use permit shall be obtained for certain uses, which would become harmonious or compatible with neighboring uses through the application and maintenance of qualifying conditions and located in specific locations within a zone, but shall not be allowed under the general conditions of the zone as stated in these regulations.

214.2 Determination The Commissioner, shall have the authority to impose conditions and safeguards as deemed necessary to protect and enhance the health, safety and welfare of the surrounding area. The authorization of a conditional-use permit shall not be made unless the evidence presented is such to establish:
1. That such use will not, under the specific circumstances of the particular case, be detrimental to the health, safety or general welfare of the surrounding area and that the proposed use is necessary or desirable and provides a service or facility that contributes to the general well being of the surrounding area.
2. That such use will comply with the regulations for such use.
3. The Commissioner shall itemize, describe or justify, then have recorded and filed in writing, the conditions imposed on the use.

214.3 Expiration and Revocation A conditional-use permit shall be considered exercised when the use has been established or when a building permit has been issued and substantial construction accomplished. When such permit is abandoned or discontinued for a period of 1 year, it shall not be reestablished, unless authorized by the commissioner.
A conditional-use permit shall be revoked when the applicant fails to comply with conditions imposed by the commissioner.

214.4 Amendments An amendment to an approved conditional use permit shall be submitted to the Chief City Planner accompanied by supporting information. The Commissioner shall review the amendment and shall permit to grant, deny or amend such amendment and impose conditions deemed necessary.

215 TDR / CONCESSIONS IN ROAD WIDENING CASES

215.1 General

1. Where any land or site or premises for building is affected in the Statutory Plan / Master Plan Road or Circulation ne twork or a road required to be widened as per Road Development Plan, such area so affected in the road or circulation network shall be surrendered free of cost to the Sanctioning Authority by the owner of land. No development permission shall be given unless this condition is complied with.

2. Upon surrendering such affected area the owner of the site would be entitled to a Transferable Development Right (TDR).
   OR
   The owner shall be allowed to construct an extra floor with an equivalent built area for the area surrendered subj ect to mandated public safety requirements.
   OR
   The owner shall be allowed to avail concessions in setbacks including the front set-back (subject to ensuring a building line of 6m in respect of roads 30m and above, 3m in respect of roads 18m and below 30m and 2m in respect of roads less than 18m and subjec t to ensuring minimum side and rear setback of 2m in case of building of height up to 12m and 2.5m in case of buildings of height above 12m and up to 15m and 3m for buildings of height above 15 and up to 18m).

3. The extent of concessions given shall be such that the total built up area after concession shall not exceed the sum of built up area allowed (as proposed) on total area without road widening and b uilt up area equivalent to surrendered area.

4. In case of plots less than 500sq.m in addition to concessions in setbacks and height, the cellar floor may be allowed keeping in view of its feasibility on ground.

5. In case of High Rise Buildings the concessions in setbacks, other than the front setback would be considered subject to maintaining minimum clear setback of 7m on the sides and rear side and such minimum setback area shall be clear without any obstruction s to facilitate movement or fire fighting vehicles and effective firefighting operation.

6. The above concessions shall be considered at the level of Sanctioning Authority. The Sanctioning Authority may consider any other concession as deemed fit with the prior approval of Executive Committee.

215.2 Grant of Transferable Development Right

1. Transferable Development Right" (TDR) can be awarded only when such lands are transferred to the local body / APCRDA as the case may be by way of registered gift deed. The award would be in the form of a TDR certificate issued by the Sanctioning Authority.

2. Grant of TDR can be considered by the Sanctioning Authority for the following areas subject to the owners complying with the conditions of development above, as per the following norms:

   (a) For the Master Plan Road / Road Development Plan undertaken and developed: equivalent to 200% of built up area of such area surrendered. For conservation and development of lakes / water bodies / nalas foreshores &

Recreational buffer development with greenery, etc: equivalent to 100% of built up area of such recreational buffer area developed at his cost.

(b) For Heritage buildings and heritage precincts maintained with adaptive reuse: equivalent to 100% of built up area of such site area.

3. The TDR may be arrived at on the basis of relative land value and equivalent amount in both export and Import areas, as per the Registration Department records. The Sanctioning Authority shall have the discretion in the matter of applicability of TDR. The TDR shall not be allowed in unauthorized buildings / structures / constructions and shall be considered only after the land is vested with the local authority / APCRDA. The TDR certificate issued would be valid or utilized / disposed only within the Amaravati Capital City area and as per guidelines and conditions prescribed.

4. **GUIDELINES ON TRANSFERABLE DEVELOPMENT RIGHT:**
In order to adopt uniform guidelines throughout the Capital City area the following conditions and guidelines are prescribed.

(a) As and when the owner of the building intends to construct the building in the remaining area of the site, he is entitled to construct the building as per the provisions of these Building Rules. In the event the owner doesn't take up any construction, the owner is entitled for TDR which can be used / disposed depending on convenience.

(b) A composite Register shall be maintained by the Sanctioning Authority on the award of TDR and its sale / disposal and utilization. A responsible officer shall be the custodian of the Register.

(c) At the time of sale / disposal / utilization of a particular TDR, the utilization details of the sale / disposal need to be entered at relevant columns in the register and that therefore the relevant file need to be referred to the custodian of the Register for making necessary entries in the register. The custodian is held responsible to enter relevant details in the register and also to enter utilization details in the TDR. When TDR Certificate is sold / utilized totally, the same shall be surrendered by the owners and the custodian shall take possession of the Certificate and make necessary entries in the register. As per Government Orders, TDR award is to be arrived on the basis of relevant land value at both export and import areas as per prevailing Registration value.

(d) TDR can either be sold or can be utilized by the sa me owner depending on convenience.

(e) TDR can be allowed to be utilized for construction of one additional floor over the normal permissible floors without insisting additional setbacks subject to compliance of other norms.

(f) Every TDR sold or disposed shall be accompanied by a prescribed agreement on Rs.l00/ - non-judiciary stamp paper between the person disposing the TDR and the person who intend to utilize the TDR. Agreement would be as per format to be prescribed by the Sanctioning Authority.

5. **DOCUMENTS REQUIRED WITH APPLICATION FOR GRANT OF TRANSFERRABLE DEVELOPMENT RIGHT CERTIFICATE:**
Application to be made by owner in the prescribed format giving the following details:

(a) Name of the owner with clear address, contact phone number, etc.

(b) Copy of the ownership documents along with clear site plan and location plan.

(c) Site Plan showing the land surrendered, its extent, location with dimensions.

(d) Building permission Plan for the site by the urban local body.

(e) Details of Building permission granted / applied for like use or purpose of building, number of floors permitted, all-round setbacks, floor area permitted and utilized, parking area permitted; etc.

(f) Whether already benefit of relaxations been utilized for the site?

(g) Whether any Court case is pending against Urban Local Body?

(h) Land value of the site where TDR is to be availed (latest copy from concerned Sub Registrar to be enclosed)

(i) TDR admissible in terms of sq.m and equivalent land value.

215.3 Compliance by Owner for ensuring Construction is undertaken as per sanctioned plan

1. The owner and builder / developer shall give an Affidavit duly notarized to the effect that in the case of any violation from the sanctioned building plan, the Enforcement Authority can summarily demolish the violated portion.

2. The owner or builder shall give a Declaration duly specifying the number of floors permitted, along with the extent of each floor. In case of any violation with regard to the Declaration, the Enforcement Authority can demolish the violations.

3. Before release of the building sanction by the sanctioning authority, the owner of the plot / site is not only required to produce the Original Land Pooling Ownership Certificate (LPOC), Original Sale Deed, registered under the provisions of the Indian Registration Act, 1908 / Certified copy issued by Stamps and Registration Department for the perusal of the sanctioning authority and cross verification with the attested copy submitted with the building application.

4. The owner is required to hand over 10% of the built-up area in the ground floor or first floor or the second floor, as the case may be, to the sanctioning authority by way of a Notarised Affidavit. In respect of row houses / detached houses / cluster housing 5% of th e units shall be handed over by way of notarized affidavit to the sanctioning authority. The Notarised Affidavit shall be got entered by the sanctioning authority in the Prohibitory Property Watch Register of the Registration Department. Then only the Building sanction will be released.

5. Individual residential buildings in plots up to 200sq.m with height up to 7m are exempted from the above conditions in the R1 zone.

215.4 Occupancy certificate

1. Occupancy Certificate shall be mandatory for all buildings. No person shall occupy or allow any other person to occupy any building or part of a building for any purpose unless such building has been granted an Occupancy Certificate by the Sanctioning Authority. Partial Occupancy Certificate may be considered by the Sanctioning authority on merits i.e. flats / units or area within a complex which have fulfilled all the requirements in addition to basic facilities like lifts water supply, sanitation, drainage, roads, common lighting etc.

2. The owner shall submit a notice of completion through the registered architect and licenced builder / developer along wi th prescribed documents and plans to the Sanctioning Authority. The Sanctioning Authority or the person authorized, on receipt of such notice of completion shall undertake inspection with regard t o the following aspects:

(a) *No. of Floors.
(b) External setbacks.
(c) Usage of the building.
(d) Parking space provision.
(e) Abutting road width

* The total height of the building may vary to a maximum of 1m with no change in the permitted number of floors subject to compliance of fire service norms.

3. The Sanctioning Authority shall communicate the approval or refusal of the Occupancy Certificate within 15days or may issue the same after levying and collecting compounding fee, if any. If the authority fails to issue the occupancy certificate within the above stipulated period the responsibility shall be fixed with the concerned officer who fails to process the file.

4. The Sanctioning Authority is empowered to compound the offence in relation to setbacks violations (other than the front setback) in respect of non high rise buildings only up to 10%, duly recording thereon the violations in writing. The rate of Compounding fee shall be equivalent to one hundred percent of the value of the land as fixed by the Registration Department at the time of compounding for the violated portion and the Government may revise this rate from time to time. Compounding of such violation shall not be considered for buildings constructed without obtaining any sanctioned plan.

5. For all high rise buildings, the work shall be subject to inspection by the Andhra Pradesh State Disasters Response & Fire Services Department and the Occupancy Certificate shall be issued only after clearance from the Andhra Pradesh State Disasters Response & Fire Services Department with regard to Fire Safety and Protection requirements.

6. The sanctioning authority shall ensure that all pub lic and semi public buildings are constructed disable friendly and prov ide facilities for specially enabled persons as per National Building Code -2005 of India while issuing occupancy certificate.

7. The functional/line agencies dealing with electric power, water supply, drainage and sewerage shall not give regular connections to the building unless such Occupancy Certificate is produced, or alternatively may charge 3 times the tariff till such time Occupancy Certificate is produced. This condition shall also be applicable to all unauthorized constructions and buildings constructed without sanctioned building plan. In addition to the above, the Local Body shall collect every ye ar two times the property tax as penalty from the owner / occupier.

8. The Registration Authority shall register only the permitted built up area as per the sanctioned building plan and only upon producing and filing a copy of such sanctioned building plan. On the Registration Document it should be clearly mentioned that the registration is in accordance with the sanctioned building plan in respect of setbacks and number of floors.

9. The financial agencies / institutions shall extend loan facilities only to the permitted built up area as per the sanctioned building plan.

215.5 Enforcement In addition to the enforcement powers and responsibilities given in the respective laws of the local authority, in respect of these Rules:

1. The Enforcement Authority concerned shall be wholly and severally responsible for ensuring and maintaining the right of way / width of the road and building restrictions as given in these Rules.

2. The Enforcement Authority shall summarily remove an y violation or deviation in build-

ing construction in maintaining the road widths and building line.

3. In respect of apartment complexes, shopping complex es and all high rise buildings, periodical inspections shall be carried out indicating the stage of work with reference to sanctioned plan. In case of any deviations from the sanctioned plan, necessary action shall be taken as per rules.

4. Any person who whether at his own instance or at t he instance of any other person or anybody including the Governmen t Department undertakes or carries out construction or development of any and in contravention of the statutory master plan or witho ut permission, approval or sanction or in contravention of any condition subject to which such permission or approval or sanction has been granted shall be punished with imprisonment for a term which may extend to three years, or with fine which may extend to ten percent of the value of land or building including land in question as fixed by the Registration Department at the time of using the land or building. Provided that the fine imposed shall, in no case be less than fifty percent of the said amount.

215.6 Licensing of real estate companies, developers, builders, town planners, engineers & other technical personnel mandatory

1. The Licencing of Real Estate Companies, Developers & Builders shall be in accordance with the rules published by the Authority.

2. The Licencing of Architects, Engineers, Supervisor, Surveyor and Structural Engineer & Town Planners shall be as per rules and regulations published by the Authority.

3. No developer / builder / real estate firm or company / engineer / town planner/other technical personnel shall be allowed to undertake development/do business / practice in a Municipal Corporation / Urban Development Authority / Municipality / Nagar Panchayat Area unless they are licenced with the sanctioning authority of the respective area.

4. Architects shall be required to be registered w ith the Council of Architecture.

5. The engaging of the services of a licenced developer / builder shall be mandatory for Apartment Buildings, Group Development, all High-Rise Buildings and all Commercial Complexes.
   Developments undertaken for construction of individual residential houses, educational/institutional/industrial buildings and developments undertaken by public agencies are exempted from the above condition.

6. Any developer / builder undertaking development or any firm doing property business soliciting property sale/transactions or advertising as such in case of above, shall necessarily mention the details of it's licence number, licence number of the licenced developer to whom the approval is given together with the permit number and it's validity for information and verification of public / prospective buyers.

7. Absence of the above or suppressing of the above facts or in the case of other licences and other technical personnel who violate the conditions would invite penal action including debarring of the real estate firm / development firm / company from practice in the local authority area for 5 years besides prosecution under the relevant laws / code of conduct by the sanctioning authority.

8. Any licenced developer / builder / other technical personnel who undertake construction in violation of the sanctioned plans shall be black- listed and this would entail cancellation of their licence besides being prosecuted under the relevant laws / code of conduct.

215.7 General. A request for a conditional use shall be permitted with conditions or denied. Each request for a conditional use approval shall be consistent with the criteria listed below:

1. The request is consistent with all applicable provisions of the master plan.
2. The request shall not adversely affect adjacent properties.
3. The request is compatible with the existing or allowable uses of adjacent properties.
4. The request can demonstrate that adequate public facilities, including roads, drainage, potable water, sanitary sewer, and police and fire protection exist or will exist to serve the requested use at the time such facilities are needed.
5. The request can demonstrate adequate provision for maintenance of the use and associated structures.
6. The request has minimized, to the degree possible, adverse effects on the natural environment.
7. The request will not create undue traffic congestion.
8. The request will not adversely affect the public health, safety or welfare.
9. The request conforms to all applicable provisions of these regulations.

CHAPTER III

ZONING DISTRICTS AND USE GROUPS

301 CLASSIFICATION OF ZONING DISTRICTS

301.1 Classification. In order to classify, regulate and restrict the locations of uses and locations of buildings designated for specific areas; and to regulate and determine the areas of setbacks, courts and other open spaces within or surrounding such buildings, property is hereby classified into zoning districts (see table 5).

Table 5: Zoning Districts

Zone	Zone code	Zoning District
Residential	R1	Village Planning Zone
	R2	Low density zone
	R3	Medium to High density zone
	R4	High density zone
Commercial	C1	Mixed use zone
	C2	General Commercial zone
	C3	Neighbourhood centre zone
	C4	Town centre zone
	C5	Regional centre zone
	C6	Central Business District zone
Industrial	I1	Business park zone
	I2	Logistics zone
	I3	Non-polluting industry zone
Open Space and Protected area	P1	Passive zone
	P2	Active zone
	P3	Protected zone
Institutional Facilities	S1	Government zone
	S2	Education zone
	S3	Special zone
Infrastructure Reserve	U1	Reserve zone
	U2	Road Reserve zone

302 ZONING MAP

302.1 General. The boundaries of each zoning district are as indicated upon the zoning map (see Annexure). Said map and subsequent amendments thereto shall be considered as a part of this zoning plan.

303 ANNEXED TERRITORY

303.1 Classification. Any territory hereafter annexed shall automatically, upon such annexation, be classified as R2, residential district and be subject to all conditions and regulations applicable to property in such district.

304 CLASSIFICATION OF USES

304.1 Classification. The uses permitted or prohibited in various zoning districts are classified into use groups (see Appendix I). The zoning regulations matrices are in Appendix II. In case of any discrepancies between Appendix II and Appendix III, Appendix II shall prevail.

305 CLASSIFICATION OF REGULATIONS

305.1 General. The regulations for any zone are classified into the following heads and presented as regulation tables for different zones.

(1) Uses- Permitted, Prohibited, and Conditional.

(2) Buildable area- Minimum plot size (m^2), Maximum building coverage (%), Minimum green coverage (%), FSI.

(3) Building type- Height (m), Maximum floors, Floor to floor height (m), Building form, Building dimensions.

(4) Parking- Minimum required parking stalls, Minimum dimensions for different type of vehicles, Location, Surfacing, Disabled parking, Circulation, Minimum shaded areas, and Vehicular access to parking lot..

(5) Setback- All setbacks (Front, Side, Rear, Common, Corner) for above grade/basement/between adjacent buildings.

(6) Service area and equipment- Loading docks, Outdoor storage, Refuse storage area, and Mechanical Equipment.

(7) Fencing- Permission, Electronic security, Plantation along boundary, heights (Rear, Side, Front, Additional), and Material.

(8) Circulation- Pedestrian circulation and Public transit circulation.

(9) Signage- Signage Uses, Location, and Specifications.

(10) Green coverage - Minumum dimensions, Planting strip, Maintenance, and Decks.

305.2 Urban design guidelines Urban design guidelines approved by the Commissioner for any land parcel, confirming to the Masterplan principles, shall have precedence over these zoning regulations.

CHAPTER IV

ZONES DEFINED

401 RESIDENTIAL ZONE

401.1 General. The regulations and guidelines in this section apply to residential uses within the various Residential Zoning Districts in Capital City. Summary of residential zoning district guidelines, with illustrative drawings are provided in Appendix III for easy reference.

401.2 Allowable Intensity. The maximum allowable intensity of residential development is guided by the Floor Area Ratio (FAR) specified in the Zoning Regulations below. The full potential of the FAR may not be achievable because of limitations imposed by site configuration, condition, layout, building setbacks, height, site coverage and the requirements of technical authorities that affect the site.

401.3 Building setbacks. Building setbacks are measured from the site boundary, excluding any strip of land that is required by the state for road or drainage widening requirements. Bay windows, ledges, roof eaves and other minor buildings features which do not significantly increase the building bulk of residential developments could be allowed to encroach into the building setback requirement from the common boundary under certain circumstances.

401.4 General.

401.4.1 Ancillary structures

Swimming pool, electric substation, water tank, air-conditioner condenser, etc. are to be adequately set back.

1. - Height of electric substation shall not exceed 6m (measured up to the springing line).
- Transformers open to the sky should be properly screen off to reduce any noise nuisance.

2. Proposed water tank, water pump (if any) is to be located minimum 1.0m from the common boundaries.

3. Sunken swimming pool in land titled developments need not set back from common boundaries. However, the owner is to take appropriate measures to prevent the splashing of water into the neighbouring property.

4. The setback control is the green buffer requirement based on the predominant use of the development.

5. Air-conditioner condensers and air-conditioning ledges is to be located minimum 2 m from the common boundaries to minimise noise and other nuisance to the neighbouring property. For good class bungalows, minimum 3m setback shall be provided from the common boundaries.

401.4.2 Road categories

Category 1	60m RoW	Major Arterial
Category 2	50m RoW	Arterial
Category 3	50m RoW	Sub-arterial
Category 4 & 5	25m RoW	Collector roads

401.5 R1 Village Planning zone. R1 is a zoning district offering low rise developments within the existing villages. The R1 Zone is intended to offer low rise housing as part of the farming community and complementary public facilities as needed. The purpose is to create good community areas within the villages falling within the capital city. Site Required for maintaining road width as proposed in village development/circulation plan approved by Commissioner shall be handed over to the Authority/local body free of cost for which APCRDA may consider TDR or relaxation for additional built up area of 200%. Apartments may be allowed whereever site has access through a 12 m wide existing road. While permitting buildings in R1 zone, abutting minimum 9m wide road, shall be ensured by the authority. The applicant has to indicate road widths on the site plan to maintain minimum width as

TYPE OF ANCILLARY STRUCTURES	REQUIRED SETBACK FROM THE ROAD	REQUIRED SETBACK FROM THE OTHER BOUNDARY LINE
Electric substation (ESS) – 22KV / 6.6KV (1.5 storey) – 22KV / LV (1.5 storey) – 6.6KV/ LV (1 storey)	5m from Category 1 Road 3-5m from Category 2 Road 3m from Category 3 Road 3m from Category 4 Road 3m from Category 5 Road	2m
Sunken swimming pool	5m from Category 1 Road 3-5m from Category 2 Road 3m from Category 3 Road 3m from Category 4 Road 3m from Category 5 Road	2m
Raised swimming pool -protruding >1m from the ground	minimum of 6m	6m
Toilet, Store room, Outdoor kitchen, Maid's quarter, Guard house, Parking garage, Management Office, First aid room, Display area, Security Facilities etc.	Minimum 1m	Minimum 1m

Table 6: Minimum setbacks for Ancillary structures

prescribed in the area development plan as prepared by CRDA.

401.6 R2 Low Density Zone. The R2 is a zoning district established to develop low density premium residential developments. The Zone allows development of detached, semi detached, attached houses and apartments. This zone is in proximity to the ceremonial axis.

401.7 R3 Medium to High Density Zone. R3 is a zoning district established to allow medium to high density residential developments across the city, and create well planned medium to high density housing complexes with ample open spaces. All the returnable residential land for farmers falls under this zone. To create a medium density zone a variety in the housing types ranging from single to multi-family dwelling types offering higher building coverage and building height have been given to encourage land owners to amalgamate and benefit from the Higher FAR offered by the apartment typology within the zone. This is to facilitate the creation of a well planned medium-density residential neighbourhood with green character.

401.8 R4 High Density Residential Zone. R4 is a zoning district where are multi-family high density housing options planned within the Capital City to provide high-quality public transport oriented lifestyle for those who desire an urban lifestyle with easy access to regional goods and services. This zone is largely planned along the riverfront, and in areas with proximity to the town and regional centres. Communal facilities with generous greening are encouraged to enhance the quality of living in this high density environment.

402 COMMERCIAL ZONE

The regulations and guidelines in this section apply to commercial uses within the various Commercial zones in Capital City. Summary of some commercial zoning district guidelines, with illustrative drawings are provided in Appendix III for easy reference.

402.1 Basement Setbacks. A basement is a sunken structure which does not protrude more than 1m above the ground level on all sides. For basements setbacks depending on varying plot sizes, refer Appendix II.

402.2 Ancillary Structures Setbacks. Swimming pool, electric substation, etc. are to be adequately set back as stated in Table 6. For other structures, refer Appendix II.

402.3 Roof garden or Flat roof Roof garden, if any, should be left uncovered at all times unless otherwise approved by the Commissioner. This is to ensure that no structure is added as it is tantamount to an additional storey in areas where there is storey height restriction; or the allowable development intensity may be exceeded. This treatment is similar for flat roofs.

402.4 C1 Mixed Use Commercial Zone. C1 is a zoning district to be used mainly for mixed residential and commercial purposes, which can have up to 30% GFA used for commercial purpose.

402.5 C2 General Commercial Zone. C2 zoning district includes the commercial land that will be returned to the land owners under the Andhra Pradesh Land Pooling (Formulation and Implementation) Rules, 2015. This zone creates attractive mixed use establishments to foster local businesses.

402.6 C3 Neighbourhood Centre Zone. C3 zoning district creates attractive small mixed use establishments. C2 developments within the Transit Overlay allow for compact mixed use developments with a commercial frontage. Neighbourhood Centres (NCs) located outside the transit overlay are also zoned C3. Such (NCs) provide for small commercial such as banks, local markets, eating establishments and offices, as well as some housing component. A variety of public facilities such as health centres, community halls and post offices etc. are also to be provided within the Neighbourhood Centre to cater to the needs of the surrounding neighbourhood (Approximately 15,000-25,000 population). The Neighbourhood Park is also incorporated as part of the C3 Development. The Neighbourhood Park and the public facilities will consist of 40% of the overall C3 zoned area (To be identified and planned).

402.7 C4 Town Centre Zone. C4 zoning district is an area established to create a medium rise commercial zone within the townships. The purpose is to intensify the land use, while ensuring intimate human scale and a continuous shopping street environment.

402.8 C5 Regional Centre Zone. C5 zoning district is an area established to create a medium rise commercial zone within the Regional centres. The purpose is to intensify the land use, while ensuring intimate human scale and a continuous shopping street environment.

402.9 C6 Central Business District zone. C6 zoning district is an area established to create a high rise commercial zone in the finance city/downtown. The purpose is to intensify the land use, while ensuring intimate human scale and a continuous shopping street environment.

403 INDUSTRIAL ZONE

Summary of zoning district guidelines, with illustrative drawings are provided in Appendix III for easy reference.

403.1 I1 Business Park Zone. I1 zoning district are specifically set aside for non-pollutive industries and businesses that engage in high technology, research and development (R&D), high value added and knowledge intensive activities. The value of the business park zone is between industrial and commercial uses. The two main

features that distinguish business parks from industrial estates are:
(i) The range of permitted uses that are generally nonproduction in nature but are characteristic of high technology research and prototype development.
(ii) The emphasis on landscaping, quality building designs and provision of amenity facilities to reflect the image of the business park.

403.2 I2 Logistics Zone. I2 zoning district consist of predominantly activities related to transport, logistics, goods distribution and storage for regional, national and international transit. Generally, these developments consist of warehouses, loading & unloading bays, open storage facilities and supporting ancillary services with efficient internal vehicular circulation and external multi-modal transport links.

403.3 I3 Non-polluting industry Zone. I3 zoning district are for light manufacturing/industry which are non-polluting.

404 PARKS AND OPEN SPACES ZONE

Summary of zoning district guidelines, with illustrative drawings are provided in Appendix III for easy reference.

404.1 P1 Passive Recreational Zone. P1 zoning districts are districts established to provide recreational and leisure facilities and activities in selected areas that have unique features (including visual corridors, environmentally sensitive areas, buffer areas, or along significant routes). These parks can include recreational commercial or public facilities at the neighbourhood, community, and regional level.

404.2 P2 Active Recreational Zone. P2 zoining district is established to provide parks that offer active recreational and sporting activities. While structures within the parks are allowed, the general character of the Active Recreational Zone should remain as green and recreational.

404.3 P3 Protected Area. P3 zoning districts have been established to conserve and protect the environmentally sensitive areas such as steep slopes and rivers which are rich in nature and biodiversity. These areas are non-developable for other strategic purposes. In the case of highly sensitive areas like forests and rivers the zoning for the protected areas shall supersede.

405 INSTITUTIONAL ZONE

Summary of zoning district guidelines, with illustrative drawings are provided in Appendix III for easy reference.

The regulations and guidelines apply to all developments proposed in the Capital City designated within the special development zones presented in the Zoning Plan.

405.1 S1 Government Zone. S1 zoning district is a special zone for institutions such as State Legislature, Secretariat, High Court of Judicature, Heads of Department offices, Raj Bhawan, Head of Department office, Government of India offices, International missions / Consulates and Government Complex related residential facilities with other allied activities. In order to enhance the strategic location and symbolic value of these projects, Urban Design Proposals shall be prepared addressing the character of public spaces as well as functions of the of government institutions. Design brief for the Urban Design proposal shall follow the essential parameters like site location; major and sub arterial roads as shown in Land use Plan & Zoning Plan. Other elements of the master plan like primary and secondary green network; mass transportation lines and interchanges; number of stipulated public facilities; and other surrounding land uses shall be considered in the Urban Design Proposal for Government Zone. All security measures shall be integrated within the Urban Design Proposal to safeguard Government functioning and at the same time making it an publicly accessible place. All the development guidelines for subsequent Architectural Design Projects shall be stipulated in the

Urban Design Proposal. Zoning regulations for Government Zone are not prescribed for the same purpose.

405.2 S2 Education Zone. S2 zoning district enables the Authority in securing land for strategic institutional projects like University, Colleges, Schools, Hospitals and so on. In order to locate these projects at accessible locations and to ensure that adequate land is reserved for its development, this zone is identified as separate zone. For Campus development projects like Universities, large Hospitals detailed Master plan shall be prepared before constructing the buildings to ensure that allocated land is planned well. For individual land parcels such as schools, stipulated number of students and allied facilities shall be worked out as per government's educational department guidelines or private sector developer requirements as applicable. Development guidelines for all parcels under Education Zone shall be based on above. Zoning regulations for Education Zone are not prescribed for the same purpose.

405.3 S3 Special Zone. S3 zoning district, also known as 'White Sites 'have been allocated to enable the Authority in developing market demand driven necessary urban projects. The "white-site" gives more flexibility in the use of the sites through Authority's land allocation program. Endowed with the switch use options, prospective buyers / developers can respond to the market demand and supply conditions more effectively by instantly adjusting and optimizing the space among different uses available at such time. The prospective buyers / developers could rely on the flexibility granted by the "white" site rules to optimize the development potential of the site in a market with uncertain demand. The successful tenderer / buyer of a white site has the options to develop the site for commercial, residential or hotel use, or a mix of these uses, as well as the rights to choose the quantum and/or the mix of the use when initiating or launching the development with approval from Authority at such time. For the layout plots, in this zone, which are registered prior to the notification date of these regulations, the regulations of R3 (Medium to High density residential) shall be applicable.

406 INFRASTRUCTURE ZONE

Summary of zoning district guidelines, with illustrative drawings are provided in Appendix III for easy reference.

406.1 U1 Reserve Zone. U1 zone to enables the Authority in securing land for Strategic Infrastructure and Transportation projects. It includes large scale transport utilities like Bus Terminal, Metro Depot as well as large scale Infrastructure utilities like Water Treatment Plant, Sewage Treatment Plant, and Electrical Substations etc. These projects are strategically located in order to service the Capital City in proper manner and are marked under this zone to ensure that adequate land is reserved for its development. Development briefs for all the parcels are subjected to detailed infrastructure and transportation related studies that need to be taken up by CRDA in the implementation phase. It will determine the development guidelines for all parcels marked under Reserve Zone. Zoning regulations for Reserve Zone are not prescribed for the same purpose.

406.2 U2 Road Reserve Zone. U2 zone enables the Authority in securing the Right of Way(RoW) to develop Major Arterial road, Arterial, sub-arterial road, and Collector roads. Schematic cross sections of proposed Right of Way and its cross sectional elements shall be referred from the Master plan Report. Apart from the traffic movement the Right of Way shall allow space for tree verge, footpaths, utility corridors, bicycle tracks, bicycle parking shelters, bus shelters, street furniture, lighting, signage; and any other transport and utility structures. Detailed study shall be undertaken to further detail the transport provisions and General Road Guidelines.

CHAPTER V

OTHER REGULATIONS

501 OFF-STREET PARKING

501.1 General. Off-street Parking shall be provided at the time of erection of any main building or at the time such buildings are altered, enlarged, converted or increased in capacity minimum offstreet parking space with adequate provision for ingress and egress by standard-sized vehicles in accordance with the requirements of these regulations.

501.2 Parking space requirements. Parking spaces shall be in accordance with provisions given below.

501.2.1 Required number.

The off-street parking spaces required for each use permitted by these regulations shall not be less than that found in Appendix II, provided that any fractional parking space be computed as a whole space.

501.2.2 Combination of uses.

Where there is a combination of uses on a lot, the required number of parking spaces shall be the sum of that found for each use.

501.2.3 Location of lot.

The parking spaces required by these regulations shall be provided on the same lot.

501.2.4 Accessible spaces.

Accessible parking spaces and passenger loading zones shall be provided in accordance with the building code.

501.3 Parking stall dimension. Parking stall dimensions shall be in accordance provisions given below.

501.3.1 Width.

A minimum width of 2.5 m shall be provided for each parking stall.
Exceptions:
1. The width of a parking stall shall be increased 26 cm for obstructions located on either side of the stall within 4.3 m of the access aisle.

501.3.2 Length.

A minimum length of 5 m shall be provided for each parking stall.
Exceptions:
1. Compact parking stalls shall be permitted to be 5.5 m in length.
2. Parallel parking stalls shall be a minimum 6 m in length.

501.4 Minimum dimensions The following are the minimum dimension for parking:

	Width(m)	Depth(m)
Car Parking	2.5	5
Disabled car parking	4.85	5.5
Lorry Parking	3.5	10
Heavy Vehicle Parking	3.75	10
Ambulance parking	3	9

501.5 Design of parking facilities. The design of parking facilities shall be in accordance with provisions given in this section.

501.5.1 Driveway width.

Every parking facility shall be provided with one or more access driveways, the width of which shall be the following:
1. Private driveways at least 2.8 m.
2. Commercial driveways:
2.1. 3.6 m for one-way enter/exit.

2.2. 5.4 m for two-way enter/ exit.

501.5.2 Driveway and ramp slopes.

The maximum slope of any driveway or ramp shall not exceed 12.5 percent (1 in 8). Transition slopes in driveways and ramps shall be provided in accordance with the standards set by the Chief City Planner.

501.5.3 Stall access.

Each required parking stall shall be individually and easily accessed. No automobile shall be required to back onto any public street or sidewalk to leave any parking stall when such stall serves more than two dwelling units or other than residential uses. All portions of a public lot or garage shall be accessible to other portions thereof without requiring the use of any public street.

501.5.4 Compact-to-standard stall ratio.

The maximum ratio of compact stalls to standard stalls in any parking area shall not exceed 1 to 2.

501.5.5 Screening.

A 9.2 m buffer at the public way shall be provided for all parking areas of five or more parking spaces.

501.5.6 Striping.

All parking stalls shall be striped.
Exception: A private garage or parking area for the exclusive use of a single-family dwelling.

501.5.7 Lighting.

All lights illuminating a parking area shall be designed and located so as to reflect away from any street and adjacent property.

502 FENCING

502.1 General. Fence wall heights in required setbacks shall not exceed those specified under Appendix II.

503 LOCATION OF ANCILLARY BUILDINGS

503.1 General. Ancillary buildings shall occupy the same lot as the main use or building.

503.2 Separation from main building. All accessory buildings shall be separated from the main building by 3 m and from the lot boundary by 1m.

503.3 Private garages. An ancillary building used as a private garage shall be permitted to be located in the rear setback or side setback provided that setbacks are maintained and the structures do not encroach into any recorded easements. The building shall be permitted to be located in the front setback of a sloping lot if the lot has more than a 3 m difference in elevation from midpoint of the front lot line to a point 16 m away midway between the side lot lines.

503.4 Storage buildings. All ancillary buildings used for storage or other similar use shall be permitted to be located in any portion of the rear setback or side setback. No storage building shall be located in the front setback.

504 ALLOWABLE PROJECTIONS INTO SETBACKS

504.1 General. Eaves, cornices or other similar architectural features shall be permitted to project into a required setback no more than 30 cm. Chimneys shall be permitted to project no more than 61 cm, provided the width of any side setback is not reduced to less than 75 cm.

504.2 Front setback. Open, unenclosed ramps, porches, platforms or landings, not covered by a roof, shall be permitted to extend no

more than 1.8 m into the required front setback, provided such porch does not extend above the first level and is no more than 1.8 m above grade at any point.

504.3 Rear setback. Windows shall be permitted to project into a required rear setback no more than 1.5 m.

505 GREEN STRIP REQUIREMENTS

505.1 General. Greening / Landscaping is required for all new buildings and additions over 100 m^2 as defined in Appendix II. Said landscaping shall be completed before occupancy of the building.

505.2 Green building norms Green building norms and Environmentally sustainable development shall be followed as prescribed by the Sanctioning Authority.

505.3 Front setback. Front setbacks required by these regulations shall be completely landscaped, except for those areas occupied by access driveways and parking.

505.4 Street-side side setbacks. All flanking street-side side setbacks shall be completely landscaped, except for those areas occupied by utilities, access driveways, paved walks, walls and structures.

505.5 Maintenance. All greenery and live landscaping required by these regulations shall be properly maintained. All dead or dying landscaping shall be replaced immediately and all sodded areas mowed, fertilized and irrigated on a regular basis.

506 LOADING SPACES

506.1 General. Loading spaces shall be provided on the same lot for every building in the C or I zones. No loading space is required if prevented by an existing lawful building. The City Planner shall be authorized to waive this requirement on unusual lots.

506.2 Size. Each loading space shall have a clear height of 4.3 m and shall be directly accessible through a usable door not less than 90 cm in width and 2 m high. The minimum area of a loading space shall be 37.2 m^2 and the minimum dimensions shall be 6 m long and 3 m deep.

507 PASSAGEWAYS

507.1 Residential entrances. There shall be a passageway leading from the public way to the exterior entrance of each dwelling unit in every residential building of not less than 3 m in width. The passageway shall be increased by 60 cm for each storey over two.

507.2 Separation between buildings. There shall be at least 3 m of clear space between every main building and accessory building on a lot. There shall be at least 6 m of clear space between every residential building and another main building on the same lot.

507.3 Location of passageways. Passageways shall be permitted to be located in that space set aside for required setbacks. Passageways shall be open and unobstructed to the sky and shall be permitted to have such projections as allowed for setbacks, provided the users of said passageway have a clear walkway to the public way. Any space between buildings or passageways that has less width than that prescribed herein shall not be further reduced.

508 APPROVAL FOR AND AVAILABILITY OF ESSENTIAL SERVICES

508.1 General. All projects that require the additional use of new facilities or essential services, such as sewers, storm drains, fire hydrants, potable water, public streets, street lighting and similar services, shall obtain such approval as required by the agency providing such service prior to project approval.

Nonavailability of essential services shall be permitted to be grounds for denying permits for additional development until such services are available. The jurisdiction is not obligated to extend or supply essential services if capacity is not available. If capacity is available, the extension of services shall be by and at the cost of the developer entity, unless the jurisdiction agrees otherwise. All service extensions shall be designed and installed in full compliance with the jurisdiction's standards for such service, and shall be subject to review, permit and inspection as required by other policies or laws of the jurisdiction.

509 GRADING AND EXCAVATION REGULATIONS

509.1 General. This section is intended to provide the community with fair and equitable grading practices and shall not supersede the requirements of any other regulation.

509.2 Grading responsibilities: Grading operations shall be in accordance with following sections.

509.2.1 Protection of utilities.

Public utilities or services shall be protected from damage caused by grading or excavation operations.

509.2.2 Protection of adjacent property.

Adjacent properties shall be protected from damage caused by to grading operations. No person shall excavate on land sufficiently close to the property line to endanger any adjoining public street, sidewalk, alley, or other public or private property, without supporting and protecting such property from any damage that might result.

509.2.3 Inspection notice.

The concerned official shall be notified at least 24 hours prior to the start of work.

509.2.4 Temporary erosion control.

Precautionary measures necessary to protect adjacent watercourses and public or private property from damage by water erosion, flooding or deposition of mud or debris originating from the site shall be put in effect. Precautionary measures shall include provisions of properly designed sediment control facilities so that downstream properties are not affected by upstream erosion.

509.2.5 Traffic control and protection of streets.

Flaggers, signs, barricades and other safety devices to ensure adequate safety when working in or near public streets shall be provided.

509.2.6 Hazard from existing grading.

Whenever any existing excavation, embankment or fill has become a hazard to life or limb, endangers structures, or adversely affects the safety, use stability of a public way or drainage channel, such excavation, embankment or fill shall be eliminated.

509.2.7 Tracking of dirt onto public streets.

Adequate cleaning of equipment to prevent the tracking of dirt and debris onto public streets shall be provided.

509.2.8 Maintenance of waterway and irrigation canals.

Precautionary measures to protect and maintain the flow of waterways and irrigation canals shall be taken.

509.2.9 Revegetation.

The loss of trees, ground cover, and topsoil shall be minimized on any grading project. In addition to mechanical methods of erosion control, graded areas shall be protected to the extent practical from damage by erosion by planting grass or ground cover plants and/or trees. Such plantings

shall provide for rapid, short-term coverage of the slopes as well as long-term permanent coverage. A plan by a licenced professional shall be provided where required by the City Planner.

509.3 Design standards. The grading design standards required herein shall be those found in nationally recognized standards.

CHAPTER VI

NON STANDARD APPLICATIONS

601 GENERAL

Any application not permitted as-of-right from the standard zoning regulations may be granted conditional development approval by the Commissioner through the Non Standard Application process. Approvals for such Non Standard Applications shall be carried out by panel review. Such Non Standard Applications can address various unique conditions where relief for the development from the zoning regulations could be granted. The Non-Standard Applications can include but is not limited to the following.
-Non-Conforming Existing Use.
-Zoning Lots Divided by Administrative Boundaries.
-Special Regulations for Large Scale Developments.
-Provisions for Home Offices.
-Non-Conforming and irregular shaped plots.

602 NON-CONFORMING EXISTING USE

602.1 General. Non-Complying Uses are uses in existence prior to the zoning regulations, which are incompatible and non-complying with the new zoning regulations. Regulations for such are provided to permit the continuance of such uses for a reasonable period of time, but restricting further such developments. The regulations aim to establish the character of the area and protect the public health, safety and general welfare. Criteria to assess the development are based on its impact on the surrounding community and are listed below.

602.2 Conditions. -The development is to be located at proximity to arterial roads for ease of access.
-Compliance with parking requirements and loading berths within the lot boundary comparable to regulations for similar use.
-Evaluation of Traffic Impact Assessment.
-Evaluation of Environmental Inventory & Assessment regarding pollution, noise, smell, and light etc.

602.3 Allowable additions and alterations. No material change in use which does not comply with the prevailing zoning regulations.

602.4 Damage, destruction or discontinuance. -If any damage or destruction of the non-conforming use exceeding more than 25% of the assessed valuation of buildings in use, the non-conforming use shall terminate, and the development should comply with conforming use.
-If damage or destruction of the non complying use is less than 25% of the assessed valuation of buildings in use, the non conforming use may be restored provided that the there is no increase in degree of non-compliance.
-If the non-conforming use is discontinued for more than a period of two years, or any use discontinued, thereafter only conforming use shall be applicable. However this shall not be applicable in case of war, government or public body related improvement project and labour difficulties.

602.5 Termination. Non-conforming uses may be continued for five years after the date of gazette of the zoning regulations. After such date, the non-conforming use shall terminate and thereafter only conforming use shall be applicable, unless conditional approval has been obtained from the Commissioner.

603 ZONING LOTS DIVIDED BY ADMINISTRATIVE BOUNDARIES

This regulation is applicable when a zoning lot is located between two or more administrative boundaries or landuse boundaries with different uses.

603.1 Criteria for assessment. The zoning regulation of the parcel area which has more than 50% total parcel of the overall parcel area shall apply to the entire parcel.
The part of the parcel in the landuse zone with less than 50% of the area shall follow the zoning regulation of the larger area of the parcel from the adjacent landuse zone.

604 PROVISION FOR HOME-OFFICE

604.1 General. Residential Zones allow residents to engage in uses other than residences so long as the principal use of the residence remains as a dwelling and the proposed ancillary use meets the requirements and restrictions as set forth in the regulations. Home Office is allowed in R1, R2 and R3 Zones. Some common ancillary uses include offices (for medicine, dentistry, architecture, engineering, law, or psychiatry), Music rehearsal studio, IT/ other consultancy services, web design, accountancy services, data entry, teaching not extending to classes or school like establishments, or other professional related uses and so on. The following are the criteria for assessment.

604.2 Conditions.

1. Prohibit exterior physical changes to the home for the purposes of conducting business, which is not residential in character.
2. The home occupation shall not exceed 25 percent of the floor area of the primary structure.
3. Other than those related by blood, marriage or adoption, no more than one person may be employed in the home occupation.
4. Inventory and supplies shall not occupy more than 50 percent of the area permitted to be used as a home occupation.
5. There shall be no exterior display or storage of goods on said premises.
6. Home occupations involving beauty shops or barber shops shall require a conditional-use permit.
7. Two additional parking spaces shall be provided on the premises, except only one need be provided if the home occupation does not have an employee. Said parking shall comply with the parking requirements in these regulations.
8. Prohibit the use of display of advertisements or posters.

604.3 Traffic assessment. -The business activities must not introduce extra human or vehicular traffic to the surroundings or the neighbourhood.
-Allow a maximum of two non-residents to work from a residential unit.
-Additional off street parking to be provided for every $200m^2$ of floor area used for the home office. (Refer Figure 1).
Multi-family apartments in zones that allow home offices should make provision for such additional off street parking to cater for future home-offices.

604.4 Prohibited business activities. -The business activities must not be illegal, unlawful or immoral.
-The business must not generate noise, smoke, odour, chemical/liquid waste or dust that could become a nuisance.
-Storage and use of dangerous chemicals and hazardous substances are strictly prohibited.
-There must be no solicitation of business that may cause annoyance to the residents or public.
-There must be no selling of physical goods.
-The only kind of office that can be allowed in group development is that which serves only the

Figure 1: Provision for home office

lawful inhabitants of the lot. It cannot serve members of a group or organization who live elsewhere.

604.5 Businesses not permitted in home office.

- Contractors business.
- Car-Trading business.
- Commercial schools
- Employment agency.
- Businesses involving gathering of large number of people.
- Courier businesses.
- Manufacture/ preparation/ processing of products and goods.
- Repair of household appliances, electrical products, footwear, etc.
- Catering/restaurants.
- Shops and any form of retail activity, including pet shops.
- Funeral chapels or homes.

604.6 Safety requirements. The business must comply with safety requirements imposed by the Fire Safety Regulations.

605 NON-CONFORMING AND IRREGULAR SHAPED LOTS

605.1 General. The intent is to allow potential development for non-conforming and irregular shaped parcels of land to have meaningful layout within landed housing through marginal allowable deficiencies in plot width and zoning relaxation. Only parcels in which development in a lower zone is not possible shall be considered for assessment. The criteria for assessment.

605.2 Marginal deficiency/ land acquisition affected lots -For parcels not conforming to zoning size a variation can be considered if the proposal is an infill development in existing plots. The reduced variation should be 10% of the minimum lot size.
-Variation is applicable for parcels affected by surrendering land for city road and infrastructure projects. The reduced variation should be 10% of the minimum lot size.

605.3 Irregular-shaped housing lots, detached houses. -The subject plot with the deficient plot width should have an average plot width of at least 8m so as to ensure a meaningful building layout.
-The subject plot with the deficient plot width must comply fully with the minimum lot size of the respective zone, and all other zoning regulations e.g. setback, road buffer, etc.
-The odd-shaped configuration allowance is only applicable for an existing lot configuration and not for lots created by subdividing regular or less regular-shaped plots.

605.4 Irregular-shaped housing lots, detached houses in corner lots with long frontage. The standard front setback will apply for a width of 8m, which is to be measured from the common boundary line with the adjoining neighbouring lot; beyond the 8m width, a reduced front setback of 2m is allowed.

605.5 Housing lots located away from access roads, or inadequate vehicle access. -Property access is not guaranteed for developments which do not have access via any of the types of roads. Hence, development permit should be denied.
-Authority can help to coordinate between the concerned neighbouring lots. A property with inadequate proper access shall not be subdivided.
-Maximum distance of the property without adequate vehicular access should be 30m from the city road or as per the National Building Code regulations.

606 OTHER CONDITIONS

1. All existing Acts/Rules restricting development activities near Water bodies, Railways, Electrical lines, Airport, Oil / Gas Pipelines, Heritage Structures, Religious Structures and EIA Notification shall be followed in all zones, example

    - Rain Water Harvesting Structures shall be provided as given in Acts /Rules
    - Provisions of the Andhra Pradesh Water, Land and Trees Act, 2002 shall be complied in such sites and schemes where ever applicable.

2. The building requirements and standards not covered in these regulations shall be compiled with National Building Code.

3. Provisions for Economical Weaker Section/LIG housing shall be followed where proposed site area for residential project is 4000 Sqm and above by reserving 10% built up area or 25% of no of dwelling units or shelter fee as prescribed by Commissioner.

4. Buildings shall be designed for compliance with earth quake resistance and resisting other natural hazards. The Completion Certificate shall mention that the norms have been followed in the design and construction of buildings for making the buildings resistant to earthquake.

5. In case of Apartment / Group Development where there are 100 units and above, a minimum 3% of the total built up area shall be planned and developed for common amenities and facilities.

6. In case of Apartment / Group Development where there are 100 units and above, buildings proposed for Nursing Homes, Hospitals and Hotels provision for Solar Water Heating System and Solar Lighting System, in the building and in the site for outdoor lighting, etc. For all such buildings provision of Recycling of Water shall be made. In case of apartments and Group development having 100 units and above, 10% of site area shall be developed as organized open space for totlot. At least 50% of totlot shall be provided at one place.

7. Engaging of the services of a licenced developer / builder shall be mandatory for Apartment Buildings, Group Development, all types of Planned Unit Development Schemes, all High-Rise Buildings and all Commercial Complexes. Developments undertaken for undertaken by public agencies are exempted from the above condition.

8. Any licenced developer / builder / other professionals who undertake construction in violation of the sanctioned plans shall be blacklisted and this would entail cancellation of their licence besides being prosecuted under the relevant laws / code of conduct.

9. No developer /professional shall be allowed to undertake development/do business / practice unless they are licenced with the sanctioning authority.

607 PLANNED UNIT DEVELOPMENT

607.1 Approval. Planned unit developments (PUDs) shall be allowed by Commissioner in any zoning district. No such planned unit development permit shall be granted unless such development will meet the use limitations of the zoning district in which it is located and meet the density and other limitations of such districts, except as such requirements may be lawfully modified as provided by these regulations. Compliance with these regulations in no way excuses the developer from the applicable requirements of a subdivision regulation, except as modifications thereof are specifically authorized in the approval of the application for the planned unit development.

607.2 Intent. These regulations are to encourage and provide means for effecting desirable and quality development by permitting greater

flexibility and design freedom than that permitted under the basic district regulations, and to accomplish a well-balanced, aesthetically satisfying city and economically desirable development of building sites within a PUD. This regulation facilitates large-scale developments spanning several zoning lots by creating greater flexibility for the purpose of producing better site planning. Its objective is to enable better arrangement of open spaces and utilization of natural features. These regulations are established to permit latitude in the development of the building site if such development is found to be in accordance with the purpose, spirit and intent of this regulation and is found not to be hazardous, harmful, offensive or otherwise adverse to the environment, property values or the character of the neighborhood or the health, safety and welfare of the community. It is intended to permit and encourage diversification, variation and imagination in the relationship of uses, structures, open spaces and heights of structures for developments conceived and implemented as comprehensive and cohesive unified projects. It is further intended to encourage more rational and economic development with relationship to public services, and to encourage and facilitate the preservation of open lands.

607.3 Conditions.

607.3.1 Area

No planned unit development shall have an area less than 4 ha.

607.3.2 Uses

A planned unit development which will contain uses not permitted in the zoning district in which it is to be located will require a change of zoning district and shall be accompanied by an application for a zoning amendment, except that any residential use shall be considered a permitted use in a planned unit development, which allows residential uses and shall be governed by density, design and other requirements of the planned unit development permit. Where a site is situated in more than one use district, the permitted uses applicable to such property in one district may be extended into the adjacent use district.

607.3.3 Ownership

The development shall be in single or corporate ownership at the time of application, or the subject of an application filed jointly by all owners of the property.

607.3.4 Project information

Requirement for a time schedule for carrying out development, financial plan, common parking areas provision plan, and maintenance plan for common open spaces and parking. A subdivision plan if applicable to the development should be provided and shall comply with all applicable regulations.

607.3.5 Design

The Commissioner shall require such arrangements of structures and open spaces within the site development plan as necessary to ensure that adjacent properties will not be adversely affected.

607.3.6 Density

Density of land use shall in no case be more than 15 percent higher than allowed in the zoning district.

607.3.7 Arrangement

Where feasible, the least height and density of buildings and uses shall be arranged around the boundaries of the development.

607.3.8 Specific regulations.

Lot area, width, setback, height, density and coverage regulations shall be determined by approval of the site development plan.

607.3.9 Environment

Evaluate Environmental Impact Assessment (EIA) for the proposal.

607.3.10 Traffic and Parking.

-Evaluate Traffic Impact Assessment (TIA) for the proposal.
-Allowance to be provided for multiple accesses into development as per the TIA.
-Private internal roads shall confirm to required standards set by the fire regulations.
-Development with multiple uses having mixed use, or commercial need to comply with the parking requirements of such zone and should be provided within the boundary.

607.3.11 Infrastructure

-Compliance to infrastructure connectivity with surrounding areas.
-Drainage study or drainage plan to show impact of proposed development to the Surrounding with the additional outflow.
-Compliance of infrastructure requirements such as sewerage treatment plants, electric substation, drainage etc.

607.3.12 Facilities

Where required provision of public facilities in compliance with regulations of the Authority shall be made.

607.3.13 Open spaces

Preservation, maintenance and ownership of required open spaces within the development shall be accomplished by either:
1. Dedication of the land as a public park or parkway system; or
2. Creating a permanent, open space easement on and over the said private open spaces to guarantee that the open space remain perpetually in recreational use, with ownership and maintenance being the responsibility of an owners' association established with articles of association and bylaws, which are satisfactory to the legislative body.

607.3.14 Landscaping

Landscaping, fencing and screening related to the uses within the site and as a means of integrating the proposed development into its surroundings shall be planned and presented for approval, together with other required plans for the development. A planting plan showing proposed tree and shrubbery plantings shall be prepared for the entire site to be developed. A grading and drainage plan shall also be submitted to the Commissioner with the application.

607.3.15 Signs.

The size, location, design and nature of signs, if any, and the intensity and direction of area or flood lighting shall be detailed in the application.

607.3.16 Desirability.

The proposed use of the particular location shall be shown as necessary or desirable, to provide a service or facility that will contribute to the general well being of the surrounding area. It shall also be shown that under the circumstances of the particular case, the proposed use will not be detrimental to the health, safety or general welfare of persons residing in the vicinity of the planned unit development.

607.3.17 Urban design

Provide strategy plan to explain harmonious blending of development with surrounding location.
Urban Form strategy of the development.

607.4 Determination by Commissioner

607.4.1 Considerations.

In carrying out the intent of this section, the Commissioner shall consider the following principles:
1. It is the intent of this section that site and

building plans for a PUD shall be prepared by a designer or team of designers having professional competence in urban planning as proposed in the application.
2. It is not the intent of this section that control of the design of a PUD by the Commissioner be so rigidly exercised that individual initiative be stifled and substantial additional expense incurred; rather, it is the intent of this section that the control exercised be the minimum necessary to achieve the purpose of this regulation.
3. In an approval, the commissioner may impose such conditions as it deems necessary to secure compliance with the purposes set forth in this chapter.

607.5 Required Contributions

607.5.1 General.

Commissioner as part of the approval of a PUD, may require an applicant to make reasonable contributions to include, but not limited to any combination of the following:
1. Dedication of land for public park purposes.
2. Dedication of land for public school purposes.
3. Dedication of land for public road right-of-way purposes.
4. Construction of, or addition to, roads serving the proposed project when such construction or addition is reasonably related to the traffic to be generated.
5. Installation of required traffic safety devices.
6. Preservation of areas containing significant natural, environmental, historic, archeological or similar resources.

607.6 Commissioner's Action

607.6.1 Approval.

The Commissioner may require that the following condition for a planned unit development (among others he deems appropriate) be met by the applicant:
-That the development is planned as one complex land use rather than as an aggregation of individual and unrelated buildings and uses.

607.6.2 Limitations on application.

1. Upon approval of a PUD, construction shall proceed only in accordance with the plans and specifications approved by the Commissioner and in compliance with any conditions attached by the jurisdiction as to its approval.
2. Amendment to approved plans and specifications for a PUD shall be obtained only by following the procedures here outlined for first approval.
3. The City Planner shall not issue any permit for any proposed building, structure or use within the project unless such building, structure or use is in accordance with the approved development plan and with any conditions imposed in conjunction with its approval.

CHAPTER VII

REGULATIONS FOR SPECIAL FACILITIES

701 PUBLIC FACILITIES

Developments allowed within the zoning as conditional uses or permitted uses, but which are not residential, commercial or industrial and do not fall under the parks category require a special assessment and permit for development. These developments need to be evaluated based on their provisions, location and distribution. The regulations of the particular zone in which the plot is located shall be followed unless otherwise stated in the following tables in Appendix IV. The developments that require evaluation are as follows.

1. Educational Institutes.
2. Medical and Health facilities.
3. Religious Institutes.
4. Civic & Community Institutes.
5. Other Uses.

Specialized Evaluation criteria for each of the above mentioned development types are elaborated in the following sections.

702 EDUCATIONAL INSTITUTES

702.1 General. An educational institution is an area used or intended to be used mainly for educational purposes. Examples of educational institution include.

- Kindergarten.
- Primary/ Secondary schools.
- Colleges and Vocational Institutes.
- Training institutes.
- Universities.
- Foreign and special schools (e.g. school for the disabled).

Commercial schools and tuition centers are considered as commercial uses and should be located on land zoned "Commercial" in the Zoning Plan. Such developments are therefore not allowed under the education zones. Examples of Commercial Schools are: tuition centre, language school, computer school, dress-making school, baking and cooking school, music/dancing school, child development school, children playgroup, art school. The criteria for assessment of education institutes are given in Appendix IV.

702.2 Kindergarten/child care centre. Refer Appendix IV fir regulations and criteria for assessment.

702.3 Special education schools. These regulations are intended for Special Education Schools, which provide education and training for the disabled. The schools are grouped into two broad categories for the purpose of development controls.

1. Ambulatory: These include schools for the mentally challenged, visually handicapped and the hearing impaired.

2. Non-ambulatory: These include schools for the orthopedic impaired or multi-handicaps.

Purpose-built special education schools are allowed on land zoned for educational purposes. They can also be allowed on government allocated land for such purposes e.g Reserve Sites. Conversion of properties to special education schools to be evaluated on a case-by-case basis, depending on the amenity of the area by CRDA.

703 HOSPITALS AND HEALTH INSTITUTIONS

703.1 General. Hospitals and health institutions are development that provide healthcare and ward services to patients. Hospitals are commonly freestanding developments. Hospitals are conditional uses in most residential and commercial zones. The sites for potential locations are identified in the land use plan. The regulations are as provided in Appendix IV.

Types of Health institutes that can be developed as hospitals are:

1. Teaching hospital with educational facilities- public/private
2. Super specialty hospital with two or more specialties- public/private
3. Super specialty hospital with single specialty- public/private
4. Area Hospital/ multi-specialty hospital having general medicine, paediatrics, gynaecology and obstetrics, general surgery, orthopaedics, ophthalmology, dental surgery, and anaesthesia - public/private

704 CIVIC AND COMMUNITY FACILITIES

704.1 General. Civic and Community Facilities are defined as developments uses or intended to be used mainly for civic community or cultural facilities or other similar purposes. They can be further categorized into the following.

1. Civic Institutions such as a courts, police station, fire station, special government building, prison, etc.
2. Community Institutions such as an association building, community club/ centre, professional institution, welfare home, home for the disabled, home for the aged/sheltered homes, youth and children complex, social welfare complex, crematorium etc.
3. Cultural Institutions such as Performing Arts Centre, Library, Museum, Arts/ Science, Centre, Art Gallery etc.

Most of the Civic and Community Facilities are allowed within Residential, Commercial and Industrial zones either as permitted uses, allowable uses or conditional uses.

704.2 Special institutional buildings. Old Age Homes, Disabled Homes, and Community Centers are the institutional buildings, which require special development regulations on top of the regulations of the other institutional buildings. The parameters to evaluate them are provided in Appendix IV.

704.3 Religious institutions. Places used or intended to be used, for religious public worship purpose can be termed as Religious Institutes. e.g. Temples, Churches, Mosques and other places of worship are considered as religious institutes. Places of worship are usually freestanding developments, and in some special situations may share a common wall development. Sites for potential religious places are identified in the proposed land use plan. Religious institutions can occur in residential, commercial and industrial zones, but require special evaluation for development from the Authority.

704.4 Petrol stations. A petrol station is a development which is involved in the sale of fuel for motor vehicles. The petrol station can also include a range of other facilities such as: minor repairing and servicing of vehicles, retail outlets, and car wash and tire service facilities. Petrol stations are usually free-standing developments. Petrol stations are conditional uses in most residential and commercial uses and are allowable uses in industrial zones.

704.5 Golf course. A golf course is an area designated for playing golf and may consist of a driving range and clubhouse for use by its members. It is zoned as P2 Zone which allows active recreation.

CHAPTER VIII

APPENDIX I

USES MATRIX

Appendix I

Zoning Regulations for Detailed Masterplan of Capital City - Amaravati

Zoning District

| USE GROUPS | Common facilities | | | | | | | | | | | | | | Residential | | | | | | | | | | | | | |

CHAPTER IX

APPENDIX II

ZONING REGULATIONS MATRIX

Zoning Regulations Matrix

| Typology | | | R1 D | R1 SD | R1 A | R1 AP1 | R1 AP2 | R1 AP3 | R1 AP4 | R1 GD | R1 AL | R2 D | R2 SD | R2 A | R2 AP | R2 AL | R3 D | R3 SD | R3 A | R3 AP1 | R3 AP2 | R3 AP3 | R3 AP3_HR | R3 AP4 | R3 AP4_HR | R3 GD | R3 AL | R4 AN | R4 AL | C1 AN | C1 HR | C1 AL | C2 50 | C2 100 | C2 300 | C2 500 | C2 2000 | C2 2000_HR | C2 3000 | C2 3000_HR | C2 AL | C3 AN | C3 AL | C4 AN | C4 HR | C4 AL | C5 AN | C5 HR | C5 AL | C6 AN | C6 HR | C6 AL | I1 AN | I1 HR | I1 AL | I2 AN | I2 HR | I2 AL | I3 AN | I3 HR | I3 AL | P1 AN | P2 AN | P2 ST | P3 AN | S1 AN | S2 AN | S3 AN |
|---|---|---

APPENDIX III–ZONING REGULATION TABLES

1001. Village Planning Zone (R1)

	Regulation	Remarks
These regulations shall apply to: • All new and redeveloped residential uses within the Village Planning Zone (R1). • Lots zoned or re-zoned for residential uses within the Village Planning Zone (R1).		
1.0 USES		
1.1 Permitted Uses	• Attached (A), Semi-detached (SD), detached houses (D), Apartments(AP) &Group Development (GD) • For approved layouts & plots having access through existing 12m wide road in R1 zone, all uses allowed in R3 are applicable. • Non confirming use • For detail list of uses refer to Appendix I	
1.2 Conditional Uses	• Standalone food outlet with less than 50 seats/100 sqm including kitchen • Public facilities • Convenience stores not exceeding 60m² of floor area or 5% of GFA, whichever is less • For detail list of uses refer to Appendix I • All unauthorised layouts shall be subjected to review by CRDA. • Fish market only if it is existing • Banquet hall/commercial shopping complex/centre, minimum plot size 2000 sqm (accessible by existing 12m wide road) • All public facilities related to health to follow public health department guidelines/Indian medical association. • Non-polluting units 5HP power consumption. • Communication towers/gas supply installations-subject to fulfilling the guidelines of statuary bodies. • Spiritual centre/Religious centre/Sports complex – minimum size 500 sqm subject to availability of 12m wide existing access road.	
1.3 Prohibited Uses	• Organised Informal Market • Service Apartments • General commercial uses • Industrial uses • Major infrastructure • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• Car parking garage • Outdoor kitchen • Store rooms • For detail list of uses refer to Appendix I	

2.0 BUILDABLE AREA (COVERAGE)		
2.1 Minimum Plot Sizes (sq.m)	• Refer Appendix II	
2.2 Maximum Building Coverage	• Refer Appendix II.	
2.3 No. of Basements	• Refer Appendix II.	
2.4 Maximum Floor Space Index (FSI)	• Refer Appendix II.	
3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	• G+3 for below 300m² • G+4 for 300m² and above • G (ancillary buildings)	
3.2 Floor to Floor Height	• Ground Floor – 4.5m maximum • Other Floors – 3.6m maximum	
3.3 Building Form	• Detached House • Semi Detached House • Attached House • Apartment • Group Development	

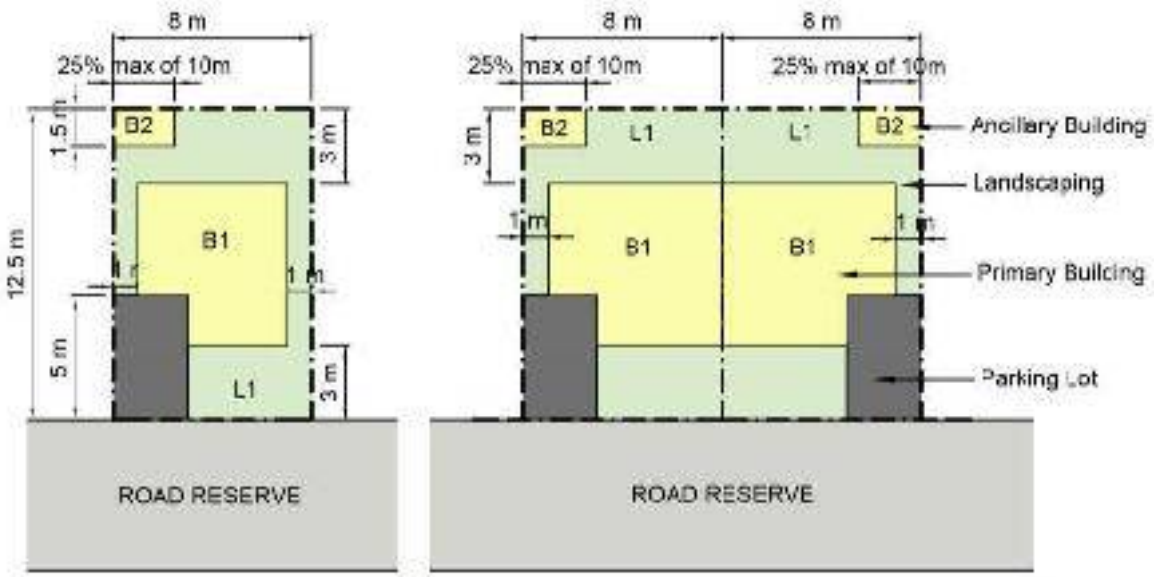
3.4 Existing Buildings	• Additions and alterations necessary to retain an existing approved legally non-conforming building and its use in good order and repair will be allowed, subject to:
	  • No material change in use which does not comply with the prevailing zoning regulations;
	  • No further increase in floor area of the existing non-conforming use
	• Conversion of a residential building to other permitted uses shall be considered subject to:
	  • Compliance with parking requirements for non-residential use
	  • Removal of the front boundary wall; and
	  • Aesthetic enhancement of the front elevation of the building	

4.0 SETBACK (MINIMUM)		
4.1 Building (Above Grade)	Refer Appendix II.	
4.2 Basement Setback	Refer Appendix II.	
4.3 Ancillary Buildings	Refer Appendix II.	
4.4 Between Multiple Buildings on the Same Lot	Refer Appendix II.	

5.0 SERVICE AREAAND EQUIPMENT		
5.1 Loading Docks	• Refer Appendix II.	
5.2 Outdoor Storage Areas	• No outdoor storage shall be allowed	
5.3 Refuse Storage Areas	• Proper location of the outdoor refuse areas shall be decided by CRDA or other relevant authorities upon review of the development application	
5.4 Mechanical Equipment	• Refer Appendix II.	
6.0 PARKING		
6.1 Location	• Required parking stalls shall be provided within the lot boundary	
6.2 Surfacing	• Parking shall be hard surfaced and provided with adequate drainage	
6.3 Minimum Required Parking Stalls	Refer Appendix II.	
6.4 Visitor Parking accessible to specially abled.	Refer Appendix II.	
6.5 Minimum Dimensions	Refer Chapter V.	
6.6 Vehicular Access to Parking Lot	• Only 1 vehicular ingress and egress point shall be allowed for plot less than 4000m² and 2 for more than 4000m² • Additional vehicular ingress and egress point shall be evaluated on case-by-case basis by CRDA or other relevant authorities	
7.0 FENCING		
7.1 Location	• Fencing and walls in the front, side and rear yards shall be at the perimeter of the lot	
7.2 Heights	• Rear and side fencing or walls shall not exceed 2.0 m in height. Front boundary wall should not exceed 2.0 m in height. • Additional height • Shall be evaluated on case-by-case basis by CRDA or other relevant authorities	
7.3 Materials	• The front boundary wall shall use material that allows 50% transparency	
8.0 CIRCULATION		
8.1 Pedestrian	Refer Appendix II.	
8.2 Public Transit	Refer Appendix II.	
9.0 SIGNAGE		
9.1 Permitted	• One sign shall be located on the fencing wall along the front setback • A maximum of 35cm height x 35cm width of signage shall be permitted Protrusion of the signage must be contained within plot boundary	

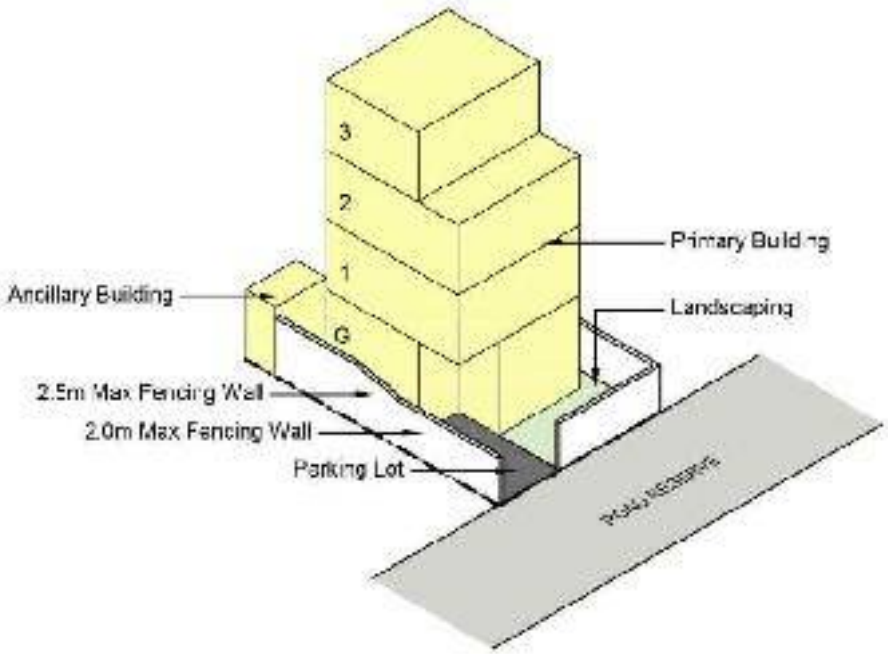
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area asOrganised open space for recreation	Refer Appendix II.	
10.3 Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4 Maintenance	Refer Appendix II.	
10.5 Decks as recreational facility	Refer Appendix II.	

DETACHED AND SEMI DETACHED DEVELOPMENT:



PLAN
(Not to scale)

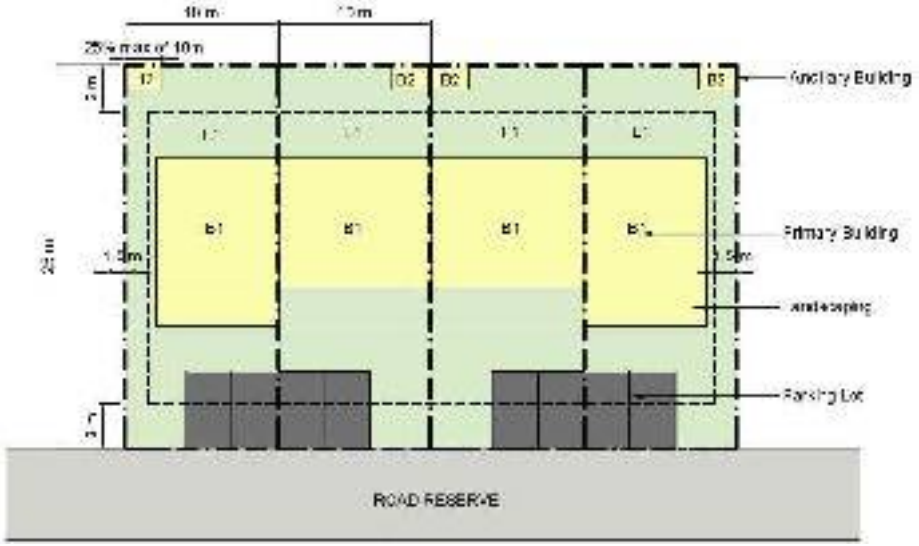
B1 – Primary BuildingP1 – Hard Paved Area
B2 – Ancillary Building L1 – Landscaped Area



ISOMETRIC VIEW(Not to scale)

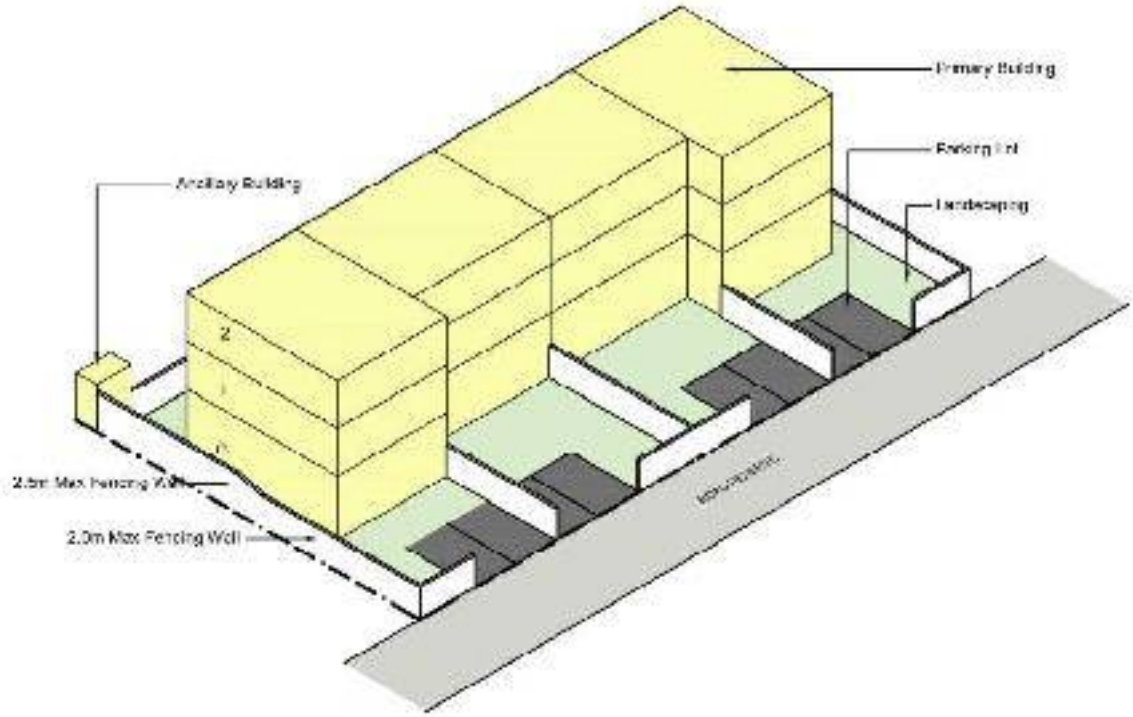
Figure: Illustration of Village Planning Zone (R1) – Option 2

ATTACHED DEVELOPMENT:



PLAN
(Not to scale)

B1 – Primary BuildingP1 – Hard Paved Area
B2 – Ancillary Building L1 – Landscaped Area



ISOMETRIC VIEW
(Not to scale)

Figure: Illustration of Village Planning Zone(R1) – Option 1

1002.Low Density Zone (R2)

	Regulation	Remarks
These regulations shall apply to: • All new and redeveloped residential uses within the Low Density (R2) • Lots zoned or re-zoned for residential uses within the Low Density Zone (R2)		
1.0 USES		
1.1 Permitted Uses	• Attached, Detached, Semi- Detached houses and Apartments • Residential apartments (all plots accessible by 12m wide road) • For detail list of uses refer to Appendix I	
1.2 Conditional Uses	• Standalone food outlet with less than 50 seats/100 m^2 including kitchen • Hotels (incl. its ancillary uses) • Public facilities • Convenience stores not exceeding 60m^2 of floor area or 5% of GFA, whichever is less • Home Office • Banquet hall of minimum size 2000 sqm plot (accessible by existing 12m wide road)	
1.3 Prohibited Uses	• Residential apartments (all plots NOT accessible by 12m wide road) • Service Apartments • Industrial uses • Major infrastructure • General commercial use • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• Car parking garage • Guard house • Maids' quarters • Outdoor kitchen • Store rooms • For detail list of uses refer to Appendix I	
2.0 BUILDABLE AREA (COVERAGE)		
2.1 Minimum Lot Size	• Lot size of 450$m^2$for detached landed housing development, 250m^2 for semi-detached, 250$m^2$for attached development, 500m^2 for apartment	
2.2 Maximum Building Coverage	• 50% for Detached house • 50% for Semi-detached house • 50% for Attached house and 40% for Apartments	
2.3 No. of Basements allowed.	• Refer Appendix 2	

	Regulation	Remarks
2.4 Maximum Floor Space Index(FSI)	• Detached -1.0, • Semi-Detached- 1.0 • Attached House – 1.0 • Apartments – 1.2	
3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	• Detached – G+2 • Semi-Detached- G+2 • Attached House – G+2 • Apartments – G+4 • G (ancillary buildings)	
3.2 Floor to Floor Height	• Ground Floor – 4.5m maximum • Other Floors – 3.6m maximum	
3.3 Building Form	• Detached house (D) • Semi-Detached house (SD) • Attached house (A) and Apartment (AP)	

3.4 Existing Buildings	• Additions and alterations necessary to retain an existing approved legally non-conforming building and its use in good order and repair will be allowed, subject to:
	  • No material change in use which does not comply with the prevailing zoning regulations;
	  • No further increase in floor area of the existing non-conforming use
	• Any additional floor area required for the non-conforming use will:
	• Conversion of a residential building to other permitted uses shall be considered, subject to:
	  • Compliance with parking requirements for non-residential use
	  • Removal of the front boundary wall;
	  • Aesthetic enhancement of the front elevation of the building	

4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	• Refer Appendix II.	Attached housing should include minimum of 3 plots.
4.2 Basement Setback	• As per Appendix II.	

	Regulation	Remarks

4.3 Ancillary Buildings	• Refer Appendix II.
	• Other ancillary uses
	  • May be allowed within the side and rear setbacks
	  • Are subject to their overall width not exceeding 25% of length of the boundary within which they encroach	

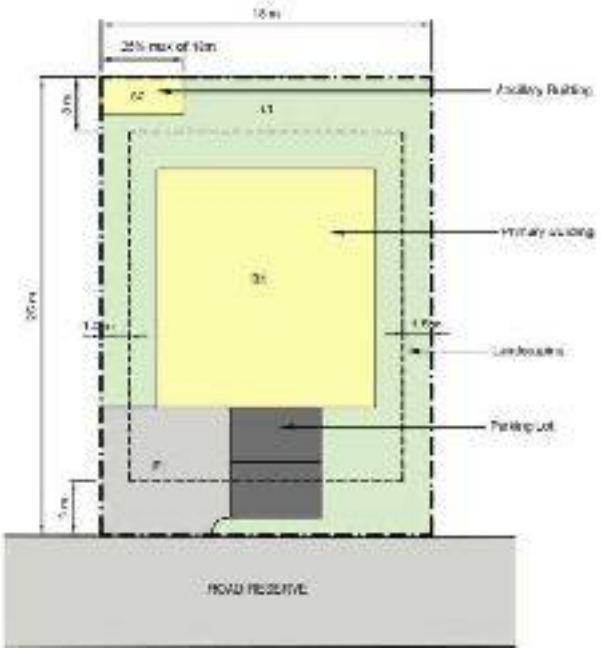
4.4 Between Multiple Buildings on the Same Lot	• Refer Appendix II.	
5.0 SERVICE AREA AND EQUIPMENT		
5.1 Loading Docks	• Refer Annexure II	
5.2 Outdoor Storage Areas	• No outdoor storage shall be allowed	
5.3 Refuse Storage Areas	• Proper location of the outdoor refuse areas shall be decided by CRDA or other relevant authorities upon review of the development application	

5.4 Mechanical Equipment	• At grade water tank and mechanical equipment:
	  • Shall be located to the side or rear of the building
	• At grade or rooftop water tank, mechanical and telecommunications equipment including solar energy equipments:
	  • Shall be screened subject to approval by CRDA or other relevant authorities	

6.0 PARKING		
6.1 Location	• Required parking stalls shall be provided within the lot boundary	
6.2 Surfacing	Refer Appendix II.	
6.3 Minimum Required Parking Stalls	Refer Appendix II.	
6.4 Visitor Parking accessible to specially abled.	Refer Appendix II.	
6.5 Minimum Dimensions	Refer Appendix II.	
6.6 Vehicular Access to Parking Lot	• Only 1 vehicular ingress and egress point shall be allowed • Additional vehicular ingress and egress point shall be evaluated on case-by-case basis by CRDA or other relevant authorities	
7.0 FENCING		
7.1 Location	• Fencing and walls in the front, side and rear yards shall be at the perimeter of the lot	

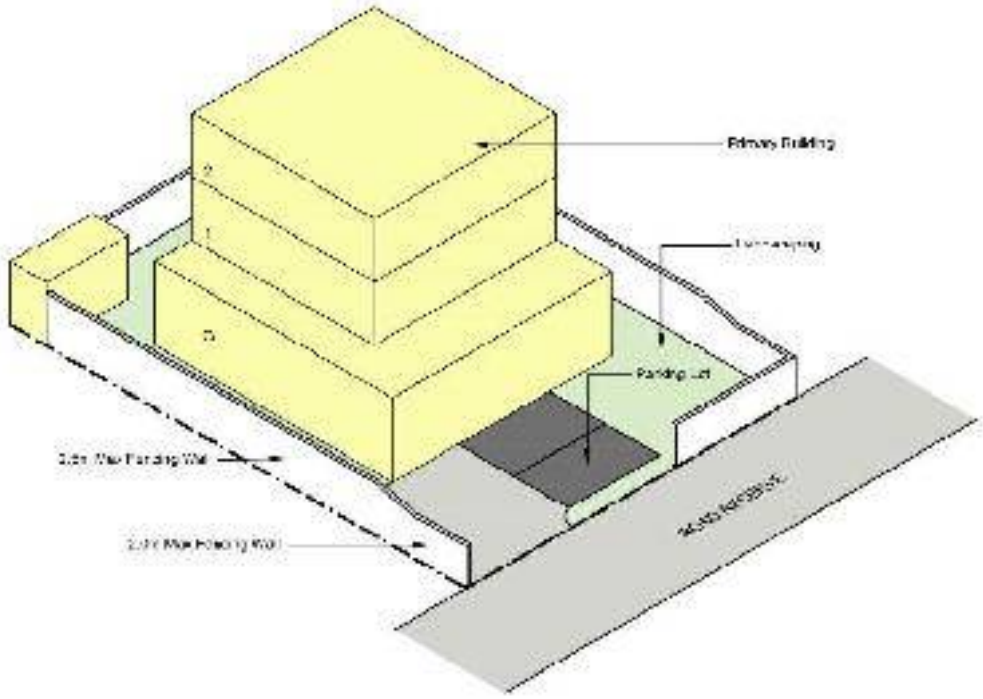
	Regulation	Remarks
7.2 Heights	• Rear and side fencing or walls shall not exceed 2 m in height, front boundary wall shall not exceed 2 m • Additional height • Shall be evaluated on case-by-case basis by CRDA or other relevant authorities	
7.3 Materials	• The front boundary wall shall use materials that allow 50% transparency	
8.0 CIRCULATION		
8.1 Pedestrian	Refer Appendix II.	
8.2 Public Transit	Refer Appendix II.	
9.0 SIGNAGE		
9.1 Permitted	• One sign shall be located on the fencing wall along the front setback • A maximum of 35cm height x 35cm width of signage shall be permitted • Protrusion of the signage must be contained within plot boundary	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area as Organised open space for recreation	Refer Appendix II.	
10.3 Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4 Maintenance	Refer Appendix II.	
10.5 Decks as recreational facility	Refer Appendix II.	

DETACHED DEVELOPMENT:



PLAN
(Not to scale)

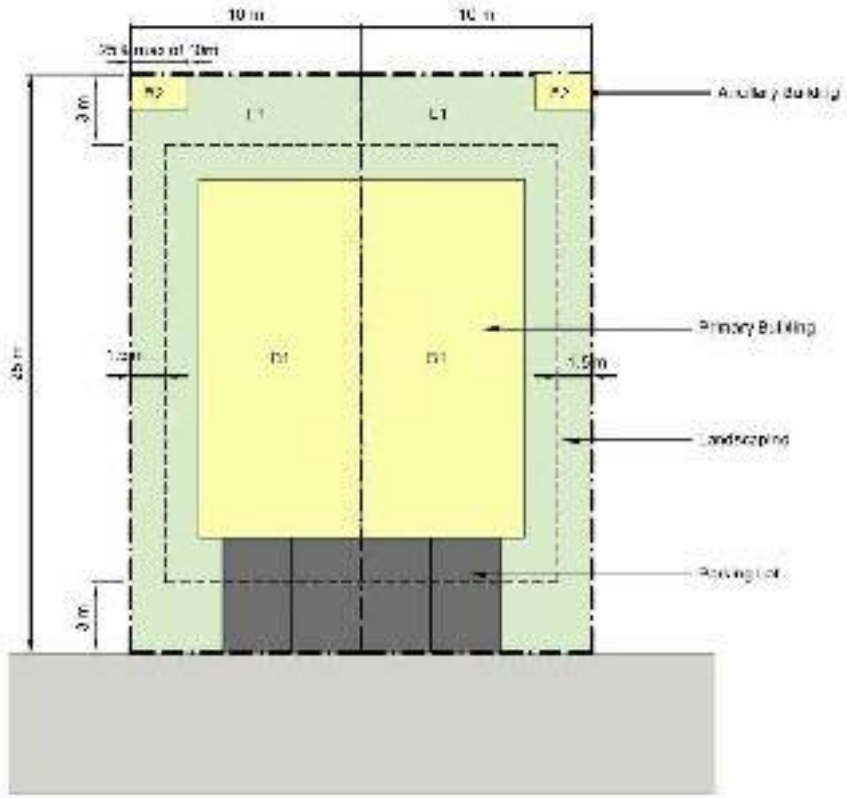
B1 – Primary BuildingP1 – Hard Paved Area
B2 – Ancillary Building L1 – Landscaped Area



ISOMETRIC VIEW
(Not to scale)

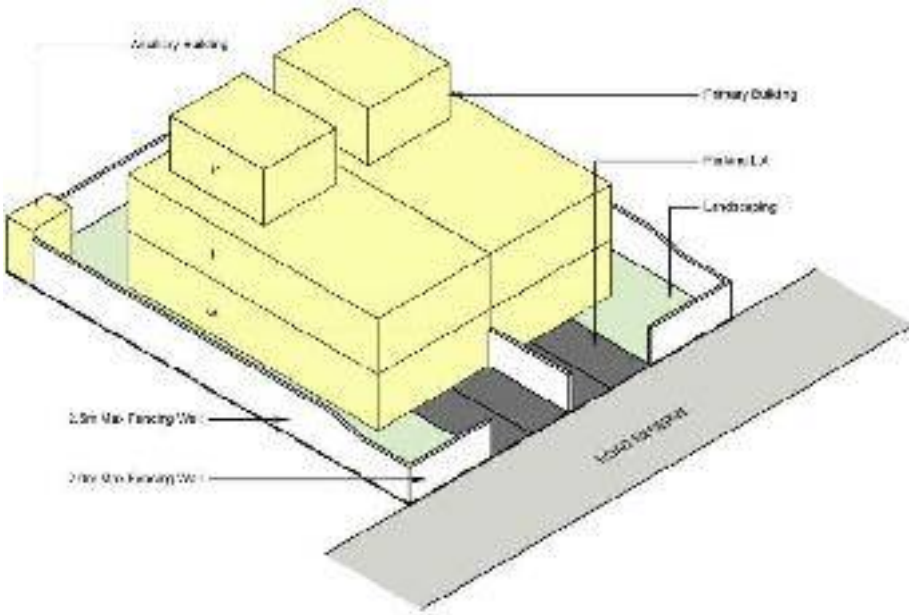
Figure - Illustration of Low Density Zone (R2) Detached Villa

SEMI DETACHED DEVELOPMENT:



PLAN
(Not to scale)

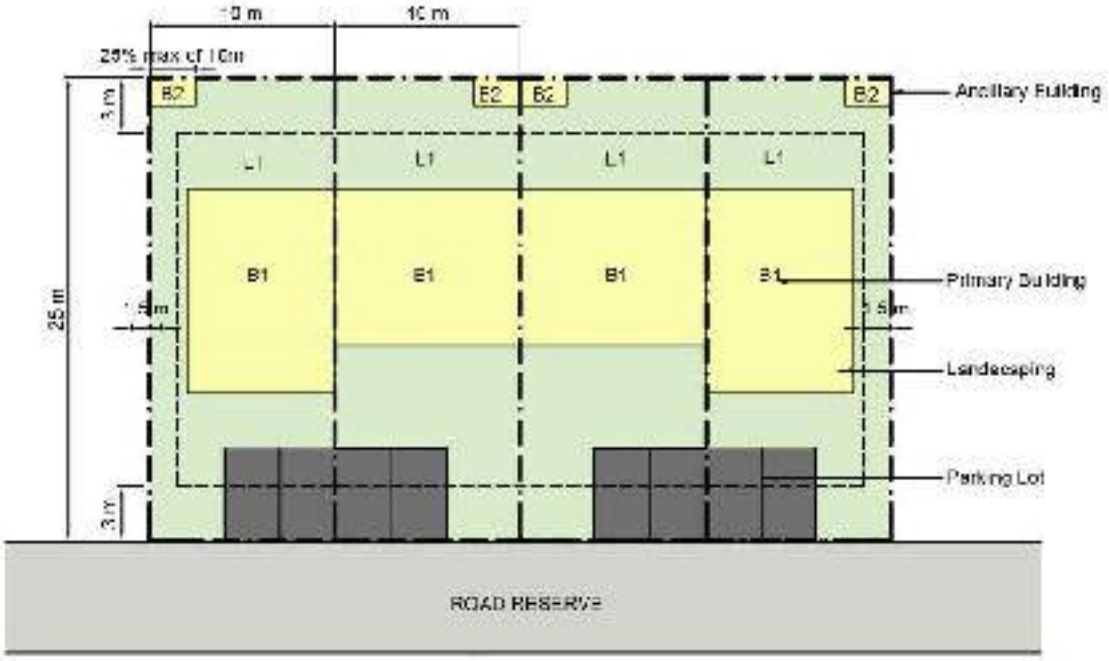
B1 – Primary BuildingB2 – Ancillary Building
L1 – Landscaped Area



ISOMETRIC VIEW
(Not to scale)

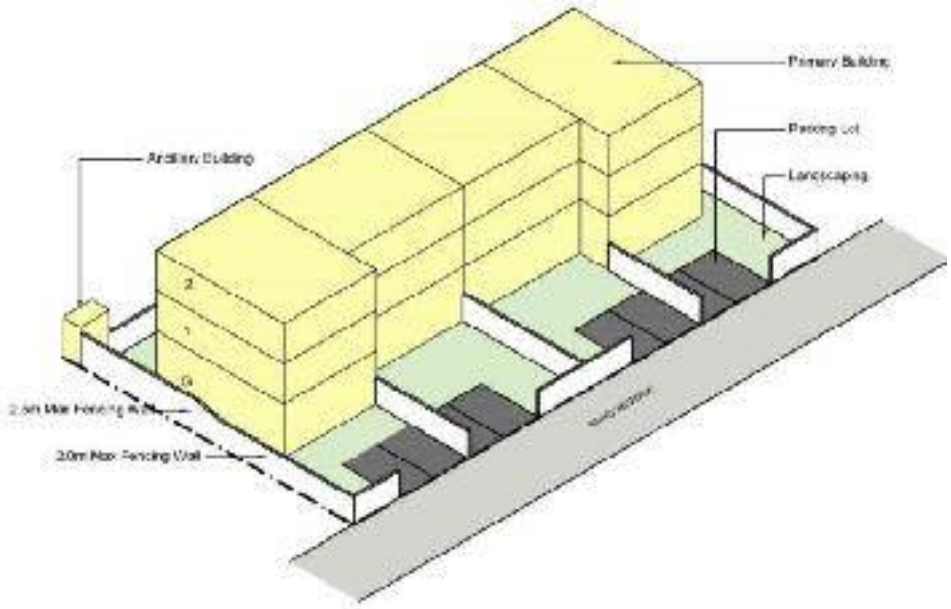
Figure: Illustration of Low Density Zone (R2) Semi- Detached Villa

ATTACHED DEVELOPMENT:



PLAN
(Not to scale)

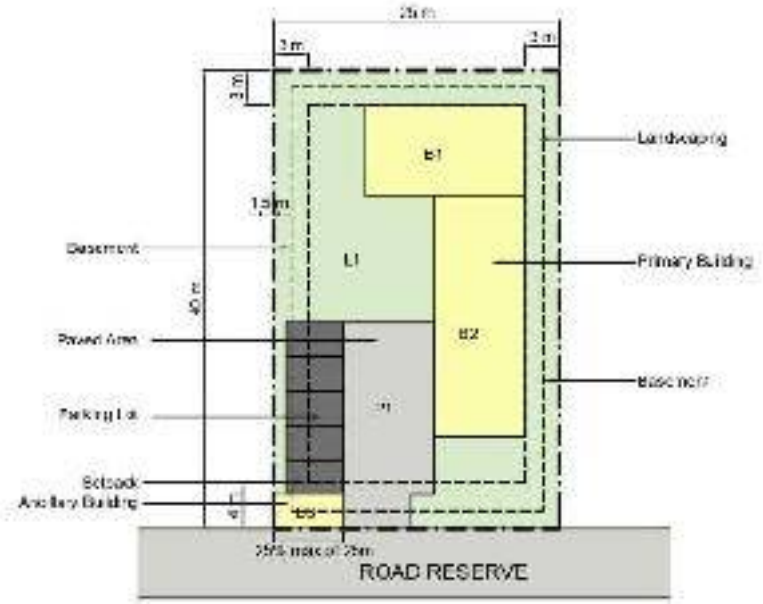
B1 – Primary BuildingB2 – Ancillary Building
L1 – Landscaped Area



ISOMETRIC VIEW
(Not to scale)

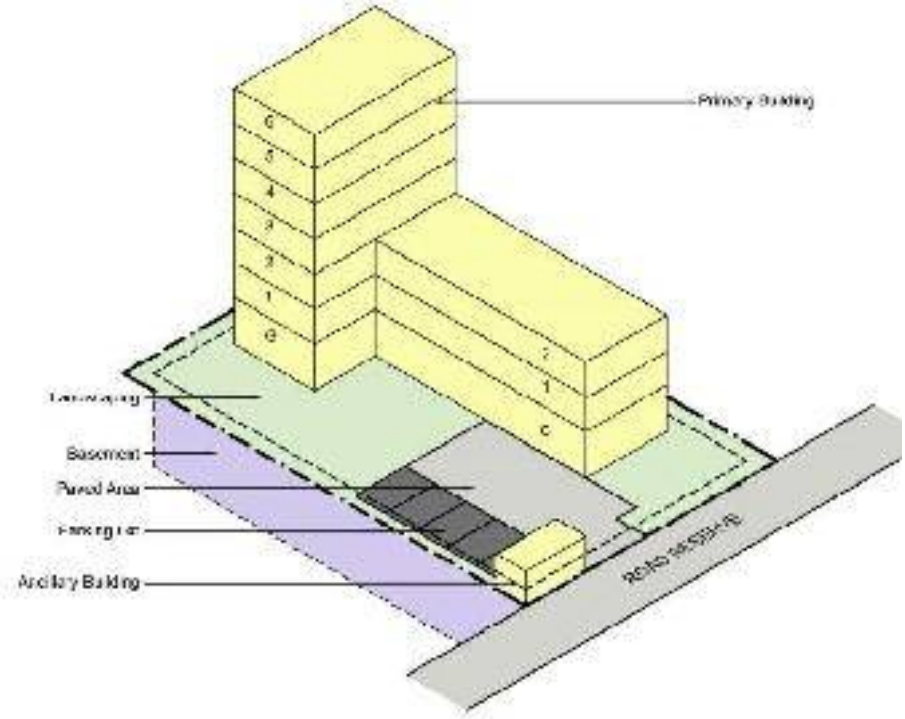
Figure: Illustration of Low Density Zone (R2) Semi- Attached house

APARTMENT DEVELOPMENT:



PLAN
(Not to scale)

B1, B2 – Primary BuildingP1 – Hard Paved Area
B3 – Ancillary Building L1 – Landscaped Area



ISOMETRIC VIEW
(Not to scale)

Figure: Illustration of Low Density Zone (R2) Apartment

1003. Medium to High Density Zone (R3)

	Regulation	Remarks
These regulations shall apply to: • All new and redeveloped residential uses within the Medium to High Density Zone (R3) • Lots zoned or re-zoned for residential uses within the Medium to High Density Zone (R3)		
1.0 USES		
1.1 Permitted Uses	• Attached(A), semi-detached(SD) and detached(D) houses • Apartments (all plots accessible by minimum 12m wide road) • For detail list of uses refer to Appendix I	
1.2 Conditional Uses	• Standalone food outlet with less than 50 seats/100 sqm including kitchen • Hotels (incl. its ancillary uses) • Public facilities • Convenience stores not exceeding 60m² of floor area or 5% of GFA whichever is less. • Home Office • All permitted uses in R1 and R2 zone • All unauthorised layouts shall be subjected to review by CRDA. • Banquet hall/commercial shopping complex/centre, minimum size 2000 sqm (accessible by existing min. 12m wide road) • Non-polluting industries units machinery up to 5HP • For detail list of uses refer to Appendix I	
1.3 Prohibited Uses	• Apartments (all plots NOT accessible by 12m wide road) • Service Apartments • Industrial uses • Major infrastructure • General commercial use • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• Car parking garage • Guard house • Maids' quarters • Outdoor kitchen • Store rooms • For detail list of uses refer to Appendix I	
2.0 BUILDABLE AREA (COVERAGE)		
2.1 Minimum Lot Size	• Refer Appendix II.	
2.2 Maximum Building Coverage	• Refer Appendix II.	

	Regulation	Remarks
2.3 No. of Basements allowed	• Refer Appendix II.	
2.4 Maximum Floor Space Index(FSI)	• Detached, Semi-Detached and Attached -1.75 • Medium Density Apartments: 2.0 • High Density Apartments : 2.4 • Group development: 2.4	
3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	• G+3 (Attached, semi-detached and detached) up to 300 sqm • G+5 up to 2000sqm • G+11(Apartments)> 2000 sqm – High rise • G (ancillary buildings)	
3.2 Floor to Floor Height	• Ground Floor – 4.5m maximum • Other Floors – 3.6m maximum	
3.3 Building Form	• Detached (D) • Semi-Detached (SD) • Attached (A) • Apartments (AP) • Group development(GD)	

3.4 Existing Buildings	• Additions and alterations necessary to retain an existing approved legally non-conforming building and its use in good order and repair will be allowed, subject to:
	  • No material change in use which does not comply with the prevailing zoning regulations;
	  • No further increase in floor area of the existing non-conforming use
	• Conversion of a residential structure to other permitted uses shall be considered, subject to:
	  • Compliance with parking requirements for non-residential use
	  • Removal of the front boundary wall; Aesthetic enhancement of the front elevation of the building.	

4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	• Refer Appendix II.	
4.2 Basement Setback	• Refer Appendix II.	

	Regulation	Remarks

4.3 Ancillary Buildings	• In the front setback along the lot frontage,
	  • May be allowed at the zero setback provided their width does not exceed 25% of the lot frontage
	• Other ancillary uses
	  • May be allowed within the side and rear setbacks
	  • Are subject to their overall width not exceeding 25% of length of the boundary within which they encroach	

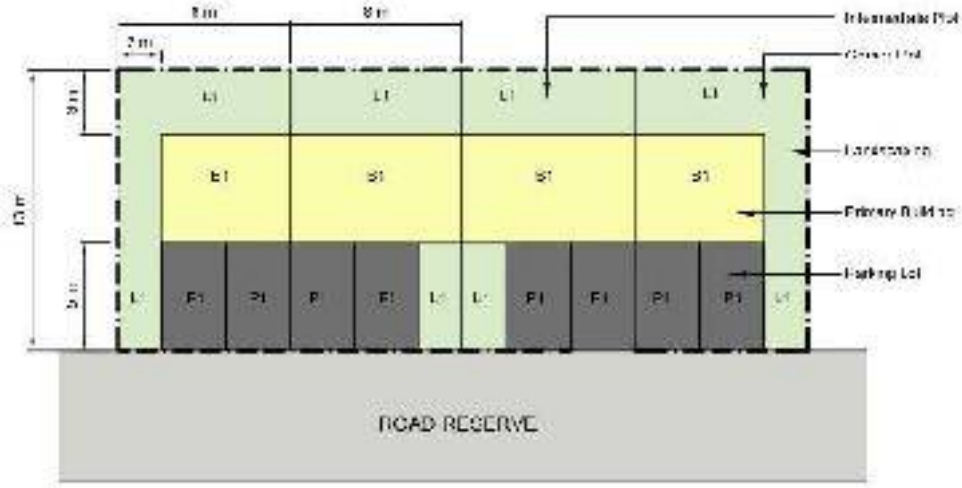
4.4 Between Multiple Buildings on the Same Lot	• Refer Annexure II.	
5.0 SERVICE AREA AND EQUIPMENT		
5.1 Loading Docks	• Refer Annexure II.	
5.2 Outdoor Storage Areas	• No outdoor storage shall be allowed	
5.3 Refuse Storage Areas	• Proper location of the outdoor refuse areas shall be decided by CRDA or other relevant authorities upon review of the development application	

5.4 Mechanical Equipment	• At grade water tank and mechanical equipment:
	  • Shall be located to the side or rear of the building
	• At grade or rooftop water tank, mechanical ,telecommunications and solar equipment :
	  • Shall be screened subject to approval by CRDA or other relevant authorities	

6.0 PARKING		
6.1 Location	• Refer Appendix II.	
6.2 Surfacing	• Parking shall be hard surfaced and provided with adequate drainage	
6.3 Minimum Required Parking Stalls	Refer Appendix II.	
6.4 Visitor Parking accessible to specially abled	Refer Appendix II.	
6.5 Minimum Dimensions	• Refer Chapter V	

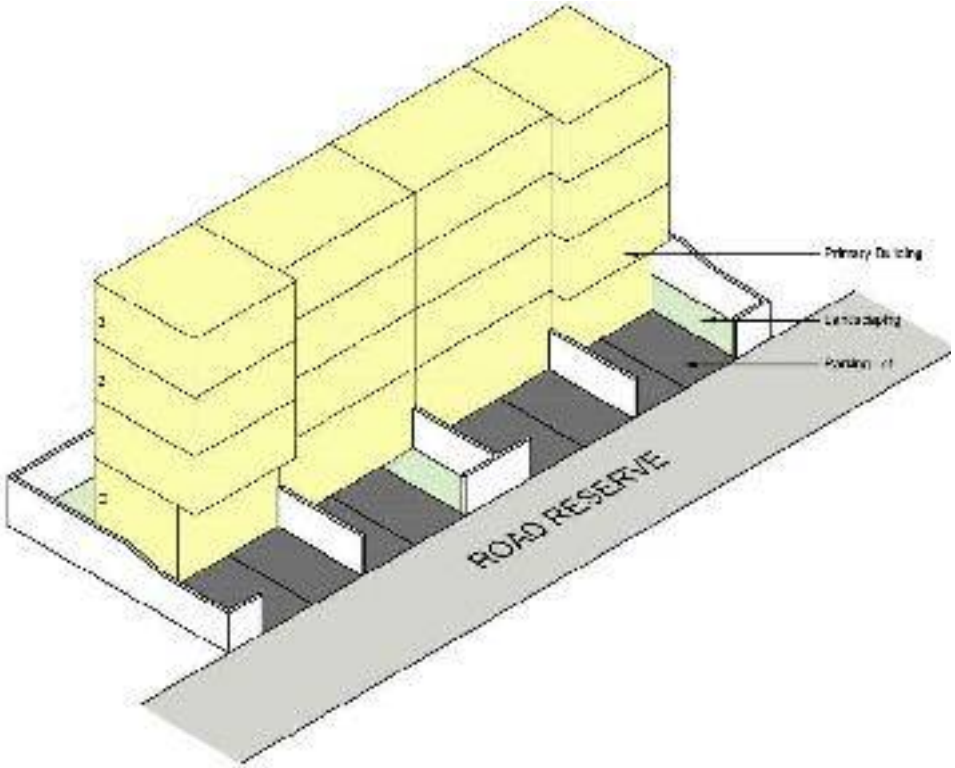
	Regulation	Remarks
6.6 Vehicular Access to Parking Lot	• Only 1 vehicular ingress and egress point shall be allowed • Additional vehicular ingress and egress point shall be evaluated on case-by-case basis by CRDA or other relevant authorities	
7.0 FENCING		
7.1 Location	• Fencing and walls in the front, side and rear yards shall be at the perimeter of the lot	
7.2 Heights	• Rear and side fencing or walls shall not exceed 2 m in height, front boundary wall shall not exceed 2 m • Additional height • Shall be evaluated on case-by-case basis by CRDA or other relevant authorities	
7.3 Materials	• The front boundary wall shall use materials that allow 50% transparency	
8.0 CIRCULATION		
8.1 Pedestrian	Refer Appendix II.	
8.2 Public Transit	Refer Appendix II.	
9.0 SIGNAGE		
9.1 Permitted	• One sign shall be located on the fencing wall along the front setback • A maximum of 35cm height x 35cm width of signage shall be permitted • Larger sign is allowed for an apartment complex, subject to approval from CRDA or the other relevant authorities • Protrusion of the signage must be contained within plot boundary	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area asOrganised open space for recreation	Refer Appendix II.	
10.3 Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4 Maintenance	Refer Appendix II.	
10.5 Decks as recreational facility	Refer Appendix II.	

ATTACHED DEVELOPMENT:



PLAN
(Not to scale)

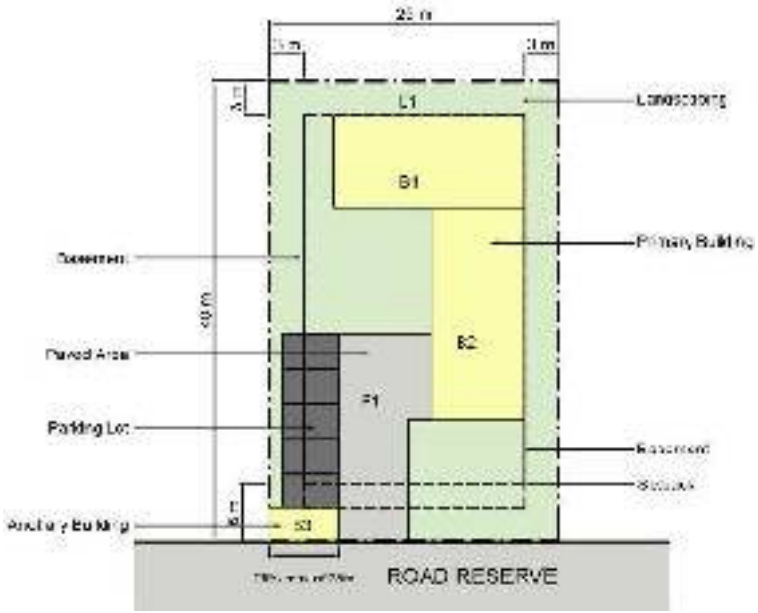
B1 – Primary BuildingP1 – Hard Paved Area
L1– Landscaped Area



ISOMETRIC VIEW
(Not to scale)

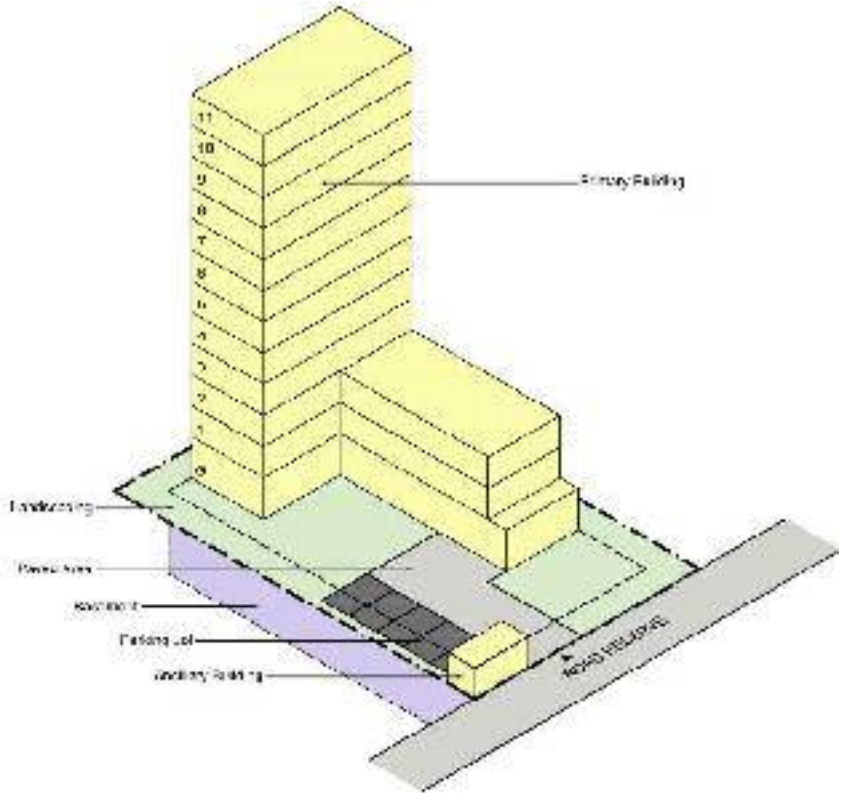
Figure: Illustration of Medium to High Density Zone – Attached (R3)

MEDIUM DENSITY APARTMENT DEVELOPMENT:



PLAN
(Not to scale)

B1, B2 – Primary BuildingP1 – Hard Paved Area
B3 – Ancillary Building L1– Landscaped Area

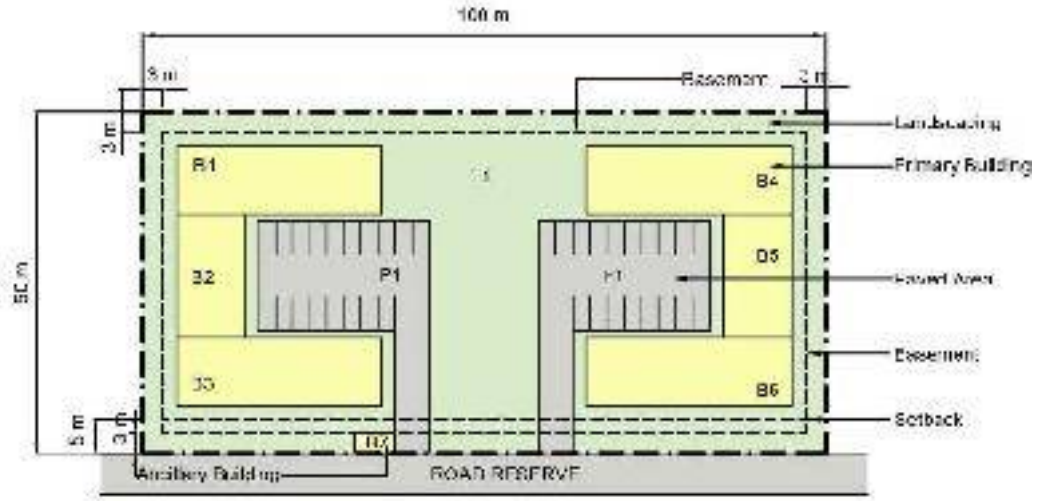


ISOMETRIC VIEW

(Not to scale)

Figure: Illustration of Medium to High Density Zone – Medium Density Apartment (R3)

HIGH DENSITY APARTMENT DEVELOPMENT:

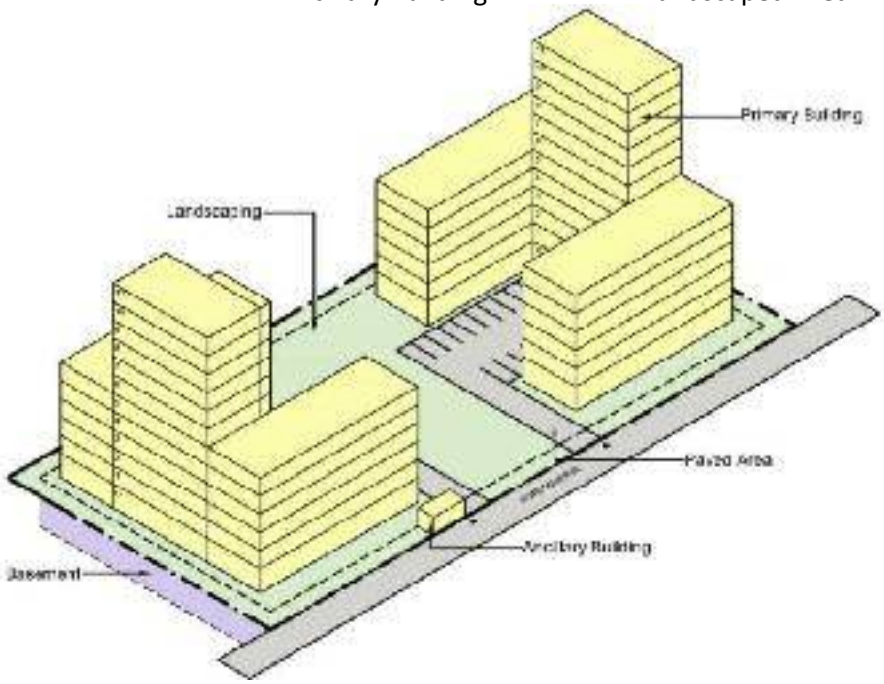


PLAN

(Not to scale)

B1 to B6 – Primary Building P1 – Hard Paved Area

B7 – Ancillary Building L1– Landscaped Area



ISOMETRIC VIEW

(Not to scale)

Figure - Illustration of Medium to High Density Zone – High Density Apartment (R3)

1004.High Density Zone (R4)

	Regulation	Remarks
These regulations shall apply to: • All new and redeveloped residential uses within the High Density Zone (R4) • Lots zoned or re-zoned for residential uses within the High Density Zone (R4)		
1.0 USES		
1.1 Permitted Uses	• Apartments (all plots accessible by 12m wide road) • High rise apartments (all plots accessible by 12m wide road) • Shop within apartment complex not exceeding 60 m² of floor area or 5% of GFA whichever is less. • Clubhouse • For detail list of uses refer to Appendix I	
1.2 Conditional Uses	• Standalone food outlet with less than 50 seats/100 sqm including kitchen • Hotels (incl. its ancillary uses) • Public facilities • Home Offices • All permitted uses in R1, R2 and R3 zone • Banquet hall/commercial shopping complex/centre, minimum size 2000 sqm (accessible by existing 12m wide road) • Non-polluting industries units machinery up to 5HP • For detail list of uses refer to Appendix I	Refer land use plan for guidance on location of facility Refer appendix for regulations regarding facilities. Refer regulations for home offices
1.3 Prohibited Uses	• Apartments (all plots not accessible by 12m wide road) • Service Apartments • General Commercial uses • Industrial uses • Major infrastructure • Single Family Residential developments • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• Car parking garage • Guard house • Maids' quarters • Outdoor kitchen • Store rooms • For detail list of uses refer to Appendix I	
2.0 COVERAGE		
2.1 Minimum Lot Size	• 4000 m²	
2.2 Maximum Building Coverage	• 50% maximum	

	Regulation	Remarks
2.3 No. of basements allowed	• Refer Appendix II.	
2.4 Maximum Floor Space Index(FSI)	• 3.5 maximum	
3.0 BUILDABLE AREA (COVERAGE)		
3.1 Maximum Number of Floors	• Refer Appendix II.	
3.2 Floor to Floor Height	• Ground Floor - 4.5m • Other Floor- 3.6m	
3.3 Building Form	• Refer Appendix II.	

3.4 Existing Buildings	• Additions and alterations necessary to retain an existing approved legally non-conforming building and its use in good order and repair will be allowed, subject to:
	  • No material change in use which does not comply with the prevailing zoning regulations;
	  • No further increase in floor area of the existing non-conforming use
	• Conversion of a residential structure to other permitted uses shall be considered subject to:
	  • Compliance with parking requirements for non-residential use
	  • Removal of the front boundary wall; and
	  • Aesthetic enhancement of the front elevation of the building	

4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	• Refer Appendix II.	
4.2 Basement Setback	• All lot boundaries: 3 m (min) (to allow for any below grade services that may be required and ensure the viable growth of trees)	

4.3 Ancillary Buildings	• In the front setback along the lot frontage,
	  • May be allowed at the zero setback provided their width does not exceed 25% of the lot frontage
	• Other ancillary uses
	  • May be allowed within the side and rear setbacks
	  • Are subject to their overall width not exceeding 25% of length of the boundary within which they encroach.	

4.4 Between Multiple Buildings on the Same Lot	• The setback between multiple adjacent buildings within the same lot shall be a minimum of 6 m	

5.0 SERVICE AREA AND EQUIPMENT		
5.1 Loading Docks	• Refer Annexure II	
5.2 Outdoor Storage Areas	• No outdoor storage shall be allowed	
5.3 Refuse Storage Areas	• Proper location of the outdoor refuse areas shall be decided by CRDA or other relevant authorities upon review of the development application.	

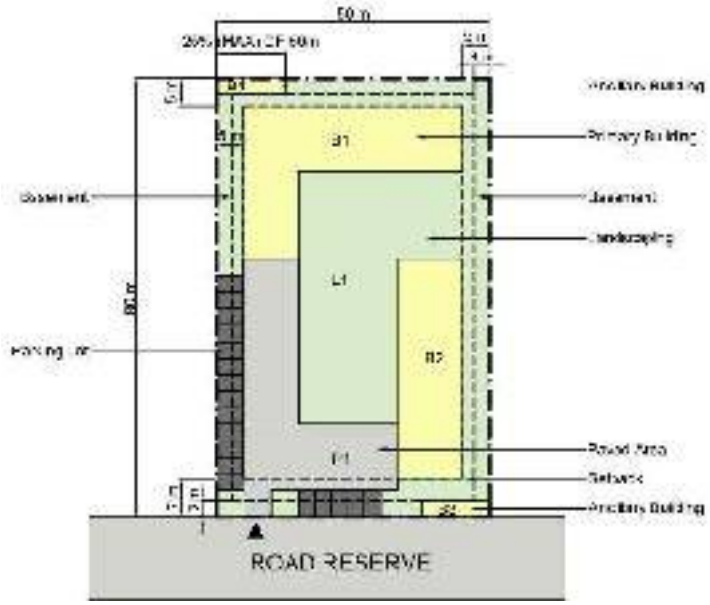
5.4 Mechanical Equipment	• At grade water tank and mechanical, solar equipment:
	  • Shall be located to the side or rear of the building
	  • May be located in the setback provided a minimum of 2 m is maintained free of obstruction and do not impede circulation
	• At grade or rooftop water tank, mechanical and telecommunications equipment :
	  • Shall be screened subject to approval by CRDA or other relevant authorities	

6.0 PARKING		
6.1 Location	• Required parking slots shall be provided within the lot boundary	
6.2 Surfacing	• Parking shall be hard surfaced and provided with adequate drainage	
6.3 Minimum Required Parking Stalls	• Refer Appendix II.	
6.4 Visitor parking accessible to specially abled.	• Visitors parking should have provision for disable parking in the apartment complex.	
6.5 Minimum Dimensions	• Refer Chapter V	
6.6 Minimum Shaded Areas	• At least one covered vehicular drop-off point should be provided.	
6.7 Circulation in Parking	• Clearly designated and marked parking stalls, driveways and sidewalks within the parking lots shall be provided	
6.8 Vehicular Access to Parking Lot	• Only 1 vehicular ingress and egress point shall be allowed • Additional vehicular ingress and egress point shall be evaluated on case-by-case basis by CRDA or other relevant authorities	
7.0 FENCING		
7.1 Location	• Fencing and walls in the front, side and rear yards shall be at the perimeter of the lot	

7.2 Heights	• Front fencing or walls shall not exceed2 m and rear/side fencing wall shall not exceed 2 m in height
	• Additional height
	  • Shall be evaluated on case-by-case basis by CRDA or other relevant authorities
	  • Front fencing or walls shall conform with the height on directly adjacent lots	

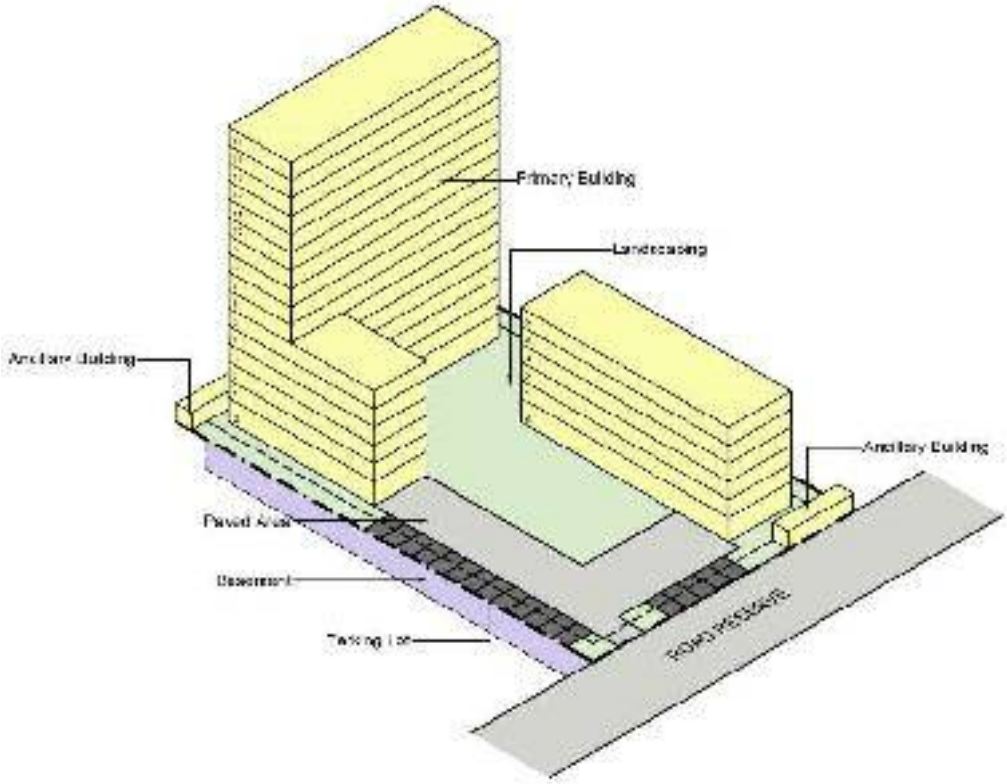
7.3 Materials	• The front boundary wall • Materials and design should allow for 50% transparency.	
8.0 CIRCULATION		
8.1 Pedestrian	• Pedestrian circulation shall link all buildings and amenities on site • All pedestrian circulation shall be accessible to the specially abled.	
8.2 Public Transit	• Refer Appendix II.	
9.0 SIGNAGE		
9.1 Permitted	• Two signs shall be permitted one along the fencing wall and the other within the front setback • A Maximum of 1.5 m height x 7 m length of signage shall be permitted • Protrusion of the signage must be contained within plot boundary	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area as Organised open space for recreation	Refer Appendix II.	
10.3 Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4 Maintenance	Refer Appendix II.	
10.5 Decks as recreational facility	Refer Appendix II.	

HIGH DENSITY APARTMENT DEVELOPMENT:



PLAN

(Not to scale) B1, B2 – Primary BuildingP1 – Hard Paved Area
B3, B4 – Ancillary Building L1– Landscaped Area



ISOMETRIC VIEW

(Not to scale)

902.Figure: Illustration of High Density Zone – High Density Apartment (R4)

1005.Mixed Use Commercial Zone (C1)

	REGULATION	REMARKS
These regulations shall apply to: • All new and redeveloped commercial uses within the Mixed Use Commercial Zone (C1) • Lots zoned or re-zoned for commercial uses within the Mixed Use Commercial Zone (C1)		
1.0 USES		
1.1 Permitted Uses	• Maximum commercial quantum control of 30% of the total allowable gross floor area. • Multi-family residential apartments above 1st or 2nd floor • For detail list of uses refer to Appendix I	
1.2 Conditional Uses	• All permitted uses in R1 and R2 zone. • Non-polluting industries units machinery up to 10 HP • For detail list of uses refer to Appendix I	
1.3 Prohibited Uses	• Large scale independent commercial complex • All type of industrial uses • Major infrastructure installations • Commercial uses that cause or are likely to cause disamenity to the residents are not allowed. For example, nightclubs and karaoke lounges may only be allowed on a case-by-case basis. • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• Electrical substation (ESS) • Refuse area • Swimming Pool • For detail list of uses refer to Appendix I	
2.0 BUILDABLE AREA (COVERAGE)		
2.1 Minimum Lot Size	• Refer Appendix II	
2.2 Maximum Building Coverage	• 50% maximum	
2.3 No. Of Basements	• Refer Appendix II	
2.4 Maximum Floor Space Index(FSI)	• 3.5 maximum	
2.5 Sustainable construction methods	• Sustainable building design technology and sustainable construction methods are encouraged. • Roof top communal facilities or roof gardens can be provided.	

3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	• G+5 for any other. • G+8(High Rise Apartments) maximum • G (ancillary buildings) maximum	The resultant building height must also comply with the technical height controls imposed by other authorities such as aviation path restrictions, telecommunication and military installations.
3.2 Floor to Floor Height	• Ground Floor -3.6m maximum • Other Floors – 3 m maximum	
3.3 Building Form	• Most common form is commercial podium with apartment tower block • Pure tower block • Attached buildings • Residential component may also be physically separated from the commercial use	The building form depends on the location of the site and street block plans for the area.

3.4 Existing Buildings	• Additions and alterations necessary to retain an existing approved legally non-conforming building and its use in good order and repair will be allowed, subject to:
	  • No material change in use which does not comply with the prevailing zoning regulations;
	  • No further increase in floor area of the existing non-conforming use
	• Conversion of a residential structure to other permitted uses shall be considered subject to:
	  • Compliance with parking requirements for non-residential use
	  • Removal of the front boundary wall; and
	  • Aesthetic enhancement of the front elevation of the building	

4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	• Refer Appendix II.	
4.2 Basement Setback	• Refer Appendix II.	
4.3 Ancillary Buildings	Refer Appendix II.	
4.4 Between Multiple Buildings on the Same Lot	• Refer Appendix II.	

5.0 SERVICE AREA AND EQUIPMENT		
5.1 Loading Docks	• Loading docks, if any, shall be located to the rear or side of the building. • Where the rear of the building faces residential uses, the loading area must be appropriately screened so as not to be visible from residential uses	
5.2 Outdoor Storage Areas	• No outdoor storage shall be allowed	
5.3 Refuse Storage Areas	• Proper location of the outdoor refuse areas shall be decided by CRDA or other relevant authorities upon review of the development application.	

5.4 Mechanical Equipment	• At grade water tank and mechanical equipment:
	  • Shall be located to the side or rear of the building
	  • May be located in the setback provided a minimum of 2 m is maintained free of obstruction and do not impede circulation
	• At grade or rooftop water tank, mechanical and telecommunications equipment:
	  • Shall be screened subject to approval by CRDA or other relevant authorities
	  • Shall not be visible from street	

6.0 PARKING		
6.1 Location	• Required parking stalls shall be provided within the lot boundary	
6.2 Surfacing	• Parking shall hard paved surface and provided with adequate drainage	
6.3 Minimum Required Parking Stalls	• Refer Appendix II.	
6.4 Visitor Parking accessible to specially abled.	• Refer Appendix II.	
6.5 Minimum Dimensions	• Refer Chapter V	
6.6 Minimum Shaded Areas	• Refer Appendix II.	
6.7 Circulation in Parking	• Clearly designated and marked parking spaces, driveways and sidewalks within the parking lots shall be provided	
6.8 Vehicular Access to Parking Lot	• Only one ingress-egress point to the development plot is allowed. • To be taken from the rear service road. Access from the main street is discouraged.	

7.0 FENCING		
7.1 Location	Refer Appendix II.	
7.2 Heights	Refer Appendix II.	
8.0 CIRCULATION		
8.1 Pedestrian	• 2m(min) covered publicly accessible pedestrian walkway/ covered arcade shall be provided along the perimeter of the buildings fronting the main roads • Pedestrian circulation shall link all buildings and amenities on site • Throughout the site development, all pedestrian linkages shall be a minimum 1.5m wide • All pedestrian circulation shall be accessible to the disabled	
9.0 SIGNAGE		

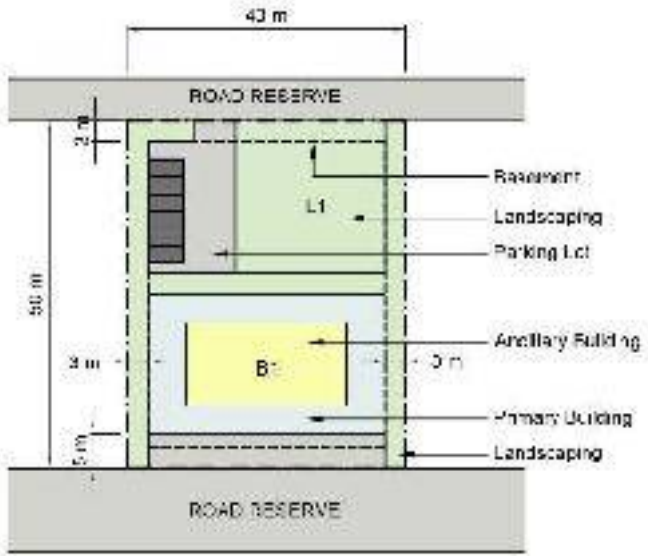
9.1 Permitted	• One building identification sign shall be permitted on the tower
	• One Commercial sign per tenant shall be permitted:
	  • Wall Signage (15% of the Building Face or 9 m^2 whichever less)
	  • Window Signage (Transparent, 15% of the Building Face or 2.5m^2 whichever less)
	  • Awning Signage (Min 2.5m clearance from ground and 25% of the building face or 2.5m^2 whichever less)	

9.2 Prohibited	• The following signs are prohibited:
	  • Roof mounted signs
	  • String lights, flashing, excessively bright lights
	  • Off-site signage	

9.3 Location	• Individual signs for commercial tenants within a multi-tenanted commercial development shall be mounted to the façade of the development • Permitted free standing signage shall not exceed 5m in height, and may be located within the front setback	
9.4 Lighting	• No flashing lights are allowed	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	

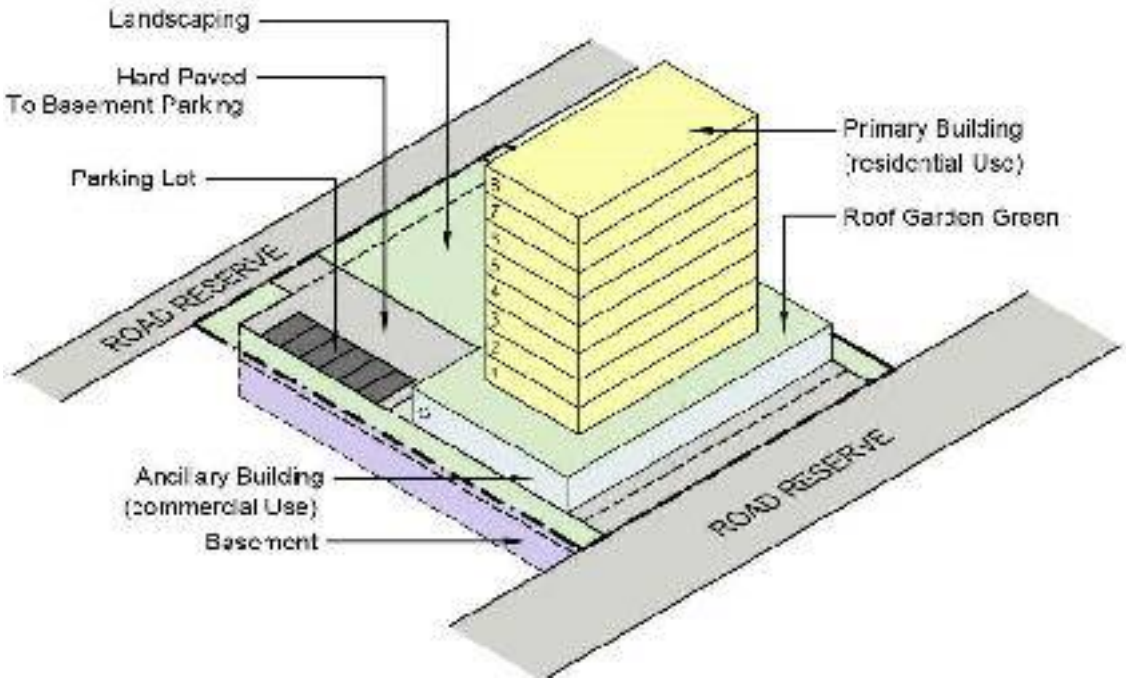
10.2	5% of Plot area asOrganised open space for recreation	Refer Appendix II.	
10.3	Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4	Maintenance	Refer Appendix II.	
10.5	Decks as recreational facility	Refer Appendix II.	

MIXED USE COMMERCIAL ZONE (C1):



PLAN
(Not to scale)

B1 – Primary BuildingP1 – Hard Paved Area
B2, B3 – Ancillary Building L1 – Landscaped Area



ISOMETRIC VIEW
(Not to scale)

Figure: Illustration of Mixed Use Commercial District (C1)

1006.General Commercial Zone (C2)

	REGULATION	REMARKS
These regulations shall apply to: • All new and redeveloped commercial uses within the General Commercial Zone (C2) • Lots zoned or re-zoned for commercial uses within the General Commercial Zone (C2)		
1.0 USES		
1.1 Permitted Uses	• Residential uses as shown per Appendix I	
1.2 Conditional Uses	• Public facilities • Petrol stations • Apartment (on the 2nd storey and above) with min. 12 m wide road access. • All permitted uses in C1 zone. • Residential uses as shown per Appendix I • Non-polluting industries units machinery up to 10 HP • Construction material store should be showroom type and no storage is allowed either in open or closed area. • Cinema halls/multiplex shall be allowed for plots abutting to 18m width road and minimum 3000 sqm plot.	Refer appendix for regulations regarding facilities
1.3 Prohibited Uses	• All types of industrial uses • Large scale commercial uses such as shopping centres, hyper-marts, showrooms, offices etc. • Major infrastructure • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• Electrical substation (ESS) • Refuse area • For detail list of uses refer to Appendix I	
2.0 COVERAGE		
2.1 Minimum Lot Size	• Refer Appendix II	
2.2 Maximum Building Coverage	• Refer Appendix II.	
2.3 No. of Basements	Refer Appendix II.	
2.4 Maximum Floor Area Ratio (FAR)	Refer Appendix II.	
3.0 BUILDABLE AREA (COVERAGE)		
3.1 Maximum Number of Floors	• Refer Appendix II.	
3.2 Floor to Floor Height	• Ground Floor - 4m maximum • Other Floors - 3m maximum	
3.3 Building Form	• Free Standing Buildings • Shop houses	

	REGULATION	REMARKS

3.4 Existing Buildings	• Additions and alterations necessary to retain an existing approved legally non-conforming building and its use in good order and repair will be allowed, subject to:
	  • No material change in use which does not comply with the prevailing zoning regulations;
	  • No further increase in floor area of the existing non-conforming use
	• Conversion of a residential structure to other permitted uses shall be considered subject to:
	  • Compliance with parking requirements for non-residential use
	  • Removal of the front boundary wall; and
	  • Aesthetic enhancement of the front elevation of the building	

4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	Refer Appendix II.	
4.2 Basement Setback	Refer Appendix II.	
4.3 Ancillary Buildings	Refer Appendix II.	
4.4 Between Multiple Buildings on the Same Lot	Refer Appendix II.	
5.0 SERVICE AREAAND EQUIPMENT		
5.1 Loading Docks	Refer Appendix II.	
5.2 Outdoor Storage Areas	• No outdoor storage shall be allowed	
5.3 Refuse Storage Areas	• Proper location of the outdoor refuse areas shall be decided by CRDA or other relevant authorities upon review of the development application.	

5.4 Mechanical Equipment	• At grade water tank and mechanical equipment:
	  • Shall be located to the side or rear of the building
	  • May be located in the setback provided a minimum of 2 m is maintained free of obstruction and they do not impede circulation
	• At grade or rooftop water tank, mechanical and telecommunications equipment:
	  • Shall be screened subject to approval by CRDA or other relevant authorities	

	REGULATION	REMARKS
6.0 PARKING		
6.1 Location	• Refer Appendix II.	
6.2 Surfacing	• Parking shall be hard surfaced and provided with adequate drainage	
6.3 Minimum Required Parking Stalls	Refer Appendix II.	
6.4 Visitors parking accessible for specially disabled	• Refer Appendix II.	
6.5 Minimum Dimensions	Refer Chapter V.	
6.6 Minimum Shaded Areas	• Refer Appendix II.	
6.7 Circulation in Parking	• Clearly designated and marked parking spaces, driveways and sidewalks within the parking lots shall be provided	
6.8 Vehicular Access to Parking Lot	• Only 1 vehicular ingress and egress point shall be allowed. Additional vehicular ingress and egress point shall be evaluated on a case-by-case basis by CRDA or other relevant authorities • To be taken from the rear service road. Access from the main street is discouraged.	
7.0 FENCING		
7.1 Location	• Refer Appendix II.	
7.2 Heights	• Refer Appendix II.	
7.3 Materials	• Refer Appendix II.	
8.0 CIRCULATION		
8.1 Pedestrian	• Pedestrian circulation between adjacent buildings and amenities shall be seamlessly connected; the linkages shall be min 2 m in width. • All pedestrian circulation shall be accessible to the disabled	
8.2 Public Transit	• Integration of bus transit facility into the C2 Zone is encouraged	

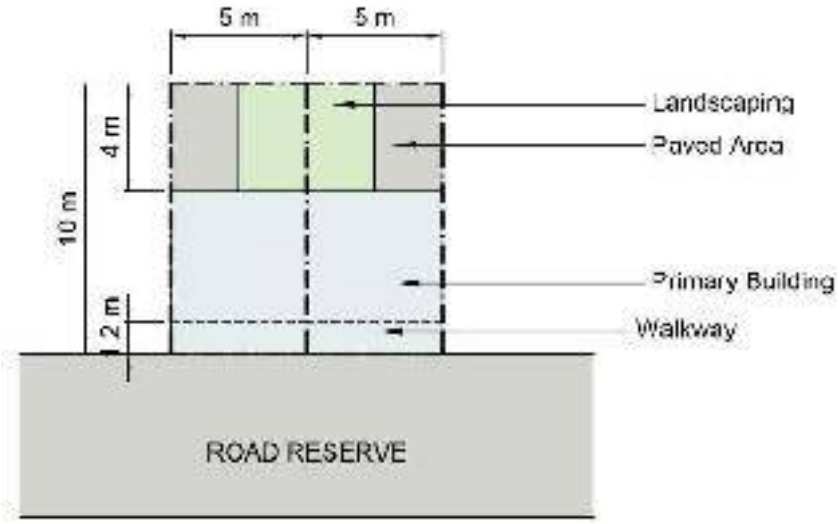
9.0 SIGNAGE		

9.1 Permitted	• One Building identification sign shall be permitted. One Commercial sign per tenant shall be permitted:
	  • Wall Signage (15% of the Building Face or 9 m whichever less)
	  • Window Signage (Transparent, 15% of the Building Face or 2.5m² whichever less)
	  • Awning Signage (Min 2.5m clearance and 25% of the Building Face or 2.5m² whichever less)
	  • Free Standing Signage (Maximum 1.5 m height)	

9.2 Prohibited	• The following signs are prohibited:
	  • Roof mounted signs
	  • String lights, flashing, excessively bright lights
	  • Off-site signage	

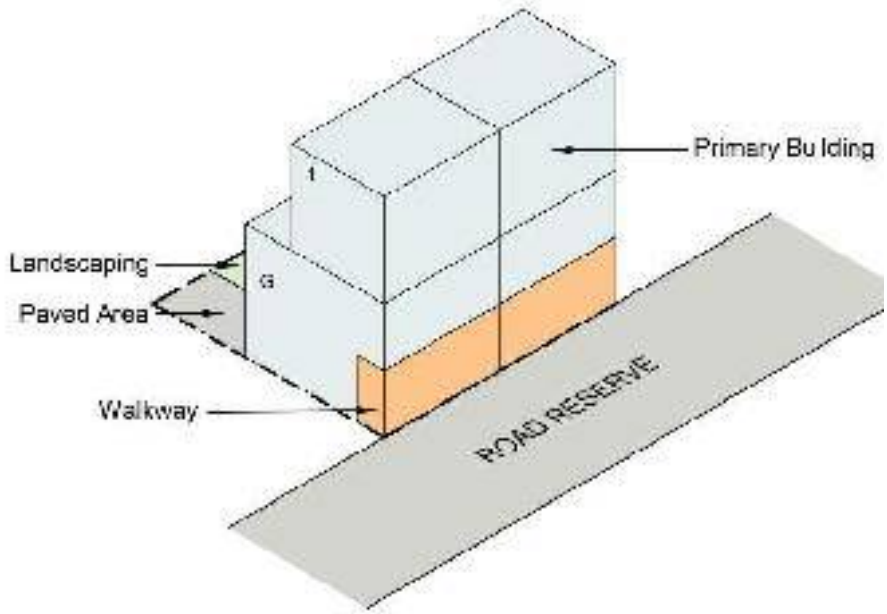
9.3 Location	• Individual signs for commercial tenants within a multi-tenanted commercial development shall be mounted to the façade of the development • Permitted free standing signage shall not exceed 5m in height, and may be located within the front setback	
9.4 Lighting	• N/A	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area asOrganised open space for recreation	Refer Appendix II.	
10.3 Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4 Maintenance	Refer Appendix II.	
10.5 Decks as recreational facility	Refer Appendix II.	

GENERAL COMMERCIAL ZONE (50 -125 SQM):



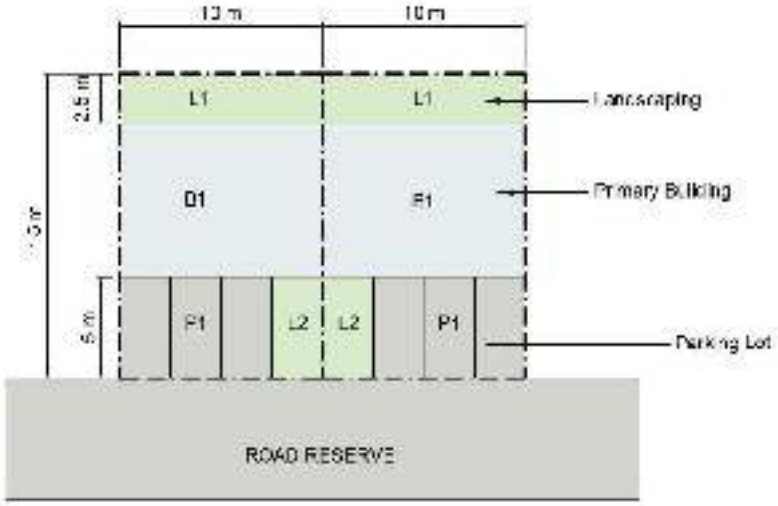
PLAN
(Not to scale)

B1&B2 – Primary Building L1&L2 – Landscaped Area
B3 – Ancillary BuildingP1 – Hard Paved Area



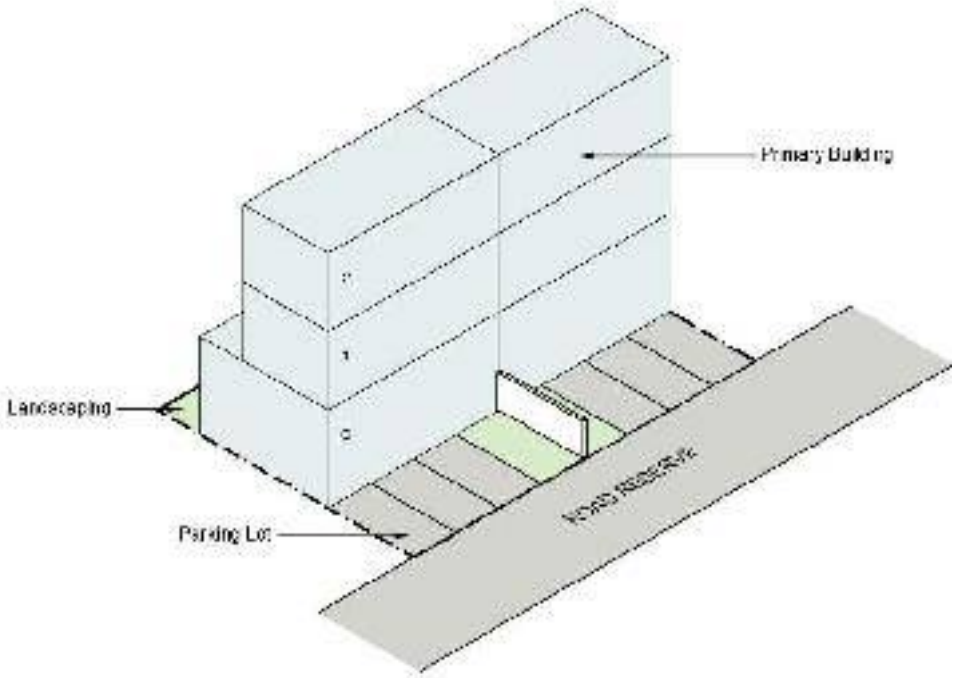
ISOMETRIC VIEW
(Not to scale)
Figure: Illustration of General Commercial (C2)

GENERAL COMMERCIAL ZONE (150-350 SQM):



PLAN
(Not to scale)

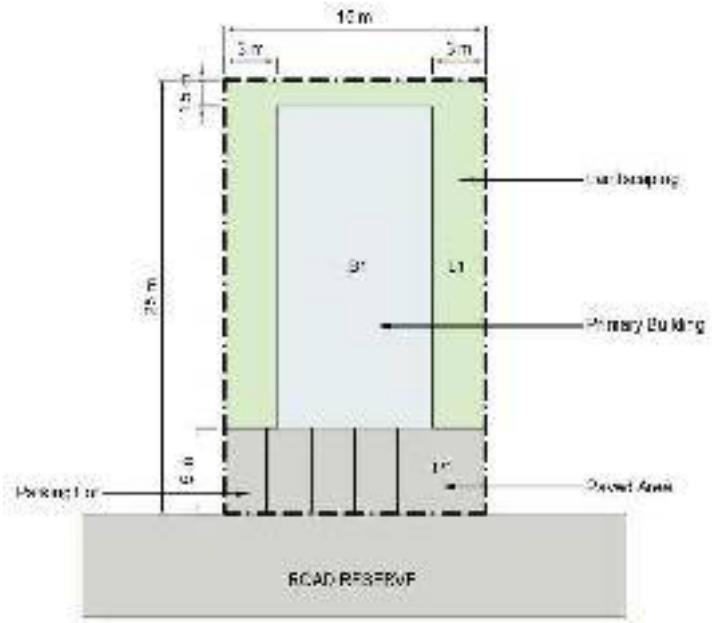
B1&B2 – Primary Building L1&L2 – Landscaped Area
B3 – Ancillary BuildingP1 – Hard Paved Area



ISOMETRIC VIEW
(Not to scale)

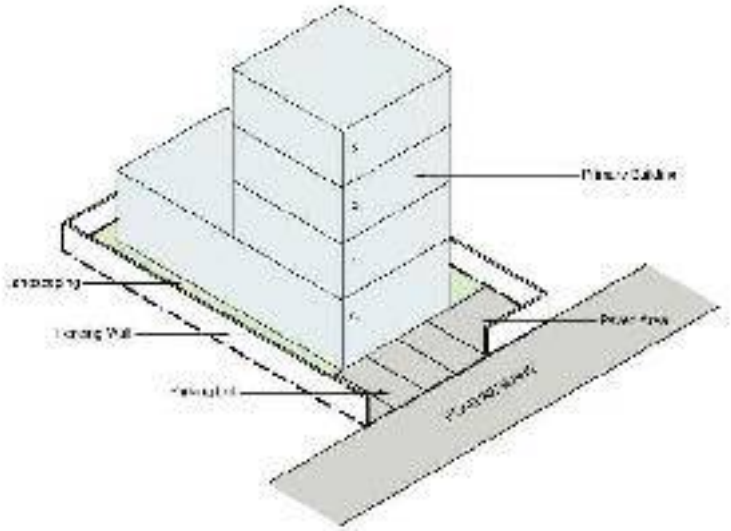
Figure: Illustration of General Commercial (C2) -(150-350 SQM)

GENERAL COMMERCIAL ZONE (375 - 500 SQM):



PLAN
(Not to scale)

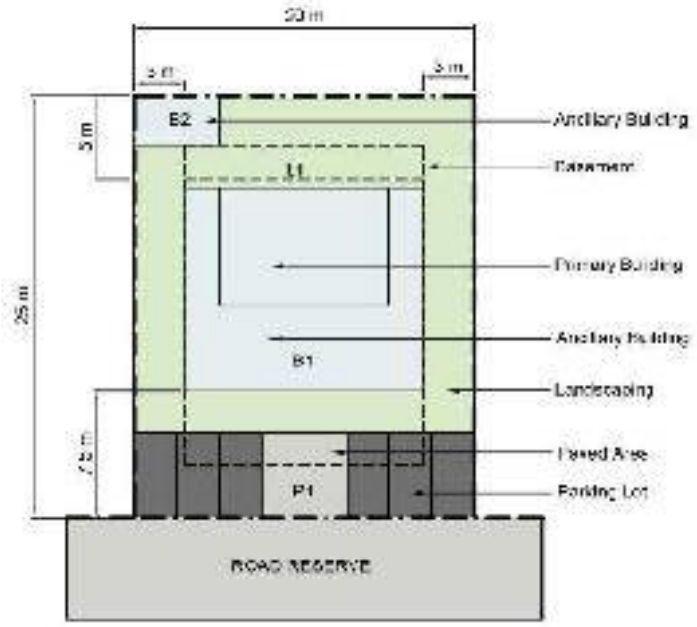
B1&B2 – Primary Building L1&L2 – Landscaped Area
B3 – Ancillary BuildingP1 – Hard Paved Area



ISOMETRIC VIEW
(Not to scale)

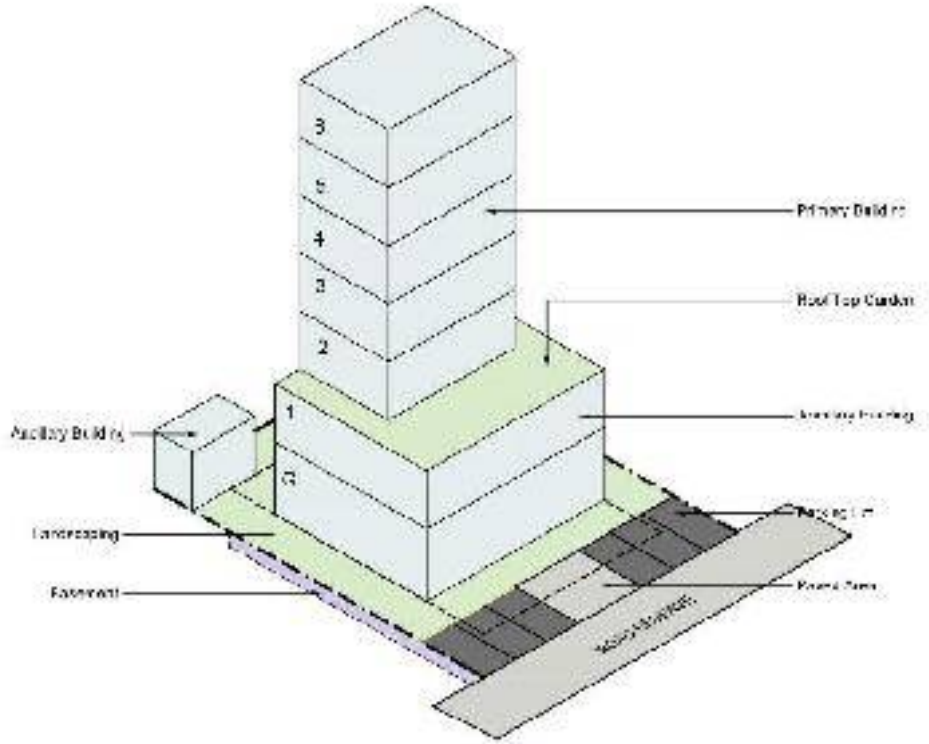
Figure: Illustration of General Commercial (C2)- (375 - 500 SQM)

GENERAL COMMERCIAL ZONE (> 500 SQM):



PLAN
(Not to scale)

B1 – Primary Building L1 – Landscaped Area
B2 – Ancillary BuildingP1 – Hard Paved Area



ISOMETRIC VIEW
(Not to scale)

Figure: Illustration of General Commercial (C2)- (>500 SQM)

1007.Neighbourhood Centre Zone (C3)

REGULATION		REMARKS
These regulations shall apply to: • All new and redeveloped commercial uses within the Neighbourhood Centre Zone (C3) • Lots zoned or re-zoned for commercial uses within the Neighbourhood Centre Zone (C3)		
1.0 USES		
1.1 Permitted Uses	• For detail list of uses refer to Appendix I	
1.2 Conditional Uses	• Public facilities • Petrol stations • Apartment with min. 12 m wide access road(on the 2nd storey and above) • All permitted uses in C1 and C2 zone. • Residential uses as shown per Appendix I • For detail list of uses refer to Appendix I	
1.3 Prohibited Uses	• All types of industrial uses • Large scale commercial uses such as shopping centres, hyper-marts, showrooms, offices etc. • Major infrastructure • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• Electrical substation (ESS) • Refuse area • For detail list of uses refer to Appendix I	
2.0 BUILDABLE AREA (COVERAGE)		
2.1 Minimum Lot Size	• Refer Appendix II.	
2.2 Maximum Building Coverage	• Refer Appendix II.	
2.3 No. of Basements allowed	• Refer Appendix II.	
2.4 Maximum Floor Space Index(FSI)	• Refer Appendix II.	
3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	• G+3 • G (ancillary buildings)	
3.2 Floor to Floor Height	• Ground Floor - 4m maximum • Other Floors - 3m maximum	
3.3 Building Form	• Free Standing Buildings • Shop houses	

REGULATION		REMARKS

3.4 Existing Buildings	• Additions and alterations necessary to retain an existing approved legally non-conforming building and its use in good order and repair will be allowed, subject to:
	  • No material change in use which does not comply with the prevailing zoning regulations;
	  • No further increase in floor area of the existing non-conforming use
	• Conversion of a residential structure to other permitted uses shall be considered subject to:
	  • Compliance with parking requirements for non-residential use
	  • Removal of the front boundary wall; and
	  • Aesthetic enhancement of the front elevation of the building	

4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	• Refer Appendix II.	
4.2 Basement Setback	• Refer Appendix II.	
4.3 Ancillary Buildings	• Refer Appendix II.	
4.4 Between Multiple Buildings on the Same Lot	Refer Appendix II.	
5.0 SERVICE AREA AND EQUIPMENT		
5.1 Loading Docks	• Refer Appendix II.	
5.2 Outdoor Storage	• No outdoor storage area shall be allowed	
5.3 Refuse Storage Areas	• Proper location of the outdoor refuse areas shall be decided by CRDA or other relevant authorities upon review of the development application.	

5.4 Mechanical Equipment	• At grade water tank and mechanical equipment:
	  • Shall be located to the side or rear of the building
	  • May be located in the setback provided a minimum of 2 m is maintained free of obstruction and they do not impede circulation
	• At grade or rooftop water tank, mechanical and telecommunications, solar equipment:
	  • Shall be screened subject to approval by CRDA or other relevant authorities	

6.0 PARKING		
6.1 Location	• Required parking stalls shall be provided within the lot boundary • Refer Appendix II.	
6.2 Surfacing	• Parking shall be soft paved and provided with adequate drainage	
6.3 Minimum Required Parking Stalls	• Refer Appendix II.	
6.4 Visitor parking accessible to specially abled	• Refer Appendix II.	
6.5 Minimum Dimensions	• Refer Chapter V.	
6.6 Minimum Shaded Areas	• Refer Appendix II.	
6.7 Circulation in Parking	• Clearly designated and marked parking spaces, driveways and sidewalks within the parking lots shall be provided	
6.8 Vehicular Access to Parking Lot	• Only 1 vehicular ingress and egress point shall be allowed. Additional vehicular ingress and egress point shall be evaluated on a case-by-case basis by CRDA or other relevant authorities • To be taken from the rear service road. Access from the main street is discouraged.	
7.0 FENCING		
7.1 Location	• Fencing and walls are not permitted along the front setback • Fencing and walls in the side and rear yards shall be at the perimeter of the lot	
7.2 Heights	• 2 m high solid perimeter fencing wall is allowed at the side and rear of the lot	
7.3 Materials	• N/A	
8.0 CIRCULATION		
8.1 Pedestrian	• Pedestrian circulation between adjacent buildings and amenities shall be seamlessly connected; the linkages shall be min 2 m in width. • All pedestrian circulation shall be accessible to the disabled	
8.2 Public Transit	• Integration of bus transit facility into the C3 Zone is encouraged	

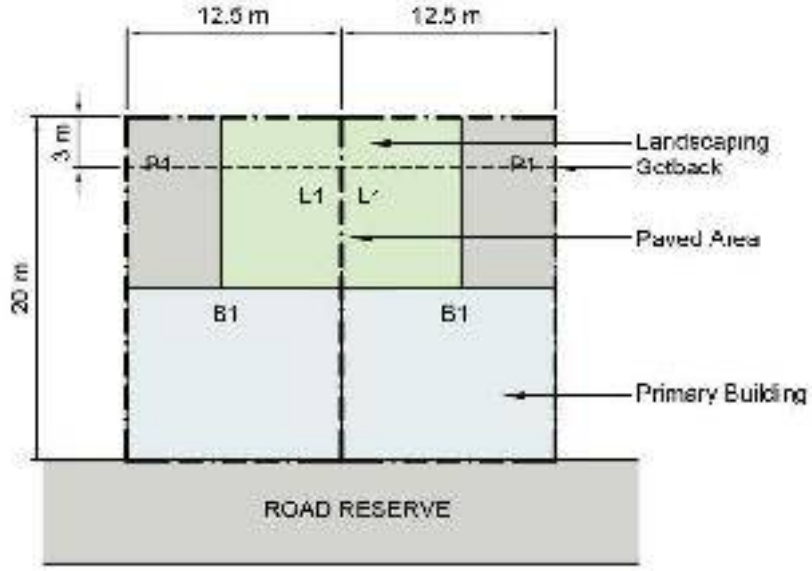
9.0 SIGNAGE		

9.1 Permitted	• One Building identification sign shall be permitted:
	  • Wall Signage (15% of the Building Face or 9 m whichever less)
	  • Window Signage (Transparent, 15% of the Building Face or 2.5m² whichever less)
	  • Awning Signage (Min 2.5m clearance and 25% of the Building Face or 2.5m² whichever less)
	• Free Standing Signage (Maximum 1.5 m height)	

9.2 Prohibited	• The following signs are prohibited:
	  • Roof mounted signs
	  • String lights, flashing, excessively bright lights
	  • Off-site signage	

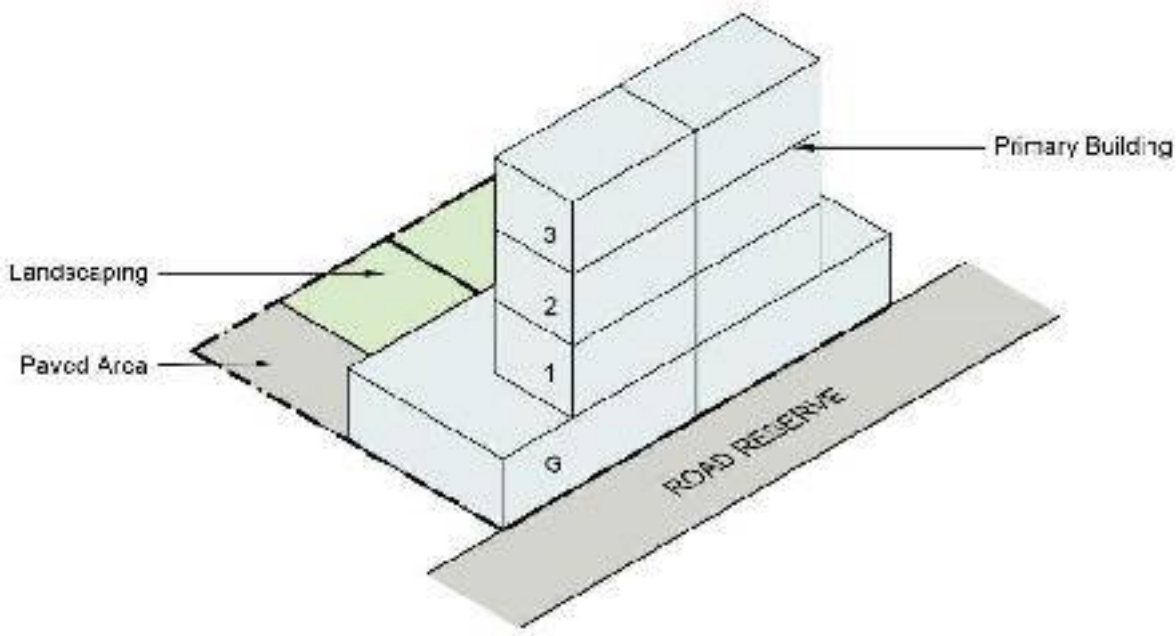
9.3 Location	• Individual signs for commercial tenants within a multi-tenanted commercial development shall be mounted to the façade of the development • Permitted free standing signage shall not exceed 5m in height, and may be located within the front setback	
9.4 Lighting	• N/A	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area asOrganised open space for recreation	Refer Appendix II.	
10.3 Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4 Maintenance	Refer Appendix II.	
10.5 Minimum % of green coverage	Refer Appendix II.	

NEIGHBOURHOOD CENTRE ZONE (250sqm min lot size):



LAYOUT PLAN
(Not to scale)

B1 – Primary Building L1– Landscaped Area
P1& P2 – Hard Paved Area



ISOMETRIC VIEW
(Not to scale)

Figure: Illustration of Neighbourhood Centre Zone- (C3)

INTEGRATED NEIGHBOURHOOD CENTRE ZONE (10,000 sqm):

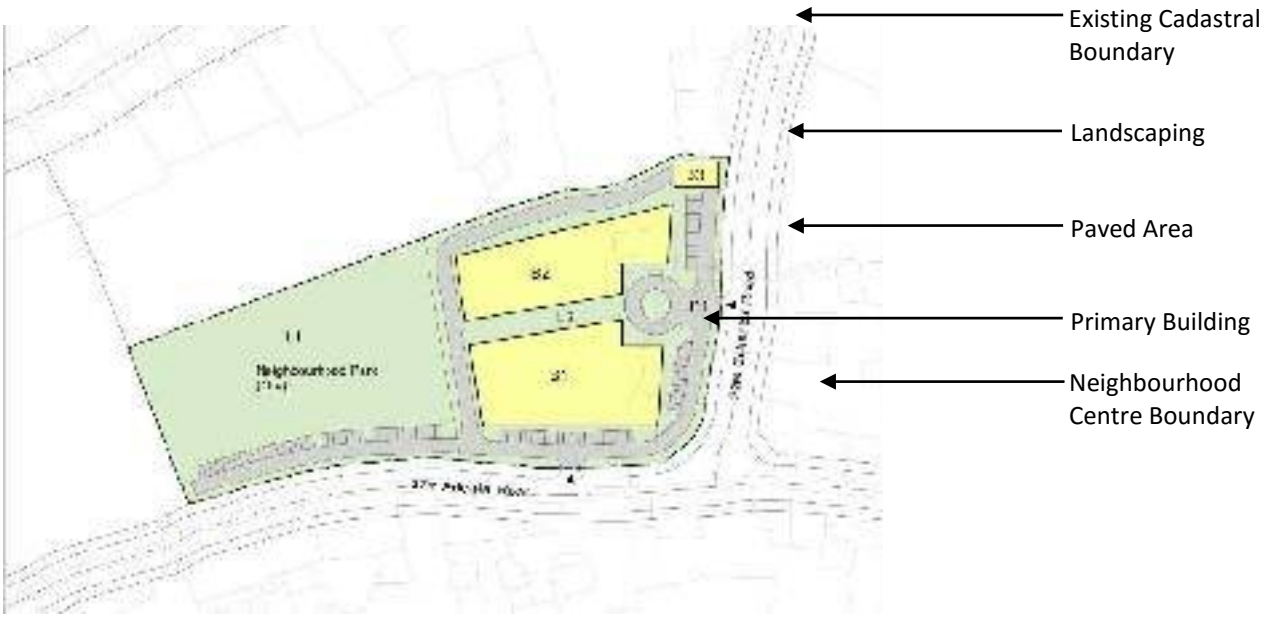
Option 1 LAYOUT PLAN
(Not to scale)

B1&B2 – Primary Building L1&L2 – Landscaped Area
B3& B4 – Ancillary BuildingP1 – Hard Paved Area

ISOMETRIC VIEW
(Not to scale)

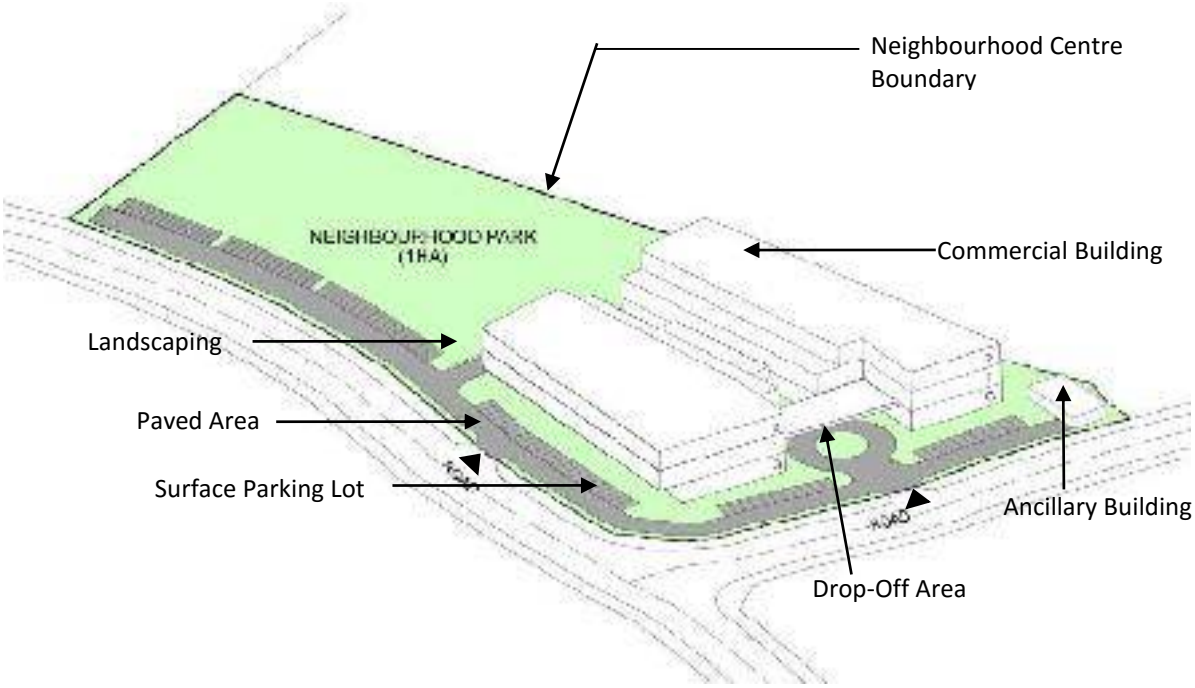
Figure: Illustration of Integrated Neighbourhood Centre Zone- Option 1 (C3)

INTEGRATED NEIGHBOURHOOD CENTRE ZONE (10,000 sqm):



Option 2 LAYOUT PLAN
(Not to scale)

B1&B2 – Primary Building L1&L2 – Landscaped Area
B3 – Ancillary BuildingP1 – Hard Paved Area



ISOMETRIC VIEW
(Not to scale)

Figure: Illustration of Integrated Neighbourhood Centre Zone- Option 2 (C3)

1008.Town Centre Zone (C4)

	REGULATION	REMARKS
These regulations shall apply to: • All new and redeveloped commercial uses within the Town Centre Zone (C4) • Lots zoned or re-zoned for commercial uses within the Town Centre Zone (C4)		
1.0 USES		
1.1 Permitted Uses	• For detail list of uses refer to Appendix I	Ground floor use have to be activity-generating uses
1.2 Conditional Uses	• Public facilities • Petrol stations • Residential flats with commercial at ground floor • Rapid transit station • Clinics • All permitted uses in C1, C2 and C3 zone • Residential uses as shown per Appendix I • For detail list of uses refer to Appendix I	
1.3 Prohibited Uses	• All type of industrial uses • Major infrastructure installations • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• Electrical substation • Refuse area • For detail list of uses refer to Appendix I	
1.5 Minimum Lot Size	• 1,000 m^2	
2.0 BUILDABLE AREA (COVERAGE)		
2.1 Minimum Lot Size	• Refer Appendix II	
2.2 Maximum Building Coverage	• Refer Appendix II	
2.3 No. Of Basements	• Refer Appendix II	
2.4 Maximum Floor Space Index(FSI)	• 5.0Global FSI (maximum as per approved urban design proposals)	
2.5 Sustainable construction methods	• The following measures are encouraged: • Sustainable building design technology and sustainable construction methods • Roof top communal facilities or roof gardens	

	REGULATION	REMARKS
3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	• Conditional to consumption of Global FSI	
3.2 Floor to Floor Height	• Ground Floor - 4m maximum • Other Floors - 3m maximum	
3.3 Building Form	• Free standing or attached	

3.4 Existing Buildings	• Additions and alterations necessary to retain an existing approved legally non-conforming building and its use in good order and repair will be allowed, subject to:
	  • No material change in use which does not comply with the prevailing zoning regulations;
	  • No further increase in floor area of the existing non-conforming use
	  • Compliance with parking requirements for non-residential use
	  • Removal of the front boundary wall; and
	  • Aesthetic enhancement of the front elevation of the building	

4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	• Refer Appendix II	
4.2 Basement Setback	Refer Appendix II	
4.3 Ancillary Buildings	Refer Appendix II	
4.4 Between Multiple Buildings on the Same Lot	• Refer Appendix II	
5.0 SERVICE AREAAND EQUIPMENT		
5.1 Loading Docks	• Refer Appendix II	
5.2 Outdoor Storage Areas	• No outdoor storage shall be allowed	
5.3 Refuse Storage Areas	• Proper location of the outdoor refuse areas shall be decided by CRDA or other relevant authorities upon review of the development application.	

	REGULATION	REMARKS

5.4 Mechanical Equipment	• At grade water tank and mechanical equipment:
	• At grade or rooftop water tank, mechanical and telecommunications, solar equipment :
	  • Shall be screened subject to approval by CRDA or other relevant authorities
	  • Shall not be visible from any street	

6.0 PARKING		
6.1 Location	• Refer Appendix II.	
6.2 Surfacing	• Parking shall be hard surfaced and provided with adequate drainage	
6.3 Minimum Required Parking Stalls	• Refer Appendix II.	
6.4 Visitor parking accessible to specially abled	• Refer Appendix II	
6.5 Minimum Dimensions	• Refer Chapter V	
6.6 Minimum Shaded Areas	• Refer Appendix II	
6.7 Circulation in Parking	• Refer Appendix II	
6.8 Vehicular Access to Parking Lot	• Refer Appendix II	
7.0 FENCING		
7.1 Location	• Refer Appendix II	
7.2 Height	• Refer Appendix II	
7.3 Material	• Hotel/ resort: solid fencing material that complements architecture style of the building. • Refer Appendix II	
8.0 CIRCULATION		
8.1 Pedestrian	• Refer Appendix II . • All pedestrian circulation shall be accessible to the disabled	
8.2 Public Transit	• The use of public transit should be encouraged through the integration of a public transport stop into the commercial development lot • Refer Appendix II . • A pedestrian linkage should be provided from the main building to the bus shelter located in front of the commercial lots (where applicable)	

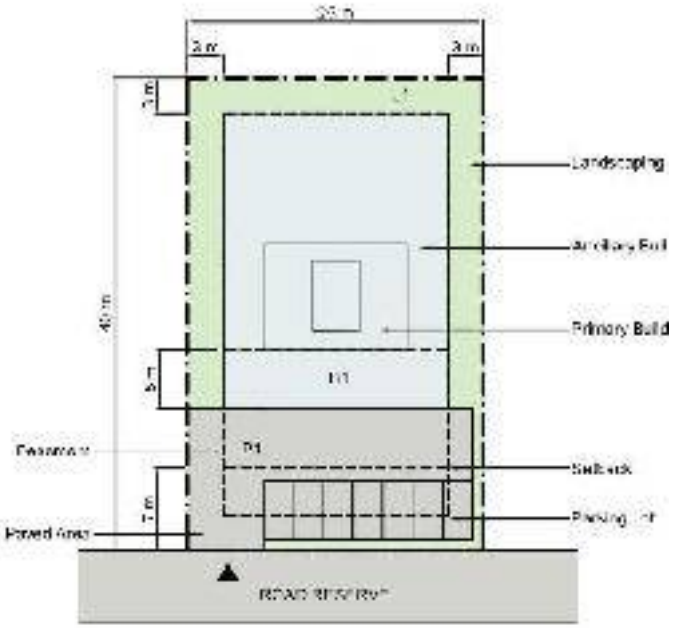
9.0 SIGNAGE		

9.1 Permitted	• One Building identification sign shall be permitted on the tower
	• One Commercial Sign per tenant shall be permitted:
	  • Wall Signage (15% of the Building Face or 9 m^2 whichever less)
	  • Window Signage (Transparent, 15% of the Building Face or 2.5m^2 whichever less)
	  • Awning Signage (Min 2.5m clearance and 25% of the Building Face or 2.5m^2 whichever less)	

9.2 Prohibited	• The following signs are prohibited:
	  • Roof mounted signs
	  • Off-site signage	

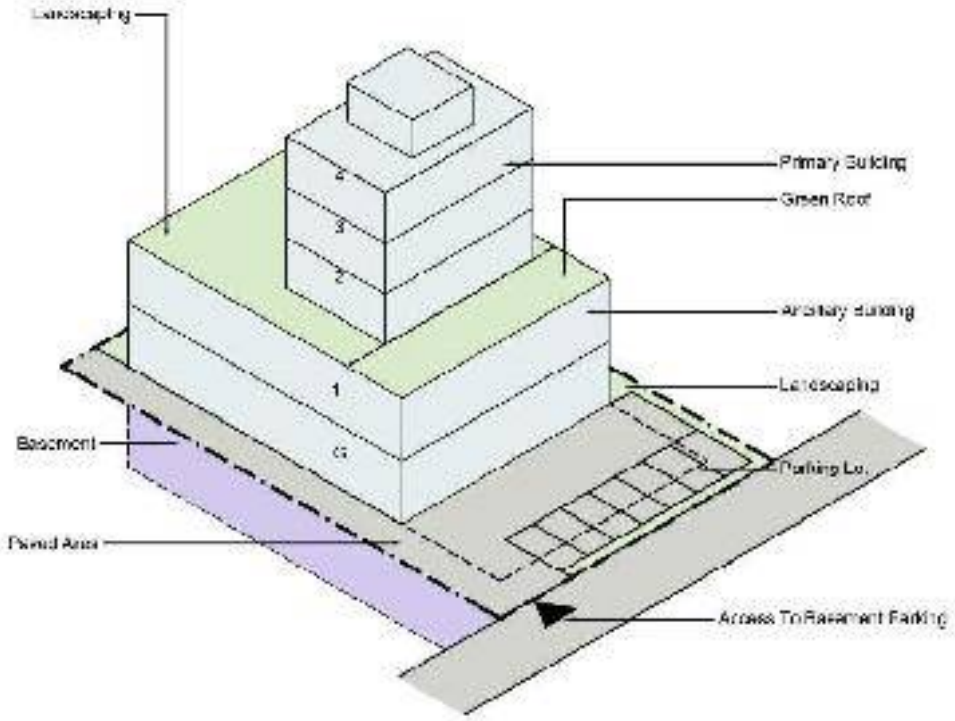
9.3 Location	• Individual signs for commercial tenants within a multi-tenanted commercial development shall be mounted to the façade of the development • Permitted free standing signage shall not exceed 5m in height, and may be located within the front setback	
9.4 Lighting	• No flashing lights are allowed	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area asOrganised open space for recreation	Refer Appendix II.	
10.3 Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4 Maintenance	Refer Appendix II.	
10.5 Minimum % of green coverage	Refer Appendix II.	

TOWN CENTRE ZONE (1,000 sqm min lot size):



PLAN
(Not to scale)

B1 – Primary Building L1 – Landscaped Area
P1 – Hard Paved Area



ISOMETRIC VIEW
(Not to scale)Figure: Illustration of Town Centre (C4)

1009.Regional Centre Zone (C5)

	REGULATION	REMARKS
These regulations shall apply to: • All new and redeveloped commercial uses within the Regional CentreZone(C5) • Lots zoned or re-zoned for commercial uses within the Regional CentreZone (C5)		
1.0 USES		
1.1 Permitted Uses	• For detail list of uses refer to Appendix I	Ground floor use have to be activity-generating uses .
1.2 Conditional Uses	• For detail list of uses refer to Appendix I • Public facilities • Petrol stations • Residential flats with commercial at ground floor • Rapid transit station • Clinics • All permitted uses in C1, C2 , C3 and C4 zone • Residential uses as shown per Appendix I • Construction material store should be showroom type and no storage is allowed either in open or closed area.	Refer land use plan for guidance on location of facility Refer appendix for regulations regarding facilities
1.3 Prohibited Uses	• All type of industrial uses • Major infrastructure installations • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• Electrical substation • Refuse area • For detail list of uses refer to Appendix I	
1.5 Minimum Lot Size	• 1,000 m^2	
2.0 BUILDABLE AREA (COVERAGE)		
2.1 Minimum Lot Size	• Refer Appendix II	
2.2 Maximum Building Coverage	• Refer Appendix II	
2.3 No. Of Basements	• Refer Appendix II	
2.4 Maximum Floor Space Index(FSI)	• 5.0Global FSI (maximum as per approved urban design proposals)	

	REGULATION	REMARKS
2.5 Sustainable construction methods	• The following are encouraged: • Sustainable building design technology and sustainable construction methods • Roof top communal facilities or roof gardens	
3.0 BUILDABLE TYPE		
3.1 Maximum Number of Floors	• Conditional to consumption of Global FSI	
3.2 Floor to Floor Height	• Ground Floor - 5m maximum • Other Floors - 4m maximum	
3.3 Building Form	• Free standing or attached	

3.4 Existing Buildings	• Additions and alterations necessary to retain an existing approved legally non-conforming building and its use in good order and repair will be allowed, subject to:
	  • No material change in use which does not comply with the prevailing zoning regulations;
	  • No further increase in floor area of the existing non-conforming use
	• Conversion of a residential structure to other permitted uses shall be considered subject to:
	  • Compliance with parking requirements for non-residential use
	  • Removal of the front boundary wall; and
	  • Aesthetic enhancement of the front elevation of the building	

4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	• Refer Appendix II	
4.2 Basement Setback	• Refer Appendix II)	
4.3 Ancillary Buildings	Refer Appendix II	
4.4 Between Multiple Buildings on the Same Lot	• Refer Appendix II	
5.0 SERVICE AREA AND EQUIPMENT		
5.1 Loading Docks	• Refer Appendix II	
5.2 Outdoor Storage Areas	• No outdoor storage shall be allowed	

	REGULATION	REMARKS
5.3 Refuse Storage Areas	• Proper location of the outdoor refuse areas shall be decided by CRDA or other relevant authorities upon review of the development application.	

5.4 Mechanical Equipment	• At grade water tank and mechanical equipment:
	  • Shall be located to the side or rear of the building
	  • May be located in the setback provided a minimum of 2 m is maintained free of obstruction and they do not impede circulation
	• At grade or rooftop water tank, mechanical and telecommunications , solar equipment :
	  • Shall be screened subject to approval by CRDA or other relevant authorities
	  • Shall not be visible from any street	

6.0 PARKING		
6.1 Location	• Required parking stalls shall be provided within the lot boundary • Parking Ht. is permitted up to 4m • Basement parking is encouraged.	
6.2 Surfacing	• Parking shall be hard surfaced and provided with adequate drainage	
6.3 Minimum Required Parking Stalls	• Refer Appendix II.	
6.4 Visitor Parking accessible to specially abled	• Refer Appendix II	
6.5 Minimum Dimensions	• Refer Chapter V	
6.6 Minimum Shaded Areas	• Refer Appendix II	
6.7 Circulation in Parking	• Refer Appendix II	
6.8 Vehicular Access to Parking Lot	• Refer Appendix II	
7.0 FENCING		
7.1 Location	• Refer Appendix II	
7.2 Heights	• Hotel/ resort: 2.0 (max). • Refer Appendix II	
7.3 Materials	• Hotel/ resort: solid fencing material that complements architecture style of the building. • Refer Appendix II	

8.0 CIRCULATION		
8.3 Pedestrian	• Refer Appendix II . • All pedestrian circulation shall be accessible to the disabled	
8.4 Public Transit	• The use of public transit should be encouraged through the integration of a public transport stop into the commercial development lot • Minimum 1 taxi stand for at least 2 taxis shall be provided within lot boundary. • A pedestrian linkage should be provided from the main building to the bus shelter located in front of the commercial lots (where applicable)	
9.0 SIGNAGE		

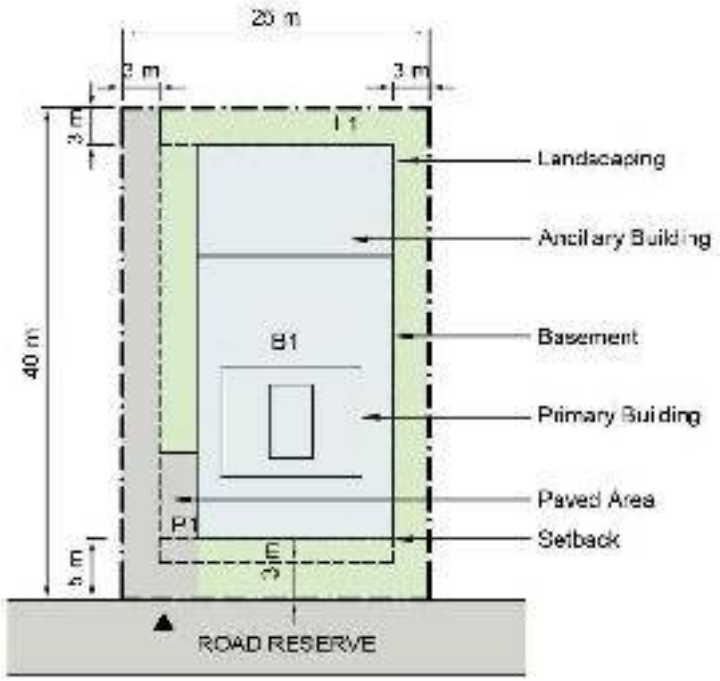
9.1 Permitted	• One Building identification sign shall be permitted on the tower
	• One Commercial Sign per tenant shall be permitted:
	  • Wall Signage (15% of the Building Face or 9 m^2 whichever less)
	  • Window Signage (Transparent, 15% of the Building Face or 2.5m^2 whichever less)
	  • Awning Signage (Min 2.5m clearance and 25% of the Building Face or 2.5m^2 whichever less)	

9.2 Prohibited	• The following signs are prohibited:
	  • Roof mounted signs
	  • Off site signage	

9.3 Location	• Individual signs for commercial tenants within a multi-tenanted commercial development shall be mounted to the façade of the development • Permitted free standing signage shall not exceed 5m in height, and may be located within the front setback	
9.4 Lighting	• No flashing lights are allowed	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area as organised open space for recreation	Refer Appendix II.	
10.3 Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4 Maintenance	Refer Appendix II.	

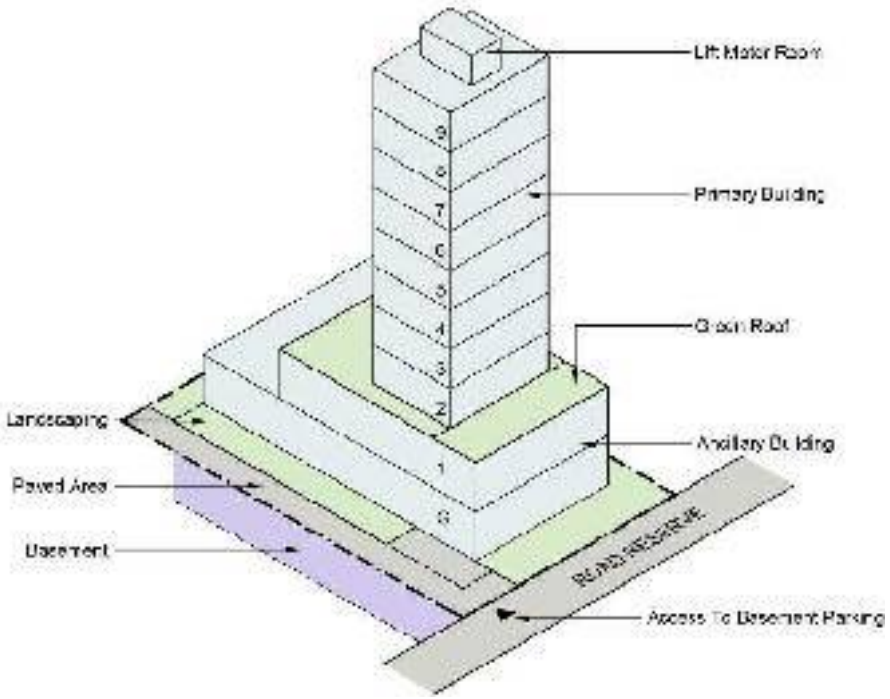
10.5	Minimum % of green coverage	Refer Appendix II.	

REGIONAL CENTRE ZONE (1,000 sqm min lot size) (C5):



PLAN
(Not to scale)

B1 – Primary Building L1 – Landscaped Area
B2 – Ancillary BuildingP1 – Hard Paved Area



ISOMETRIC VIEW
(Not to scale)

Figure: Illustration of Regional Centre Zone(C5)

1010.Central Business District zone (C6)

	REGULATION	REMARKS
These regulations shall apply to: • All new and redeveloped commercial uses within the Central Business District zone (C6) • Lots zoned or re-zoned for commercial uses within the Central Business District zone (C6)		
1.0 USES		
1.1 Permitted Uses	• For detail list of uses refer to Appendix I	Ground floor use have to be activity-generating uses
1.2 Conditional uses	• Public facilities • Petrol stations • Residential flats with commercial at ground floor • Rapid transit station • Clinics • All permitted uses in C1, C2 , C3, C4 and C5 zone. • Residential uses as shown per Appendix I • For detail list of uses refer to Appendix I	
1.3 Prohibited Uses	• All type of industrial uses • Major infrastructure installations • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• Electrical substation • Refuse area • For detail list of uses refer to Appendix I	
2.0 BUILDABLE AREA (COVERAGE)		
2.1 Minimum Lot Size	• Refer Appendix II	
2.2 Maximum Building Coverage	• Refer Appendix II	
2.3 No. Of Basements	• Refer Appendix II	
2.4 Maximum Floor Space Index(FSI)	• 5.0Global FSI (maximum as per approved urban design proposals)	
2.5 Sustainable construction methods	• The following shall be encouraged: • Sustainable building design technology and sustainable construction methods • Roof top communal facilities or roof gardens	

3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	• Conditional to consumption of Global FSI	
3.2 Floor to Floor Height	• Ground Floor - 5m maximum • Other Floors - 4m maximum	
3.3 Building Form	• Free standing or attached	

3.4 Existing Buildings	• Additions and alterations necessary to retain an existing approved legally non-conforming building and its use in good order and repair will be allowed, subject to:
	  • No material change in use which does not comply with the prevailing zoning regulations;
	  • No further increase in floor area of the existing non-conforming use
	• Any additional floor area required for the non-conforming use will:
	• Conversion of a residential structure to other permitted uses shall be considered subject to:
	  • Compliance with parking requirements for non-residential use
	  • Removal of the front boundary wall; and
	  • Aesthetic enhancement of the front elevation of the building	

4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	Refer Appendix II	When facing public road, has to follow the road buffer requirement.
4.2 Basement Setback	Refer Appendix II	
4.3 Ancillary Buildings	Refer Appendix II	
4.4 Between Multiple Buildings on the Same Lot	• Refer Appendix II	
5.0 SERVICE AREA AND EQUIPMENT		
5.1 Loading Docks	• Refer Appendix II	
5.2 Outdoor Storage Areas	• No outdoor storage shall be allowed	
5.3 Refuse Storage Areas	• Proper location of the outdoor refuse areas shall be decided by CRDA or other relevant authorities upon review of the development application.	

5.4 Mechanical Equipment	• At grade water tank and mechanical equipment:
	  • Shall be located to the side or rear of the building
	  • May be located in the setback provided a minimum of 2 m is maintained free of obstruction and they do not impede circulation
	• At grade or rooftop water tank, mechanical and telecommunications, solar equipment :
	  • Shall be screened subject to approval by CRDA or other relevant authorities
	  • Shall not be visible from any street	

6.0 PARKING		
6.1 Location	• Required parking stalls shall be provided within the lot boundary • Refer Appendix II	
6.2 Surfacing	• Parking shall be hard surfaced and provided with adequate drainage	
6.3 Minimum Required Parking Stalls	• Refer Appendix II.	
6.4 Visitor parking accessible to specially abled.	• Refer Appendix II	
6.5 Minimum Dimensions	• Refer Chapter V	
6.6 Minimum Shaded Areas	• Refer Appendix II	
6.7 Circulation in Parking	• Refer Appendix II	
6.8 Vehicular Access to Parking Lot	• Refer Appendix II	
7.0 FENCING		
7.1 Location	• Refer Appendix II	
7.2 Heights	• Refer Appendix II	
7.3 Materials	Refer Appendix II	
8.0 CIRCULATION		
8.5 Pedestrian	• Refer Appendix I. • I Pedestrian circulation between adjacent buildings and amenities shall be seamlessly connected; • All pedestrian circulation shall be accessible to the disabled	
8.6 Public Transit	• The use of public transit should be encouraged through the integration of a public transport stop into the commercial development lot • Refer Appendix II.	

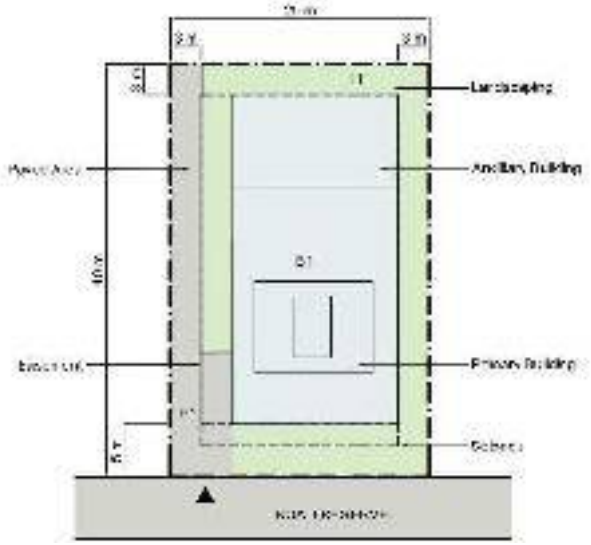
9.0 SIGNAGE		

9.1 Permitted	• One Building identification sign shall be permitted on the tower
	• One Commercial Sign per tenant shall be permitted:
	  • Wall Signage (15% of the Building Face or 9 m^2 whichever less)
	  • Window Signage (Transparent, 15% of the Building Face or 2.5m^2 whichever less)
	  • Awning Signage (Min 2.5m clearance and 25% of the Building Face or 2.5m^2 whichever less)	

9.2 Prohibited	• The following signs are prohibited:
	  • Roof mounted signs
	  • Off site signage	

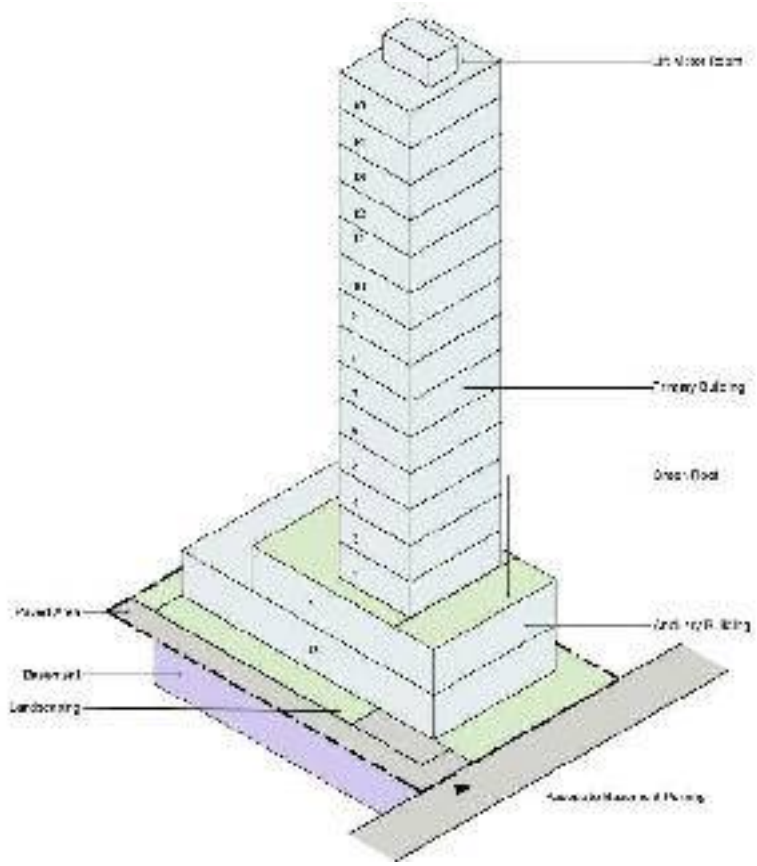
9.3 Location	• Individual signs for commercial tenants within a multi-tenanted commercial development shall be mounted to the façade of the development • Permitted free standing signage shall not exceed 5m in height, and may be located within the front setback	
9.4 Lighting	• No flashing lights are allowed	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area as organised open space for recreation	Refer Appendix II.	
10.3 Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4 Maintenance	Refer Appendix II.	
10.5 Minimum % of green coverage	Refer Appendix II.	

CENTRAL BUSINESS DISTRICT ZONE (1,000 sqm min lot size) (C6):



PLAN
(Not to scale)

B1 – Primary Building L1 – Landscaped Area
B2 – Ancillary BuildingP1 – Hard Paved Area



ISOMETRIC VIEW
(Not to scale)

Figure: Illustration of Central Business District Zone (C6)

1011. Business Park Zone(I1)

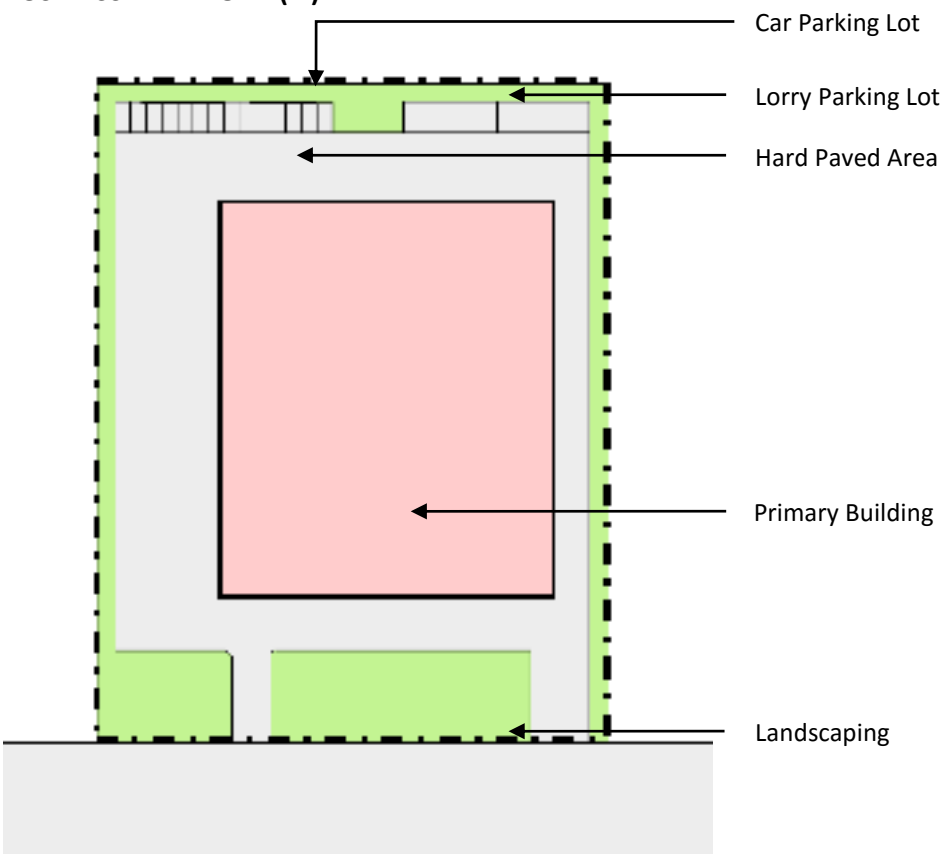
	Regulation	Remarks
These regulations shall apply to: • All new and redeveloped uses within the Business Park Zone (I1)		
1.0 USES		
1.1 Permitted Uses	• For detail list of uses refer to Appendix I	
1.2 Conditional uses	• For detail list of uses refer to Appendix I	
1.3 Prohibited Uses	• For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• Ancillary office • Security facilities • Showroom • Banking services/ ATM/ clinics • Staff Canteen • For detail list of uses refer to Appendix I	The ancillary use quantum must not exceed 20% of the total GFA.
1.5 Secondary Uses	• Independent Amenity Centre / Childcare centre	500 m walking radii
2.0 BUILDABLE AREA (COVERAGE)		
2.1 Minimum land area	5 Ha	
2.2 Maximum Building Coverage	40%	
2.3 No. Of Basements	Refer Appendix II	
2.4 Maximum Floor Area Ratio (FAR)	1.6	
2.5 Sustainable construction methods	The following are encouraged: • Sustainable building design technology and sustainable construction methods • Roof top communal facilities or roof gardens • 10% additional GFA allowed within 300 m belt/radius from/of MRT/LRT stations	
3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	Refer Appendix II	
3.2 Floor to Floor Height	• Case-to-case basis	
3.3 Building Form	Refer Appendix II	
4.0 SETBACK (Minimum)		

	Regulation	Remarks
4.1 Building (Above Grade)	• Refer Appendix II	Boundary fronting public road need to follow the road buffer requirement.
4.2 Basement Setback	• Refer Appendix II	
4.3 Ancillary Buildings	Refer Appendix II	
4.4 Between Multiple Buildings on the Same Lot	Refer Appendix II	
5.0 SERVICE AREA AND EQUIPMENT		
5.1 Loading Docks	Loading docks, if any, shall be located to the side/ rear of the building subject to fire norms.	
5.2 Outdoor Storage Areas	No outdoor storage shall be allowed	
5.3 Refuse Storage Areas	Proper location of the outdoor refuse areas shall be decided by the relevant local authorities upon review of the development application.	
5.4 Mechanical Equipment	At grade water tank and mechanical equipment: • Shall be located to the side or rear of the building • May be located in the setback provided a minimum of 2 m is maintained free of obstruction and they do not impede circulation At grade or rooftop water tank, mechanical and telecommunications, solar equipment : • Shall be screened subject to approval by the relevant local authorities • Shall not be visible from any street	
6.0 PARKING		
6.1 Location	• Surface Parking should be minimum • Basement Parking & Multi-storey car parking are encouraged.	
6.2 Surface Parking	Parking shall be hard or semi perforated surfaced with adequate drainage	
6.3 Minimum Required Parking Stalls	• Refer Appendix II.	
6.4 Visitor Parking accessible to specially abled	• Refer Appendix II	
6.5 Minimum Dimensions	Refer Chapter V	

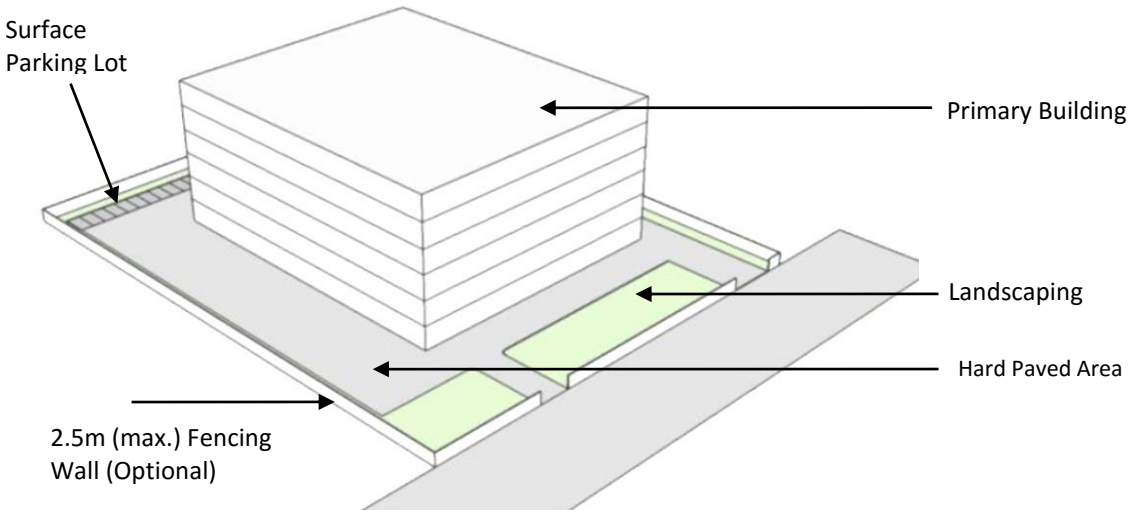
	Regulation	Remarks
6.6 Minimum Shaded Areas	Should follow urban design guidelines.	
6.7 Circulation in Parking	• Clearly designated and marked parking spaces, driveways and sidewalks within the parking lots shall be provided. • Pedestrian circulation pathways should be provided, linking both the site access and the building.	
6.8 Vehicular Access to Parking Lot	Refer Appendix II	
7.0 FENCING		
7.1 Location	• Plantation along lot boundary. • E-security and surveillance is encouraged instead of physical boundary walls. • Refer Appendix II	
7.2 Materials	• The use of visually permeable materials is recommended all around the development lot subject to detailed urban design and evaluation.	
8.0 CIRCULATION		
8.1 Pedestrian	• Covered pedestrian walkways shall be provided along the perimeter of the buildings fronting the main roads • Refer Appendix II • All pedestrian circulation shall be accessible to the disabled	
8.2 Public Transit	• Refer Appendix II	
9.0 SIGNAGE		
9.1 Permitted	• One Building identification sign shall be permitted on the tower • One Commercial Sign per tenant shall be permitted: - Wall Signage (15% of the Building Face or 9 m^2 whichever less) - Window Signage (Transparent, 15% of the Building Face or 2.5m^2 whichever less) - Awning Signage (Min 2.5m clearance and 25% of the Building Face or 2.5m^2 whichever less)	
9.2 Prohibited	The following signs are prohibited: • Roof mounted signs • String lights, flashing, excessively bright lights	
9.3 Location	Signs shall not obstruct views, vistas or important landmarks	
9.4 Lighting	Lighting shall be aesthetically pleasing and in keeping with the overall theme of the development	

10.0	**GREEN COVERAGE**		
10.1	Minimum % of green coverage	Refer Appendix II.	
10.2	5% of Plot area as organised open space for recreation	Refer Appendix II.	
10.3	Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4	Maintenance	Refer Appendix II.	
10.5	Minimum % of green coverage	Refer Appendix II.	

BUSINESS PARK ZONE (I1):



PLAN (Not to scale)



ISOMETRIC VIEW (Not to scale)

Figure: Illustration of Business Park District (I1)

1012.Logistics Zone (I2)

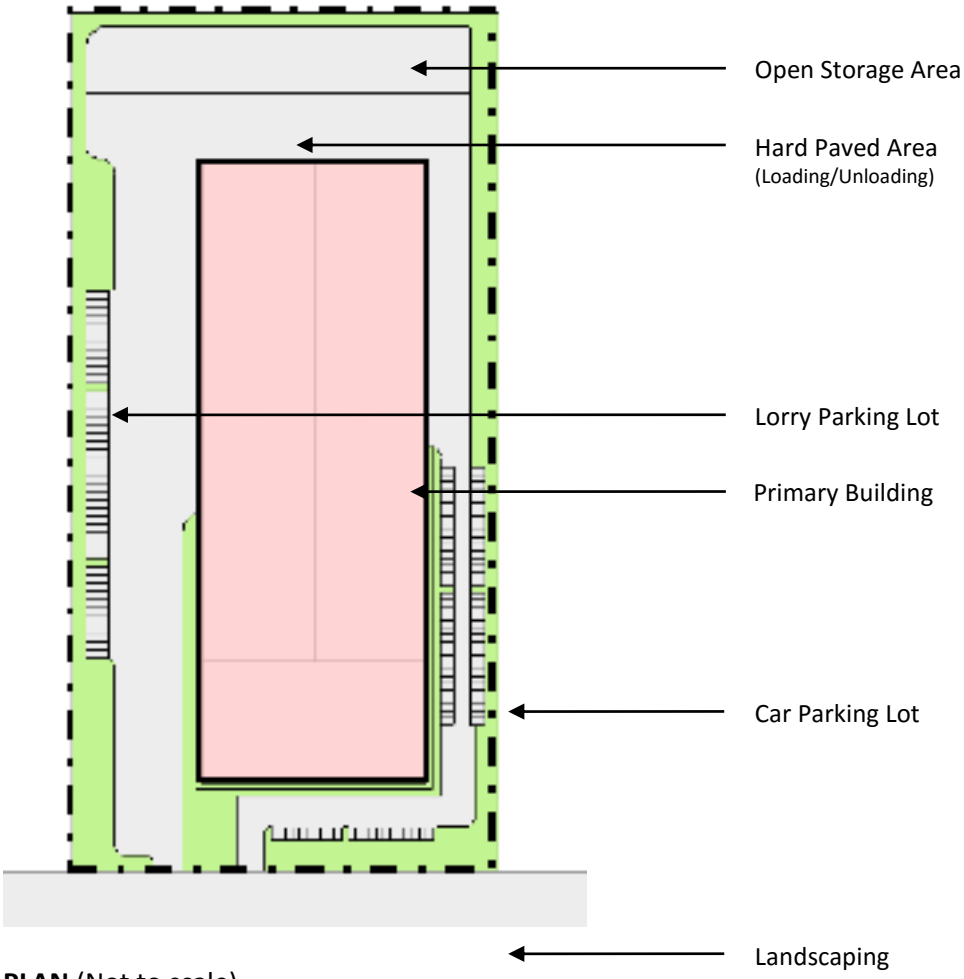
	Regulation	Remarks
These regulations shall apply to: • All new, redeveloped and re-zoned permitted uses within the Logistics (I2)		
1.0 USES		
1.1 Permitted Uses	• Regional warehouses • Heavy distribution warehouses • Rack supported warehouses • Bulk handling warehouses • Refrigerated Warehouses • Factory outlets & wholesale warehouse • Customs services • High-rise stack up warehouses • For detail list of uses refer to Appendix I	Predominant use. These uses shall be at least 60% of the total GFA.
1.2 Conditional uses	• Religious facilities • Workers' accommodation • Selected commercial activities • Wholesale markets such as grain, vegetables, flower, spices etc. • Automobile showrooms / service centre • Container stack-yards/ open storage based on locational suitability • Heavy vehicle parking • For detail list of uses refer to Appendix I	These uses must not exceed 40% of the overall GFA.
1.3 Prohibited Uses	• All type of polluting manufacturing and fabrication industries and production houses • All type of residential uses • Retail facilities • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• Electrical substation (ESS) • Refuse area • Management Office, meeting room • Sick room/first aid room • Display area (own products) • Staff Canteen • For detail list of uses refer to Appendix I	These uses must not exceed 40% of the overall GFA.
2.0 BUILDABLE AREA (COVERAGE)		
2.1 Land Area	1 ha	
2.2 Maximum Building Coverage	50 %	
2.3 No. Of Basements	Refer Appendix II	
2.4 Maximum Floor Space Index(FSI)	• Refer Appendix II	

3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	Refer Appendix II	
3.2 Building Form	Detached/Semi-detached/Terrace Buildings(can also be flatted) and high rise	
3.3 Floor to Floor Height	• 6.0m to 9.0m (normal type) • Rack supported warehouses (as per technical requirement)	
4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	Refer Appendix II	Boundary fronting public road need to follow the road buffer requirement.
4.2 Ancillary Buildings	2 m from the plot boundary	
4.3 Between Multiple Buildings on the Same Lot	Refer Appendix II	
5.0 SERVICE AREA AND EQUIPMENT		
5.1 Loading Docks	Loading docks, if any, shall be located to the rear of the building.	
5.2 Outdoor Storage Areas	Dedicated outdoor storage is allowed as per operational requirement with provision of adequate heavy vehicle parking, circulation and loading –unloading bays. Stack-yard needs to be visually screened from the public roads.	
5.3 Refuse Storage Areas	Proper location of the outdoor refuse areas shall be decided by the relevant local authorities upon review of the development application.	
5.4 Mechanical Equipment	At grade water tank and mechanical equipment: • Shall be located to the side or rear of the building grade or rooftop water tank, mechanical and telecommunications equipment: • Shall be screened subject to approval by the relevant local authorities.	
6.0 PARKING		
6.1 Location	Required parking stalls shall be provided within the lot boundary including adequate provision for two wheeler parking. Refer Appendix II	
6.2 Minimum Required Parking Stalls	• Refer Appendix II.	
6.3 Surfacing	• Parking shall be hard surfaced and provided with adequate drainage.	

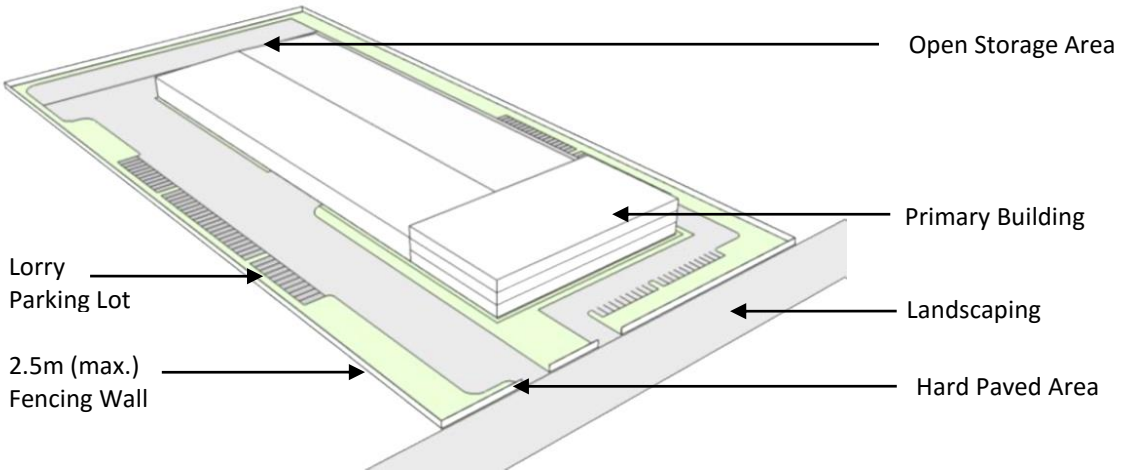
6.4 Visitor Parking accessible to specially abled	• Refer Appendix II.	
6.5 Minimum Dimensions	• Refer Appendix II.	
6.6 Circulation in Parking	• Refer Appendix II.	
7.0 FENCING		
7.1 Location	• Plantation along lot boundary. • E-security and surveillance is encouraged.	
7.2 Materials	• The use of visually permeable materials is recommended all around the development lot subject to detailed urban design and evaluation.	
8.0 CIRCULATION		
8.1 Pedestrian	• Covered pedestrian walkways shall be provided along the perimeter of the buildings fronting the main roads • Refer Appendix II.	
8.2 Public Transit	• The use of commuters' transit should be encouraged through the integration of a shuttle bus stop (shelter). • Refer Appendix II. .	
9.0 SIGNAGE		
9.1 Permitted	• One Building identification sign shall be permitted on the tower • One Commercial Sign per tenant shall be permitted: - Wall Signage (15% of the Building Face or 9 m^2 whichever less) - Window Signage (Transparent, 15% of the Building Face or 2.5m^2 whichever less) • Awning Signage (Min 2.5m clearance and 25% of the Building Face or 2.5m2 whichever less)	
9.2 Prohibited	The following signs are prohibited: • Multiple free standing signage • Off-site signage	
9.3 Location	Signs shall not obstruct views, vistas or important landmarks	
9.4 Lighting	Lighting shall be aesthetically pleasing and in keeping with the overall theme of the district.	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	

10.2	5% of Plot area as organised open space for recreation	Refer Appendix II.	
10.3	Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4	Maintenance	Refer Appendix II.	
10.5	Minimum % of green coverage	Refer Appendix II.	

LOGISTICS ZONE (I2):



PLAN (Not to scale)



ISOMETRIC VIEW (Not to scale)

Figure: Illustration of Logistics Zone (I2)

1013.Non-polluting industry Zone (I3)

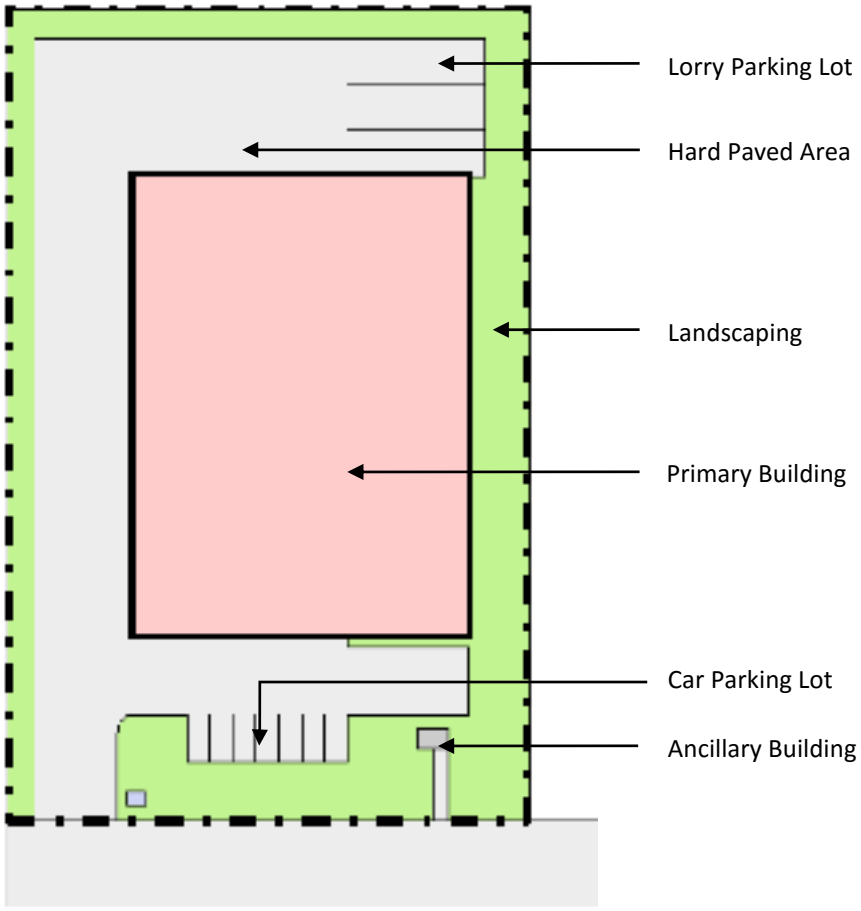
	Regulation	Remarks
These regulations shall apply to: • All new, redeveloped and re-zoned industrial uses within the Non-polluting industry zone(I3)		
1.0 USES		
1.1 Permitted Uses	The target industrial clusters envisaged for the initial phase of the Capital City are as follows: • **Food & beverages (F&B)** • **Electronics & Hardware** Electronic equipment, include personal computers, telephones, MP3 players, audio equipment, televisions, calculators, GPS automotive electronics, digital cameras and players and recorders using video media such as DVDs, VCRs or camcorders. • **Printing and Packaging** • **Other Green Industries:** Downstream Textiles, Auto components, Engine Parts, Electrical Parts, some Pharmaceutical, Supporting industries (SMEs) etc. • **Logistics/ Warehouses** • For detail list of uses refer to Appendix I	Predominant use. These uses shall be at least 55% of the total GFA.
1.2 Prohibited Uses	• All type of polluting manufacturing and fabrication industries under 'Red' & 'Ultra Red' categories • Residential uses other than dormitories • Major Retail uses • For detail list of uses refer to Appendix I	
1.3 Conditional uses	• Religious facilities • Workers' accommodation/ dormitories • Group development scheme provided employees work in same industries. • Sundries / grocery shop • Food-court • Child care centre • For detail list of uses refer to Appendix I	These uses must not exceed 45% of the overall GFA.
1.4 Ancillary Uses	• Electrical substation (ESS) • Refuse area • Staff Canteen • Management / Admin Office, meeting room • Sick room/first aid room • Display area (own products) • Storage Area • Showroom • For detail list of uses refer to Appendix I	

2.0 COVERAGE		
2.1 Minimum Lot Size	0.4 Ha	
2.2 Maximum Building Coverage	50%	
2.3 No. Of basements	Refer Appendix II	
2.4 Minimum Floor Space Index(FSI)	Refer Appendix II	
3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	Refer Appendix II	
3.2 Building Form	Detached/Semi-detached/Terrace Buildings (can also be flatted/ high-rise).	
3.3 Floor to Floor Height	5.0 m and / or as per technical requirement.	
4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	Refer Appendix II	Boundary fronting public road need to follow the road buffer requirement.
4.2 Ancillary Buildings	Refer Appendix II	
4.3 Between Multiple Buildings on the Same Lot	Refer Appendix II	
5.0 SERVICE AREA AND EQUIPMENT		
5.1 Loading Docks	Loading docks, if any, shall be located to the rear of the building.	
5.2 Outdoor Storage Areas	No outdoor storage shall be allowed	
5.3 Refuse Storage Areas	Proper location of the outdoor refuse areas shall be decided by the relevant local authorities upon review of the development application.	
5.4 Mechanical Equipment	At grade water tank and mechanical equipment: • Shall be located to the side or rear of the building At grade or rooftop water tank, mechanical and telecommunications equipment: • Shall be screened subject to approval by the relevant local authorities	
6.0 PARKING		
6.1 Location	Adequate Surface Parking with provision of Multi-storey car parking is encouraged.	
6.2 Minimum Required Parking Stalls	• Refer Appendix II.	

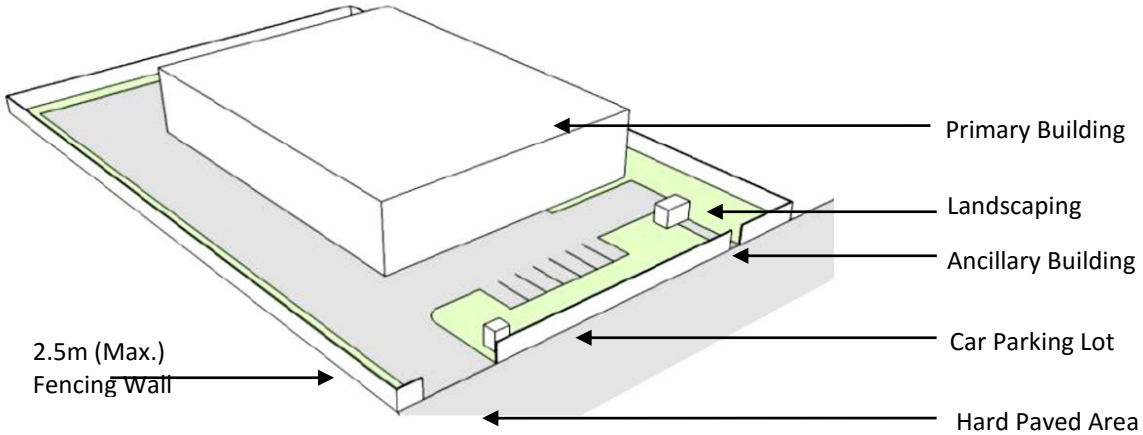
6.3 Surfacing	Parking shall be hard or semi perforated surfaced with adequate drainage	
6.4 Visitor Parking accessible by the specially abled	• Where required, at least 1 parking stalls per public entrance shall be designated for the disabled • The location shall be immediately adjacent to the building entrance/access	
6.5 Minimum Dimensions	Refer Chapter V	
6.6 Minimum Shaded Areas	Refer Appendix II	
6.7 Circulation in Parking	• Clearly designated and marked parking spaces, driveways and sidewalks within the parking lots shall be provided • Pedestrian circulation pathways should be provided, linking both the site access and the building. • Refer Appendix II	
6.8 Vehicular Access to Parking Lot	Multiple vehicular ingress and egress points may be permitted. Refer Appendix II	
7.0 FENCING		
7.1 Location	• Plantation along lot boundary. • E-security and surveillance is encouraged.	
7.2 Heights	Refer Appendix II	
7.3 Materials	• The use of visually permeable materials is recommended all around the development lot subject to detailed urban design and evaluation.	
8.0 CIRCULATION		
8.1 Pedestrian	• Covered pedestrian walkways shall be provided along the perimeter of the buildings fronting the main roads • Refer Appendix II . • All pedestrian circulation shall be accessible to the disabled.	
8.2 Public Transit	• The use of commuters' transit should be encouraged through the integration of a shuttle bus stop (shelter). • Adequate taxi drop off point(s) to be provided. • Refer Appendix II	

9.0 SIGNAGE		
9.1 Permitted	• One Building identification sign shall be permitted on the tower • One Commercial Sign per tenant shall be permitted: - Wall Signage (15% of the Building Face or 9 m^2 whichever less) - Window Signage (Transparent, 15% of the Building Face or 2.5m^2 whichever less) - Awning Signage (Min 2.5m clearance and 25% of the Building Face or 2.5m^2 whichever less)	
9.2 Prohibited	The following signs are prohibited: • Multiple free standing signage • Off-site signage	
9.3 Location	Signs shall not obstruct views, vistas or important landmarks	
9.4 Lighting	Lighting shall be aesthetically pleasing and in keeping with the overall theme of the district	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area as organised open space for recreation	Refer Appendix II.	
10.3 Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4 Maintenance	Refer Appendix II.	
10.5 Minimum % of green coverage	Refer Appendix II.	

NON POLLUTING INDUSTRY ZONE (I3):



PLAN (Not to scale)



ISOMETRIC VIEW (Not to scale)

Figure: Illustration of Non Polluting Industry Zone (I3)

1014. Passive Recreational Zone (P1)

	Regulation	Remarks
These regulations shall apply to: • All new and redeveloped park uses within the Passive Recreational Zone (P1) • Lots zoned or re-zoned for park uses within the Passive Recreational Zone (P1)		
1.0 USES		
1.1 Permitted Uses	• Botanical gardens, arboretums and conservatories. • Outdoor recreational facilities, such as hiking and bicycle trails, greens and commons, sitting areas and picnic areas. • Park related public facilities such as public toilet/ changing room. • Standalone food outlet with less than 50 seats/100 sqm including kitchen •	
1.2 Prohibited Uses	• All types of industrial uses • All types of residential uses • All types of commercial uses • All types of major public facilities • Major infrastructure installations • For detail list of uses refer to Appendix I	
1.3 Conditional Uses	• Minor Public Facilities • Restaurants • Small kiosk not exceeding 100 m^2 • For detail list of uses refer to Appendix I	Development shall be allowable in only 10% of the plot area or 500 m^2 (whichever is smaller) Developments in P1 zone require approval by sanctioning authority.
1.4 Ancillary Uses	• Refer Appendix II	
2.0 BUILDABLE AREA (COVERAGE)		
2.1 Minimum Lot Size	• Refer Appendix II	
2.2 Maximum Building Coverage	• Refer Appendix II	
2.3 Visitor parking accessible to specially abled	• Refer Appendix II	

	Regulation	Remarks
2.4 Maximum Floor Space Index(FSI)	• Refer Appendix II	
3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	• Refer Appendix II	
3.2 Building Form	Refer Appendix II	
3.3 Existing Buildings	Refer Appendix II	
4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	Refer Appendix II	
4.2 Basement Setback	Refer Appendix II	
4.3 Ancillary Buildings	Refer Appendix II	
4.4 Between Multiple Buildings on the Same Lot	Refer Appendix II	
5.0 SERVICE AREA AND EQUIPMENT		
5.1 Loading Docks	• Refer Appendix II	
5.2 Outdoor Storage Areas	• No outdoor storage shall be allowed	
5.3 Refuse Storage Areas	• Proper location of the outdoor refuse areas shall be decided by CRDA or other relevant authorities upon review of the development application.	

5.4 Mechanical Equipment	• At grade water tank and mechanical equipment:
	  • Shall be located to the side or rear of the building
	• At grade or rooftop water tank, mechanical and telecommunications equipment :
	  • Shall be screened subject to approval by CRDA or other relevant authorities	

6.0 PARKING		
6.1 Location	• Refer Appendix II	
6.2 Surfacing	• Parking shall be hard surfaced and provided with adequate drainage	
6.3 Minimum Required Parking Stalls	• Refer Appendix II.	
6.4 Visitor parking accessible to specially abled.	• Refer Appendix II	
6.5 Minimum Dimensions	• Refer Appendix II	

	Regulation	Remarks
6.6 Minimum Shaded Areas	• Refer Appendix II	
6.7 Circulation in Parking	• Refer Appendix II	
6.8 Vehicular Access to Parking Lot	• Refer Appendix II	
7.0 FENCING		
7.1 Location	• Refer Appendix II	
7.2 Heights	Refer Appendix II	
7.3 Materials	Refer Appendix II	
8.0 CIRCULATION		
8.1 Pedestrian	• Layout and design shall give due regard for safe pedestrian circulation throughout the site • All pedestrian circulation shall be accessible to the disabled. • Refer Appendix II	
8.2 Public Transit	• Refer Appendix II	
9.0 SIGNAGE		
9.1 Permitted	• All signs shall be- - Integrated into the design and theme of the park. - Wall mounted signs not to exceed 2.5m² and max height of 10m. - Freestanding signs not to exceed 1m² - Directional signs not to exceed 1m² - Temporary signs subject to approval from APCRDA.	
9.2 Prohibited	• The following signs are prohibited: • Multiple free standing signage • Off-site signage	
9.3 Location	• Refer Appendix II	
9.4 Lighting	• N/A	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area as organised open space for recreation	Refer Appendix II.	

		Regulation	Remarks
10.3	Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4	Maintenance	Refer Appendix II.	
10.5	Minimum % of green coverage	Refer Appendix II.	

1015. Active Recreational Zone (P2)

	Regulation	Remarks
These regulations shall apply to: • All new and redeveloped parks within the Active Recreational Zone (P2) • Lots zoned or re-zoned for parks within the Active Recreational Zone (P2)		
1.0 USES		
1.1 Permitted Uses	• Sports Complexes • Theme Parks • Resort Hotels • Golf Courses • Recreational Clubs • Zoo • Stadiums • For detail list of uses refer to Appendix I	
1.2 Prohibited Uses	• All types of industrial uses • All types of residential uses • Most of the commercial uses • All types of major public facilities • Major infrastructure installations • For detail list of uses refer to Appendix I	
1.3 Conditional Uses	• Single Family Residences • Resort • Complementary commercial uses • Minor Public Facilities • Supporting Infrastructure • Public Swimming Pools • For detail list of uses refer to Appendix I	Developments in P2 zone require approval by review panel
1.4 Ancillary Uses	• Parking • Toilets • For detail list of uses refer to Appendix I	
2.0 BUILDABLE AREA (COVERAGE)		
2.1 Minimum Lot Size	• Refer Appendix II	
2.2 Maximum Building Coverage	• Refer Appendix II	
2.3 No. Of Basements	• Refer Appendix II	
2.4 Maximum Floor Space Index(FSI)	• Refer Appendix II	
3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	• Refer Appendix II	
3.2 Building Form	• Refer Appendix II	
3.3 Architecture	• Architecture and materials that are complementary to the natural landscape should be encouraged	

4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	• Refer Appendix II	
4.2 Basement Setback	Refer Appendix II	
4.3 Ancillary Buildings	Refer Appendix II	
4.4 Between Multiple Buildings on the Same Lot	Refer Appendix II	
5.0 SERVICE AREAAND EQUIPMENT		
5.1 Loading Docks	• Refer Appendix II	
5.2 Outdoor Storage Areas	• No outdoor storage shall be allowed	
5.3 Refuse Storage Areas	• Proper location of the outdoor refuse areas shall be decided by CRDA or other relevant authorities upon review of the development application.	

5.4 Mechanical Equipment	• At grade water tank and mechanical equipment:
	  • Shall be located to the side or rear of the building
	• At grade or rooftop water tank, mechanical and telecommunications equipment :
	  • Shall be screened subject to approval by CRDA or other relevant authorities
	  • Shall not be visible from any street	

6.0 PARKING		
6.1 Location	• Required parking stalls shall be provided within the lot boundary	
6.2 Surfacing	• Parking shall be hard surfaced and provided with adequate drainage	
6.3 Minimum Required Parking Stalls	• Refer Appendix II.	
6.4 Disabled Parking	• Where required, at least 2 parking stalls per public entrance shall be designated for the disabled • The location shall be immediately adjacent to the building entrance/access	
6.5 Minimum Dimensions	• Refer Chapter V	
6.6 Minimum Shaded Areas	• A minimum of 70% of parking stalls shall be shaded	
6.7 Circulation in Parking	• Clearly designated and marked parking spaces, driveways and sidewalks within the parking lots shall be provided • Pedestrian circulation pathways should be provided, linking both the site access and the building	

6.8 Vehicular Access to Parking Lot	• Multiple vehicular ingress and egress points may Refer Appendix II	
7.0 FENCING		
7.1 Location	• Fencing walls are permitted	
7.2 Heights	Refer Appendix II	
7.3 Materials	Refer Appendix II	
8.0 CIRCULATION		
8.1 Pedestrian	• Layout and design shall give due regard for safe pedestrian circulation throughout the site • All pedestrian circulation shall be accessible to the disabled. • Refer Appendix II	
8.2 Public Transit	• Refer Appendix II	
9.0 SIGNAGE		
9.1 Permitted	• All signs shall - Be integrated into the design and theme of the building - Wall mounted signs not to exceed 2.5m² and max height of 10m. - Freestanding signs not to exceed 1m² - Directional signs not to exceed 1m² - Temporary signs subject to approval from APCRDA.	
9.2 Prohibited	• The following signs are prohibited: • Multiple free standing signage • Off-site signage	
9.3 Location	• Signs shall not obstruct views, vistas or important landmarks	
9.4 Lighting	• Lighting shall be aesthetically pleasing and in keeping with the overall theme of the district	
10.0 GREENING COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area as organised open space for recreation	Refer Appendix II.	
10.3 Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4 Maintenance	Refer Appendix II.	
10.5 Minimum % of green coverage	Refer Appendix II.	

1016.Protected Area (P3)

	Regulation	Remarks
These regulations shall apply to: • All nature and protected area within the Protected Area (P3)		
1.0 USES		
1.1 Permitted Uses	• Forests • Wetlands • Rivers • Lake • Hills • Other Environmentally sensitive features • For detail list of uses refer to Appendix I	
1.2 Prohibited Uses	• All types of industrial uses • All types of residential uses • All types of commercial uses • All types of public facilities • For detail list of uses refer to Appendix I	
1.3 Conditional Uses	• Infrastructure • Botanical gardens, arboretums and conservatories. • Outdoor recreational facilities, such as hiking and bicycle trails, greens and commons, sitting areas and picnic areas. • Park related public facilities such as public toilet/ changing room. • Minor Public Facilities • Restaurants • Eco Resort • Small kiosk not exceeding 100 m^2 • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• For detail list of uses refer to Appendix I	
2.0 BUILDABLE AREA (COVERAGE)		
2.1 Minimum Lot Size	• Refer Appendix II	
2.2 Maximum Building Coverage	Refer Appendix II	
2.3 Minimum Landscaping Coverage	Refer Appendix II	
2.4 Maximum Floor Area Ratio (FAR)	Refer Appendix II	
3.0 BUILDING TYPE		
3.1 Maximum Number of Floors	Refer Appendix II	
3.2 Building Form	Refer Appendix II	
3.3 Architecture	Refer Appendix II	

	Regulation	Remarks
4.0 SETBACK (Minimum)		
4.1 Building (Above Grade)	Refer Appendix II	
4.2 Basement Setback	Refer Appendix II	
4.3 Ancillary Buildings	Refer Appendix II	
4.4 Between Multiple Buildings on the Same Lot	Refer Appendix II	
5.0 SERVICE AREA AND EQUIPMENT		
5.1 Loading Docks	Refer Appendix II	
5.2 Outdoor Storage Areas	Refer Appendix II	
5.3 Refuse Storage Areas	Refer Appendix II	
5.4 Mechanical Equipment	Refer Appendix II	
6.0 PARKING		
6.1 Location	Refer Appendix II	
6.2 Surfacing	Refer Appendix II	
6.3 Minimum Required Parking Stalls	Refer Appendix II	
6.4 Disabled Parking	Refer Appendix II	
6.5 Minimum Dimensions	Refer Appendix II	
6.6 Minimum Shaded Areas	Refer Appendix II	
6.7 Circulation in Parking	Refer Appendix II	
6.8 Vehicular Access to Parking Lot	Refer Appendix II	
7.0 FENCING		
7.1 Location	Refer Appendix II	
7.2 Heights	Refer Appendix II	
7.3 Materials	Refer Appendix II	
8.0 CIRCULATION		
8.1 Pedestrian	Refer Appendix II	
8.2 Public Transit	Refer Appendix II	

9.0 SIGNAGE		
9.1 Permitted	• All signs shall - Be integrated into the design and theme of the park. - Wall mounted signs not to exceed 2.5m² and max height of 10m. - Freestanding signs not to exceed 1m² - Directional signs not to exceed 1m² • Temporary signs subject to approval from APCRDA.	
9.2 Prohibited	• The following signs are prohibited: - Multiple free standing signage - Off-site signage	
9.3 Location	• Signs shall not obstruct views, vistas or important landmarks	
9.4 Lighting	• Lighting shall be aesthetically pleasing and in keeping with the overall theme of the district	
10.0 GREEN COVERAGE		
10.1 Minimum % of green coverage	Refer Appendix II.	
10.2 5% of Plot area as organised open space for recreation	Refer Appendix II.	
10.3 Minimum width of organised open space for recreation. (m)	Refer Appendix II.	
10.4 Maintenance	Refer Appendix II.	
10.5 Minimum % of green coverage	Refer Appendix II.	

1017. Government Zone – (S1)

	Regulation	Remarks
These regulations shall apply to: • All land parcels within the Government Zone (S1)		
1.0 USES		
1.1 Permitted Uses	• Special Government buildings and Institutions, International Organizations /Office, Residences for Government Officials,Other government functions considered necessary by CRDA • For detail list of uses refer to Appendix I	
1.2 Prohibited Uses	• For detail list of uses refer to Appendix I	
1.3 Conditional Uses	• For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• For detail list of uses refer to Appendix I	
1.5 Minimum Lot Size	• N/A	
2.0 SIGNAGE		
	•Signage regulation of all zones apply unless specified in Urban Design Proposal. • Special signage subject to CRDA approval	

1018.Education Zone (S2)

	Regulation	Remarks
These regulations shall apply to: • All land parcels within the Education Zone (S2)		
1.0 USES		
1.1 Permitted Uses	• Educational Institutions, Public Facilities, Health centres, • Public Utilities,Educational Hostel • For detail list of uses refer to Appendix I	
1.2 Prohibited Uses	• Residential Developments, Light and Heavy Industries • For detail list of uses refer to Appendix I	
1.3 Conditional Uses	• Local shops ,Café, restaurant up to 100 sqm including kitchen • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• For detail list of uses refer to Appendix I	
1.5 Minimum Lot Size	• Refer Appendix II	
2.0 SIGNAGE		
	• Signage regulation of all zones apply • Special signage subject to CRDA approval	

1019.Special Zone (S3)

	Regulation	Remarks
These regulations shall apply to: • All land parcels within the Special Zone (S3)		
1.0 USES		
1.1 Permitted Uses	• Residential, commercial , industrial and institutional	
1.2 Prohibited Uses	• For detail list of uses refer to Appendix I	
1.3 Conditional Uses	• For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• For detail list of uses refer to Appendix I	
1.5 Minimum Lot Size	• Refer Appendix II	
2.0 SIGNAGE		
	• Signage regulation of all zones apply • Special signage subject to CRDA approval	

1020.Reserve Zone (U1)

	Regulation	Remarks
These regulations shall apply to all land parcels within the Reserve Zone (U1)		
1.0 USES		
1.1 Permitted Uses	• Transport and Utility related infrastructure • For detail list of uses refer to Appendix I	
1.2 Prohibited Uses	• For detail list of uses refer to Appendix I	
1.3 Conditional Uses	• Dormitory can be allowed only if it is bus terminal and falls under land use • For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• For detail list of uses refer to Appendix I	
1.5 Minimum Lot Size	• N/A	
2.0 SIGNAGE		
1. Permitted	• All signs shall - Be integrated into the design and theme of the park. - Wall mounted signs not to exceed 2.5m² and max height of 10m. - Freestanding signs not to exceed 1m² - Directional signs not to exceed 1m² • Temporary signs subject to approval from APCRDA.	
2. Prohibited	• The following signs are prohibited: - Multiple free standing signage - Off-site signage	

1021. Road Reserve Zone (U2)

	Regulation	Remarks
These regulations shall apply to land reserved for roads for future needs		
1.0 USES		
1.1 Permitted Uses	• For detail list of uses refer to Appendix I	
1.2 Prohibited Uses	• For detail list of uses refer to Appendix I	
1.3 Conditional Uses	• For detail list of uses refer to Appendix I	
1.4 Ancillary Uses	• For detail list of uses refer to Appendix I	
1.5 Minimum Lot Size	• N/A	
2.0 SIGNAGE		
1. Permitted	• All signage to be bilingual in English and Telugu. • CRDA to develop comprehensive road signage manual • All signage subject to CRDA approval	
2. Prohibited	N/A	
3. Location	• Signs shall not obstruct views, vistas or important landmarks	

APPENDIX IV - GENERAL REQUIREMENT FOR FACILITIES

1101. Zoning Regulations – Public Facilities

Criteria for Assessment for Education Institutes		Remarks
BUILDING SETBACKS		
Building (Above Grade)	• Front: 7.0 m (min) • Side: 4.5 m (min) • Rear: 4.5 m (min) • Basement: N/A • Ancillary Buildings: N/A	
OTHER CRITERIA		
	Refer to respective Zone Regulations	The regulations of the particular zone in which the plot is located shall be followed unless otherwise stated in the following regulations

1102. Kindergarten/ Child Care Centre

Criteria for Assessment for Education Institutes		Remarks
1.0 USES		
1.1 Permitted Uses	• Kindergarten & Nursery uses, Child Care Centers	• Should meet the standards set by Ministry of Education
1.2 Parameters for Location Assessment	• Allowed in Commercial and Residential Areas, Institutional Buildings, Civic and Community Institutes, Neighborhood Centers, Medical and Healthcare buildings, Sports and Recreational Premises, Hotels • Allowed in places identified for ancillary uses for Religious Institutes, Factories, Warehouses, Business parks, Private gated residential development. • New childcare centers and kindergartens are to be considered for approval if there are no other approved childcare centers (including any kindergarten and student care centre) within 400m radius distance from the subject premises. • Proposed development shall not be located along major arterial road or arterial road.	• Should meet the standards set by Ministry of Education • To be considered by CRDA on a case to case basis
1.3 Minimum Size	• For developments where Child Care Centre is allowed : Proposed child care center should not exceed 40% of the total Gross Floor Area of the development • For Developments where Child Care Centre is allowed within ancillary uses: Proposed child care center should not exceed 300 m^2.	
2.0 COVERAGE		
2.1 Maximum Floor Area Ratio (FAR)	• Can range from 0.8 -1.4 dependent on the surrounding density.	
3.0 FLOORS		
3.1 Maximum Number of Floors	• Can range from 2-4 dependent on the surrounding building heights.	
4.0 PARKING		
4.1 Minimum Required Parking Stalls	1 car park per 200 m^2 of GFA	

1103. Education Institutes

Criteria for Assessment for Education Institutes		Remarks
5.0 USES		
1.4 Permitted Uses	• Primary School • Secondary School • Colleges and vocational Institutes, Training Institutes, ITC • Higher Education Institutes/ Universities • Foreign and Special Schools	
1.5 Prohibited Use	• Independent Commercial Offices or shops	
1.6 Ancillary Use	• Office Commercial allowed in Higher Education Institutes/ Universities: 5% of GFA or 30,000sqm cap whichever is lower.	Such offices or Commercial related to the institute to be considered by CRDA on a case to case basis
1.7 Minimum Lot Size	• Primary School: 0.4 ha • Secondary School: 3.0 ha • Primary Secondary Combined: 3.4 ha • Special School: 1.5 Ha • Junior College: 6 Ha • Technical Education A/B: 4.0 ha • Higher Education/ University: 6.0 ha	
6.0 COVERAGE		
2.2 Maximum Floor Area Ratio (FAR)	• Can range from 0.8 -1.4 dependent on the surrounding density.	
7.0 BUILDING		
3.2 Maximum Number of Floors	• Can range from 2-4 dependent on the surrounding building heights.	Storey height above 4 can be considered subject to evaluation by CRDA.

8.0 PARKING		
4.2 Minimum Required Parking Stalls	Primary Schools: 1 Parking Lot per 3 class rooms, Plus 20 % of standard requirement, 4 Bus Parking Lots Secondary Schools: 1 Parking Lot per 2 class rooms For workshops & Laboratories: 1 Car Parking Lot per 200 m2 of GFA, Plus 20 % of standard requirement, 4 Bus Parking Lots Colleges and vocational Institutes, Training Institutes, ITC: 1 Parking Lot per 30 staff and student population, Bus Parking as required by regulations University: 1 Parking Lot per 20 staff and student population, Bus Parking as required by regulations.	Ancillary facilities such as assembly hall, canteen, sports and recreational, facilities, etc are also excluded and provisions should be provided as per regulations
4.3 Access	• Only 1 vehicular ingress and egress point shall be allowed • Additional vehicular ingress and egress point shall be evaluated on case-by-case basis by the Capital Region Development Authority	

1104. Special Education Schools

Criteria for Assessment for Special Education Schools		Remarks
1.0 USES		
1.1 Allowable Use	• Special Education School as defined by Ministry of Education.	
1.2 Ancillary Use	• Office	Such offices related to the institute to be considered by CRDA on a case to case basis
2.0 COVERAGE		
2.1 Maximum Floor Area Ratio (FAR)	• Minimum FAR: 0.5 The maximum allowable FAR is evaluated on a case-by-case basis by CRDA.	
3.0 BUILDING		
3.1 Maximum Number of Floors	The maximum allowable floors is as follows: • Ambulatory= 4 storey (maximum) • Non Ambulatory= 2 storey (maximum)	Storey height above 4 can be considered subject to evaluation by CRDA. Lifts to be provided multistoried buildings
4.0 PARKING		
4.1 Minimum Required Parking Stalls	• 1 Parking Lot per 3 class rooms. • Plus 20 % of standard requirement. • Bus Parking Lots as required by regulations. • Disabled parking as required by regulations.	Ancillary facilities such as assembly hall, canteen, sports and recreational, facilities, etc are also excluded and provisions should be provided as per regulations
4.2 Access	• Only 1 vehicular ingress and egress point shall be allowed • Additional vehicular ingress and egress point shall be evaluated on case-by-case basis by the Capital Region Development Authority	

1105. Hospitals and Health Institutes

Criteria for Assessment for Hospitals and Health Institutes		Remarks
1.0 USES		
1.1 Parameters for locating	• Should be located along an arterial road & sub arterial road • Potential location identified in the proposed land use plan.	
1.2 Permitted Uses	• Private medical suites • In-patient facilities • Outpatient facilities • Diagnostic and treatment facilities • Dispensary • Hospital support services • Translational & Clinical Research Facilities • Education facilities • Patient-facing administration facilities	• Minimum of 60% of the total GFA should be utilized for hospital use. The uses within the 60% (minimum) hospital quantum shall include in-patient/outpatient facilities, medical suites, diagnostic and treatment facilities. • Teaching Hospitals should meet the standards set by Ministry of Health and Ministry of Education
1.3 Allowable Uses	• Visitors Hostel • Commercial	• 10% of GFA or 1500m² can used for visitors hostel for family members and companions of hospital patients and is allowable only on case to case basis on evaluation by CRDA. • 5% of GFA can be used for commercial e.g. retail pharmacy, F&B outlets, shops, banks etc.
1.4 Ancillary Use	• Nurses quarters • General administration facilities • Staff facilities • Child Care Center for Staff • Mechanical and Electrical services	• Up to 40% of the GFA
1.5 Minimum Lot Size	• District Hospital, Regional Hospital, Polyclinic: 5 ha • Health Clinics: 0.015-0.02 ha	• Health Clinics are to be developed along with the Neighbourhood Centers.

2.0 COVERAGE		
2.1 Maximum Floor Area Ratio (FAR)	• Maximum FAR Subject to evaluation by CRDA	
3.0 BUILDING		
3.1 Floor to Floor Height	• 5m (maximum)	

4.0 PARKING		
4.1 Minimum Required Parking Stalls	• First 500 beds: 1 Parking Lot per 4 beds • Beyond 500 beds: 1 Parking Lot per 5 beds • 2 Parking Lots should be allocated for disabled visitor parking. 8 additional parking lots (9m x 3m) to be provided for ambulances for hospitals with Accident and Emergency (A+E) departments. For hospitals without A+E departments, 3 additional parking lots (9m x 3m) should be provided for ambulances.	• Additional spaces should be Provided for Ambulances and other office vehicles. • Ancillary facilities such as assembly hall, canteen, sports and recreational, facilities, etc are also excluded and provisions should be provided as per regulations • Additional spaces should be Provided for delivery vehicles, drop offs and taxi lay-bys as per the Ministry of Health regulations.
4.2 Access	• Only 1 vehicular ingress and egress point shall be allowed • Additional vehicular ingress and egress point shall be evaluated on case-by-case basis by the Capital Region Development Authority	

SITE PLAN
Figure A3.2: Typical Hospital layout demonstrating multiple access points and parking

1106. Civic and Community Institutes

Criteria for Assessment of Civic and Community Institutes		Remarks
1.0 USES		
1.1 Prohibited Use	• Independent Commercial Offices or Shops	
1.2 Ancillary Use	• Office should be ancillary to the function of the institute	• Such offices or Commercial related to the institute to be considered by CRDA on a case to case basis
1.3 Minimum Lot Size	• Museums/ Cultural Centre: 1.5 ha • Health Clinic: 0.5 ha • Polyclinic: 5 ha • Community Halls: 0.5 ha • Police Station: 1.0 ha • Fire Station: 1.0 ha • Regional Library: 0.5 ha	• Police stations should be located fronting at least two main roads. • Fire stations site should have a minimum frontage of 50m. • Regulations related to Police and Fire Stations should meet the standards set by the Indian National Police
2.0 COVERAGE		
2.2 Maximum Floor Area Ratio (FAR)	• Can range from 0.8 -1.4 dependent on the surrounding density.	
3.0 BUILDING		
3.2 Maximum Number of Floors	• Can range 2-4 dependent on the surrounding building heights.	Storey height above 4 can be considered subject to evaluation by CRDA.
4.0 PARKING		
4.1 Minimum Required Parking Stalls	• Museums, Library, Community Centres, Fires Station, Police Station, Health Centres: 1 car per 200 m^2 of GFA • Theatres/ Cinema: 1 car per 12 seats Health Clinics Polyclinics: 1car parking spaces for each consulting room. 3 additional parking lots (9m x3m) for ambulances Polyclinics. 2 car parking spaces should be reserved for disabled person.	• Car park requirements for specific facilities shall follow the regulations • Ancillary facilities such as assembly hall, canteen, sports and recreational, facilities, etc are also excluded and provisions should be provided as per regulations.

Criteria for Assessment of Civic and Community Institutes		Remarks
4.2 Access	Only 1 vehicular ingress and egress point shall be allowed. Additional vehicular ingress and egress point shall be evaluated on case-by-case basis by the Capital Region Development Authority	

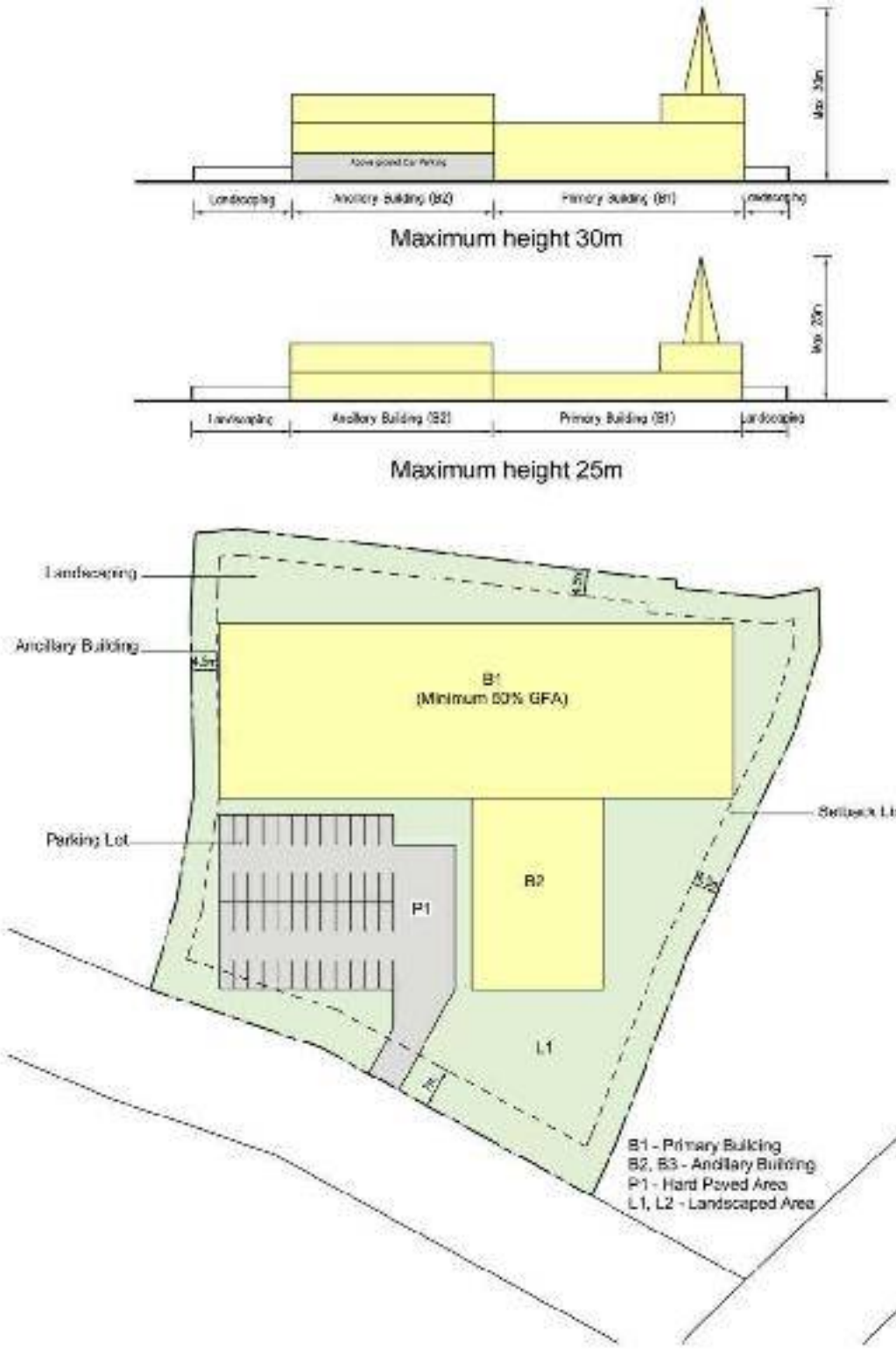
1107. Evaluation for Special Institutional Buildings

Criteria for Assessment for Special Institutional Buildings		Remarks
1.0 Old Age Home:		
A home for the aged is a place where elderly people dwell in and are cared for by trainedpersonnel.		
1.1 Evaluation Criteria	• **Site Coverage:** o Minimum 35% of the site is to provided for communal open space meant for the enjoyment of the occupants but excludes car parks and other services areas like septic tank, bin center etc. • **Building Height:** o The building height is to be evaluated on the merits of each case, taking into consideration its compatibility with the surrounding developments. Homes for the aged that are 3-storey and above should be provided with lifts.	• All areas to be accessible to the disabled
2.0 Disabled Home:		
A home for the disabled is a place where the disabled dwell in and are cared for by trainedpersonnel.		
2.1 Evaluation Criteria	• **Site Coverage:** o There is no site coverage control for Home for the Disabled. • **Building Height:** o The building height is to be evaluated on the merits of each case, taking into consideration its compatibility with the surrounding developments. • **Intensity:** o The allowable GPR is evaluated on a case-by-case basis, taking into consideration surrounding land uses.	• All areas to be accessible to the disabled
3.0 Community Centers:		
Places which providing community facilities and services to the public can be integrated with the Neighborhood Centre		
3.1 Evaluation Criteria	• **Use Quantum Control:** The maximum allowable commercial use is 20%. • **Building Height:** The building height is to be evaluated on the merits of each case, taking into consideration its compatibility with the surrounding developments. • **Intensity:** The GPR for community club / centre sites is 1.4 (minimum). • Community Centres are to be integrated with Neighbourhood Centre Development	

1108. Religious Institutions (RI)

Criteria for Assessment for Religious Institutes		Remarks
1.0 USES		
1.1 Permitted Uses	• Minimum 50% of the GFA should be used for praying area	Subject to review by committee constituted by commissioner
1.2 Prohibited Use	• No Independent Commercial Offices or Shops	
1.3 Ancillary Use	• Maximum 50% of the GFA can be used for Ancillary uses such as: o Religious classrooms o Priest's room o Caretaker's room o Ancillary related uses • Maximum 10% of total GFA can be used for Ancillary uses such as: o Library o Conference room o Meeting room o Kindergarten o Childcare Center • Maximum 20-40% of total GFA can be used for Ancillary uses such as: o Columbarium	• Such offices or Commercial related to the institute to be considered by CRDA on a case to case basis • Combined area of child care or Kindergarten shall not exceed 300 m^2 • Amount of GFA allowable for the Columbarium is subject to evaluation by CRDA based on the location and surrounding density & use. • Education Centers with religious institutes should meet the minimum lot size requirement for the education facility as well as the religious facility and is subject to evaluation by the CRDA. It should also follow the regulations set by Ministry of Education.
1.4 Minimum Lot Size	• 0.5 ha	
2.0 COVERAGE		
2.1 Maximum Floor Area Ratio (FAR)	Can range from 0.8 -1.4 dependent on the surrounding density.	

3.0 BUILDING		
3.1 Maximum Number of Floors	• For Religious Institutes (RI) located within R1, R2 & R3 Zones, the development can develop up to 2 or 3 storeys For RIs located within high-density areas, storey height controls for RIs with FAR up to 1.4 will be capped at 4 storeys. For RIs with FAR of more than 1.4, storey height will be capped at 5 storeys, with an allowable height of 25m (including attic), RIs located in high-density areas that provide above-ground car park, can be allowed an additional height allowance of up to 5m (i.e. within envelop control of 30m). This can be considered to facilitate the provision of multi storey car parking within the site. • For RI in industrial areas the storey height is capped at 5 storeys with an allowable height of 25m (including attic), • The maximum height of any religious symbolic structure (e.g. cross, minaret, statue etc.) should not be more than the overall height of the Religious Institute based on the permitted number of storeys inclusive of the additional 5m allowances.	• Storey height is subject to evaluation by CRDA on a case-to-case basis, and is subject to detailed localized planning assessment; so that the proposed storey height does not create adverse impact to the surrounding development.
4.0 PARKING		
4.1 Minimum Required Parking Stalls	• Churches: 1 parking lot per 10 seats/persons • Other Religious Institutes: 1 parking lot per 50m² of praying area	• Car park requirements for specific facilities shall follow the regulations • The main prayer hall area is to be taken as the praying area
4.2 Access	• Only 1 vehicular ingress and egress point shall be allowed • Additional vehicular ingress and egress point shall be evaluated on case-by-case basis by Capital Region Development Authority	



SITE PLAN
Figure A3.3: Typical Religious Institution layout and section demonstrating building height

1109. Petrol/Fuel Station

Criteria for Assessment of Petrol Stations		Remarks
1.0 USES		
1.1 Permitted Uses	• Petrol / Fuel Station • Minor vehicle Repair and Servicing • Tire service facilities • Car wash • Retail Outlets	• Maximum allowable quantum for retail is 15% of the approved GFA or 150 m2 whichever is lower. • Preparation, processing and cooking of food is not allowed within the site.
1.2 Prohibited Use	• Residential • Commercial Offices • Industrial Uses • Civic Facilities	
1.3 Ancillary Use	• Office, store and compressor room associated with the functioning of the petrol station	Maximum allowable quantum for ancillary uses is 10% of the approved GFA.
1.4 Minimum Lot Size	• 400 sqm	Minimum frontage 30 m
2.0 COVERAGE		
2.1 Maximum Building Coverage	• 50% of the Site Area	
2.2 Minimum Landscaping Coverage	• 10% of Site Area	
2.2 Maximum Floor Area Ratio (FAR)	• Maximum FAR of 0.5	
3.0 BUILDING		
3.1 Maximum Number of Floors	• Single Storey	

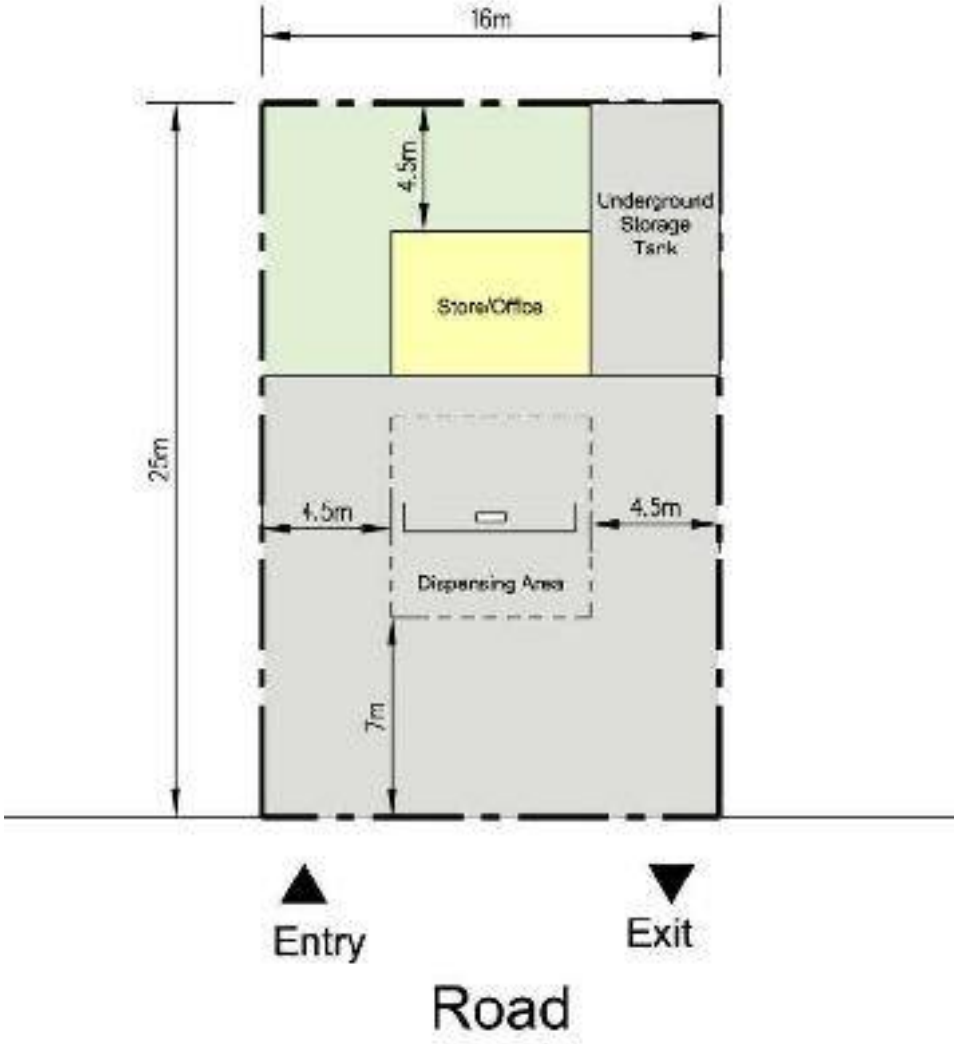


Figure A3.4: Typical Petrol Pump Layout

1110. Golf Course

Criteria for Assessment for Golf Course		Remarks
These regulations are intended to be used for Golf Course		• Approval is subject to technical requirements of Department of Infrastructure • EIA to be taken into account for Golf Courses close to water catchment areas.
1.0 USES		
1.1 Permitted Uses	• Golf Course	
1.2 Prohibited Use	• Industrial Uses • Infrastructure • Civic Facilities	
1.3 Ancillary Use	• Chalet/guest house facility/hotel room • Commercial Uses such as: o Restaurant o Bar & lounge o Refreshment area o Canteen o Kitchen o Dining area o Saloon o Golf equipment/Pro shop	• The allowable quantum for Chalet/guest house facility/hotel room should not be more than 30% of the allowable GFA or 10,000m^2 whichever is lower. • Commercial GFA for ancillary uses should not be more than 30% of the allowable GFA or 4,000m^2, whichever is lower. • Commercial uses not listed above may be considered on a case-by-case basis
2.0 COVERAGE		
2.1 Maximum Floor Area Ratio (FAR)	• Subject to Evaluation by CRDA	

CHAPTER XII

APPENDIX V

1201 METHOD OF CALCULATING BUILDING COVERAGE

Building Coverage = Building foot print of the principle building + Building foot prints of the ancillary building / Total lot area
Building Coverage = B1 +B2 +B3 / Total lot area
Where B1 is the primary building;
B2 and B3 are the ancillary buildings.

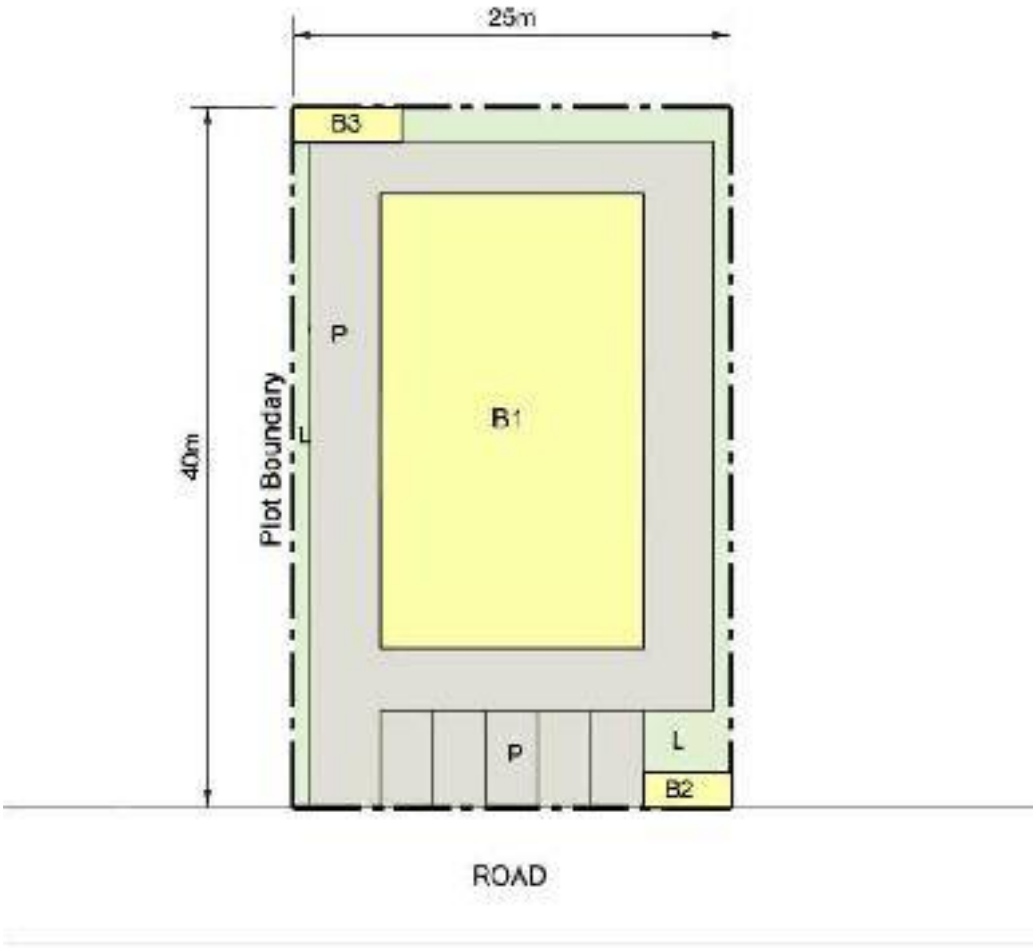


Figure 2: Building coverage

1202 METHOD OF CALCULATING LANDSCAPE COVERAGE

Foot prints of the ancillary building - Hard paved areas / Total lot area
Landscape Coverage = Total site area - B1 - B2 - B3 - P / Total lot area
Where B1 is the primary building;
B2 and B3 are the ancillary buildings;
P is the hard paved areas.

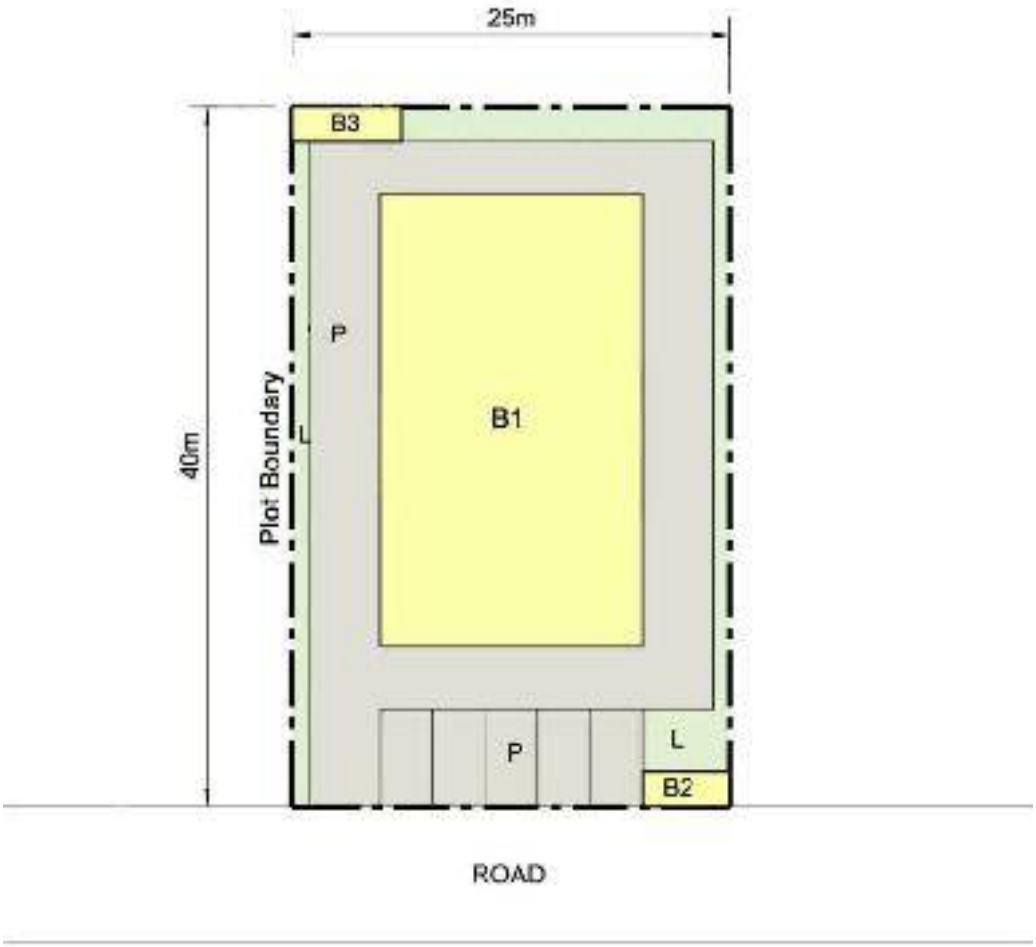


Figure 3: Landscape coverage

1203 METHOD OF CALCULATING LOT COVERAGE

Lot Coverage = Building foot print of the principle building + Building foot prints of the ancillary building + Hard paved areas + Circulation areas / Total lot area
Lot Coverage = B1 + B2 + B3 + P / Total lot area
Where B1 is the primary building;
B2 and B3 are the ancillary buildings;
P is the hard paved area.

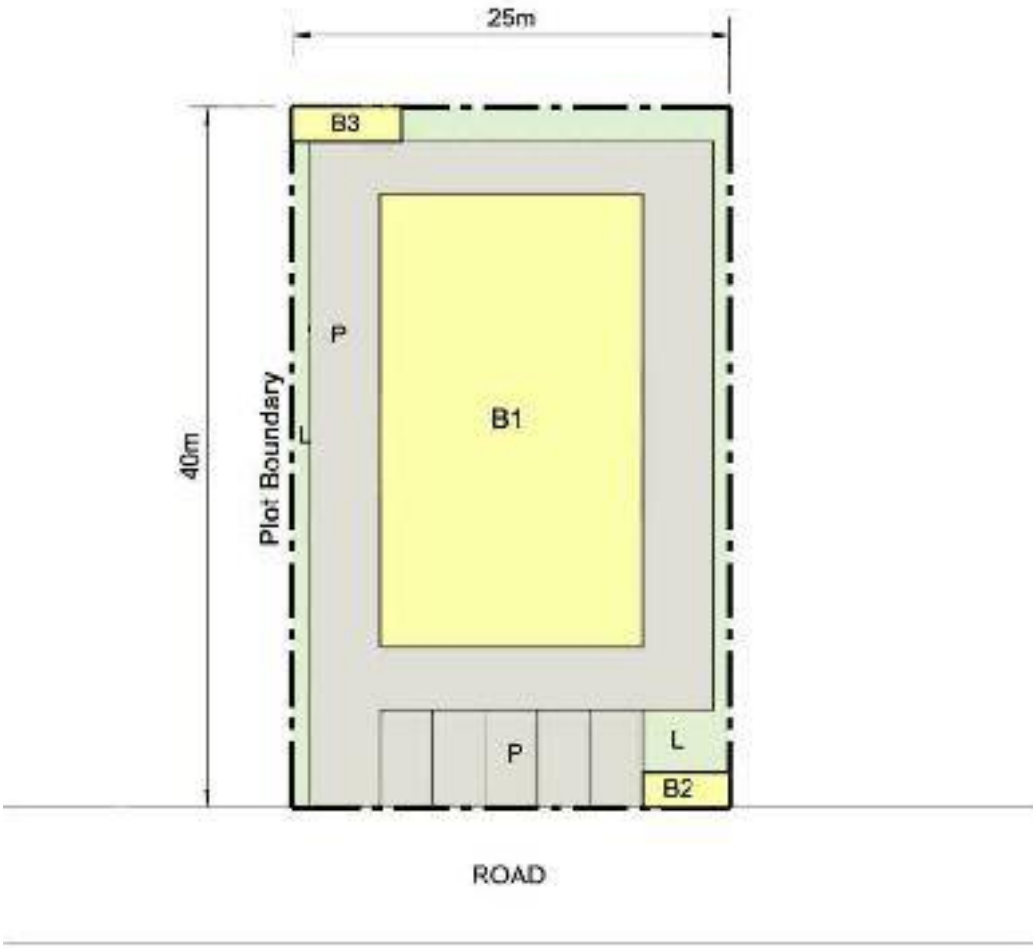


Figure 4: Lot coverage

1204 BASEMENT SETBACK ILLUSTRATION

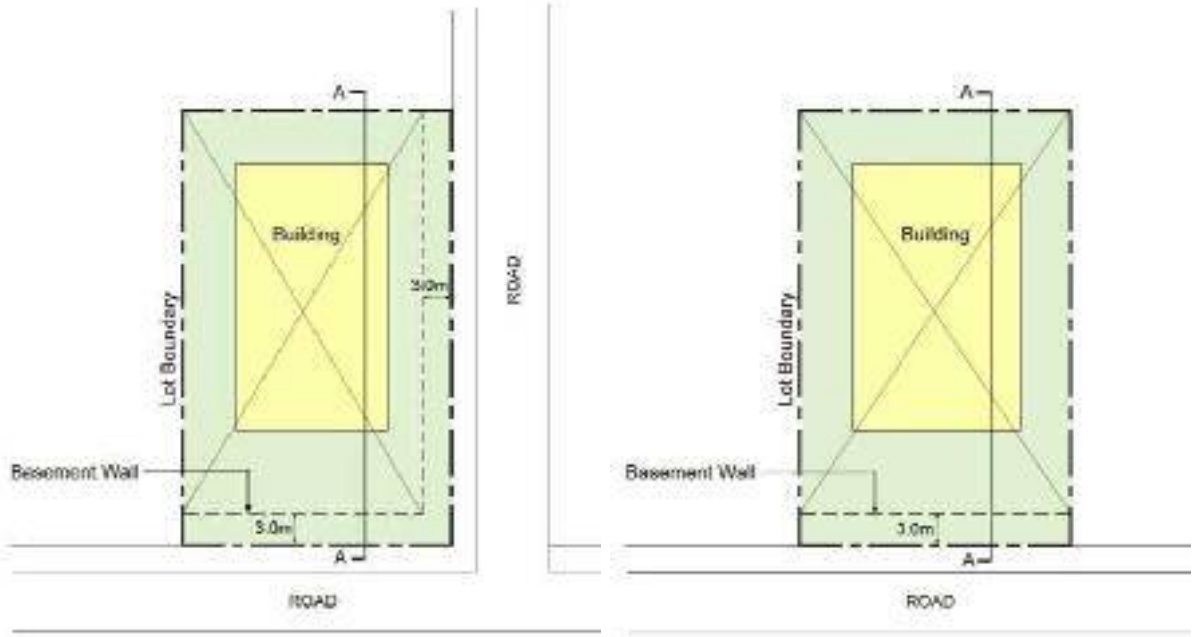


Figure 5: Basement setbacks

Figure 6: Basement setbacks

1205 SCREENING FOR MECHANICAL AND ELECTRICAL EQUIPMENTS

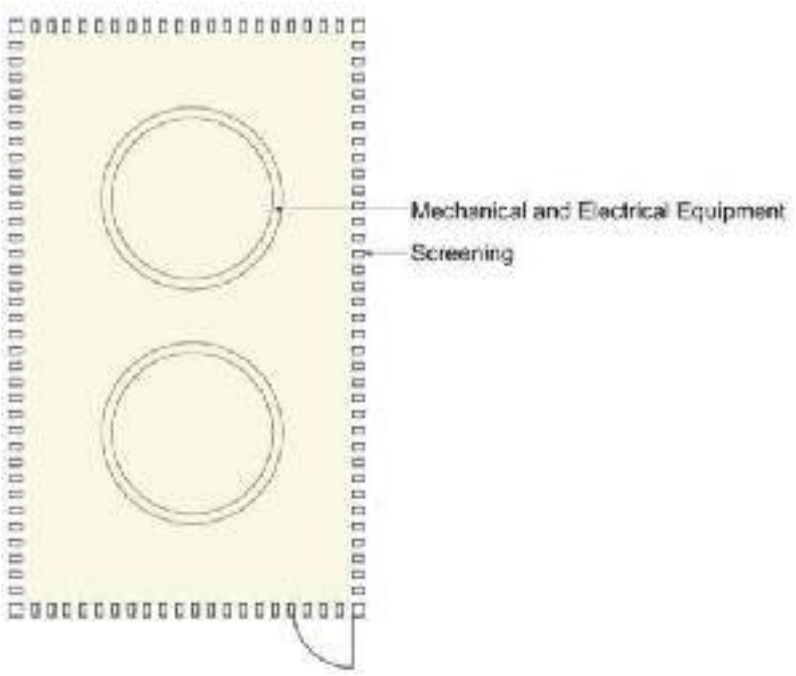


Figure 7: Screening for Mechanical and Electrical equipment plan

Figure 8: Illustration of Light Industrial (I1) - Flatted factory

1206 CAR PARKING DIMENSIONS

1206.1 General Provisions:

- Minimum width of driveway (travel isle) for two way 90 degree parking shall be at least 7 m.
- Minimum width of driveway (travel isle) for two way parallel parking shall be at least 7 m.
- Minimum width of driveway (travel isle) for 90 degree or one way parallel parking shall be at least 4.5 m.
- The maximum slope of any driveway or ramp shall not exceed 12.5% or 1 in 8.

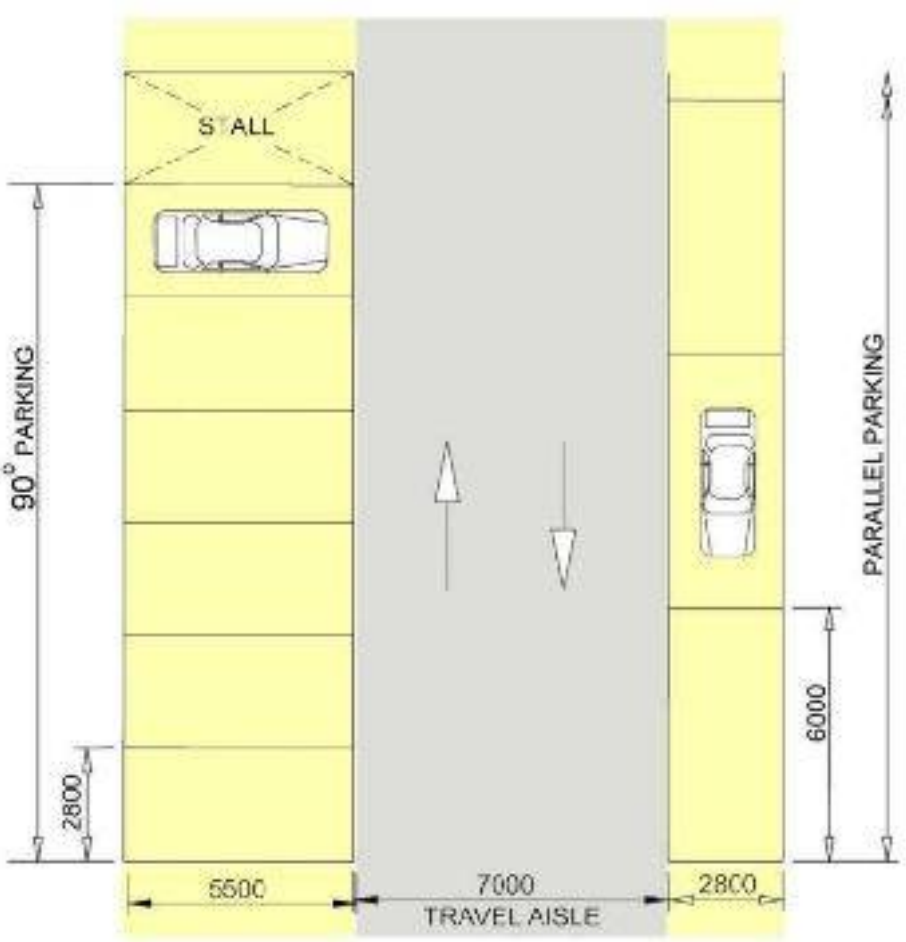


Figure 9: Car parking stall dimensions

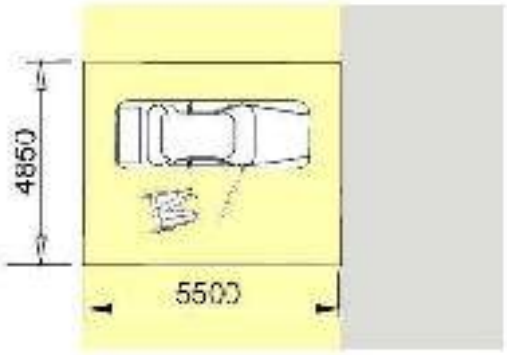


Figure 10: Car parking stall dimensions for the disabled

1207 FENCING

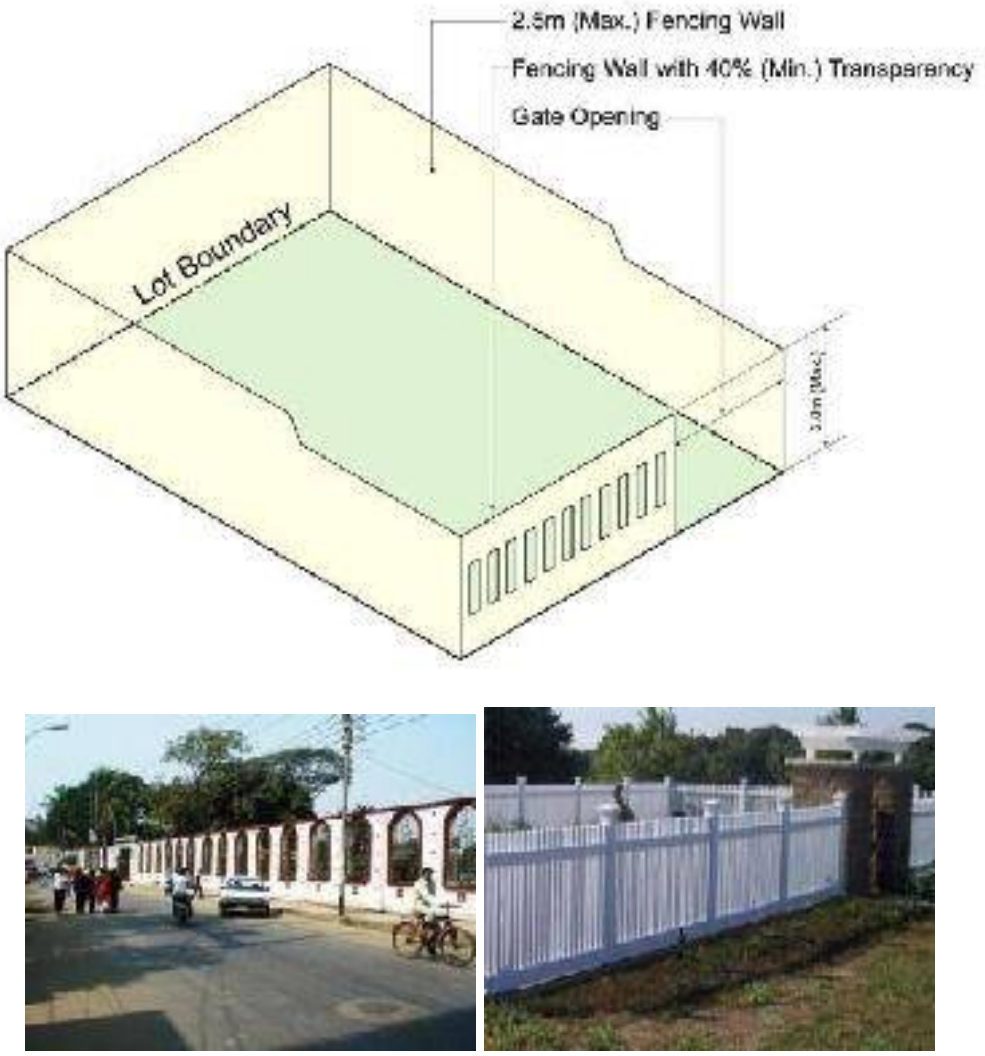
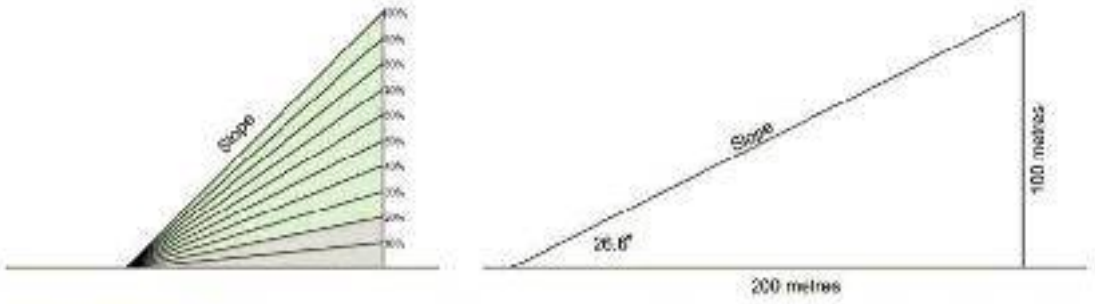


Figure 11: Fencing boundary

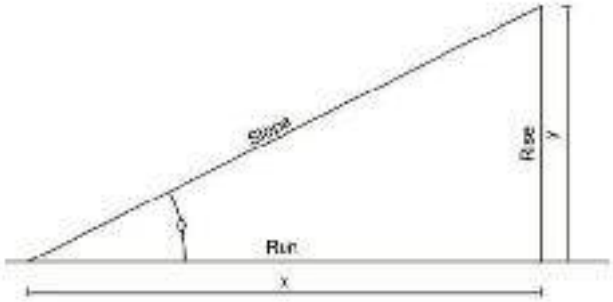
1208 SLOPES

Steep Slopes are lands along the hillsides or natural terrain that have a slope angle of 20% or greater for a minimum horizontal distance of 10 metres. All properties with a 15% or greater portion of the parent property having sloped land of 20% or greater are identified in the Slope Overlay Plan. Properties with slope less than 20% for a minimum horizontal distance of 10m are not considered a sleep slope for this guideline. Properties identified in the Overlay Plan are required to fulfill the guidelines set for the sloped areas.

The illustration in Figure A2.13 describes the measurement of slopes. Slopes can be defined in percentage, ratio or degrees. The figure explains the measurement of a slope and gives a quick means of estimating equivalencies between degrees, ratios and percentage. Note that it is possible to have a slope greater than 100% or 45^O (1:1).



Slope								
	Ratio		5:1	3:1	2:1	1.5:1	1:1	>1:1
	Percent	0	20	33	50	67	100	>100
	Degrees	0	11	18	26	34	45	>45 to 90



$$\text{Slope Ratio} = \frac{\text{Rise}}{\text{Run}} = \frac{y}{x}$$

$$\text{Slope Percentage} = \frac{y}{x} \times 100$$

$$\text{Slope Angle}(\theta) = \tan^{-1}\left(\frac{y}{x}\right)$$

CHAPTER XIII

APPENDIX VI

DETAILED MASTERPLAN OF CAPITAL CITY - AMARAVATI

Legend

- Existing Railway Stations
- Capital City Planning Boundary
- Village Administrative Boundaries
- Survey Parcels
- Land mark
- Existing Railway line
- DownTown Road Alignment
- Proposed Bund Alignment
- Existing Bund Road
- Road Network Outside Planning Boundary

Residential

- R1-Village planning zone
- R2-Low density zone
- R3-Medium to high density zone
- R4-High density zone

Commercial

- C1 -Mixed use zone
- C2- General commercial zone
- C3-Neighbourhood centre zone
- C4-Town centre zone
- C5-Regional centre zone
- C6-Central business district zone

Industrial

- I1-Business park zone
- I2-Logistics zone
- I3-Non polluting industry zone

Open Space and Recreation

- P1-Passive zone
- P2-Active zone
- P3-Protected zone
- P3-Protected zone

Institutional Facilities

- S1-Government zone
- S2-Education zone
- S3-Special zone

Infrastructure Reserve

- U1-Reserve zone
- U2- Road reserve zone

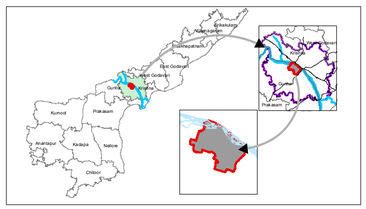
Note:

1) R1 includes all the notified water bodies and they will continue to exist.

2) The Cadastral boundaries and numbers shall be read with revenue records.

3) Draft Detailed Master Plan of Capital city-Amaravati prepared by M/s Surbana Jurong Consultants Pte Ltd, Singapore

KEY MAP :



TITLE :

Detailed Master Plan of Capital city-Amaravati

SCALE: 1:30,000

0 0.5 1 2 3 KM

N W E S

DATE

Assistant Planner	Zonal Assistant Director 2
Zonal Assistant Director 1	Zonal Assistant Director 3
(G. Nageswara Rao) Planning Officer	(R. Ramakrishna Rao) Director - Planning
(V. Prasanna Venkatesh, I.A.S) Additional Commissioner	(Dr. N .Srikant, I.A.S) Commissioner

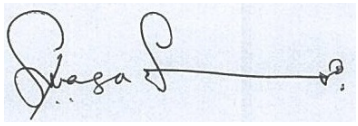
Andhra Pradesh Capital Region Development Authority

Andhra Pradesh Capital Region Development Authority (APCRDA)

Draft prepared by: Surbana Jurong Consultants Pte. Ltd., Singapore

Final Document prepared by:

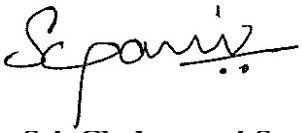
Sri. Jubin Cheeran Roy
Zonal Assistant Director



Smt. Naga Sundari
Zonal Deputy Director

Sri. G. Nageswara Rao
Planning Officer

Checked by:



Sri. Chakrapani S.
Zonal Joint Director

Sri. N.R. Aravind,
Principal Planner, Traffic & Transportation

Verified by:

Sri. Ramudu V.
Director, Development Control

Sri. Ramakrishna Rao
Director, Planning

Approved by:

Sri. V. Prasanna Venkatesh, I.A.S.
Addl. Commissioner (CCP)

Dr. Srikant Nagulapalli, I.A.S.
Commissioner, APCRDA & CA

ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY,
GOVERNORPET, VIJAYAWADA-520002

Lr.No. MAU61-USI0INFR(OTH)/19/2025-IFR1 (C#2828121) Dt: 09-06-2025.

From
Sri. Ch. Dhanunjaya,
Chief Engineer (LPS Infra)
APCRDA, Vijayawada

To
Sri. G.S.S. Praveenchand I.A.S,
Additional Commissioner.
APCRDA, Vijayawada

Sir,

Sub: APCRDA – LPS Infra - ESMU - Reply to the Compliance to Environment Clearance and Hon'ble NGT directions – Conditions to be compiled at city and neighbourhood level – compliance report submitted – Reg

Ref:

1. Proc.No. MAU61-EE0ENV(APCP)/3/2025-CZLE received on Dt. 09.05.2025
2. Note-9 of File no. MAU61-USI0INFR(OTH)/19/2025-IFR1, computer no. 2828121.

** ** **

It is submitted that, in pursuance of the proceedings cited Ref-1, the replies to EC conditions are approved by the Commissioner, APCRDA on 07/06/2025 vide Ref-2 and the same are here with submitted for taking further action.

S.No.	EC Conditions	Replies by LPS Infra
1	Water pumping system and sewage conveyance and treatment systems are energy intensive and as such the proponent shall follow bureau of energy efficiency norms.(Measures taken and included in the BOQ may please be provided in floodworks, STPs, Pumping stations, WTP, WS mains –pumps –also submit the supporting document evidence. The items if not covered shall be included in the Part-B fund and an order in this regard from the Head of the Institution may be provided.)	With regards to the above EC condition, the INFRA wing looking after the STP projects only. The information with respect to the above point is herewith provided. Provision of Variable Frequency Drives, SCADA and Required Power Factor has been included in BOQ of STP facilities as per BEE Guidelines. ***Necessary conditions provided in the bid document are attached in Annexure-1.***
2	The Proponent shall provide continuous online water quality monitoring facilities for WTPs, STPs & up stream drinking water source at Krishna River results of monitoring shall be linked to SPCB/CPCB website. (Measures taken and included in the BOQ may please be provided for the relevant works also submit the supporting	With regards to the above EC Condition, the INFRA wing looking after the STP projects only. The information with respect to the above point is herewith provided. Provision of Continuous Online Water Quality monitoring system has been included

S.No.	EC Conditions	Replies by LPS Infra
	document evidence. The items if not covered shall be included in the Part-B fund and an order in this regard from the Head of the Institution may be provided.)	in BOQ of STP facilities. After commissioning the STP facilities, the results will be linked to SPCB/ CPCB websites. ***The BoQ of STP Package is attached in Annexure-2.***
3	The Proponent shall encourage battery operated vehicles by providing separate lane with a provision for recharging. (Decision taken regarding separate lane recharge infrastructure, items included in the BoQ may be provided for the relevant works- also please submit supporting documents evidence.)	With respect to the above EC Condition, it is to inform that separate lane for battery operated vehicles was not included in the DPRs as the roads taken up by the infra wing is only in LPS layouts and In LPS, there is no provision for recharging of battery vehicles.
5	Develop atleast 5 safe street crossings per Km for bicycles with spacing between two crossing not more than 250 mts. (Details as per plan and BOQ may please be provided with supporting document evidence. The items if not covered shall be included in the Part-B fund and an order in this regard from the Head of the Institution may be provided.)	With regards to the above EC condition, it is to inform that a Lumpsum provision was made in all the estimates towards street furniture. The same will be provided at appropriate time as per site requirement and as per standards. ***A copy of abstract of estimate is attached in Annexure-3.***
6	Proponent shall construct a continuous and obstructed footpath on each side of all streets with RoW wider than 12m .Min. width of footpath shall be 2 m. In addition to space for trees/ Greenary / vending spaces and surface utilities. Width of footpath shall be determine based on pedestrian volume and have to be wider than 2m whenever required. **Intermittent buffers/ bollards and other physical elements should be used to protect foot paths from encroachments by motor vehicle parking. Footpath elevation over the carriage Way at all times should be less than 150 mm. All pedestrian facilities should be barrier free for universal access by all persons with reduced mobility including those hearing and visual impairments for the text in Bold.**- Details as per the plan and BOQ may please be provided with supporting document evidence. The items if not covered shall be included in the Part-B fund and an order in this regard from the Head of the Institution may be provided.	In pursuance of the EC Condition, it is to submit that the width of the footpath was provided at 1.8m on either side of right of way for effective functioning of pedestrian system as per clause 6.1.5.1. of IRC-103-2012 code. ***The extract of IRC- 103-2012 Code is attached in Annexure-4.*** With regards to the road furniture highlighted in the above para, it is to inform that a Lumpsum provision was made in all the estimates towards street furniture. The same will be provided at appropriate time as per site requirement and as per standards. At present, designs & drawings upto utilities are under finalization. The drawings for footpaths i.e. Height of kerb wall will be finalized at a later date. Soon after finalization the drawing will be submitted.

S.No.	EC Conditions	Replies by LPS Infra
7	The proponent shall ensure usage of fly ash for levelling / reclamation of low lying areas, road embankments, for raising platforms in inundated areas, and usage of fly ash based products for construction purpose including fly ash bricks, PPC cement, Concrete etc., in compliance with Fly Ash Notification issued by the MOEF under Environment (Protection) Act.(Details as per BOQ may please be provided with supporting document evidence, item if not covered shall be included in the part B fund and an order in this regard from the Head of the institution may be provided)	In LPS Infra works, it is not proposed for usage of fly ash for structural work. Flyash would be used in the bricks wherever necessary.

Enclosure: Annexure-1,2,3,4

Yours faithfully,

9/6/25

Chief Engineer (LPS Infra)
APCRDA, Vijayawada

09/06/25
FE

Copy Submitted to:

1. The Commissioner APCRDA in favour of information.
2. The Group Director (EnC), USI, APCRDA in favour of information.

Annexure - 1

GOVERNMENT OF ANDHRA PRADESH,

Andhra Pradesh Capital Region Development Authority (APCRDA)

NIT NO: 64/PROC/MAU61-USI0INFR(OTH)/46/2024-IFR1/STP

Name of the Work: **WORLD BANK & ADB financed Amaravati Capital City Development Program related Construction of Sewage Treatment Plants (STPs) in the Zone-1, Zone-2, Zone-3, Zone-5 & Zone-6 including Engineering, Construction, Supply & Installation of Electro-Mechanical Equipment, Testing and Commissioning in Amaravati Capital City, Andhra Pradesh on Lumpsum Contract (% Percentage Tender) & Performance based O&M for a period of 7 Years including DLP of 2 Years.**

ISSUED ON: DD.MM.2025

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Section VI - Works' Requirements

Scope of Works

Name of the Work: WORLD BANK & ADB financed Amaravati Capital City Development Program related Construction of Sewage Treatment Plants (STPs) in the Zone-1, Zone-2, Zone-3, Zone-5 & Zone-6 including Engineering, Construction, Supply & Installation of Electro-Mechanical Equipment, Testing and Commissioning in Amaravati Capital City, Andhra Pradesh on Lumpsum Contract (% Percentage Tender) & Performance based O&M for a period of 7 Years including DLP of 2 Years)

Brief Description of the work:

1) Acronyms:

S. No.	Abbreviation	Full Form
a)	RoW	Right of Way
b)	PCC	Plain Cement Concrete
c)	RCC	Reinforced Cement Concrete
d)	IRC	Indian Road Congress
e)	FRL	Finished Road Level
f)	GFC	Good For Construction
g)	GIS	Geographic Information System
h)	HDPE	High-Density Polyethylene
i)	DWC-PE–SN	Double Wall Corrugated Polyethylene - Stiffness Nominal
j)	IPS	Intermediate Pumping Station
k)	CPHEEO	Central Public Health and Environmental Engineering Organisation
l)	DI	Ductile Iron
m)	ICT	Information and Communications Technology
n)	MORTH	Ministry of Road Transport and Highways
o)	BIS	Bureau of Indian Standards
p)	ISO	International Organization for Standardization
q)	NAC	National Academy of Construction

2) Introduction:

In keeping with the aspiration of the Government of Andhra Pradesh to build the "Peoples' Capital", the land procurement mechanism has been designed to be voluntary and is based on consensual process of land pooling. Land pooling mechanism is mainly adopted for development of the Amaravati Capital City area, wherein, the land parcels owned by individuals or group of Employers are legally consolidated by transfer of ownership rights to the authority, which later transfers the ownership of a part of the land back to the land

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Employers and balance land proposed to be used for undertaking of development of such areas.

The broad objective of the scheme is to provide fair compensation to the land Employers for residential purposes or commercial activities in exchange of pooling of their agriculture lands. This is in sync with the overall vision of Amravati to be a "People's Capital" and involving people in the development process. Accordingly, the Government have issued the "Andhra Pradesh Land Pooling Scheme".

In pursuance of developing the capital city region, APCRDA has decided to prepare a Smart Integrated Infrastructure works encompassing the Capital City of an area of 217 sq. km which also includes the development of Tier-II infrastructure for 17,000 acres of returnable lands under Land Pooling Scheme.

The Development of Construction of Sewage Treatment Plants (STPs) in the Zone-1, Zone-2, Zone-3, Zone-5 & Zone-6 including Engineering, Construction, Supply & Installation of Electro-Mechanical Equipment, Testing and Commissioning in Amaravati Capital City, Andhra Pradesh on Lumpsum Contract (% Percentage Tender) & Performance based O&M for a period of 7 Years including DLP of 2 Years on Lump sum contract (Percentage Tender).

The Summary of scope of the Project Works are enumerated below:

S.No.	Description	Scope
1	Zone-1B (for 1A & 1B) Sewerage Treatment Plant (STP)	14 MLD
2	Zone-2B (for 2A & 2B) Sewerage Treatment Plant (STP)	12 MLD
3	Zone-3B (for 3A & 3B) Sewerage Treatment Plant (STP)	18 MLD
4	Zone-5D (for 5A,5B,5C & 5D Sewerage Treatment Plant (STP)	33 MLD
5	Zone-6 Sewerage Treatment Plant (STP)	13 MLD
	Total	**90 MLD**

The following are the key components to be developed FOR THE PROJECT WORK but are not limited to below:

1) In Amaravati capital city the supply of potable water proposed at 150 LPCD. The sewerage network is designed for the peak factor considering 2.25 based on the size of the population. The Contractor has to design the STPs considering the sewerage generation at 80% of potable water supply as per CPHEEO norms. The STP is proposed to be taken up in modular basis for process of Sewage subject to availability of any quantity lesser than designed Quantity. The standards for the treated sewerage are been bench marked to higher standards both in BOD, N & P nutrients.

2) The tertiary treatment due to mandated reuse of treated sewage for Landscaping,

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horticulture& Agriculture purposes, golf courses, vehicular exterior washing, fire protection, Toilet flushings etc.,

3) The Contractor shall ensure the treatment in accordance with NGT existing norms and as per amended norms in table 7.19 of the manual on Sewage Treatment Systems, 2013 vide D.O Q-12011/9/2023-CPHEEO dt 18.12.2023, Total Nitrogen -10 mg/l and Total Phosphorus 1.0 mg/l, while discharge the treated sewage in to the Water bodies.

4) The STPs are to be designed and equipped with latest state of art technologies either A2O/SBR with IFAS process. Further, the unit shall have systems for disinfection using Chlorination. Effluent monitoring systems shall be installed with data transfer facility.

5) The STPs are to be operated 24X7 with PLC/ SCADA.

6) The Contractor shall carry out the O&M for STPs for a period of 7 years from the date of Completion & Commissioning including Defect liability period for 24 Months strictly in compliance with NGT norms and subsequent amendments and also as per CPHEEO guidelines.

7) The Contractor shall make necessary arrangement for safe disposal of excess treated unutilized sewage into nearest natural water bodies.

8) The Contractor shall carry out detailed soil investigation and geo tech survey vetted from reputed Engineering Colleges/Accredited NABL Laboratory, for the STP Project Work where in , reconfirmation of stability need to be satisfied. The contractor shall evolve economical and cost effective design for such jobs for which the indicative drawings will be furnished. The contractor shall follow relevant CPHEEO/BIS/ISO/ NEC (National Electric Code)/IE rules/CEI (Chief Electrical Inspectorate) to GoAP/EEC/MID-EC/IEC/NBC/NIDM Guide lines/ ECBC norms including all the state of the art Green features applicable for this project and in conformity with best National & International practices. They have to carry out designing and analysis in the latest versions of design software. Analysis using 3D modelling & NAVIS/Revit(BIM)/ other equivalent platform shall be done by the contractor considering the sequence of the utility crossings like storm water, water supply, sewer, power & ICT ducts etc.

9) The Contractor shall get the designs and drawings proof checked by Indian Institute of Technology Chennai/Hyderabad/Mumbai/Delhi Or another accredited consultant, agreed by the Employer (the “Proof Consultant”, the payment to proof consultant shall be done by contractor). The Proof Consultant shall proof check the detailed calculations, drawings and designs, which have been submitted by the contractor. The Contractor shall agree to incorporate any value engineering suggestions made by the PMC/PgMC/Department/Proof Consultant. The contractor thereupon shall prepare good for construction drawings for approval of PMC/Department and works shall be carried out accordingly.

10) The Contractor shall supply the Electrical & Mechanical Equipments from the reputed Manufacturers with a Warranty period of minimum Two (02) Years and further extendable period of another Period of Two (02) Years, if required, at the cost of the Contractor.

11) All the Electrical Equipment & Motors installed at Construction site shall be Energy Efficient conforming to IS Code: 12615:2018.

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12) VFD system should be ensured for Submersible Pumps and the Pumpsets conforming to IS Code: 8034:2002

13) All RCC members of the STP Plant shall be constructed with Sulphate Resistant Cement (SRC) conforming IS Code: 12330:1988

14) All RCC members of the STP Plant shall be constructed with Corrosion Resistance Steel (CRS) Conforming IS Code: 1786: 2008

15) The Levels shown in the flow diagram are indicative. The Contractor shall ensure the Levels while undertaking Design Drawings duly coordination with other stakeholders. To de detailed

16) All Design Parameters of the STPs shall conform the CPHEEO/NGT and other relevant Code of Practices.

17) The Technology for STPs shall be adopted as per A2O/Sequence Batch Reactor (SBR).

BROAD SCOPE OF WORK

1.1 General

Design , Supply, Construction, erection, testing and commissioning of (5 STPs) STPs of 90 MLD capacity (Decentralized) in part of as a part of APCRDA including cost of all associated civil, mechanical, electrical and instrumentation items of work etc., complete including miscellaneous works associated with plant, with Defects Liability warranty period of two years for equipment & instrumentation items from the date of commissioning of the plant on turnkey basis including Manning, operation and maintenance of the plant and assets created for a period of 7 years.

a) Construction of civil engineering works for all the units and all the ancillary structures as detailed in BoQ
b) Supply, erection, testing & commissioning of all the mechanical equipment as detailed in BoQ .
c) Supply, erection, testing & commissioning of all the electrical & instrumentation and PLC /SCADA Automation equipment as detailed in BoQ.
d) Supply, erection, testing & commissioning of all the piping, valves and specials etc. as detailed in BoQ.
e) O&M for 7 years including of 2 yrs DLP.

Hydraulic testing of all the water retaining structures.

Operation & Maintenance of Sewage Treatment Plant during trial run/ start-up/ stabilization for a period of six (6) months or complete stabilization of the plant indicating satisfactory performance of the plant for continuous period of **two** weeks.

Manning, Operation & Maintenance of the plant along with electrical and mechanical equipment for a period of Seven (7) years after stabilization of the plant process.

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During the stabilization period & trial run period electricity charges will be borne by the department.

During the Operation and Maintenance Period after successful stabilization and Trial run period, electricity charges will be borne by the department.

Defect liability for a period of twenty-four (24) months after the completion and commissioning of works i.e. after stabilization period .

Supply of equipment drawings, Technical specification/ Catalogue.

Supply of as built drawings after completion.

Supply of Operation & Maintenance manual including manufacturer manual of the equipment supplied.

1.2 Site Information

The Sewage Treatment Plants (STP), based on Sequential Batch Reactor Process Technology (SBR)/ A2O with IAFS Process/ MBBR Process is proposed to be constructed at various locations (Decentralized) as per below given capacities.

S.No.	Zone	STP Capacity in MLD (Phase - I)
1	Zone 1	14
2	Zone 2	12
3	Zone 3	18
4	Zone 5	33
5	Zone 6	13
	Total	**90**

1.3 Location

The APCRDA, Amaravati - Vijayawada city is situated centrally (Geographically) in the country in Andhra Pradesh State.

1.4 Plant Capacity

Five (5) Nos of STPs of total Capacity 90 MLD capacity sewage treatment plants based on Sequential Batch Reactor Process Technology/ A2O with IFAS Process/ MBBR Process, followed by post chlorination system shall be constructed at various locations with 30% capacities for Tertiary Treatment.

1.5 Treated Sewage Quality

The treated sewage quality of final effluent for which sewage treatment plant is designed and to be guaranteed by the contractor during operation and maintenance period as per NGT norms and APPCB/CPCB norms and discharged to the nearby Rivers/Streams by pipeline conveyance:

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Sl. No	Parameters	After Secondary Treatment	After Tertiary Treatment
1	Ph	5.5 to 9.0	5.5 to 9.0
2	BOD (mg/l)	< 10	< 5
3	COD (mg/l)	<50	< 50
4	TSS (mg/l)	< 10	< 5
5	Fecal Coliform (MPN/100 ml)	NIL	NIL
6	NH4-N (ppm)	< 5	< 5
7	TP(ppm)	< 1	< 1
8	Total Nitrogen (ppm)	<10	<10

Note 1: STPs shall be designed for 100% capacity upto Secondary treatment and 30% of the Capacity shall be pass through Tertiary Treatment to meet the above standards.

SCOPE OF WORK FOR CIVIL WORKS

All the units of STPs at respective locations shall be developed as per approved designs and drawings in accordance with CPHEEO norms / Sewer Manual / IS Codes and its latest amendments

1.6 Various Components of Wet Well / Pumping Station:

The components of the Wet Well / Raw Sewage Pumping Station for the Agency/ Contractor / bidder are as under:

i. Receiving Chamber / Inlet chamber
ii. Coarse Screen channels (1 Mechanical + 1 Manual) of required size with Gates, Mechanical bar screens & conveyor belt etc.
iii. Wet Well / Raw Sewage Pumping Station with Pump header arrangement
iv. Delivery piping & rising main of required size
v. Main Electrical Panel Room of required size with required Instrumentation for auto operation.
vi. Wet well shall be designed for 10 minutes retention time for peak flow with free board of minimum 50 cm to receive the raw sewage below the invert level of raw sewage inlet main.

1.7 Various Components of Sewage Treatment Plant (STP)

i. Fine Screen channel of mechanical & manual, with Gates, Mechanical bar screens & Manual Fine screen with Conveyor belt etc.
ii. Vortex Grit Tank with Gates/Detroiter Tank with Screw classifier, flow distribution system, overflow weir, scraping mechanism, organic return pump and grit washing arrangement.
iii. Raw sewage channel with partial flow.
iv. Sequential Batch Reactor process sludge basins with decanters and Pumps for return sludge and excess sludge withdrawal

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Annexure -2

Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg.Earth Work, Electrical Works..etc (up to 200 Characters)	Item Short Description (Up to 100 Characters)	APSS / Morth Cl. Number (upto 200 Characters)	Rate (INR) (Upto 2 Decimals)	UOM (Up to 50 Characters)	Amount (INR) (Up to 2 Decimals)
	ZONE-1 STP						
	STP SECONDARY TREATMENT						
14.00	Providing, construction, erection, hydraulic testing, commissioning, stabilisation, and giving satisfactory trials of sewage treatment plant consisting of stilling chamber, Screen Chamber, vortex grit removal tanks, Parshall Flume Channel, distribution chamber and biological process either SBR (Sequential Batch Process) basins with decanters (or) A2O with IFAS with Secondary Clarifier, Fine Bubble Diffusers, Air blowers, Sludge sumps, Sludge Pump House, Centrifuge Building, Chlorine contact tank, chlorinator / Tonner Room, sludge centrifuge / Belt press/ Screw Press, necessary piping work with required valves, gates, MCC cum PLC Panel Room, Air blower room, equipments, tools and plants, spare parts, etc., complete as turnkey job with all involved civil works using Sulphate Resistant Cement (SRC), Corrosion Resistant Steel, Electrical and mechanical works, inclusive of following items, units as per detailed specifications for civil, electrical, mechanical and instrumentation & PLC/SCADA Automation components with all duties and taxes etc., complete to achieve BOD < 10 ppm, COD < 50 ppm, PH=5.5 to 9, TSS < 10 ppm, NH4N < 5 ppm and TP < 1 ppm, fecal coliform - NIL) to get recyclable quality of water for industrial / agricultural purposes. Ground improvement works including land reclamation with Pile foundation considering Upliftment pressure for foreshore soils at the water bodies/streams and land stabilization/pile foundation to achieve required bearing capacity, byepass arrangement up to the disposal point as directed by the Engineer-In-charge.	STP Primary & Secondary Tretament	STP Primary & Secondary Tretament	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	1,95,00,000.00	MLD	273000000
0	**(a) Stilling Chamber:** Providing and constructing RCC M30 & CRS steel stilling chamber for the peak flow of 2.25 DWF with 0.5m free Board and 1.2m RCC walkway all around the periphery. Each compartment will have phosphor, bronze, steel gates with extension road, head stock, operating wheels, SS Railing of SS316 grade etc. The work includes providing and making necessary bypass arrangement & to connect the flow to screen chamber by approach channel as directed and as per specifications.			APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	0		
0	**(b) Screen Chamber (6 mm):** Providing, constructing, testing and commissioning of screen chamber, designed peak flow of (2.25 X DWF) in RCC (M-30) & CRS Steel, including inlet pipe/channel from inlet chamber, outlet pipe / channel to Vortex grit tank, free board of 0.5 m minimum, RCC walkway minm 1.2m width with SS Railing of SS316 grade, RCC staircase of 1.2m width from GL to screen chamber with manual Standbye Screens (10 mm openings) with mechanical conveyor systems for the screenings. All the screens shall be of SS 316.			APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	0		
0	**(c) Vortex Grit Tank:** Providing and constructing continuous grit removal tank consisting of two chambers with necessary Grit washer, Screw Classifier & Vortex Propeller drive Motor mechanically operating in auto mode in RCC M30 capable of removing > 95%, 0.15mm size particle and above, having specific gravity 2.65 designed for peak 2.25 DWF with suitable arrangement of separation of grit from putrescible solids. Inlet and outlet channels of required sizes as maybe required to connect the flow to connecting unit etc., complete including hydraulic testing for water tightness of structure having minimum FB of 0. 5m, wash out arrangement to Grit chamber and platform minimum 1.2m wide RCC walkway with SS Railing of SS316 grade shall be provided. The grit from Screw Classifier shall be collected through Chute. A pit for collecting grit conveyed by conveyor shall be provided. All arrangements shall be as detailed specifications and as directed by Engineer-in-Change. The MOC of mechanical equipment shall be SS 316.			APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	0		
0	**(d) Parshall Flume :** Providing, constructing, testing and commissioning of Parshall Flume designed for average 1DWF and maximum peak flow of 2.25 DWF in RCC (M-30) & CRS Steel to measure the flow. All the arrangements shall be as detalied specifications and as directed.			APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	0		
0	**(e-1) SBR Basins:** Providing and constructing in RCC M30 & CRS Steel, two/four SBR basins for biological removal of BOD along with Nitrification, Denitrification, Bio-P removal in compartments to handle combined hydraulic flow of 2.25 DWF incoming flow and recirculation flow including construction of selector compartments and providing 1.2m wide clear approach walkways, expansion joints wherever necessary, including foundations etc as per specifications with F/M ratio - 0.15, MLSS -2000-5000 ppm with ratio of MLVSS to MLSS 0.8, HRT between 12 - 13 hrs & SRT suitable for full fully digested sludge complete with 1 deacnter per basin , minm 2 No. of air blowers working during aeration/ fillling of a basin with 50% standby, fine bubble diffused fixed aeration grid / equipment and FB 0.5m and SWD as required. DO level in basin to be minimum 2 mg/l complete with "Oxygen Uptake Rate" control system and all related instruments Stainless Steel SS 304 decanters and all related actuating gates , valves, Instruments & automation works. The design criteria shall be considered from CPHEEO and to achieve N,P removal HRT shall be 15-18 hrs.			APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	0		
0	**(e-2) A2O with Integrated Fixed film activated sludge Media with Secondary Clarifier:** **IFAS Tanks:** Providing and constructing in RCC M30 & CRS Steel, two/four A2O IFAS basins for biological removal of BOD along with Nitrification, Denitrification, Bio-P removal in Separate Anaerobic & Anoxic, IFAS Aeration tanks to handle combined hydraulic flow of 2.25 DWF incoming flow and recirculation flow including construction of selector compartments and providing 1.2m wide clear approach walkways, expansion joints wherever necessary, including foundations etc as per specifications with Minimum Specific growth Surface area of FAS media: 23 m2/m2, MLSS -3000-8000 ppm with ratio of MLVSS to MLSS 0.8, HRT between 9 – 10.5 hrs & SRT suitable for full fully digested sludge complete, minm 2 No. of air blowers working during aeration with 50% standby, fine bubble diffused fixed aeration grid / equipment and FB 0.5m and SWD as required. DO level in basin to be minimum 2 mg/l complete with "Oxygen Uptake Rate" control system and all related instruments Stainless Steel SS 304 decanters and all related actuating gates , valves, Instruments & automation works. The design criteria shall be considered from CPHEEO. In case FAS technology is designed to achieve N,P removal HRT shall be 9-10.5 hrs. Clarifier / Clarifier with Tube Settler : Designing, providing and constructing in RCC mixed (M :30) with CRS Steel, basins for settling of solids and providing 1.2 m wide clear approach walkways, expansion joints wherever necessary, including foundations, paintings etc as per specifications. and with all other related works/arrangements shall be as as detailed specifications and as directed. All arrangements shall be as detailed specifications and as approved by Engineer-in-charge			APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	0		
0	**(f) Chlorine Contact Tank:** Providing and constructing chlorine contact chamber of adequate capacity to deal with 1 Dry Weather Flow. The chlorine contact tank should be desinged considering the rate of maximum decant flow per cycle and minimum contact time for the decanted flow shall be 30 mins. Chlorine to achieve 99.99% coliform reduction. Chlorine dose shall be maintained as per standard provisions, including designing, providing and constructing water supply provision for chlorination, including providing dewatering and bypass arrangement jointing to final effluent mains and outlet weir etc., complete. The effluent quality should match with the standards laid down by AP state Pollution Control Board and as per obligatory provision and as detailed specification and as directed by Engineer-In-Incharge.			APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	0		

0	**(g) Chlorinator and Chlorinator Room / Tonner Room:** Providing and constructing chlorinators vacuum type 2 Nos, with auto switch over facility and having capacity for dosage of adequate chlorine to ensure 99.99% coliform reduction as per obligatory provisions and detailed specifications with necessary provisions of having chlorinator room of adequate size. The chlorinator equipment shall include cost of chlorine cylinders/tonner, piping, valves, measuring and controlling equipments safety devices, lifting equipments, etc., complete as per IS-10553 (part ii) 1982. The tonner room should have minimum 5 MT capacity crane for loading and unloading facility. Tonner storage should be distinctly isolated and should be for minimum storage as directed in the design specification and as per gas laws 1981 and factory act shall be provided. All other matching amenities shall be provided, 3 MT gantry rail shall be provided for full length of tonner room at minimum 4.5 m height from level of			APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0		
0	**(h) Sludge Sump cum Sludge Pump House:** Providing and constructing of sludge sump and pump house of appropriate size with pumps, Air Blower for Coarse bubble diffuser system and ceiling height minimum of 4.5 m over sump for discharging sludge to centrifuge and recycling of flow for blending of sludge using DI pipe complete as per detailed specification and as directed by Engineer-in-Charge.			APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0		
0	**(I) Sludge Centrifuge Building with Centrifuges / Belt Press / SCrew Press Equipment:** Providing, constructing and installing including foundation etc., sludge centrifuge/Belt press/ Screw Press to handle the flow of 1 day in 20 hours per unit with sludge dewatering unit drain etc., complete as per specification, sludge centrifuges/belt press/ Screw Press equipment with the necessary arrangement as per detailed specification mentioned in tender and obligatory provisions to be provided with satisfactory functioning. All associated ploymer dosing systems shall be provided.			APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0		
0	**(J) Outfall Sewer:** Providing and constructing appropriate outfall sewer of RCC NP3 pipe to discharge treated effluent from outlet chamber (after basin / chlorination tank) including necessary chambers for inspection and cleaning including necessary excavation, dewatering, refilling, concrete encasing / bedding concrete step to reach the nallah bed level, pitching and energy disspation chamber in stream/ nallah portion etc., complete as per the approved plan and as directed by Engineer-in-Charge			APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0		
0	(k) **Piping work** in CI/DI D/F -K9 class for pressure main with HAC lining, including CI/DI Sluice Valves, Reflux Valves, CI Gates, MS Epoxy linining pipe for Air supply, SS down comers, SS pipe for coarse bubble diffusers in selector zones & DWPE dosing for sludge, PVC piping for Coarse bubble diffusers in sludge sump : Providing , laying and jointing pipes other than those already included in the above items for interconnection by pass RCC NP3 pipe/ drains, etc., of all units including adequate numbers of manhole chambers. The item includes excavations, refilling and hydraulic testing of pipes, valves, gates, accessories and cost of jointing materials. The items includes required channels with gates for interconnection of units by pass drains etc., for all units as directed etc., complete as per detailed specifications.			APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0		
0	**(l) Providing Instrumentation and Automation works;** EMF / Ultra sonic Flow meters for Raw Sewage pumping station (RSPS), Raw Sewage Line, Sludge Waste Line, Differential Level Indicators - at RSPS screens, Screens, Level transmitters in RSPS, SBR Tanks/ IFAS Tanks, Sludge Sump, CCT. Pressure transmitters - at RSPS, Air blower discharge Level Switches - for DWPE Dosing Tanks, DO transmitters - for each biological tanks SBR Tanks/ IFAS Tank Pressure gauges, cabling, junction boxes; non redundant PLC panel, cabling trays, earthing, UPS, SCADA, Computers, printers etc. complete for automatic operation and monitoring of the RSPS and Sewage Treatment Plant as per detailed specification and as directed by the Engineer -In-Charge			APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0		
0	**(m) Electrical works:** Providing Motor Control Center, Power & Control Cables, Cable trays/Raceways, junction boxes, earthing, Variable Frequency Drives, Air Blowers, Ligthtning arrestors, STP area lighting indoor & Outdoor for all STP components etc., receptacles as required complete as directed by the Engineer -In-Charge			APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0		
0	**(n) MCC cum PLC Panel /STP SCADA Building:** Providing and construction of MCC and Control Room building. This shall be a building having adequate carpet area and complete as per specifications including necessary excavation, suitable foundation, RCC M20 framed structure Brick masonry, 20mm thick internal and external plastering of CM (1:3), Aluminium/ UPVC Doors, Windows with glass panels, vitrified tile flooring and skirting and all other allied items, fixtures fastening electrification arrangement, water supply arrangement etc complete. The building should have beautification, comminication systems like mobiles phones, Internet with Router arrangement.			APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0		
0	**(O) Air Blower Room :** Providing and construction of Air Blower Room. The height of the Building shall be as per vendor recomendation for lifting the Blowers & Motors. These shall be buildings having minimum adequate carpet area and complete as per specifications including necessary excavation, suitable foundation, RCC M20 framed structure Brick masonry, 20mm thick internal and external plastering of CM (1:3), Aluminium/UPVC Doors, Windows with glass panels, vitrified tile flooring and skirting and all other allied items, fixtures fastening electrification arrangement etc complete. Lifting arrangement			APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0		
	STP Tertiary Tretament						
5.00	Supply, Errection & Commissioning of Tertiary Treatment with Disc Cloth Filter as approved by the Engineer-in-charge of the work for STP including Civil works shall be with M30 Concrete with SRC cement & CRS Steel for Disc cloth filter tank & Bypass Channel and electromechanical equipment for backwash requirement, instrumentation with control panel,Cable Tray, necessary piping & Valves etc, Complete to meet the Peak demand as per approved designs, specifications and drawings to meet the TSS NGT norms.	STP Tertiary Tretament	STP Tertiary Tretament	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	40,00,000.00	MLD	20000000

0	Technical Details of Disc Cloth Filters Application - Tertiary Treatment Design Flow : to meet the Biological basin Design Peak Factor - 2.25 Average inlet TSS - 15 ppm, Peak inlet TSS - 20 ppm Outlet TSS from Disc cloth filter - < 5 mg/l Nominal Filtration rating - 5 Micron Submergence of Discs - 100%, out to in flow type Max filtration area per Disc - 5 m2 Max Disc Dia - 2100 mm MOC of Filter Cloth - Pile Type Cloth Type of Filtration - Gravity No of Units Working - 2 Nos. Standby - NA Total No. - 2 Nos. Disc Cloth Filters Civil works with "M30 Concrete including Earth Work, PCC, Plastering, necessary walks ways, SS hand rails, staircases for tank approaches, Backwash pumps/ motors, Piping connections, Electrical works including panels, cables, instrumentation & automation etc., complete to achieve outletlet parameters BOD< 5 ppm and TSS < 5ppm.	STP Tertiary Tretament	STP Tertiary Tretament	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	0	0	0
	Receiving Chamber						
1,364.76	Earthwork excavation in all type of soils including ordinary rock by mechanical means **upto 3mts** depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork by mechanical means upto 3mts depth	Earthwork	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	133.77	Cum	182563.95
908.78	Earthwork excavation in all type of soils including ordinary rock by mechanical means **3 to 6 mts** depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork by mechanical means 3mts to 6mts depth	Earthwork	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	152.88	Cum	138934.29
54.60	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - **Raft**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	7926.42	Cum	432782.53
84.78	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - **Side wall concrete-Long side (1.0 m Thick)**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	10190.28	Cum	863931.94
54.95	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - **Side wall concrete-Short side (1.0 m Thick)**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	10190.28	Cum	559955.89
8.87	Supply and placing of the Design Mix Concrete PCC M20 corresponding to IS 456 using WEIGH BATCHER / MIXER with 40mm size graded machine crushed hard granite metal (coarse aggregate) from approved quarry including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water etc., to site and including Seigniorage charges, sales & other taxes on all materials including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc.,complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402)with minimum cement content as per IS code from standard suppliers approved by the department including pumping, centering, shuttering, laying concrete, vibrating, curing etc. complete but excluding cost of steel and its fabrication charges for finished item of work.	Design Mix Concrete PCC M20	Design Mix Concrete PCC M20	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	6004.98	Cum	53264.17
23,319.60	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars **Fe - 500/500D/550 grade** as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size,tying,lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars,binding wire, cover blocks all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	Steel	Steel	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	91.45	Kg	2132577.42
89.00	Supply, delivery and fixing of **PVC water stopper 310 mm width** finished item of work as directed by Engineer-in-charge	PVC water stopper	PVC water stopper	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	519.22	Rmt	46210.58
2,400.00	Bailing out water from the pipe line trenches with oil engine driven pumpsets, including hire charges, fuel charges and wages for Driver and Helper complete Finished item of work as directed by Engineer-in-charge	De-watering	De-watering	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	72.21	Hp-Hr	173304
69.00	Providing, fabricating and fixing in position permanent Stainless steel supports as per details including cost of all materials, machinery, labour, cutting, bending, welding, grinding, lighting, ventilation, drainage and all other ancillary operations etc., complete with initial lead upto 1 km and all lifts as per drawing to the finished item of work as directed by Engineer-in-Charge	Stainless Steel Structural steel work	Stainless Steel Structural steel work	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	784.51	Kg	54131.19
23.17	Manufacture supply transportation and fixing of encapsulated plastic steps for man holes anywhere in A.P. as per company's standard specification including cost of materials packing as per company's standards, loading, transportation, unloading and stacking at site of work etc, complete and as directed by the Engineer-in-charge.	Encapsulated plastic steps for man holes	Encapsulated plastic steps for man holes	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	188.60	Each	4369.86
108.33	Painting by providing solvent free epoxy resin primer for protective coatings – Procoat SNC or Zoriprime EPF or Equivalent (Coverage : 3 Kg unit covers about 13m2 for DFT of about 120 micron.)- in three coats for inside of the water tank including cost and conveyance of all materials and labour charges for painting, curing etc complete for finished item of work for Internal walls & Ceiling and as directed by Engineer-in-charge.	Epoxy Resin Primer for Protective Coating	Epoxy Resin Primer for Protective Coating	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	258.85	Sqm	28041.22
	Rising Main From SPS to STP Inlet Chamber						

50.00	Manufature, Supply and delivery of **500 mm nominal dia Centrifugally Cast (Spun) Ductile Iron Pressure pipes with Flanged (welded) End** for Water, Gas and Sewerage confirming to IS: 8329/2000 for classification K9 with cement mortor lining inside the pipes with outside zinc coating, including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge	DI Pipes	DI Pipes	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	37550.49	Rmt	1877524.5
500.00	Manufature, Supply and Delivery of Centrifugal Cast (spun) **Ductile Iron fittings -PN16 Upto 500 mm dia** size suitable for DI K7 pipes conforming to IS: 9523/2000 having dimensions as per BIS, with zinc coating externally and inside mortar lining (with finishing as per clause 13/IS9523/2000) including transportation to site, unloading & stacking and as directed by the Engineer - in - charge	DI Fittings	DI Fittings	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	154.02	Kg	77010
60.00	Jointing with **Upto 500mm dia Double flanged pipe** for valves including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete as directed by Engineer -in-Charge (Reference to specifications. BIS No.3114/1994). -	Jointing of DI Flanged Pipes	Jointing of DI Flanged Pipes	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	2704.30	Nos	162258

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	Coarse Screen Chamber						
1,945.23	Earthwork excavation in all type of soils including ordinary rock by mechanical means **upto 3mts depth** for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork by mechanical means upto 3mts depth	Earthwork	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	133.77	Cum	260213.42
1,130.19	Earthwork excavation in all type of soils including ordinary rock by mechanical means **3 to 6 mts depth** for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork by mechanical means 3mts to 6mts depth	Earthwork	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	152.88	Cum	172783.45
628.17	Earthwork excavation in all type of soils including ordinary rock by mechanical means **Above 6 mts** depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork by mechanical means 6mts to 9mts depth	Earthwork	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	188.92	Cum	118673.88
48.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - **Raft**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	7926.42	Cum	380468.16
170.10	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - **Side Wall (Long & Short side) 1.0 m Thick**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	10190.28	Cum	1733366.63
2.810	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - **Staircase**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	10190.28	Cum	28634.69
7.84	Supply and placing of the Design Mix Concrete PCC M20 corresponding to IS 456 using WEIGH BATCHER / MIXER with 40mm size graded machine crushed hard granite metal (coarse aggregate) from approved quarry including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water etc., to site and including Seigniorage charges, sales & other taxes on all materials including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc.,complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402)with minimum cement content as per IS code from standard suppliers approved by the department including pumping, centering, shuttering, laying concrete, vibrating, curing etc. complete but excluding cost of steel and its fabrication charges for finished item of work.	Design Mix Concrete PCC M20	Design Mix Concrete PCC M20	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	6004.98	Cum	47079.04
26,509.00	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars Fe - 500/500D/550 grade as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size,tying,lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars,binding wire, cover blocks all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	Steel	Steel	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	91.45	Kg	2424248.05
80.00	Supply, delivery and fixing of **PVC water stopper 310 mm width** finished item of work as directed by Engineer-in-charge	PVC water stopper	PVC water stopper	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	519.22	Rmt	41537.6
2,400.00	Bailing out water from the pipe line trenches with oil engine driven pumpsets, including hire charges, fuel charges and wages for Driver and Helper complete Finished item of work as directed by Engineer-in-charge	De-watering	De-watering	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	72.21	Hp-Hr	173304
80.00	Providing, fabricating and fixing in position permanent Stainless steel supports as per details including cost of all materials, machinery, labour, cutting, bending, welding, grinding, lighting, ventilation, drainage and all other ancillary operations etc., complete with initial lead upto 1 km and all lifts as per drawing to the finished item of work as directed by Engineer-in-Charge	Stainless Steel Structural steel work	Stainless Steel Structural steel work	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	784.51	Kgs	62760.8
21.00	Manufacture supply transportation and fixing of encapsulated plastic steps for man holes anywhere in A.P. as per company's standard specification including cost of materials packing as per company's standards, loading, transportation, unloading and stacking at site of work etc, complete and as directed by the Engineer-in-charge.	Encapsulated plastic steps for man holes	Encapsulated plastic steps for man holes	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	188.60	Each	3960.6
156.00	Painting by providing solvent free epoxy resin primer for protective coatings – Procoat SNC or Zoriprime EPF or Equivalent (Coverage : 3 Kg unit covers about 13m2 for DFT of about 120 micron.)- in three coats for inside of the water tank including cost and conveyance of all materials and labour charges for painting, curing etc complete for finished item of work for Internal walls & Ceiling and as directed by Engineer-in-charge.	Epoxy Resin Primer for Protective Coating	Epoxy Resin Primer for Protective Coating	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	258.85	Sqm	40380.6
	Raw Sewage Sump						
398.86	Earthwork excavation in all type of soils including ordinary rock by mechanical means **upto 3mts depth** for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	Earthwork	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	133.77	Cum	53355.5
3,635.36	Supply, delivery, fabrication and erection of Cutting toe for Well curb with ISA 150x150x12mm including cost and conveyance to work spot including all labour charges for fabrication and erection etc.,complete as directed by the departmental authorities.	Erection of Cutting toe for Well curb	Erection of Cutting toe for Well curb	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	121.49	Kg	441659.89
2.00	Sinking of RCC 13.0 m dia well in sandy soils, soft disintegrated rock, loamy and clayey soils etc; under water by manual or mechanical means including dewatering until the completion of sinking of the well to the required depth, the dummies of the weep holes pipes are opened for seepage of water into well, including all hire charges complete as per SS and as directed by the departmental officers (Open well excavation) **Upto 2m Depth**	Well Sinking - 13m Dia **Upto 2m Depth**	Well Sinking	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	90106.08	Rmt	180212.16

2.00	Sinking of RCC 13.0 m dia well in sandy soils, soft disintegrated rock, loamy and clayey soils etc; under water by manual or mechanical means including dewatering until the completion of sinking of the well to the required depth, the dummies of the weep holes pipes are opened for seepage of water into well, including all hire charges complete as per SS and as directed by the departmental officers (Open well excavation) **2m to 4m Depth**	Well Sinking - 13m Dia **2m to 4m Depth**	Well Sinking	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	291888.44	Rmt	583776.88
2.00	Sinking of RCC 13.0 m dia well in sandy soils, soft disintegrated rock, loamy and clayey soils etc; under water by manual or mechanical means including dewatering until the completion of sinking of the well to the required depth, the dummies of the weep holes pipes are opened for seepage of water into well, including all hire charges complete as per SS and as directed by the departmental officers (Open well excavation) **4m to 6m Depth**	Well Sinking - 13m Dia **4m to 6m Depth**	Well Sinking	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	420302.73	Rmt	840605.46
2.00	Sinking of RCC 13.0 m dia well in sandy soils, soft disintegrated rock, loamy and clayey soils etc; under water by manual or mechanical means including dewatering until the completion of sinking of the well to the required depth, the dummies of the weep holes pipes are opened for seepage of water into well, including all hire charges complete as per SS and as directed by the departmental officers (Open well excavation) **6m to 8m Depth**	Well Sinking - 13m Dia **6m to 8m Depth**	Well Sinking	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	563564.78	Rmt	1127129.56
2.00	Sinking of RCC 13.0 m dia well in sandy soils, soft disintegrated rock, loamy and clayey soils etc; under water by manual or mechanical means including dewatering until the completion of sinking of the well to the required depth, the dummies of the weep holes pipes are opened for seepage of water into well, including all hire charges complete as per SS and as directed by the departmental officers (Open well excavation) **8m to 10m Depth**	Well Sinking - 13m Dia **8m to 10m Depth**	Well Sinking	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	680633.70	Rmt	1361267.4
1.30	Sinking of RCC 13.0 m dia well in sandy soils, soft disintegrated rock, loamy and clayey soils etc; under water by manual or mechanical means including dewatering until the completion of sinking of the well to the required depth, the dummies of the weep holes pipes are opened for seepage of water into well, including all hire charges complete as per SS and as directed by the departmental officers (Open well excavation) **10m to 12.85m Depth**	Well Sinking - 13m Dia **10m to 12.85m Depth**	Well Sinking	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	1178094.04	Rmt	1531522.25
15.22	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - **Well Curb Traingular (Average 1.0 m Thick)**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	10190.28	Cum	155096.06
680.94	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - **Well Steining (0.75m Thick)**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	10562.18	Cum	7192210.85
146.68	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - **Bottom Raft, Pedestals for Pump & Transformer**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	7926.42	Cum	1162647.29
47.51	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - **Top Floor Slab - 0.3m Thick**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	7686.00	Cum	365161.86
228.10	Supply and placing of the Design Mix Concrete PCC M20 corresponding to IS 456 using WEIGH BATCHER / MIXER with 40mm size graded machine crushed hard granite metal (coarse aggregate) from approved quarry including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water etc., to site and including Seigniorage charges, sales & other taxes on all materials including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc.,complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402)with minimum cement content as per IS code from standard suppliers approved by the department including pumping, centering, shuttering, laying concrete, vibrating, curing etc. complete but excluding cost of steel and its fabrication charges for finished item of work.	Design Mix Concrete PCC M20	Design Mix Concrete PCC M20	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	6004.98	Cum	1369735.94
1,11,292.00	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars Fe - 500/500D/550 grade as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size,tying,lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars,binding wire, cover blocks all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	Steel	Steel	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	91.45	Kg	10177653.4
3.60	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - **Columns**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	12239.90	Cum	44063.64
5.54	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - **Roof Beams**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	10563.08	Cum	58519.46

27.94	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - **Roof Slab - 0.15m Thick**	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	9480.70	Cum	264890.76
56.00	Providing brick work of 230mm thick in CM (1:6) prop., with traditional size 23 x 11 x 7 cms or Equivalent Size using common burnt clay bricks of class as per Table-1 of IS:1077-1992 Non-Modular or traditional size , including cost & conveyance of all material and labour charges, hire and operational charges etc., centering & scafolding charges etc., complete as per APSS No.501 and directed by engineer-in-charge.	Brick work	Brick work	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	8865.13	Cum	496447.28
612.00	Plastering with CM (1:3) prop., 12 mm thick, with sponge finishing including cost and conveyance of all materials to site, tools and plants, labour charges, leads, lifts, curing, scaffolding and all other incidental and operational charges etc., complete for finished item of work	Plastering	Plastering	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	465.90	Sqm	285130.8
357.00	Supply, delivery and fixing of **PVC water stopper 310 mm width** finished item of work as directed by Engineer-in-charge	PVC water stopper	PVC water stopper	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	519.22	Rmt	185361.54
186.00	Plastering with CM (1:3) prop., 20 mm thick, with sponge finishing including cost and conveyance of all materials to site, tools and plants, labour charges, leads, lifts, curing, scaffolding and all other incidental and operational charges etc., complete for finished item of work	Plastering	Plastering	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	484.60	Sqm	90135.6
1,179.00	Painting by providing solvent free epoxy resin primer for protective coatings – Procoat SNC or Zoriprime EPF or Equivalent (Coverage : 3 Kg unit covers about 13m2 for DFT of about 120 micron.)- in three coats for inside of the water tank including cost and conveyance of all materials and labour charges for painting, curing etc complete for finished item of work for Internal walls & Ceiling and as directed by Engineer-in-charge.	Epoxy Resin Primer for Protective Coating	Epoxy Resin Primer for Protective Coating	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	258.85	Sqm	305184.15
5.00	Supply & fixing of Rolling shutter made of 80 x 1.25 mm machine rolled CRCA laths, interlocked together through their entire length and jointed together at the ends by end-locks, mounted on specially designed pipe shaft of 50mm dia nominal bore MS B class pipe with brackets, plates, guide channels, stoppers, bottom locking plates and arrangements for inside & outside locking with push-pull operations including cost of hood cover and springs complete, painted with one coat of approved steel primer, locks, ball bearings, all accessories etc complete for finished item of work as per special spn: 1108 (BMT-F.29)	Rolling Shutter	Rolling Shutter	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	5091.09	Sqm	25455.45
6.00	Supply and fixing of pre-painted steel windows & top hung and fixed louvered ventilators made of pre - painted steel (base steel as per IS 513 of -0.58 mm thick 'D" quality, galvanized as per IS 277 with zinc of 120 GSM) primer coated with epoxy primer of 5-7 microns thick, finish painted with a polyester paint of 12-16 microns thick and back coated with 5-7 microns thick alkyd backer, section for outer frame of 46 x 52 mm section and for shutter of 46 x 46 mm section for mullion 46 x 70 mm, and section for beading should be 18 x 25 mm and section for louvered ventilation of 33 x 56 mm Box section and the windows panelled with 5 mm thick plain float glass & 4 mm pinhead glass for ventilators with Ethyl propylene Diamine monomer Gasket (EPDM) and the sections cut to length mitre joined with corner brocket centre mullions fixed using mullion cap and with handle made of high grade aluminium powder coated and nylon receiver, corner brackets made of CRCA with Zinc Phosphate, Mullion caps made of glass filled nylon, frames fixed to the concrete /masonry wall by means of self expanding screws including 10 mm square guard bars with 6" pitch complete for finished item of work. Windows: Double shutter 4'-0" x 4 '-0" (1219.2x1219.2mm) outer frame section size of 46 x 52 mm shutter frame section size of 46 x 46 mm Mullion section size of 46 x 70 mm.	Windows	Windows	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	7579.26	Sqm	45475.56
25.00	Supply, transportation & installation of following sizes of **Hot Dipped Galvanized Iron ladder type cable trays 600x75x2mm** with rungs at span of 250 mm including horizontal and vertical bends, reducers tees, cross members and other accessories as required and duly suspended from the ceiling/wall with suspenders and etc., complete	Hot Dipped Galvanized Iron ladder type cable trays 600x75x2mm	Hot Dipped Galvanized Iron ladder type cable trays 600x75x2mm	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	1270.22	Rmt	31755.5
48.00	Supply, delivery and fixing of 110mm dia single socket PVC pipes 4 kg/sqcm prince/Sudhakar or any ISI brand for rain water pipes with clamps	110mm dia single socket PVC pipes 4 kg/sqcm	110mm dia single socket PVC pipes 4 kg/sqcm	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	326.73	Rmt	15683.04
1,520.00	Manufacture supply delivery of 800 mm RCC NP3 class pipes conforming to BIS-458/2003 including perforatation charges, cost of rubber rings, transportation including cost and conveyance of all meterials and all taxes, duties and all labour charges for laying and jointing etc., complete	RCC Pipe	RCC Pipe	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	8696.07	Rmt	13218026.4
1,520.00	Lowering & Jointing the RCC S/S pipes carefully into the trenches laying them true to alignment and gradient, jointing with rubber rings and testing including filling with water with a water lead upto 500 meters including cost of rubber rings as per BIS No. 783/1985. 800mm Dia	RCC Pipe Laying & Jointing	RCC Pipe Laying & Jointing	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	648.74	Rmt	986084.8
1,000.00	Manufacture supply delivery of 1000 mm RCC NP3 class pipes conforming to BIS-458/2003 including perforatation charges, cost of rubber rings, transportation including cost and conveyance of all meterials and all taxes, duties and all labour charges for laying and jointing etc., complete	RCC Pipe	RCC Pipe	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	11133.02	Rmt	11133020
1,000.00	Lowering & Jointing the RCC S/S pipes carefully into the trenches laying them true to alignment and gradient, jointing with rubber rings and testing including filling with water with a water lead upto 500 meters including cost of rubber rings as per BIS No. 783/1985. 800mm Dia	RCC Pipe Laying & Jointing	RCC Pipe Laying & Jointing	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	931.64	Rmt	931640
	Mechanical Works						
1.00	Providing, supplying, erecting, testing and commissioning of Manual raked coarse bar J-type screen with bar sizing of 50mm wide x 10mm thick and having 20mm clear gap between screen bar of SS 316L with screenings collection trolley. . Size 7000mm Length channel 1000mm width x 1500mm SWD + 500 mm Free Board (total depth 8.18m)	Manual Raked Coarse Bar	Manual Raked Coarse Bar	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	2,13,000.00	Nos	213000
1.00	Providing, supplying, erecting, testing and commissioning of Mechanical multi rake coarse bar screen with bar sizing of 50mm wide x 10mm thick and having 20mm clear gap between screen bar of SS 316L.. Size 7000mm Length channel 1000mm width x 1500mm SWD + 500 mm Free Board (total depth 8.18m)	Mechanical Multi Rake Coarse Bar Screen	Mechanical Multi Rake Coarse Bar Screen	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	18,29,000.00	Nos	1829000
2.00	Providing, supplying, erecting, testing and commissioning of differential level sensor	differential level sensor	differential level sensor	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0.00	Nos	0
1.00	Providing, supplying, erecting, testing and commisioning of Belt conveyor to transfer screening from mechanical bar screen to screenings collection trolley.	Belt Conveyor	Belt Conveyor	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0.00	Nos	0
2.00	Cast Iron Wall thimble mounted sluice gate of size 1000x 1000mm suitable for 5m seating and 5 m unseating water head from CL of gate, having 6mCL-PL distance manual operated ,FBC type, rising type spindle , platform operated.	SS Sluice Gate	SS Sluice Gate	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	4,88,000.00	Nos	976000
2.00	Supply & Fixing of 18" (450mm) ISI, 900 RPM Heavy duty exhaust fan with metallic blades with ISI Mark. Makes: As per list of recommended brands.	Ventilation Fans	Ventilation Fans	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	5,602.36	Nos	11204.72

2.00	Supply and fixing of Co2 type Fire Extinguishers 4.5 Kg capacity confirming to IS 2878 made from ISI marked steam less cylinder confirming to IS:7285 & CE certified and fitted with ISI marked controlled valve confirming to IS:3224, high pressure 1 Mtr discharge hose & horn complete with initial gas charged with carrying handle with wheels and wall mounting bracket. Squeeze lever discharge, used un-used indicator, epoxy coated paint (Red) with 93% gloss with 2 years warranty including transportation, all taxes and all labour charges etc complete.	CO2 Type Portable Fire Extinguisher	CO2 Type Portable Fire Extinguisher	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	16,279.89	Nos	32559.78
	Pumps & Electrical Works & Instrumentation						
2.00	Providing, erecting, testing and commissioning of non clog sewage submersible pump with SS CF8 M Impellar, CI casing, SS 410 shaft suitable for 3 Phase 415V, 50 Hz, AC supply, submersible motor having TEFC enclosure with class F insulation and IP 68 protection. The scope shall include all required accessories viz, auotmatic coupling device, guide pipe, chain with shakle, flat submersible cable upto starter panel through suitable size GI pipe with necessary electrical connection with the starter panel and as per specification. Submersible Pump with 55 kW motor , inclusive of startup and commissioning spares Solids handling capacity of 50mm. - 650 to 667 m3/hr @ 10 to 16m head	Submersible Pump - 650 to 667 m3/hr @ 10 to 16m head	Submersible Pump	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	524313.00	Nos	1048626
2.00	Providing, erecting, testing and commissioning of non clog sewage submersible pump with SS CF8 M Impellar, CI casing, SS 410 shaft suitable for 3 Phase 415V, 50 Hz, AC supply, submersible motor having TEFC enclosure with class F insulation and IP 68 protection. The scope shall include all required accessories viz, auotmatic coupling device, guide pipe, chain with shakle, flat submersible cable upto starter panel through suitable size GI pipe with necessary electrical connection with the starter panel and as per specification. Submersible Pump with 55 kW motor , inclusive of startup and commissioning spares Solids handling capacity of 50mm. - 328 to 330 m3/hr @ 10 to 16 m head	Submersible Pump - 328 to 330 m3/hr @ 10 to 16 m head	Submersible Pump	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	254515.00	Nos	509030
2.00	Supply, Delivery of 500mm dia D.I double flanged Sluice Valves (Scour) PN-1.6(MPa) Resilient seated soft sealing gate valves (Sluice valves) with body bonnet of ductile cast iron of grade GGG40/ SG400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO, transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work as directed by the Engineer - in - charge.	Scour Valve	Scour Valve	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	287502.76	Nos	575005.52
2.00	Supply, Delivery of 350 mm dia D.I double flanged Sluice Valves (Scour) PN-1.6(MPa) Resilient seated soft sealing gate valves (Sluice valves) with body bonnet of ductile cast iron of grade GGG40/ SG400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO, transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work as directed by the Engineer - in - charge.	Scour Valve	Scour Valve	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	117774.73	Nos	235549.46
2.00	Supply, Delivery of 250mm dia D.I double flanged Sluice Valves (Scour) PN-1.6(MPa) Resilient seated soft sealing gate valves (Sluice valves) with body bonnet of ductile cast iron of grade GGG40/ SG400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO, transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work as directed by the Engineer - in - charge.	Scour Valve	Scour Valve	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	45600.80	Nos	91201.6
2.00	Supply delivery of 350mm dia PN 1.6 (Mpa) Double Flanged Slant seat Swing Check Valve (NRV) with body and Disc of Ductile Iron GGG-40/SG-400/15 or GGG-50/SG-500/7 or Equivalent as per IS1865, IS:3896-2 with fully encapsulated in RAL 5005 with Min. Coating thickness of 250powder coating inside and outside color Bluerubber & Fusion bonded Electro Static epoxyVulcanized EPDM microns. The EPDM rubber & Epoxy rubber & Epoxy powder should conform to W 270 standards (Drinking water application) and face to face dimensions as per EN 558-1 / DIN 3202-F6 / IS 5312 & Flange connections as per IS:1538 and including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge for isolated valves	Swing Check Valve	Swing Check Valve	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	117774.73	Nos	235549.46
2.00	Supply delivery of 250mm dia PN 1.6 (Mpa) Double Flanged Slant seat Swing Check Valve (NRV) with body and Disc of Ductile Iron GGG-40/SG-400/15 or GGG-50/SG-500/7 or Equivalent as per IS1865, IS:3896-2 with fully encapsulated in RAL 5005 with Min. Coating thickness of 250powder coating inside and outside color Bluerubber & Fusion bonded Electro Static epoxyVulcanized EPDM microns. The EPDM rubber & Epoxy rubber & Epoxy powder should conform to W 270 standards (Drinking water application) and face to face dimensions as per EN 558-1 / DIN 3202-F6 / IS 5312 & Flange connections as per IS:1538 and including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge for isolated valves	Swing Check Valve	Swing Check Valve	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	65284.60	Nos	130569.2
2.00	Dismantling joint- Providing, supplying, lowering, laying and jointing in position Dismantling joint of **350mm dia** including cost of all labour, jointing material, including nut bolts and giving satisfactory hydraulic testing etc. complete.	Dismantling Joint MS	Dismantling Joint - MS	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	71320.96	Nos	142641.92
2.00	Dismantling joint- Providing, supplying, lowering, laying and jointing in position Dismantling joint of **250mm dia** including cost of all labour, jointing material, including nut bolts and giving satisfactory hydraulic testing etc. complete.	Dismantling Joint CI	Dismantling Joint - CI	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	19688.57	Nos	39377.14
10.00	Centrifugally cast (Spun) 500 mm Dia Ductile Iron pressure pies with flanged (welded) ends for water, gas, sewage conforming to IS: 8329/2000 in standard working lengths of 1 mt for classification K9 with cement mortar lining inside the pipes with outside zinc coating. Rates are ex-factory, excluding transportation, taxes & duties.	DI Pipes	DI Pipes	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	11436.85	Rmt	114368.5
20.00	Centrifugally cast (Spun) 350 mm Dia Ductile Iron pressure pies with flanged (welded) ends for water, gas, sewage conforming to IS: 8329/2000 in standard working lengths of 1 mt for classification K9 with cement mortar lining inside the pipes with outside zinc coating. Rates are ex-factory, excluding transportation, taxes & duties.	DI Pipes	DI Pipes	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	6897.43	Rmt	137948.6
20.00	Centrifugally cast (Spun) 250 mm Dia Ductile Iron pressure pies with flanged (welded) ends for water, gas, sewage conforming to IS: 8329/2000 in standard working lengths of 1 mt for classification K9 with cement mortar lining inside the pipes with outside zinc coating. Rates are ex-factory, excluding transportation, taxes & duties.	DI Pipes	DI Pipes	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	4286.68	Rmt	85733.6
675.00	Centrifugally Cast(spun) Ductile Iron fittings confirming to IS: 9523/2000 having dimensions as per table, such as and transportation to site of work, complete as the directions of the Departmental authorities Upto 500mm dia	DI Fittings	DI Fittings	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	154.02	Kg	103963.5
1.00	Providing Chain pulley block 2 Ton with triple gear arrangement, lifting hook, load chain & hand chain & locking device with necessary mounting girder / structure, spur gear travelling trolley & all accessories	Chain Pully Block	Chain Pully Block	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	36900.00	Nos	36900
1.00	Supply installation testing of 3 phase 415 V 4 wire free standing In doortype Floor mounted MCC made out of 14/16 SWG MS sheet after seventank process and painting with epoxy powder coating including allswitchgear as given below. With Suitable rating TPN Al bus bar (at therating of 0.8/sqmm) supported as specified and consisting of theswitchgear as mentioned below. The size of all panel mounting meters 160A TP MCCB as Incomer 1No. Digital Metering AVF with C.T. 200/5A 1 Set. I lamps 3 Nos. 63A TP MCCB - 1N for Lighting and power load, 63A TP MCCB - 4No,MNX 25A Cont -1No, 20-33A OLR -1No, I Lamps -4Nos, Push Buttons - 2Nos, for 10HP Starter 2 Set & 15 Starter 2Set	MCC Panel	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	145000	No	145000

50.00	Supply & Transportation of 1RX35 Sqmm 3.5 Core XLPE insulated, 1100V grade armoured aluminium cable as per specification confirming to IS:7098 (Part - I) and as directed by engineer-in-charge. (Transformer to PCC Panel)	Supply & Transportation of 1RX35 Sqmm 3.5 Core XLPE insulated, 1100V grade armoured aluminium cable	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	348.00	Rmt	17400
2.00	Supply and Fixing of single compression brass cable glands for 3.5 core XLPE armoured cable from 25 Sqmm to 50 Sq.mm with brass washers complete. (Transformer to PCC Panel)	single compression brass cable glands for 3.5 core XLPE armoured cable from 25 Sqmm to 50 Sq.mm	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	207.00	No	414
6.00	Supply and fixing of crimping type aluminium lugs lugs confirming to I.S specifications for cable of 35 Sq.mm including nuts and bolts with connections. (Transformer to PCC Panel)	crimping type aluminium lugs lugs confirming to I.S specifications for cable of 35 Sq.mm	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	44.31	No	265.86
60.00	Supply & Transportation of 3CX 6 Sqmm 3 Core XLPE insulated, 1100V grade armoured alluminium cable as per specification confirming to IS:7098 (Part – I) (PCC Panel to motors)	3CX 6 Sqmm 3 Core XLPE insulated, 1100V grade armoured alluminium cable	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	256.00	Rmt	15360
12.00	Supply and Fixing of single compression brass cable glands for 3 core XLPE armoured cable from 15 mm to 17 mm dia with brass washers complete. (PCC Panel to Motor)	single compression brass cable glands for 3 core XLPE armoured cable from 15 mm to 17 mm	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	56.00	No	672
24.00	Supply and fixing of crimping type aluminium lugs confirming to I.S specifications for cable upto 16 Sq.mm including nuts and bolts with connections (PCC Panel to motors)	crimping type aluminium lugs confirming to I.S specifications for cable upto 16 Sq.mm	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	13.63	No	327.12
30.00	Supply, transportation & installation of 100mm x 50mm x 1.6mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees, cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete.	100mm x 50mm x 1.6mm of Hot Dipped Galvanized Iron perforated cable trays	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	423.78	Rmt	12713.4
4.00	Providing independent earthing for Important equipment with 40mm dia 'B' class 2.5m long G.I pipe and 19mm dia 'B' class G.I pipe of 3 Mtr. long connected with reducer providing G.I funnel with mesh enclosed in C.C.Chamber of 400m x 400m x 400mm with R.C.C. Slab cover duly providing staggered holes filling with salt and charcoal from the bottom of the pipe giving earth connection from electrode through G.I strip of 40 x 6mm x 200mm length with all accessories and labour charges complete, as per IS specifications 732/1982 (Part II) complete finished item of work as directed by Engineer-in-charge.	Earthing	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	6943.51	Nos	27774.04
50.00	Supply and laying of following sizes Earth wire/Strip in horizontal /Vertical run in Ground/surface/Recess including, riveting, soldering, saddles, making connection etc as required -25mm x 6mm GI Flat (1.18Kgs/1Mtr)	Earth Wire	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	110.21	Rmt	5510.5
	STP Electrical						
1.00	Supply ,Transportation of cast Resin (Dry Type) indoor type copper double wound 33KV/0.433 KV, Three Phase 50 Hz Transformers designed and manufactured as per IS 11171/IEC 60726 , ANSI and NEMA Standards with all standard fittings, connected Delta on Primary side and Star on Secondary side with additional neutral brought out on load side 33000/433V with HV off load tap changing +5% to -15% temperature rise by the resistance 90 degrees with terminal arrangement Cable box on HV side and Bus duct on LV Side with off circuit Tap links etc.,, complete Makes: As per list of recommended brands.	Transformer	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	4154901.00	Nos	4154901
	Supply, Installation, Testing and Commissioning of indoor type floor mounted metal clad, Switchgear Panel enclosure of sheet steel preferably Aluzinc, dust tight, vermin proof, totally enclosed cubicle floor mounting, free standing type with single break, horizontally draw out type breaker with trip free mechanism as per latest standard i.e. IS/IEC 62271-200 as amended up to date and as per Technical specifications, IP4X for VCB Panel enclosure.Switchgear Panel shall be electrically & mechanically interlocked as per IEC 62271-1, full voltage insulated copper Busbar with heat shrinkable sleeving, complete with suitable metering & protection devices, breaker featured with mechanical ON-OFF indicator with hand trip device and all accessories such as shunt trip coil, motorized & manually operated spring charging mechanism, emergency trip push buttons, auxiliary switch of 2NO + 2NC, interconnections, space heaters, panel earthing etc. and equipped with following switchgear and accessories including connection suitable for 3x185 to 3x 400 Sq mm XLPE 33 kV cable (cable entry from bottom) to be connected through heat shrinkable jointing material etc., as required. (Note - Cost of end termination not included in this item.) Makes: As per list of recommended brands. Switchgear Panel shall be electrically & mechanically interlocked as per IEC 62271-1, full voltage insulated copper Busbar with heat shrinkable sleeving, complete with suitable metering & protection devices, breaker featured with mechanical ON-OFF indicator with hand trip device and all accessories such as shunt trip coil, motorized & manually operated spring charging mechanism, emergency trip push buttons, auxiliary switch of 2NO + 2NC, interconnections, space heaters, panel earthing etc. and equipped with following switchgear and accessories including connection suitable for 3x185 to 3x 400 Sq mm XLPE 33 kV cable (cable entry from bottom) to be connected through heat shrinkable jointing material etc., as required. (Note - Cost of end termination not included in this item.) Makes: As per list of recommended brands.	0	0	0	0	0	0
1.00	INCOMER/OUTGOINGS 1 No. each comprising the following 1 No. 800 Amp. VCB. 31.5KA 1 No. Integral Earth switch for line side earthing 3 No. dual core CTs 600A/1/1A of 7.5VA burden max and accuracy Class 0.5 for metering and class 5P10 for protection 3 No. Cast Resin 33000V/v3/110V/v3/110V/v3 PT Class 0.5/3P accuracy and 30VA burden max with and protection fuses / MCB. 1 No. Digital voltmeter with selector switch. 1 No. Digital Ammeter with selector switch. 1 No. Microprocessor based numerical relays with O/L, E/F and S/C protection with Integrated Arc sensing feature along with trip/lockout / anti-pumping / aux. relays. 1 No. Multi-function meter. Set of MCBs for Panel AC/DC Set of MCBs for Main AC/DC Set of Indication lamps LED types TNC Switch, L-R Switch, Pushbuttons for ON-OFF 33 KV 800A VCB Panel with 1 Nos. VCBs suitable for 50Hz 3-phase system, suitable for 31.5kA/3sec short circuit withstand capacity & 31.5kA/1sec Internal Arc capacity	VCB Panel	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOI Advisories	1193411.96	Nos	1193411.96

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	Supply Installation Testing And commissioning of CPCB IV+ DG Set complete with 1500 RPM Diesel Engine of suitable BHP & AC Brush less Alternator mounted on a common base Frame & coupled through a flexible coupling or close coupled. Alternator 1. 1500 RPM, 1P or 3P, Brushless type, screen protected, revolving field, Self-excited alternator conforming to IS/IEC 60034-1 IP23, with standard Alternator Protection (over voltage, over speed & Under voltage) 2. A reliable long life with superior class 'H' insulation with temperature rise to Class H Diesel Engine: Engine: Engine should comprise of Silencer, Electronic governor from >25 KVA & above, suitable rating battery , Battery charging alternator, battery charger , Inbuilt Fuel tank with fuel pipe, AVM pads , Control panel with 3P MCCB of suitable rating with short circuit protections (25kA,36kA, 50kA) with microprocessor based controller indicating genset parameters (i.e. volt, amps, KWH, KVAR, Hrs etc.), The diesel engine shall be capable of providing 10% overload for 1 Hr for every 11 Hrs of continuous running at full load. The DG set shall be supplied as per OEM specifications and shall be tested at site along with below. 1. CRDI Engine >25 KVA DG set 2. Water cooled Radiator coupled to engine 3. Dry type air cleaner with service indicator 4. First fill of lube oil, Coolant & first fill of Diesel 5. Electrical starter motor with soft start System 6. Battery charging alternator 7. Remote Monitor system >58.5 KVA & Above 8. 2 years / 5000 Hrs Warranty from commissioning or 30-month form supply. 9. Emission control system - EGR & (DOC, SCR for >75 KVA DG set) 10.10 Mtrs Exhaust pipe from Silencer Genset Controller: 1. Microprocessor based genset monitoring, metering and control system with full graphics LCD display for easy front panel access. 2. AMF relay, manual and remote start / stop modesfor 1-ph & 3-ph gensets 3. Backlit and full graphics display with power saving feature	DG Set	DG Set	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0.00	0	0
	4. Engine parameter monitoring -Lube oil pressure, Engine coolant temperature, Fuel level, Battery voltage, Engine running hours 5. AC Alternator parameter monitoring -Voltage L-N & L_L, Current, kW, kVA (Phase & Total), Frequency, kWH, PF 6. Genset Protection: Engine: Low lube oil pressure, High coolant temperature, Battery High/Low Volts, Fail to Start, Sensor failure, Low fuel level, Overspeed AC Alternator: Over/Under Voltage, Over/Under, Frequency, Loss of AC sensing, Over frequency, Over Current, kW Overload, Unbalancing load 7. Maintenance notification based on Engine Run Hour & due date 8.Communication: USB port, RS485, CAN 9.30-50 Event logs Acoustic Enclosure: 1. Specially designed to meet stringent MOEF/CPCB IV+ norms 2. Weatherproof, powder coated Acoustic enclosure for DG set for sound attenuation fabricated from 1.2 mm / 1.6 mm CRCA sheet steel (structure) with side wall fabricated from 1.2mm /1.6 mm CRCA sheet and filled with PU Foam/Rockwood for Fire retardant acoustic and for better safety 3. Designed to operate in extreme climatic conditions in temperatures ranging from -10 deg to 55 deg without any external aid 4. Fabricated base frame with AVM pads. 5. Noise level is less than 75 db (A) at a distance of 1 Mtrs as per CPCB norms, complete in all respect. following capacity:	DG Set	DG Set	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	0.00	0	0
1.00	250 kVA at 0.8 pf 415V 50Hz 3-Ø	DG Set	DG Set	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	2822156.83	Nos	2822156.83
150	Supply & Transportation of 400 Sqmm 3.5 Core XLPE insulated, 1100V grade armoured alluminium cable as per specification confirming to IS:7098 (Part - I)	Supply & Transportation of 400 Sqmm 3.5 Core XLPE insulated, 1100V grade armoured alluminium cable	Electrical Works	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	2823.33	Rmt	423499.5
12	Supply and making one end termination with heavy duty double compression brass gland as per BS 6121:2005, IP 66 complete, SIBG type, heavy duty Aluminum lugs duly crimped with crimping tool, PVC tape etc., for 3.5 core x 400 sq.mm of Armoured PVC insulated & PVC sheathed/ XLPE aluminum conductor cable of 1100 volt grade as required of size. Makes: As per list of recommended brands.	Compression Brass Gland	Electrical Works	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	3299.38	Nos	39592.56
8	Providing earth electrode of low carbon steel rod, UL listed of 17.2 mm dia, 3 Mtr long, coated with copper of 254 microns thickness, CPRI tested for short time current withstand test of 25 kA, coating thickness, environmental test (Salt Mist Test), Bend test, Tensile strength, Yield / tensile ratio, Electrical Resistivity test, complete with clamps and 2 bags of (Earth plus ULTRA /TIRUMALA) high grade earthing compound IEC 62561-7 complaint Eco-friendly, Maintenance free, anti-corrosive, lead-free, super conductive, mineral based high-grade earthing compound, to enhance soil conductivity. With resistance <0.20 ohms-meter, should be leach proof & Sulphur free complete with earth inspection chamber of dimensions: width: 320 mm x 320 mm, Height : 192 mm, weight : 30 Kgs, Load bearing capacity : 5000 Kgs	Earthing	Electrical Works	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	13060.04	Nos	104480.32
200	Supply and Transportation of Outer dia 200 mm and Inner dia 170 mm. double walled corrugated HDPE duct made as per specification BSEN - 500 86/IS 14930 Part-II.	DWC HDPE Duct	DWC HDPE Duct	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	824.84	Rmt	164968
200	Earth work excavation for Trench, Pole pit and Earth Pit complete for finished item of work including seigniorage excluding dewatering charges etc as per SS - 20 B (APSS 308).	Earthwork	Earthwork	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	395.38	Cum	79076
40	Supply and erecting fencing of section having size 2450 mm in height from ground level and 1200mm width by using angle iron size 50x50x6mm erected in CC foundation 15x15x40cms deep. The section of the frame shall be fitted with flat iron supports of size 25x6mm on top, bottom and middle and chain link Hot dipped Galvanised Iron Chain link mesh 8 gauge - (4.0 mm) as per IS: 2721-1979: 2"x2" (50 mm x 50 mm) - 8 Gauge G.I to the angle iron at every distance of 30 cms by iron studs complete duly painted with one coat of red oxide and two coats of aluminium paint Including Excavation, CC (M15) work Complete for finished item of work	Fencing	Fencing	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	4476.89	Rmt	179075.6
70	Providing and spreading of HBG Metal of Size 40mm for 100mm Depth above Ground Level	HBG Metal Filling	HBG Metal Filling	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	176.88	Sqm	12381.63
1	Supply, Installation, Commissioning of Online Continuous Effluent Monitoring System (OCEMS) for Proposed STP to measure BOD, COD, TSS, pH & Residual chlorine as per CPCB norms and connectivity to PCB/CPCB and client Servers.	OCEMS	OCEMS	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	2500000.00	Nos	2500000
	Ancillary Buildings - Admin Cum Lab, Staff Quarters, Workshop, Walkway						
399.35	Earthwork excavation in all type of soils including ordinary rock by mechanical means **upto 3mts depth** for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	Earthwork	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	133.77	Cum	53421.05

0.00	Boring for Cast-in-Situ piles Augoring and boring of holes in site for Bored cast-in-situ R.C.C. Piles for building foundations in loamy, clayey soils like Black cotton soils and ordinary soils without under reams as per IS 2911 - 1980 as per approved designs including all operations, incidental, labour charges, hire charges of machinery, augur bore drill and shell equipment, etc, complete for all depths and for finished item of work for piles of following diameters. Upto 300mm Dia	Augering & Boring of Piles	Augering & Boring of Piles	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	480.77	Rmt	0
297.00	Boring for Cast-in-Situ piles Augoring and boring of holes in site for Bored cast-in-situ R.C.C. Piles for building foundations in loamy, clayey soils like Black cotton soils and ordinary soils without under reams as per IS 2911 - 1980 as per approved designs including all operations, incidental, labour charges, hire charges of machinery, augur bore drill and shell equipment, etc, complete for all depths and for finished item of work for piles of following diameters. 350 mm dia to 450 mm dia	Augering & Boring of Piles	Augering & Boring of Piles	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	576.74	Rmt	171291.78
0.00	Under-reaming for Bored cast-in-situ R.C.C. Piles for building foundations in loamy, clayey soils like Black cotton soils and ordinary soils with Augoring and boring equipment in site as per IS 2911 - 1980 as per approved designs including all operations, incidental, labour charges, hire charges of machinery, augur bore drill and shell equipment, etc, complete for all depths and for finished item of work for piles of following diameters. Upto 300mm Dia	Under Reaming for Piles	Under Reaming for Piles	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	511.85	Nos	0
66.00	Under-reaming for Bored cast-in-situ R.C.C. Piles for building foundations in loamy, clayey soils like Black cotton soils and ordinary soils with Augoring and boring equipment in site as per IS 2911 - 1980 as per approved designs including all operations, incidental, labour charges, hire charges of machinery, augur bore drill and shell equipment, etc, complete for all depths and for finished item of work for piles of following diameters. 350 mm dia to 450 mm dia	Under Reaming for Piles	Under Reaming for Piles	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	721.15	Nos	47596.12
126.78	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	Sand Bedding	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	507.42	Cum	64330.71
72.15	Providing and placing Plain Cement Concrete (1:3:6) (cement: fine aggregate: Coarse aggregate) for foundations/leveling course/ under flooring bed using coarse aggregate 40mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges other taxes on all materials and including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete finished item of work as directed by Engineer-in charge.	Plain Cement Concrete (PCC) - M10	Plain Cement Concrete (PCC) - M10	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	5080.75	Cum	366576.11
0.00	Construction of Randam rubble stone masonry in CM(1:8) 2nd sort including cost and conveyance of material to site, and watering curing including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work.	Rubble Stone Masonry	Rubble Stone Masonry	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	4739.73	Cum	0
25.37	Supply and placing of the M30 Grade Design Mix Concrete corresponding to IS 456 using BATCHING PLANT at site with 20mm size graded machine crushed hard granite metal (coarse aggregate) from approved quarry including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water etc., to site and including seigniorage charges, sales & other taxes on all materials including all operational, incidental and labour charges such as batching, mixing, pouring concrete by tremmy, curing etc., complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402)with minimum cement content as per IS code from standard suppliers approved by the department including tremmy pumping, laying concrete, curing etc. complete but excluding cost of steel and its fabrication charges for finished item of work. Upto 700mm Dia	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	6109.74	Cum	155004.03
25.83	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Pile Caps	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	7926.42	Cum	204739.43
17.65	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Plinth Beams	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	10312.33	Cum	182012.62
10.59	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Columns (Ground Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	12239.90	Cum	129620.54
3.54	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Columns (First Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	12691.00	Cum	44926.14
0.94	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Columns (Second Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	13141.00	Cum	12352.54
2.60	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Lintels (Ground Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	12429.64	Cum	32317.06

0.67	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Lintels (First Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	12801.21	Cum	8576.81
0.06	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge.- Lintels (Second Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	13172.78	Cum	790.37
3.60	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Sunshades (75mm x 50mm Thick 600mm Wide) - Ground Floor	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	650.79	Cum	2342.84
3.60	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Sunshades (75mm x 50mm Thick 600mm Wide) - First Floor	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	668.51	Cum	2406.64
11.34	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Roof Beams (Ground Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	10563.08	Cum	119785.33
4.84	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Roof Beams (First Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	10843.48	Cum	52482.44
0.91	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Roof Beams (Second Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	11122.74	Cum	10121.69
34.02	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Roof Slab 0.15m Thick (Ground Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	9480.70	Cum	322533.41
16.34	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Roof Slab 0.15m Thick (First Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	9712.25	Cum	158698.17
1.99	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Roof Slab 0.15m Thick (Second Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	9926.36	Cum	19753.46
1.73	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Waist Slab 0.175m Thick (Second Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	9043.56	Cum	15645.36

1.73	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Waist Slab 0.175m Thick (Second Floor)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	9255.63	Cum	16012.24
1.22	Reinforced cement concrete (1:5:10) proportion(Cement: fine aggregates: coarse aggregate) using 20mm size (SS5) hard granite metal (coarse aggregate) from approved quarry including cost and conveyance of all materials like cement, fine aggregate (sand), coarse aggregate, water etc., to site on all materials including centering using Casurina Ballies , Bamboos , Wooden Reapers , Runners , Wood Posts , Wall Platesetc.,shuttering, machine mixing, laying concrete, lifting concrete manually , curing etc., complete as per drawings but excluding cost of steel and it's fabrication charges for finished item of work (APSS NO. 402 & 403) for Dummy columns.	Dummy Columns	Dummy Columns	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	13702.00	Cum	16716.44
0.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge. - Side Wall (0.1m Thick)	Design Mix Concrete M30 Grade	Design Mix Concrete M30 Grade	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	12393.98	Cum	0
16316.17	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars Fe - 500/500D/550 grade as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size,tying,lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars,binding wire, cover blocks all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	Steel	Steel	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	91.45	Kg	1492113.75
69.28	Providing brick work of 230mm thick in CM (1:6) prop., with traditional size 23 x 11 x 7 cms or Equivalent Size using common burnt clay bricks of class as per Table-1 of IS:1077-1992 Non-Modular or traditional size , including cost & conveyance of all material and labour charges, hire and operational charges etc., centering & scafolding charges etc., complete as per APSS No.501 and directed by engineer-in-charge. - Ground Floor	Brick work	Brick work	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	8865.13	Cum	614176.21
20.34	Providing Half brick work of 115mm thick in CM (1:6) prop., using common burnt clay bricks of class as per Table-1 of IS:1077-1992 Non-Modular or traditional size , including cost & conveyance of all material and labour charges, hire and operational charges etc., centering & scafolding charges, and overhead charges & Contractors profit etc., complete as per APSS No.501 and directed by engineer-in-charge. - Ground Floor	Brick work	Brick work	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	9336.39	Cum	189902.17
28.79	Providing brick work of 230mm thick in CM (1:6) prop., with traditional size 23 x 11 x 7 cms or Equivalent Size using common burnt clay bricks of class as per Table-1 of IS:1077-1992 Non-Modular or traditional size , including cost & conveyance of all material and labour charges, hire and operational charges etc., centering & scafolding charges etc., complete as per APSS No.501 and directed by engineer-in-charge. - First Floor	Brick work	Brick work	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	9299.71	Cum	267738.65
1.04	Providing Half brick work of 115mm thick in CM (1:6) prop., using common burnt clay bricks of class as per Table-1 of IS:1077-1992 Non-Modular or traditional size , including cost & conveyance of all material and labour charges, hire and operational charges etc., centering & scafolding charges, and overhead charges & Contractors profit etc., complete as per APSS No.501 and directed by engineer-in-charge. - First Floor	Brick work	Brick work	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	9951.56	Cum	10349.62
17.13	Providing brick work of 230mm thick in CM (1:6) prop., with traditional size 23 x 11 x 7 cms or Equivalent Size using common burnt clay bricks of class as per Table-1 of IS:1077-1992 Non-Modular or traditional size , including cost & conveyance of all material and labour charges, hire and operational charges etc., centering & scafolding charges etc., complete as per APSS No.501 and directed by engineer-in-charge. - Second Floor	Brick work	Brick work	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	9734.19	Cum	166746.67
440.47	Plastering with 20mm thick double coat in CM (1:6) 16 mm thick base coat and CM (1:4) of 4mm thick top coat with dubara sponge finish including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work - for External Walls. - Ground Floor	Plastering	Plastering	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	622.43	Sqm	274161.74
135.98	Plastering with 20mm thick double coat in CM (1:6) 16 mm thick base coat and CM (1:4) of 4mm thick top coat with dubara sponge finish including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work - for External Walls. - First Floor	Plastering	Plastering	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	683.55	Sqm	92949.13
47.40	Plastering with 20mm thick double coat in CM (1:6) 16 mm thick base coat and CM (1:4) of 4mm thick top coat with dubara sponge finish including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work - for External Walls. - Second Floor	Plastering	Plastering	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	744.66	Sqm	35296.88
586.91	Plastering in CM (1:4) with 12mm thick including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work	Plastering	Plastering	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	458.10	Sqm	268863.47
166.98	Plastering in CM (1:4) with 12mm thick including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work for Internal Walls - First Floor	Plastering	Plastering	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	503.10	Sqm	84007.64
47.40	Plastering in CM (1:4) with 12mm thick including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work for Internal Walls - Second Floor	Plastering	Plastering	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	548.10	Sqm	25979.94
179.57	Plastering in CM (1:4) with 12mm thick including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work For Ceiling - Ground Floor	Plastering	Plastering	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	469.40	Sqm	84290.16
78.83	Plastering in CM (1:4) with 12mm thick including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work For Ceiling - First Floor	Plastering	Plastering	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	518.30	Sqm	40857.59
13.26	Plastering in CM (1:4) with 12mm thick including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work For Ceiling - Second Floor	Plastering	Plastering	APDSS/BIS/MORTH/NEC/NLC/CPHEEO/GOI Advisories	567.20	Sqm	7521.07

127.92	Providing impervious coat exposed RCC roof slab surfaces to required slopes with CM (1:3) prop. using screened sand 20mm thick (average) mixed with water proofing compound manufactured by reputed manufacturers as approved by Engineer-in-charge at 1 Kg per one bag of cement, laid over roof slab when it is green, finished smooth with a floating coat of neat cement and thread lining at regular intervals of 45cmx45cm including cost and conveyance of all materials like cement, sand, water proofing compound, water etc., to site,labour charges for mixing mortar, laying, lift charges, rendering smooth and thread lining, curing including rounding off junctions of wall and slab etc., complete for finished item of work. (APSS No. 901 & 903). - Ground Floor Roof	Impervious Coat	Impervious Coat	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	648.45	Sqm	82949.22
128.39	Providing impervious coat exposed RCC roof slab surfaces to required slopes with CM (1:3) prop. using screened sand 20mm thick (average) mixed with water proofing compound manufactured by reputed manufacturers as approved by Engineer-in-charge at 1 Kg per one bag of cement, laid over roof slab when it is green, finished smooth with a floating coat of neat cement and thread lining at regular intervals of 45cmx45cm including cost and conveyance of all materials like cement, sand, water proofing compound, water etc., to site,labour charges for mixing mortar, laying, lift charges, rendering smooth and thread lining, curing including rounding off junctions of wall and slab etc., complete for finished item of work. (APSS No. 901 & 903). - Second Floor Roof	Impervious Coat	Impervious Coat	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	659.68	Sqm	84695.99
166.27	Flooring with Nano polished /stain free soluble salt porcelain vitrified tiles screen printed of size 600 x 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs with borders and design as per the approved flooring pattern as directed by the Engineer-In - Charge, laying tiles using spacers of 2mm thick, set over a base coat of CM (1:8) prop. 12mm thick using screened sand over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste to full depth mixed with pigment of matching shade including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., complete for finished item of work. (APSS No.701 & 707) - Ground Floor	Nano polished /stain free soluble salt porcelain vitrified tiles screen printed of size 600 x 600 mm	Vitrified Tiles	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	1238.31	Sqm	205893.36
51.66	Flooring with Nano polished /stain free soluble salt porcelain vitrified tiles screen printed of size 600 x 600 mm and thickness between 8-10 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs with borders and design as per the approved flooring pattern as directed by the Engineer-In - Charge, laying tiles using spacers of 2mm thick, set over a base coat of CM (1:8) prop. 12mm thick using screened sand over CC bed already laid or RCC roof slab , including neat cement slurry of honey like consistancy spread @ 3.3 kgs per Sqm. and jointed neately with white cement paste to full depth mixed with pigment of matching shade including cost and conveyance of all materials like cement, sand, water, tiles, white cement etc., to site (excluding cost of C.C. bed) all labour charges for mixing of cement mortar, laying tiles to required slope as directed by the Engineer- in-charge etc., complete for finished item of work. (APSS No.701 & 707) - First Floor	Nano polished /stain free soluble salt porcelain vitrified tiles screen printed of size 600 x 600 mm	Vitrified Tiles	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	1447.35	Sqm	74769.85
10.66	Flooring with Non-skid red or white full body Ceramic floor tiles of size 300 x 300 mm and thickness between 7-8mm 1st quality conforming to IS:13711, IS:13712,IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs as approved by Engineer-in-charge, set over base coat of cement mortar (1:8), 12mm thick using screened sand over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3 Kgs per Sqm & jointed neatly with white cement paste to full depth mixed with pigment of matching shade, including cost of all materials like cement, sand water and tiles etc., complete for finished item of work - Ground Floor	Non-skid red or white full body Ceramic floor tiles of size 300 x 300 mm	Ceramic Tiles	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	1144.96	Sqm	12205.22
2.09	Flooring with Non-skid red or white full body Ceramic floor tiles of size 300 x 300 mm and thickness between 7-8mm 1st quality conforming to IS:13711, IS:13712,IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs as approved by Engineer-in-charge, set over base coat of cement mortar (1:8), 12mm thick using screened sand over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3 Kgs per Sqm & jointed neatly with white cement paste to full depth mixed with pigment of matching shade, including cost of all materials like cement, sand water and tiles etc., complete for finished item of work - First Floor	Non-skid red or white full body Ceramic floor tiles of size 300 x 300 mm	Ceramic Tiles	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	1341.28	Sqm	2803.28
61.86	Providing dadooing to walls with glazed full body porcelain wall tiles of size 300 x 600 mm with any type of design texture such as marble finish, wooden, bamboo, stone finishes etc., scratch less, stain free and thickness between 6-8 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs with borders as approved by Engineer-in-Charge set over base coat of CM(1:5) 12 mm thick using screened sand with cement slurry of honey like consistency spread at the rate of 3.30 kgs per sqm and jointing with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like tiles, cement, sand and water etc complete for finished item of work. - Ground Floor	glazed full body porcelain wall tiles of size 300 x 600 mm	Porcelain Wall Tiles	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	942.40	Sqm	58296.86
26.96	Providing dadooing to walls with glazed full body porcelain wall tiles of size 300 x 600 mm with any type of design texture such as marble finish, wooden, bamboo, stone finishes etc., scratch less, stain free and thickness between 6-8 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs with borders as approved by Engineer-in-Charge set over base coat of CM(1:5) 12 mm thick using screened sand with cement slurry of honey like consistency spread at the rate of 3.30 kgs per sqm and jointing with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like tiles, cement, sand and water etc complete for finished item of work. - First Floor	glazed full body porcelain wall tiles of size 300 x 600 mm	Porcelain Wall Tiles	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	958.11	Sqm	25830.65
23.08	Providing skirting to internal walls to 15 cm height/risers of steps with vitrified tiles length equal to flooring stones, set over base coat of CM (1:5) 12 mm thick with cement slurry of honey like consistency spread at the rate of 3.30 kgs per sqm and jointed with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like tiles, cement, sand and water etc., complete for finished item of work as directed by the Engineer-in-Charge - Ground Floor	Skirting	Skirting	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	1229.43	Sqm	28375.17
9.99	Providing skirting to internal walls to 15 cm height/risers of steps with vitrified tiles length equal to flooring stones, set over base coat of CM (1:5) 12 mm thick with cement slurry of honey like consistency spread at the rate of 3.30 kgs per sqm and jointed with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like tiles, cement, sand and water etc., complete for finished item of work as directed by the Engineer-in-Charge - First Floor	Skirting	Skirting	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	1437.26	Sqm	14358.18
5.02	Providing 18 to 20 mm thick granite stone slabs other than black and regular colours with borders and design as per the pattern approved by the Engineer-in-Charge of length not less than 2.43 mts set over base coat of cement mortar (1:8) , 20mm thick using screened sand over CC bed already laid or RCC roof slab including neat grey cement slurry of honey like consistency spread @ 3.3 Kg per sqm and jointed neatly with white cement paste mixed with pigment of matching shade to full depth including cost and conveyance of all materials like cement , sand , water , granite slabs etc., to work site and all operational, incidental labour & lift charges, half rounding the edges of treads , polishing charges and cost of base coat etc complete for finished item of work (S.S.701 & special) - Risers - Ground Floor	Granite Flooring	Granite Flooring	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	2242.09	Sqm	11255.29
8.64	Providing 18 to 20 mm thick granite stone slabs other than black and regular colours with borders and design as per the pattern approved by the Engineer-in-Charge of length not less than 2.43 mts set over base coat of cement mortar (1:8) , 20mm thick using screened sand over CC bed already laid or RCC roof slab including neat grey cement slurry of honey like consistency spread @ 3.3 Kg per sqm and jointed neatly with white cement paste mixed with pigment of matching shade to full depth including cost and conveyance of all materials like cement , sand , water , granite slabs etc., to work site and all operational, incidental labour & lift charges, half rounding the edges of treads , polishing charges and cost of base coat etc complete for finished item of work (S.S.701 & special) - Treads - Ground Floor	Granite Flooring	Granite Flooring	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	4117.72	Sqm	35577.1

26.69	Providing 18 to 20 mm thick granite stone slabs other than black and regular colours with borders and design as per the pattern approved by the Engineer-in-Charge of length not less than 2.43 mts set over base coat of cement mortar (1:8) , 20mm thick using screened sand over CC bed already laid or RCC roof slab including neat grey cement slurry of honey like consistency spread @ 3.3 Kg per sqm and jointed neatly with white cement paste mixed with pigment of matching shade to full depth including cost and conveyance of all materials like cement , sand , water , granite slabs etc., to work site and all operational, incidental labour & lift charges, half rounding the edges of treads , polishing charges and cost of base coat etc complete for finished item of work (S.S.701 & special) - Mid Landing - Ground Floor	Granite Flooring	Granite Flooring	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	2576.92	Sqm	68778.07
5.02	Providing 18 to 20 mm thick granite stone slabs other than black and regular colours with borders and design as per the pattern approved by the Engineer-in-Charge of length not less than 2.43 mts set over base coat of cement mortar (1:8) , 20mm thick using screened sand over CC bed already laid or RCC roof slab including neat grey cement slurry of honey like consistency spread @ 3.3 Kg per sqm and jointed neatly with white cement paste mixed with pigment of matching shade to full depth including cost and conveyance of all materials like cement , sand , water , granite slabs etc., to work site and all operational, incidental labour & lift charges, half rounding the edges of treads , polishing charges and cost of base coat etc complete for finished item of work (S.S.701 & special) - Risers - First Floor	Granite Flooring	Granite Flooring	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	4259.35	Sqm	21381.94
8.64	Providing 18 to 20 mm thick granite stone slabs other than black and regular colours with borders and design as per the pattern approved by the Engineer-in-Charge of length not less than 2.43 mts set over base coat of cement mortar (1:8) , 20mm thick using screened sand over CC bed already laid or RCC roof slab including neat grey cement slurry of honey like consistency spread @ 3.3 Kg per sqm and jointed neatly with white cement paste mixed with pigment of matching shade to full depth including cost and conveyance of all materials like cement , sand , water , granite slabs etc., to work site and all operational, incidental labour & lift charges, half rounding the edges of treads , polishing charges and cost of base coat etc complete for finished item of work (S.S.701 & special) - Treads - First Floor	Granite Flooring	Granite Flooring	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	4379.63	Sqm	37840
21.58	Providing 18 to 20 mm thick granite stone slabs other than black and regular colours with borders and design as per the pattern approved by the Engineer-in-Charge of length not less than 2.43 mts set over base coat of cement mortar (1:8) , 20mm thick using screened sand over CC bed already laid or RCC roof slab including neat grey cement slurry of honey like consistency spread @ 3.3 Kg per sqm and jointed neatly with white cement paste mixed with pigment of matching shade to full depth including cost and conveyance of all materials like cement , sand , water , granite slabs etc., to work site and all operational, incidental labour & lift charges, half rounding the edges of treads , polishing charges and cost of base coat etc complete for finished item of work (S.S.701 & special) - Mid Landing - First Floor	Granite Flooring	Granite Flooring	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	3002.43	Sqm	64792.54
1007.97	Providing and applying wall putty of White cement or Polymer or Cement based puttyof average 1 to 2mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying knifing paste filler by putty knife / muslin pad, air dry for 2 -3 hrs, sand with 180 and 320 No., emery paper for the surface preparation including cost and conveyance of all materials to work site and all operational, incidental, labour charges, etc. complete for finished item of workfor Internal walls	Wall putty	Wall putty	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	258.45	Sqm	260509.85
1696.80	Painting walls with snowcem or other equal and approved Water Proof Cement paint over priming coat, 2 coats (all colours) including cost and conveyance of all materials to work site and all operational, incidental, labour charges, finsihing, scaffolding, lift charges, complete for finished item of work for Extrenal walls & Surfaces and as directed by Engineer-in-charge.	Painting - Snowcem	Painting - Snowcem	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	221.50	Sqm	375841.2
0.00	Providing and Fixing 20mm thick Expansion joint filler boards for cement concrete lining of including cost of all materials, Labour etc., complete with all leads and lifts C1 @ Every 45m C/C	Expansion Joint Filler Board	Expansion Joint Filler Board	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	83.98	Rmt	0
0.00	Providing and fixing of MS Grill including cost & Conveyance of all materials and all labour charges fabricating steel works like compound wall grills iron doors including cost of welding rods power charges and including cost of fixing and position and painting with 2 coats of grade 1 syntetic emanel paint over the primary coat etc complete finished item of work as directed by Engineer-in-Charge.	MS Grill	MS Grill	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	139.25	Kg	0
0.00	Providing and fixing of Railing with Mild Steel Tubes and Pipes including cost & Conveyance of all materials and all labour charges fabricating steel works like compound wall grills iron doors including cost of welding rods power charges and including cost of fixing and position and painting with 2 coats of grade 1 syntetic emanel paint over the primary coat etc complete finished item of work as directed by Engineer-in-Charge.	MS Tubes & Pipes	MS Tubes & Pipes	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	169.92	Kg	0
10500.00	Filling with useful available excavated earth (excluding rock) in trenches, sides of foundations and basement with initial lead in layers not exceeding 15 cm thick, consolidating each deposited layer by watering and ramming including cost and conveyance of water to work site and all operational, incidental, labour charges, hire charges of T & P etc., complete for finished item of work. (APSS NO. 309 & 310)	Filling with Useful available Earth	Filling with Useful available Earth	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	47.57	Cum	499485
34.02	Providing and fixing of factory made of High Density High MoistureResistant Wood Fibre (HDHMR) single shutter Duradoor made up of FRAME: Door frame manufactured with High Density High MoistureResistant Wood Fibre (HDHMR) of 36mm width x 100mm depth , laminated with 0.2mm thick PVC Foil using hot press andPUR adhesive, fitted with Gasket for energy efficiency and noise protection,affixed to the wall using high strength expandable PU Foam/ self-expandable wall fixing screws.Max dimensions in MM of 280 (depth) x 2440 (height)SHUTTER: Factory made 41mm thick shutter sandwiched with High Density High Moisture ResistantWood Fibre (HDHMR) of 5.5mm thick skinson both sides and HDHMR of 30mm thickness as skeleton,core of high density Honey Comb and Laminated Veneer Lumber (LVL) for holding the lock body andhardware, laminated with 0.2mm thick PVC Foil and edge-banded with 1mm thick PVCedge-band using hot press and PUR adhesives. Max dimensions in MM of 1200 (width) x 41(thickness) x 2400 (height), ARCHITRAVE: Factory made Architrave of size 80mm x 12mm fitted to pre-made grooves within the frame for addedaesthetics. Four design variants available, made with Density High Moisture Resistant Wood Fibre(HDHMR) of different thicknesses depending on the design variant, laminated with 0.2mm thickPVC Foil using hot press and PUR adhesive, fitted to the wall using strong quick actingadhesives.HARDWARE & ACCESSORIES: Imported hardware including door handles – 1 no, cylindrical magnetic lock -1 no ,SS hinges – 3 nos. Including cost and conveyance of all material, Hardware, Labour charges and transportation complete for finished item of work	High Density High MoistureResistant Wood Fibre (HDHMR) Door	High Density High MoistureResistant Wood Fibre (HDHMR) Door	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	12918.03	Sqm	439471.23
11.97	Supply and fixing of Bath/Toilet Door frame and shutter with 8mm laminated (IS.15786)using with 50mmx35mmx1.3mmthick aluminum door frame of weight 220grm per Rft with a rebate of 30 mm for provision for shutter , shutter made with 45mmx25mmx1.3mm thick aluminum section of weight 210grms per Rft with 8mm groove to accommodate 8mm thick laminated (IS.15786) and shutter having 3nos of ss 304gr Butt hinges of 100mm long, 100mm aluminum handles -2nos, and also 2 nos of 200mmx12mm aluminum aldrops ,the rates inclusive of all labor fixing at site and 50microns Ivory powder coated for aluminum door frame and shutter sections etc complete finished item of work	Bath/Toilet Door	Bath/Toilet Door	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	6261.32	Sqm	74948.03
32.94	Supplying and fixing of Unplasticised Poly Vinyl Chloride (UPVC) sliding windows three track - two glass shutters sliding and one mesh shutter duly manufactured using UPVC reinforced profiles of (94 mm x 45 mm)/(80 mm x 52 mm) x 2.0 mm for outer frames, (58 mm x 39 mm)/(54 mm x 38 mm) x 2.0 mm for sliding shutter frames capable of mounting single glazing system structurally reinforced with hot dip galvanized up to 50 microns of minimum thickness of 1.2 mm prefabricated & welded through fusion welding the window sash shall be fitted with 5 mm thick clear float glass of reputed make and mesh shutter frame shall be (42 mm x 25 mm)/(52 mm x 21.5 mm) x 2 mm fitted with nylon/ polymer mesh on rollers/ pulley duly fixed with TPV Gaskets/ EPDM weathering seal resistant accessories like locking system 1 No., per set of sashes and the system is to be installed at the site using anchor fasteners, silicon rubber sealant, easy glazing/ deglazing at site etc., including cost and conveyance of all materials, accessories, labour charges for transportation, erection at site with templates for casement sizing complete for finished item of work	Windows	Windows	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	10225.35	Sqm	336823.03

2.16	Supply and fixing of pre-painted steel windows & top hung and fixed louvered ventilators made of pre - painted steel (base steel as per IS 513 of -0.58 mm thick 'D" quality, galvanized as per IS 277 with zinc of 120 GSM) primer coated with epoxy primer of 5-7 microns thick, finish painted with a polyester paint of 12-16 microns thick and back coated with 5-7 microns thick alkyd backer, section for outer frame of 46 x 52 mm section and for shutter of 46 x 46 mm section for mullion 46 x 70 mm, and section for beading should be 18 x 25 mm and section for louvered ventilation of 33 x 56 mm Box section and the windows panelled with 5 mm thick plain float glass & 4 mm pinhead glass for ventilators with Ethyl propylene Diamine monomer Gasket (EPDM) and the sections cut to length mitre joined with corner brocket centre mullions fixed using mullion cap and with handle made of high grade aluminium powder coated and nylon receiver, corner brackets made of CRCA with Zinc Phosphate, Mullion caps made of glass filled nylon, frames fixed to the concrete /masonry wall by means of self expanding screws including 10 mm square guard bars with 6" pitch complete for finished item of work. Ventilators: Fixed louvers 4'-0" x 3'-0" (1219.2 x 914.4 mm) (Box section) outer frame section size of 33 x 56 mm Mullion section size of 33 x 56 mm	Ventilators	Ventilators	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	5811.41	Sqm	12552.64
225.00	Supply & Laying of precast concrete blocks for paving of M-30 grade and thickness not less than 50 mm for Non-traffic areas conforming to IS 15658:2006 in all shapes and designs as per the manufacturer's specification incuding Labour charges for laying & fixing of precast concrete blocks for paving of all grades, any thickness, all sizes & shapes including all labour charges for loading & unloading, laying to desired lines and levels complete excluding cost of cement, sand, water, electricity etc complete as directed by Engineer-In-Charge	Precast Concrete Blocks - M30	Precast Concrete Blocks - M30	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	704.88	Sqm	158598.56
201.24	Providing and fixing of Railing with Mild Steel Tubes and Pipes including cost & Conveyance of all materials and all labour charges fabricating steel works like compound wall grills iron doors including cost of welding rods power charges and including cost of fixing and position and painting with 2 coats of grade 1 syntetic emanel paint over the primary coat etc complete finished item of work as directed by Engineer-in-Charge. for Staircase Railing	MS Railing	MS Railing	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	169.92	Kg	34195.16
	Plumbing Items						
7.00	Supply, Installation and commissioning approved make floor mounted Close coupled EWC suit CASCADE model 'P' or 'S' trap with dual flush porcelain cistern fixed on EWC with all internal parts of dual flush cistern, ultra solid seat cover of approvedmake with rubber buffer and cap 15 mm angle stop cock 450 mm long PVC inter connection pipe wall flanges & bib cock cum health faucet with 1 m long flexible tube and wall hook all of approved make etc. complete for finished item of work in all respects:White Colour	Floor Mounted Close Coupled EWC	Plumbing Items	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	15138.06	Nos	105966.42
7.00	Supplying and fixing Indian make Flat Back Wash Hand Basin(HSW/Parryware/ Neycer) 1st quality conforming to IS:2556-Part-4:1972 of size 550mm x 400mm with 32 mm nominal size C.P. Fitting with parallel pipe thread conforming to IS:2963-1979 and fitted with 12.7 mm nominal bore Chromium Plated Pillar Tap of 1st quality Indian make 400 grams Seiko/Senior/Nice or equivalent complete with standard CI brackets including wooden blocks ,1 No.12.7 mm PVC connection with brass union nuts CP coated ,12.7 mm angle stop valve of quarter turn spindle type of not less than 400 grams weight with internal threaded conforming to IS 8931 of first quality Indian make heavy duty Seiko/Senior/Nice or equivalent, 30.0mm dia. PVC flexible waste pipe 914.4mm length of 1st quality including cost and conveyance of all materials to site, labour charges for finished item of work.	Supplying and fixing Indian make Flat Back Wash Hand Basin	Supplying and fixing Indian make Flat Back Wash Hand Basin	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	2989.21	Nos	20924.47
7.00	Supplying and fixing of 12.7 mm brass body CP finish bib tap of not less than 300 grams weight screw type (full turn) with internal / external threaded connection conforming to IS 8931as approved by the Engineer-In-Charge including cost and conveyance of all materials, labour charges complete for finished item of work in all floors.	Supplying and fixing of 12.7 mm brass body CP finish bib tap	Supplying and fixing of 12.7 mm brass body CP finish bib tap	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	281.77	Nos	1972.39
7.00	Supplying and fixing CP finish brass soap dish heavy type of approved make ISI quality with SS screws etc., complete including cost and conveyance of all materials, labour charges for fixing , for finished item of work in all floors	Supplying and fixing CP finish brass soap dish	Supplying and fixing CP finish brass soap dish	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	262.45	Nos	1837.15
7.00	Supplying and fixing TV shape mirror with plastic frame of size 609.6mm x 457.2mm, plywood back with NP screws 1st quality including cost and conveyance of all materials, labour charges , for finished item of work in all floors.	Supplying and fixing TV shape mirror with plastic frame of size 609.6mm x 457.2mm	Supplying and fixing TV shape mirror with plastic frame of size 609.6mm x 457.2mm	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	570.35	Nos	3992.45
7.00	Supplying and fixing of 25.4mm dia , 609.6mm long aluminium anodized towel rods with brackets and aluminium screws including cost and conveyance of all materials, labour charges , for finished item of work.	25.4mm dia , 609.6mm long aluminium anodized towel rods	25.4mm dia , 609.6mm long aluminium anodized towel rods	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	184.06	Nos	1288.42
7.00	Supplying and fixing of SWG Gully traps 150mm x 100mm of ISI make confirming to IS 651 & 4127 with C.I grating & constructing cement brick masonry in CM (1:6) prop., intermediate chamber and fitted with 304.8 mm X 288.6 mm (12"x9") C.I Frame with hinged cover of standard make as approved including cost and conveyance of all materials to site, labour charges, etc., complete for finished item of work.	Supplying and fixing of SWG Gully traps 150mm x 100mm	Supplying and fixing of SWG Gully traps 150mm x 100mm	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	605.57	Nos	4238.99
7.00	Supplying and fixing of 3" (76.2mm) Nahany trap with jali -UPVC/SWR pipe fittings (Prince/Sudhakar/Kisan/Supreme or any other ISI Brand)as per site requirements with standard practice of boxing of nahany traps in RCC floors including cost and conveyance of all materials to site, labour charges etc., complete for finished item of work.	Supplying and fixing of 3" (76.2mm) Nahany trap with jali	Supplying and fixing of 3" (76.2mm) Nahany trap with jali	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	294.26	Nos	2059.82
7.00	Supplying and fixing of 4" (101.6mm) multi floor trap with jali -UPVC/SWR pipe fittings (Prince/Sudhakar/Kisan/Supreme or any other ISI Brand)as per site requirements with standard practice of Boxing of Nahany traps in RCC floors for all floors including cost and conveyance of all materials to site, labour charges etc., complete for finished item of work.	Supplying and fixing of 4" (101.6mm) multi floor trap with jali	Supplying and fixing of 4" (101.6mm) multi floor trap with jali	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	353.34	Nos	2473.38
7.00	Constructing 904.0 mm (3'0") dia brick masonry inspection chamberas per IS - 4111: Part-1:1986 with cement mortar (1:6) prop using 2nd Class Clay Bricks of 225 mm thick from approved source having a minimum crushing strength of 5 N/sq.mm including plastering with cement mortar 1:3 prop; ½" thick both inside and outside fitted with 20" dia RCC manhole covers and framesincluding excavating pits up to a depth of 904 mm (3'-0")in all sorts of soils (exculding rock) and laying cement conrete (1:4:8) 150 mm thick using 40 mm HBG Metal and P.C.C. 1:2:4 benching and channel 100 mm thick as per Standard specification and including cost and conveyance of all materials like cement, sand, bricks, water etc., to site, cost of seigniorage charges on all materials and all incidental and operational, labour charges like mixing cement mortar, constructing masonry, lift charges, curing , etc., complete for finished item of work as per Standard specification.	Brick Masonry Inspection Chamber	Brick Masonry Inspection Chamber	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	6950.97	Nos	48656.79
7.00	Constructing 457.2 mm x 457.2 mm (1'6"x1'6") brick in CM 1:6 prop. Masonry. Inspection chamber up to 914.4 mm (3'0") and fitted with light weight 457.2 mm x 457.2 mm (1'6"x1'6") C.I frame andcover of 20 Kg.	Inspection Chamber - 457.2x457.2 mm	Inspection Chamber - 457.2x457.2 mm	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	4078.78	Nos	28551.46
280.00	Supplying and fixing of Double socket PVC/SWR pipes (Prince/Sudhakar/Kisan/Supreme or any ISI brand) 75mm dia 3m long 4 Kg/Sq.cm. and fixing all special such as plain bends, off sets, door bends, single junctions, double junctions as per site requirement, fixing with PVC clamps if necessary with required number of Bombay nails including cost and conveyance of all materials to site, labour charges complete for finished item of work at all floor levels. (APSS No. 1302 1319 & 1326)	Supplying and fixing of Double socket PVC/SWR pipes	Plumbing Items	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	205.08	Rmt	57422.4
280.00	Supplying & fixing CPVC pipes of 15.90 mm Dia SDR 13.5 of standard make and ISI markon ground or on wall including cost of tees, elbows, bends, reducers, couplings, running joints, union flanges, unions etc. with necessary excavation in all types of soils (except rock requiring blasting), refilling, chiseling masonry walls and making good the walls & floors to the original surface and fixing MS clamps on Teak Wood blocks on walls including cost and conveyance of all materials and labour charges complete for finished item of work.	Supplying & fixing CPVC pipes of 15.90 mm Dia SDR 13.5	Plumbing Items	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	178.38	Rmt	49946.4
7.00	Supplying and fixing Gunmetal Gate (GM peet) valves per IS-778 Class - I , Indian make heavy type including cost and conveyance of all materials , labour charges complete for finished item of work. - 15mm NB Size	Supplying and fixing Gunmetal Gate (GM peet) valves	Plumbing Items	APDSS/BIS/MOR TH/NEC/NLC/CP HEEO/GOI Advisories	686.23	Nos	4803.61

1.00	Supplying and fixing Single Bowl Stainless Steel Sink size 24"x18"x8" (609.6 x 457.2 x 203.2mm) 1 mm thick with accessories 1st quality with approved make with 32 mm nominal size C.P. Fitting with parallel pipe thread conforming to IS:2963-1979 and fitted with 12.7 mm nominal bore Chromium Plated Pillar Tap of 1st quality Indian make 400 grams Seiko/Senior/Nice or equivalent complete with standard CI brackets including wooden blocks 1 No.12.7 mm PVC connection with brass union nuts CP coated ,12.7 mm brass angle stop valve of quarter turn spindle type of not less than 400 grams weight with internal threaded conforming to IS 8931 of first quality Indian make heavy duty Seiko/Senior/Nice or equivalent, 30.0mm dia. PVC flexible waste pipe 914.4mm length of 1st quality including cost and conveyance of all materials to site, labour charges for finished item of work.	Single Bowl Stainless Steel Sink size 24"x18"x8" (609.6 x 457.2 x 203.2mm) 1 mm thick	Plumbing Items	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	7356.57	Nos	7356.57
	ELECTRICAL WORKS						
800.00	Supply & Fixing of ISI 25mm outer dia heavy (2.20mm thickness) grade with IS:9537 part 3 regid PVC pipe.	Supply & Fixing of ISI 25mm outer dia heavy (2.20mm thickness)	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	52.26	Rmt	41808
350.00	Supply & Fixing of 19/20mm PVC Flexible Pipe	Supply & Fixing of 19/20mm PVC Flexible Pipe	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	19.31	Rmt	6758.5
230.00	Supply & Fixing of PVC Junction Boxes Deep size 25mm.	Supply & Fixing of PVC Junction Boxes Deep size 25mm.	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	40.9	no	9407
370.00	Supply & Fixing of 25mm PVC Flexible Couplings	Supply & Fixing of 25mm PVC Flexible Couplings	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	23.86	no	8828.2
1000.00	Supply & Fixing of 25mm dia 1.5mm thick PVC Bends.	Supply & Fixing of 25mm dia 1.5mm thick PVC Bends.	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	13.63	no	13630
130.00	Supply & Fixing of 6" x 6" Metal Box	Supply & Fixing of 6" x 6" Metal Box	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	96.57	no	12554.1
130.00	Supply & Fixing of T.W.Deep Box of Size 6" x 6"	Supply & Fixing of T.W.Deep Box of Size 6" x 6"	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	29.54	no	3840.2
93.00	Supply & Fixing of 4" x 7" Metal Box	Supply & Fixing of 4" x 7" Metal Box	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	82.94	no	7713.42
93.00	Supply & Fixing of T.W.Deep Box of Size 4" x 7"	Supply & Fixing of T.W.Deep Box of Size 4" x 7"	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	27.27	no	2536.11
800.00	Supply & Fixing of No.8 Screws of 25mm	Supply & Fixing of No.8 Screws of 25mm	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	110.21	100 no	881.68
3200.00	Supply & Fixing of 36/0.3mm (2.5 Sqmm) FRLS / HFFR / ZHFR PVC insulated 1100V grade as perIS:694/1990 specification for Copper cable.	Supply & Fixing of 36/0.3mm (2.5 Sqmm) FRLS / HFFR / ZHFR PVC insulated 1100V grade	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	3754.98	100 Rmt	120159.36
2300.00	Supply & Fixing of (4 Sqmm) FRLS / HFFR / ZHFR PVC insulated 1100V grade as perIS:694/1990 specification for Copper cable.	Supply & Fixing of (4 Sqmm) FRLS / HFFR / ZHFR PVC insulated 1100V grade	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	5733.01	100 Rmt	131859.23
197.00	Supply & Fixing of 6A 1 Way flush type Swich.	Supply & Fixing of 6A 1 Way flush type Swich.	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	20.45	no	4028.65
64.00	Supply & Fixing of 6A 3/2 pin flush type Socket with shutter.	Supply & Fixing of 6A 3/2 pin flush type Socket with shutter.	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	30.68	no	1963.52
4.00	Supply & Fixing of 63A 10KA FP MCB, C/D Curve ISI	Supply & Fixing of 63A 10KA FP MCB, C/D Curve ISI	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	786.22	no	3144.88
44.00	Supply & Fixing of 6-32A 10KA SP MCB, C/D Curve ISI Mark.	Supply & Fixing of 6-32A 10KA SP MCB, C/D Curve ISI Mark.	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	259.04	no	11397.76
4.00	Supply & fixing of (8 +12) 4 Way TPN DB Horizontal with IP 30 protection suitable for installation of 12 Nosof SP outgoing MCBs and for 1 No 4 pole, MCB/Isolator incomer along with provision for 1 No of 4 Pole RCCB/ELCB etc., complete as per IS 8623; IS 13032; IEC 61439-3.	Supply & fixing of (8 +12) 4 Way TPN DB	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	2437.04	no	9748.16
75.00	Supply, Transportation and fixing of 6W LED Down lighter, suitable for Recessed / Surface mounting made of diecast alluminium body with powder coating, acrylic diffuser with Driver, operating voltage range of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV, THD<10% with high power LED's having efficacy of > 120 lumins / watt, CCT: 3000K - 5700K, minimum CRI > 70, Luminaire performance complies to IS 10322 (Part 5 / Sec-3) etc., complete - 6W	Supply, Transportation and fixing of 6W LED Down lighter	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	729.41	no	54705.75
29.00	Supply & fixing of 48" (1200mm) Sweep 5 star rated BLDC (Brush less Direct Current) Ceiling Fan with double ball bearings, input voltage 230V AC converted to 24 V DC, power input not more than 30W, air delivery not less than 220 cubic meter/min and a minimum service value of 7.0, with remote and without Regulator	Supply & fixing of 48" (1200mm) Sweep 5 star rated BLDC (Brush less Direct Current) Ceiling Fan	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	3916.31	no	113572.99
8.00	Supply & fixing of 9" (225mm), Light duty exhaust fan with double ball bearing and wire guard etc complete.	Supply & fixing of 9" (225mm), Light duty exhaust fan	Electrical Works	APDSS/BIS/MOTH/NEC/NLC/CPHEEO/GOIAdvisories	1763.30	no	14106.4
						TOTAL AMOUNT IN RS	**38,81,81,758.33**

Cost Summary

Annexure -3

GENERAL ABSTRACT

NAME OF THE WORK : APCRDA - "Construction of Roads, Drains, Water Supply, Sewerage, Utility Ducts for Power & ICT, Reuse waterline, Avenue Plantation, compatible with trunk infrastructure in Layouts for Land Pooling Schemes for kondamarajupalem(P), Lingayapalem(P), Uddandarayunipalem(P), Velagapudi(P) and Mandadam(P) Villages in Zone-7 Area in Amaravati Capital City, Andhra Pradesh on Lump sum Contract (% Percentage Tender) including DLP of 2 Years"

SL.No	Description of Items	Amount in Crores
Part A - Basic Infrastructure Cost (Capex)		
1	Roads	416.36
2	Storm Water Drains	144.85
3	Water Supply	30.10
4	Waste Water	55.31
5	Power & ICT	100.02
6	Reuse Water	10.75
7	Retrofitting Works	10.04
8	Cost towards Investigation,Designs and Drawings at 0.532%	4.08
9	Cost towards Implementation of Environment and Social Management Plan (ESMP) at 1%	7.68
	Sub Total part - A	**779.19**
Part B - Provisions		
1	Seignorage Charges of all works	10.84
2	Extra @ 100% on Seignorage Charges towards consideration amount	10.84
3	Extra @ 2% on Seignorage Charges towards MERIT	0.22
4	Extra @ 30% on Seignorage Charges towards DMF	3.25
5	NAC @ 0.1% on Part A & B (1+2+3+4)	0.80
6	GST @18% on Part A & B (1+2+3+4+5)	144.93
7	Provision for STP including Raw Sewage Pumping Station & Tertiary Treatment including O&M for 7 Years.	170.94
8	Administrative Charges @2% on (A)	15.58
9	Provision for Street furniture and implementation of street design guidelines, provisions for Sustainable Urban drainage systems and other sustainable features, Price Adjustment, Contingences, AMR for property connections and unforeseen items etc...	98.93
	Sub Total part - B	**456.33**
	GRAND TOTAL Part (A + B)	**1235.52**

AEE 14/2/25 DFE E.E 14/2/25 SE 14/2/25

Administrative Sanction accorded for Rs. 1235.52 crores vide G.O.Ms No. 6 MA & UD(CRDA) dept., Dt:- 17.01.2025. Technical Sanction accorded for Rs. 1235.52 crores vide CER No. 19/CE(Infra-I)/2024-25 Dt: 14/02/25.

14/2/2025

Chief Engineer
APCRDA, VIJAYAWADA.

To

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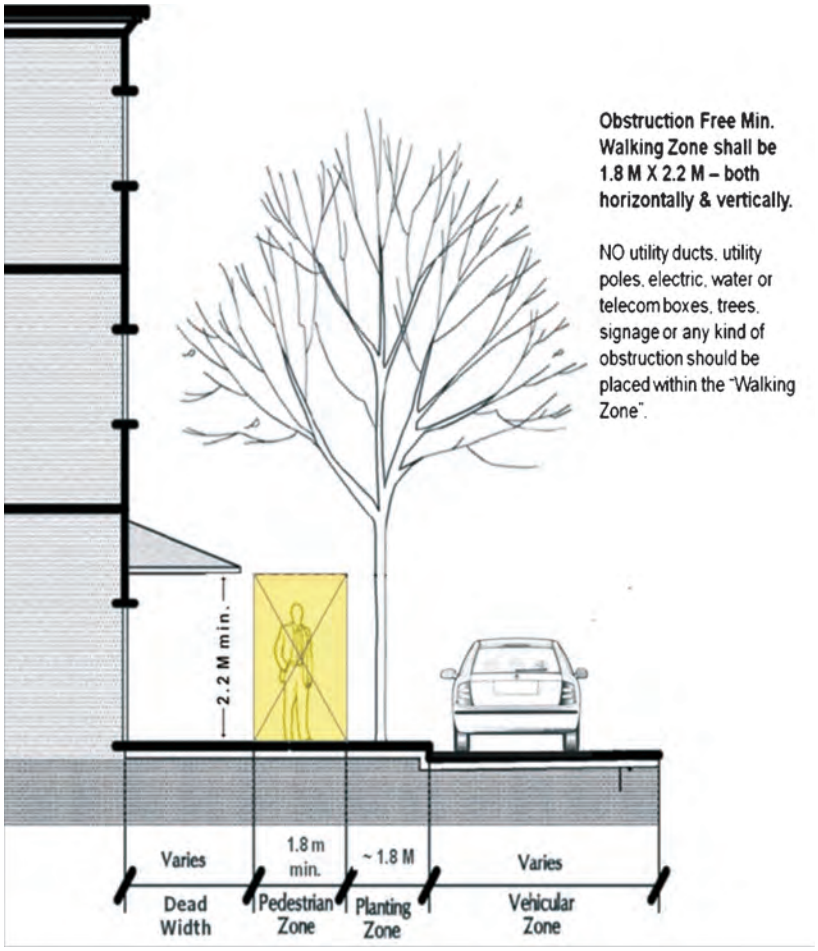

Fig. 1 Clear Walking Zone is separate from Planting Zone

6.1.4 *Clear height*

A clear height of 2.2 m is required for the entire width of the footpath walking zone. No tree branches, trees, utility poles, electric/water/telecom boxes or signage should be placed within the clear height and width of the Walking Zone.

6.1.5 *Width*

6.1.5.1 The width of a footpath is fundamental to the effective functioning of the pedestrian system. Without an optimum width, footpath will not help move enough pedestrian and will discourage them from walking. The width of side-walks depends upon the expected pedestrian flows and could be fixed with the help of guidelines given in **Table 1.** The minimum width of a clear unobstructed pathway should be 1800 mm in roads of right of way of 10 m and above. This allows two wheelchairs to pass each other comfortably **(Fig. 2)**. In case of road with right of way less than 10 m or in the areas with light pedestrian traffic, a width of 1500 mm is regarded as the minimum acceptable, giving enough space for a wheelchair user and a walker to pass each other. As an exception, the width of the footpath may be considered as 1500 mm. The full width of footpath should be maintained consistently, even behind bus shelters and in front of shop. For the actual length or width of people and equipment, the clearance lengths

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and clear outdoor passage widths needed for those people and equipment, **Annexure-I** can be referred to.

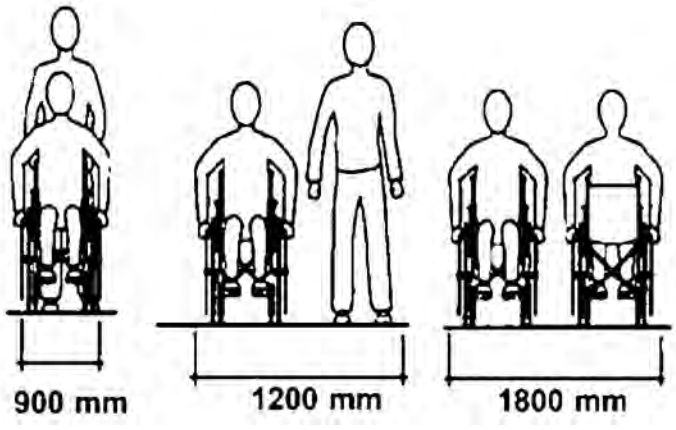

Fig. 2 Minimum Width of a Clear Footpath

6.1.5.2 Footpaths should normally be designed for a pedestrian Level of service B, thereby providing wide pedestrian facilities for pleasant and comfortable walking. Under resource constraint, Level of Service C can be adopted for deciding width of footpath **(Table 1)**. The width of the footpaths depends upon the expected pedestrian traffic and may be fixed with the help of the following guidelines subject to not being less than 1.8 m **(Table 1)**.

Table 1 Capacity of Footpath

Width of side-walk (meter)	Design Flow in Number of Persons per hour			
	In Both directions		All in One direction	
	LOS B	LOS C	LOS B	LOS C
1.8	1350	1890	2025	2835
2	1800	2520	2700	3780
2.5	2250	3150	3375	4725
3	2700	3780	4050	5670
3.5	3150	4410	4725	6615
4	3600	5040	5400	7560

The land use adjacent to roads significantly influences generation of pedestrian traffic Recommended width of footpath along various landuses are given in **Table 2.**

Table 2 Required Width of Footpath as per Adjacent Landuse

Minimum obstacle free walkway width and Residential/ Mixed Use Areas	1.8 m
Commercial/ Mixed Use Areas	2.50 m
Shopping frontages	3.5 m to 4.5 m
Bus Stops	3 m
High Intensity Commercial Areas	4 m

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Amaravati Development Corporation Limited

54-15-1, Venkateswara Nagar, Sonovision Building, Ring Road, Vijayawada, NTR District, 520008 Andhra Pradesh; website : www.adcl.in , Email: amaravati-adc@ap.gov.in , ccdmc.amaravati@gmail.com

From
Smt. D. Lakshmi Parthasarathy, IAS (R)
Chair-person & Managing Director,
Amaravati Development Corporation
Vijayawada-520003

To
The Commissioner,
APCRDA,
Lenin Centre, Governorpet
Vijayawada

Letter No. 207/ADC/IPD/2024-2025, Dt. 13.05.2025

Sir,

Sub: Sub: APCRDA – LSE – Compliance to Environment Clearance and Hon'ble NGT Directions – Conditions to be complied at City and neighbourhood level – Submission of Compliance Report – reg.

Ref:
1. Proceedings of Additional Commissioner, APCRDA MAU61-EE0ENV (APCP)/3/2025-CZLE.
2. Discussions held the officials of APCRDA and ADCL officials on 12.05.2025

This is with reference to the above captioned subject, point wise response is attached as Annexure -1. Request you to take note of the above responses for further necessary action.

Yours faithfully,

Chairperson & Managing Director
Amaravati Development Corporation Ltd

Annexure -1

Amaravati Development Corporation Limited, Vijayawada
Responses to the Proceedings of Additional Commissioner, APCRDA
MAU61-EE0ENV(APCP)/3/2025-CZLE

1. Water pumping system and sewage conveyance and treatment systems are energy intensive and as such the proponent shall follow Bureau of Energy Efficiency Norms (measures taken and included in the BoQ may please be provided in Flood works, STPS, pumping stations, WTP, WS mains - pumps - Also please submit the supporting document evidence. The items if not covered shall be included in the part B fund and an order in this regard from the Head of the institution may be provided)

   Response: Administrative sanction is received, and Technical Sanction is yet to be received. While taking the technical sanction the LT pumps selected for clear water pumping and distribution system are of IE3-rated, in compliance with the norms set by the Bureau of Energy Efficiency (BEE). The HT pumps used for clear water pumping, as well as the raw water pumps installed at the intake well and WTP are based on the 3D (Demand Driven Discharge) concept. These pumps operate according to the actual demand, ensuring optimized performance. Their operation is regulated by energy-efficient devices such as Variable Frequency Drives (VFDs), which help in controlling the pump speed and reducing energy consumption. However, as the Tender will be invited on Design Built Operate, the appointed contractor will submit the detailed designs including above.

2. The proponent shall provide continuous online water quality monitoring facilities for WTPs, STPs and upstream of drinking water source at Krishna River. Results of monitoring shall be linked to SPCB / CPCB website. (Measures taken and included in the BoQ may please be provided for the relevant works- Also please submit the supporting document evidence. The items if not covered shall be included in the part B fund and an order in this regard from the Head of the institution may be provided)

   Response: Administrative sanction is received, and Technical Sanction is yet to be received. While taking the technical sanction the proposed Water Treatment Plant will feature complete automation through SCADA (Supervisory Control and Data Acquisition), which is further integrated with an AI-based Digital Twin. This integration enables real-time online monitoring of both water quality and quantity throughout the system. Additionally, a Computerized Maintenance Management System (CMMS) is proposed for the Water Supply System of Amaravati Capital City. CMMS is a software application designed to assist organizations in efficiently managing and optimizing their maintenance operations. It primarily focuses on asset tracking, work order management, and scheduling of preventive maintenance activities. However, once the system in place, measure will be taken to link to SPCB/CPCB website. However, as the Tender will be invited on Design Built Operate, the appointed contractor will submit the detailed designs including above.

3. The proponent shall encourage battery operated vehicles by providing separate lane with a provision for recharging. (decision taken regarding separate lane, recharge infrastructure, items included in the BoQ may please be provided for the relevant works - Also please submit the supporting document evidence)

Response: ADCL has issued Letter to the Design Consultant M/s. Aarvee Associates Architects, Engineers & Consultants Pvt. Ltd. to prepare a typical plan and section with the details of necessary EV charging infrastructure along with Bill of Quantities, Cost estimate to accommodate minimum 2 to 3 EV charging stations at one location. The input from the consultant is expected on or before 28.05.2025.

With reference to Arterial Roads, EV charging infrastructure will be installed on either side of the carriageway by creating a lay bye to the main carriageway with facilitation for EV charging infrastructure for various vehicles such as Bus, Car and Two Wheelers etc. In case of Sub Arterial Roads, the central two lanes are reserved for Bus Rapid Transit System (BRTS) and EV charging for BRT will be installed at respective bus depots. However, similar concept will be considered for Sub Arterial Roads also by creating a lay bye to the main carriageway, EV charging infrastructure will be provided.

4. The proponent shall create primary green spaces of 7200 Ha. Consisting of city parks, lake parks, town parks, neighbourhood parks as committed. The proponent shall create primary green space of 3924.57 Ha in the 1st phase as committed. (no. of parks in proposal stage, under execution stage, their areas may please be submitted with supporting evidence)

Response:
ADCL invited Request for Proposal for appointment of Architectural and Landscape consultants for

- Avenue Plantation with Beautification and (ii) Median and Junction Plantation with Beautification in Trunk Roads in Amaravati
- Plantation and Beautification of (i) Reservoirs and (ii) Canals and Vagus with Buffers in Amaravati
- Development of Parks with Landscape and Plantation in Amaravati

ADCL appointed a consultant for Preparation of Project Report for (i) Avenue Plantation with Beautification and (ii) Median and Junction Plantation with Beautification in Trunk Roads in Amaravati. For the remaining Request for Proposals are in evaluation stage.

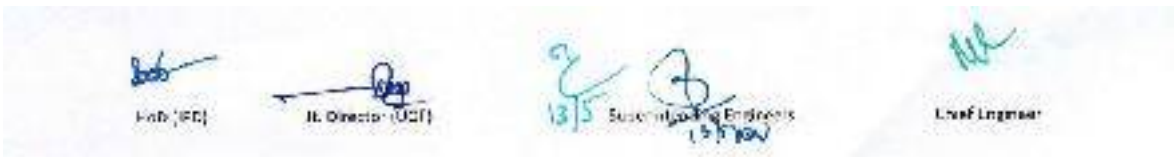
ADCL has proposed the following parks in the 1st phase. The details are stated below:

Sl. No	Park	Area in Acres	Stage	Remarks
1	Sakhamuru Park	190	Proposal Stage	RFP have been called for selection of Land scape Architects
2	Ananthavaram Park	35		
3	Malkapuram Park	21		
4	Kuragallu/Nowluru -P2	233.37		
5	Undavalli/Penumaka -P2	193.18		
6	Lingayapalem -P2	19.03		
7	Abbarajupalem – P1	8.13		
8	Thulluru - P1	17.63		
9	Thulluru – P2	18.72		
10	Malkapuram-P1	12.83		

11	Mandadam-P2	15.89		
12	Kuragallu – P1	15.59		
13	Nidamarru -P2	11.15		
14	Penumaka -P2	17.21		
15	Undavalli -P2	40.16		
16	Penumaka -P2	37.68		
17	Uddandarayanipalem-P1	73.17		
	Total Area	**959.74**		

The ADCL has proposed Greenery in the Central Median of Priority Roads with length of 643.43 Km and also in the Buffer Zone with a length of 133.30 Km.

S.NO	Name of the Road	Length in KM	Green Buffer		Total Length in Kms	Central Median Length
			Left side length in Km	Right side length in Km		
1	E1	13.72	4.6	-	4.6	27.44
2	E2	4.44	0.47	-	0.47	8.88
3	E3	18.27	12.11	-	12.11	36.54
4	E4	15.56	No buffer			31.12
5	E5	19.46	14.12	14.12	28.24	38.92
6	E6	9.845	5.52		5.52	19.69
7	E7	11.57	1.77		1.77	23.14
8	E8	14.95	5.09		5.09	29.9
9	E9	14.12	No buffer			28.24
10	E10	7.81	4.02		4.02	15.62
11	E11	6.31	No buffer			12.62
12	E12	6.791	4.11		4.11	13.582
13	E13	7.33	1.3	1.3	2.6	14.66
14	E14	7.36	3.99		4	14.72
15	E15	4.07	0.9	-	0.9	8.14
16	E16	4.465	-	0.86	0.86	8.93
17	N1	3.68	No buffer			7.36
18	N2	2.3	No buffer			4.6
19	N3A	1.452	No buffer			2.904
20	N3B	3.258	No buffer			6.516
21	N4	7.17	5.28	-	5.28	14.34
22	N5	3.34	No buffer			6.68
23	N6	13.1	8.5	-	8.5	26.2
24	N7	12.742	8.42		8.42	25.484
25	N8	13.86	1.85	-	1.85	27.72
26	N9	13.16	8.7	-	8.7	26.32



S.NO	Name of the Road	Length in KM	Green Buffer		Total Length in Kms	Central Median Length
			Left side length in Km	Right side length in Km		
27	N10	16.31	0	1.06	1.06	32.62
28	N11	8.657	0.16	-	0.16	17.314
29	N12	8.633	No buffer			17.266
30	N13	11.9	7	7	14	23.8
31	N14	8.27	5.46		5.46	16.54
32	N15	8.514	-	-		17.028
33	N16	8.77	5.59		5.59	17.54
34	N17	7.078	No buffer			14.156
35	N18	3.45	No buffer			6.9
Total		**321.715**	**108.96**	**24.34**	**133.31**	**643.43**

Remarks: (i) RFP have been called for selection of Land scape Architects; (ii) As on today far 36.17 Kms Length of Avenue Plantation along the priority roads have been established with native species

The available water bodies within Amaravati is mentioned below and improvement plan for the same is in planning stage.

Village	Area in Acre
Ananathavaram	9.18
	15.75
Inavolu	41.85
Kuragallu	24.87
Nekkallu	6.05
	23.74
	8.44
Nelapadu	20.74
Nidamarru	12.93
	30.12
Nowluru1	67.9
	26.86
	31.25
Nowluru2	24.18
Sakhamuru	26.6
Tulluru	23.8
Velagapudi	38.45

With reference to Deepening and Widening of Kondaveeti Vagu, Pala Vagu and construction of Gravity Canal along with the Three reservoirs, the green buffer of 20m to 30m is proposed on the Vagus/ Canals.

Section	Approx Length (km)	Bottom Width of Canal (m)	Top Width of Canal (m)	Green Width on each side (m)	Top Width with Green Buffer (m)	Green Belt Area in Acres
Kondaveeti Vagu (23.6 km)						
Vundavalli to Krishnayapalem	3.8	75	115	30	175	56.32
Krishnayapalem to Neerukonda	7.2	75	115	30	175	10.72
Neerukonda to Sakamuru	3.6	14	65	20	105	35.57
Sakamuru to Anantavaram	9.0	10/15	30/55	20	105	88.93
Pala Vagu (16.7 km)						
Krishnayapalem to Secretariat	9.3	25	65	20	105	91.90
Secretariat to Dondapadu	7.4	12	45	30	105	109.68
Gravity Canal (8 km)						
Vykuntapuram gravity canal	8.0	40	70	20	110	79.05
Total Length (Km)	**48.3**					**568.18**

Over and above, ADCL is constructing three reservoirs i.e., Neerukonda Reservoir, Krishnayapalem Reservoir and Sakhamuru Reservoir with a total storage capacity of 0.53 TMC. As part of construction of these reservoirs ADCL is taking up green works in a total area of 80.56 Acres; 14.17 Acres and 7.23 Acres respectively.

With above, the green works that ADCL is dealing is mentioned below:

➢ Parks	:	959.74 acres
➢ Buffer Zone	:	600.00 acres
➢ Central Median	:	354.00 acres
➢ Kondaveti Vagu, Palavagu and Gravity Canal	:	568.18 acres
➢ Reservoirs 3 Nos	:	101.96 acres
➢ Total Area	:	2583.88 acres

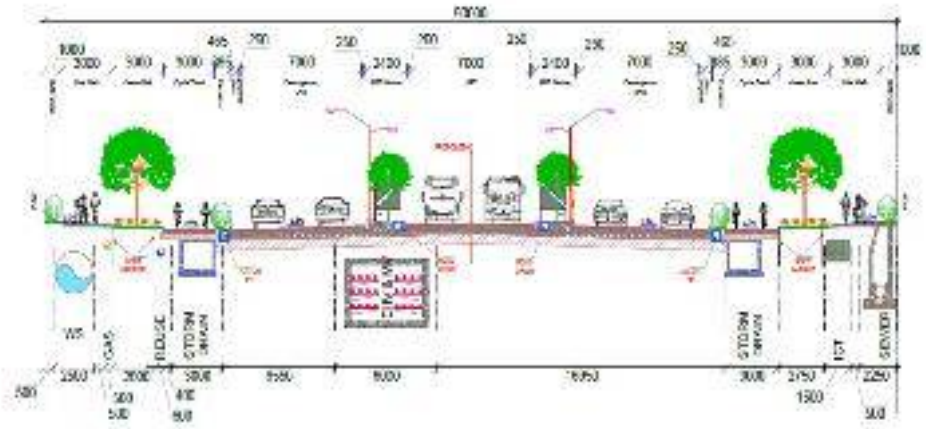
5. Proponent shall Develop at least 5 safe street crossings per km for bicycles with spacing between two crossings not more than 250m. (Details as per the plan and BoQ may please be provided with supporting document evidence. The items if not covered shall be included in the part B fund and an order in this regard from the Head of the institution may be provided)

   Response: As a part of scope of work of the Design Consultant M/s. Aarvee Associates Architects, Engineers & Consultants Pvt. Ltd. has to prepare the detailed design for cross walks at junctions including cycle track and pedestrian walkways so that the pedestrians and cyclists should cross the arterial roads/ sub arterial roads smoothly. Hence Good for Construction drawings are issued by holding the Junction locations which is under detailed design stage. Upon finalisation of the Designs model section will be prepared for necessary approval of competent authority. In Arterial and sub arterial roads, safe street crossings are placed at Junctions only.

6. Proponent shall construct a continuous unobstructed foot path on each side of all streets with ROW wider than 12 mtrs. Minimum width of footpath shall be 2 mtrs. In addition to space for trees/greenery/vending spaces and surface utilities. Width of footpath shall be determined based on pedestrian volume and have to be wider than 2m wherever required. Intermittent buffers, bollards and other physical elements should be used to protect foot paths from encroachment by motor vehicle parking. Footpath Elevation over the carriage way at all times should be less than 150 mm. All pedestrian facilities should be barrier free for universal access by all persons with reduced mobility including those with hearing and visual impairments. (for the text in bold - Details as per the plan and BoQ may please be provided with supporting document evidence. The items if not covered shall be included in the part B fund and an order in this regard from the Head of the institution may be provided.)

   Response: As a part of Trunk infrastructure sub arterial and arterial roads which is of 50m Right of way, provision of 3m each is kept for Cycle Track and sidewalk on either side. Typical sections for the same as approved by APCRDA is presented below:

Typical Cross Section : Sub-Arterial Road (50m RoW)

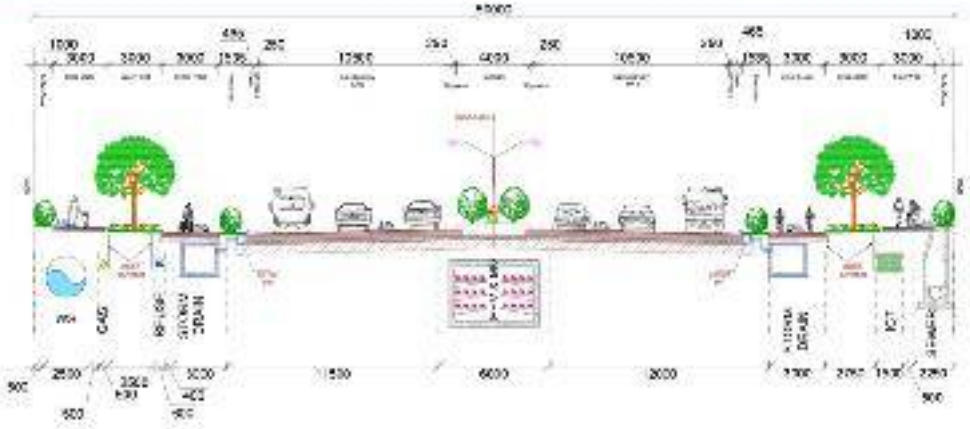


Sub-Arterial Road 4 Lane with 2 lane BRT

East Roads (8Nos) - E2, E4, E6, E8, E10, E12, E14 & E15 Roads

North Roads (10Nos) – N1, N2, N4, N5, N7, N9, N11, N14, N16 & N18 Roads

Typical Cross Section : Arterial Road (50m RoW)



Arterial Road 6 Lane

East Roads (5Nos) – E1, E7, E9, E11 & E16 Roads

North Roads (6Nos) – N3, N8, N10, N12, N15 & N17 Roads

7. The proponent shall ensure usage of fly ash for levelling / reclamation of low lying areas, road embankments, for raising platforms in inundated areas, and usage of fly ash based products for construction purpose including fly ash bricks, PPC cement, Concrete etc., in compliance with Fly Ash Notification issued by the MoEF under Environment (Protection) Act.(Details as per BoQ may please be provided with supporting document evidence, item if not covered shall

be included in the part B fund and an order in this regard from the Head of the institution may be provided)

Response: Not applicable.

8. No alteration to the pre-existing embankments if any should be permitted except as may be required for its strengthening for flood protection of the proposed Capital City. Even such exercise should be undertaken after detailed study of the flood pattern and hydraulics of the river or the storm water drains. (Report of the detailed study undertaken shall be shared)

   Response:
   Partly compiled. No alterations are proposed. As per the Environment clearance conditions measures shall be taken to strengthen the Krishna River Bund to minimize flood related issues.

   A detailed study on the flood pattern and hydraulics of the river will be undertaken and submitted prior to the embankment strengthening works for flood protection.

9. All the hills and hillocks in the catchment area of Kondaveeti Vagu, its tributaries and other storm water drains/channels should be treated with intensive soil and water conservation measures including afforestation so as to minimize surface run off and improve ground water recharge. (Measures proposed on the Hills and Hillocks in the capital city shall be shared with supporting document evidence)

   Response: Study will be taken up at the earliest to comply the same. A letter dated 13.03.2025 was addressed to the Principal Chief Conservation of Forests to take up soil and water measures including afforestation on hills and hillocks in their jurisdiction. ADCL will appoint an agency to take intensive soil and water conservation measures including afforestation so as to minimize surface run off and improve ground water recharge.

Registered No. HSE-49/2016

RIGHT TO INFORMATION

ఆంధ్రప్రదేశ్ రాజపత్రము

THE ANDHRA PRADESH GAZETTE

PUBLISHED BY AUTHORITY

PART I EXTRAORDINARY

No.761 AMARAVATI, TUESDAY, NOVEMBER 11, 2025 **G.746**

NOTIFICATIONS BY GOVERNMENT

MUNICIPAL ADMINISTRATION AND URBAN DEVELOPMENT DEPARTMENT

(ANDHRA PRADESH CAPITALREGION DEVELOPMENT AUTHORITY)

FILE.NO:MAU61-DP0AMRV(OTH)/39/2025-DP

NOTIFICATION: On Integrating the conditions of Environment Clearance, CFE and the Hon'ble NGT with Capital City bye laws.

PublicNotice

(Section-39&41ofAPCRDAAct, 2014)

In exercise of the powers conferred under section 39(1) and 41(3) of APCRDA Act, 2014 the APCRDA, Vijayawada, as per 45th Authority resolution vide no. 550/2025 Dt: 02.06.2025, published draft notification for amendments to Zoning Regulations on incorporation of the conditions of the Environment Clearance, CFE into Capital City bye laws with respect to Hon'ble NGT. Accordingly, APCRDA invited for objections/suggestions with respect to said notification within a period of 30 days from the date of publication. The objections/suggestions received within due date are examined and disposed.

Hence notice is hereby given that proposed amendments to Capital City Zoning Regulations-2016 on incorporation of the conditions of the Environment Clearance, CFE into Capital City bye laws with respect to Hon'ble NGT as stated below are notified under section 41(4) of APCRDA Act, 2014. The modifications shall come into operation from the date of publication of this gazette notification and as appended.

Schedule

Environment Clearance Condition:

Parameter	**EC Condition**	**Proposed Amendment to AmaravatiCapitalCityZoning Regulations**
Water Management	Condition 6 of EC-Proponent Shall ensure construction of Rain water harvesting structures and Promote rain water storage and use System by considering heavy rains In the area. Proponent shall make these as mandatory by Incorporating in the Bye laws of APCRDA & CA.	Rule 606 (1): Align with AP BuildingRules2017. Rule606(1) maybereadas follows "1. AllexistingActs/Rulesand Directions issued by NGT Restrictingdevelopmentactivities near Waterbodies, Railways, Electricallines,Airport,Oil/Gas Pipelines, Heritage Structures, Religious Structures and EIA Notificationshallbefollowedin Allzones,example a) RainwaterHarvesting Structuresshallbeprovidedfor Allbuildingsirrespectiveofusage and plot size. Refer to AP Building Rules, 2017issuedvide G.O.Ms.No.119, dt:28/03/2017 Anditssub-sequent amendments. b) Provisions of the Andhra PradeshWater,LandandTrees Act2002shallbecompliedin

		Suchsitesandschemes Whereverapplicable.” c)Thedevelopmentpermit ApplicationsinCapitalCityand AGCareashouldcomplythe IGBC/ECBC/GRIHA/EDGE WhichhelpsinachievingEnergy efficiency,optimumutilizationof resourceandpromotes sustainable renewable energy. A certificate in this regard shall be submitted to the authority from the certifiedexpert at the time of application submission.” d)Alltheresidential,commercial, institutional developments in plot area 200 sqm and above rainwater storage tanks for reuse within the facility.RefertoAP Building rules,2017issued vide G.O.Ms.No.119, dt:28/03/2017 anditssub-sequent amendments. All buildings have a minimum discharge of 15,000 liters and above per day or premises consisting of 25 dwelling units and above shall incorporate wastewater recycling system. The recycled watershould be used for horticultural purposes and flushing purposes A certificate in this regard shall be submitted by the Empanelled Certified expert.

	Condition8ofEC-Proponentshall encourage low flow plumbing efficient fixtures, sensors, auto valves, pressure reducing devices including for toilets, faucet aerators and shower heads to conserve the water. Proponent shall incorporate these guidelines in the Byelaws.	Add to Rule 606 (2): Compliance with NBC and AP Building Rules Rule 606 (2) may be read as follows“2. Thebuilding requirements and standards not covered in these regulations shall be governed by Andhra Pradesh Building Rules, 2017 and are to be complied with National Building Code.” “3.The developer shall install Lowflowplumbingefficient fixtures,sensors, Pressure reducersinwashbasintaps,bath and other faucets, shower heads etc.” Certificate in this regard shallbesubmittedbya Empanelledcertifiedexpert.

Air &Energy	Condition 11 of EC-The Proponent shall ensure that DG sets shall comply with noise and emission normsprescribedbyMoEF&CCin Environment (Protection) Rules.	Rule 606: Adherence to MoEFCC norms under EP Rules IncorporationRule606.10may bereadasfollows “DGsets installed shall comply with noise andemissionnormsprescribed byMoEF&CCinEnvironment (Protection) Rules”.DG sets approvedbyauthorisedagencies ofGoshallbesubmittedwhile ApplyingforOC.
	Condition13ofEC-The Proponent shall ensure installation of solar panelsbyallbuildingsbyallocating at least 1/3 of roof topfor this purpose. This is in addition to installation of solar heaters. Proponent shall incorporate these guidelines in Byelaws	Rule 606: Adherence to MoEFCC norms under EP Rules IncorporationRule606.11may beread as follows “The developershall Install solarpanelsbyallocatingat-least1/3 ofrooftopofthebuildingsin additiontoinstallationofsolar heaters”mandatoryforall BuildingsexceptforIndividual Residential Buildingslessthan 300Sq.mts
	Condition14ofEC–Theproponent shallincorporateenergyefficiency guidelines (Energy Conservation BuildingCode). AlltheCapital complexes, Commercial, institutional and major residential complexes should be constructed followingGreenBuildingconcepts andensure	Amendment proposed in rule 606(1)And is read as follows “Thedevelopmentpermit applications in CC and AGC area should comply the IGBC/ECBC/GRIHA/EDGE which helps in achieving Energy efficiency,optimumutilizationof

	Energyefficiency,lowcarbonfoot-print, resources conservation etc. The Proponent shall ensure that all the bulk consumers of the energy shall meet a greater part of their demand through renewable energies and avoid use of fossil fuels; The Proponent shall incorporate these in Byelaws.	Resourcesandpromotes sustainable renewable energy. A certificate in this regard shall be submitted to the authority from the certified expert at the time of approval of Building permission."
Solid Waste	Condition20ofECTheproponent Shallensureusageoffly ashfor leveling/reclamationof low lying areas, road embankments, for raising platforms in inundated areas,andusageofflyashbased products for construction purpose including fly ash bricks, PPC cement, Concrete etc., in Compliance with Fly Ash NotificationissuedbytheMoEF under Environment (Protection) Act. The proponent shall Incorporateusageofflyashby ConstructionagenciesintheBye-Laws.	Rule 606: Compliance with MoEFflyash notifications IncorporationRule606.12may Bereadasfollows Thedeveloppersshalluseflyash Forlevelling/reclamationoflow Lyingareas,roadembankments, Forraisingplatformsininundated areas,orflyashbasedproducts Including flyashbricks,PPC cement, Concrete etc., for construction purpose in Constructionincompliancewith MoEFflyashnotifications.A Certificateinthisregardshallbe Submittedbytheapplicantwhile Atthetimeof OC.
Ecology & Heritage	Condition 13 of EC - All archaeological, cultural and ecologically sensitive areas (i.e. estuaries, mangroves, rocky shores,cavesetc.)inandaround the Amaravati capital city be adequately protected and conserved.Theproponentshall take appropriate measures for ProtectionofUndavallicaves.The proponent hasto declare no DevelopmentactivityZoneof100	Rule 606: ASI Notification ComplianceunderAMASRAct IncorporationRule606.13may be read as follows no development activity shall take placein contraventiontothe ancient monuments and Archaeologicalsitesandremains act,1958

	to 300mtrs. Around Undavalli caves as per ASI regulations	
	Condition 15 & 26 of EC - Development of the green belts, green corridors, avenue plantations etc., be made only with the native species with multiple uses, and the plantation should not affect the native species diversity and shall help enhance carbon stocks Deep rooted large foliage plantation along the side of the roads and in the open spaces shall be developed to act as sinks of air pollutants.	Rule 606: Plantation Specifications as per guidelines of APCRDA advisory Committee on greenery IncorporationRule606.14maybe read as follows "The developers shall develop greenery with Native and Deep-rooted Trees in Open Spaces as per the guidelines of APCRDA advisory Committee on greenery.
Disaster Management	Condition 2 of EC - The proponent shall prepare earthquake response management plan by considering the location of the city in the class III seismic zone. The proponent shall incorporate structural design requirements of buildings for Seismic Zone III in the Byelaws.	Rule 606: Consideration of Capital City zone as Seismic Zone III for Earthquake Resistant Structural Analysis. Rule 606.4 may be read follows "Building and structures shall be designed for compliance with earthquake resistance considering the Capital City as Seismic Zone III and wind loads. Structural stability Certificate by structural engineer shall mention that the norms have been followed in the design and construction of buildings for making the buildings resistant to earthquake and wind loads (in case of applicable structures)".
Construction Phase	Condition 2 of EC - The Proponent shallensurefollowingmitigation	Rule 606: Environmental management measures

Controls	measures as committed to Minimizepollutionproblemsduring Constructionstage. All the loose material either Stackedortransportedshallbe provided with suitable covering Suchastarpaulinsetc. Watersprinklingshallbedoneat Thelocationwheredustgeneration Isanticipated. Constructionequipmentbe Maintainedandservicedregularly Suchthatthegaseousmissions from these equipment's are maintained within the design specifications. Provisionforinsulatingcapsand Aidsattheexitofnoisesourceon Themachinery. Theuseofdampeningmaterials Suchasthinrubber/leadsheetfor wrapping the workplaces like compressors,generators,etc. Inletandoutletmufflersshallbe provided. Earmuffs shall be provided to Workersandenforcedtobe Usedbytheworkers. Noise prone activities shall be Restrictedtotheextentpossible Duringthenighttime,inorderto have minimum environmental Impactontheworkersaswellas on theneighborhood.	Rule606.15maybereadfollows the developer shall minimise pollution during construction stage. Dust Suppression and Fugitive emission control measures,noise control. Measuresusingbarriers, mufflers,waterpollutioncontrol Measuresbyinstallingtemporary STPsfortreatmentofsewage Fromthelabourcampandsludgedis posalatauthorized facility, Solidwastemanagementasper Therelevantmanagementrules Andhandoverthewasteto authorised facilities, Work SpecificPPE for safetyandbasic Amenitiestotheworkersonsite Shallbefollowedandreported with evidence along with completion certificate. A Certificateinthisregardshallbe submitted by the empanelled Certifiedexpert.
General EC Conditions	GeneralCondition2ofEC-The Proponentshallincorporatepenal Provisioninthe byelaws/regulationsforany Violationofenvironmentalissues.	Rule606:Legalen force ability for EC Violations. Rule606.17maybereadfollows Penalprovisionsforviolationof Environmental Conditions will

	The proponent shall also create proper intuitional mechanism to ensure continual environmental Awarenessamongallstakeholders.	lead to non issuance of Occupancycertificate.

NationalGreenTribunalConditions

Parameter	NGT Condition	ProposedAmendment
SolidWaste	Conditionno. 5: All bulk generators of municipal solid waste in the proposedconstructions,both residential and non-residential, must necessarily segregate waste at the source and process entire biodegradable waste by composting or bio-methanation Withinthepremises.	Rule 606: Solid waste management by bulk generators Rule606.16maybereadfollowsBulk generators(whogenerates100kgper day)- commercial complex, institutions andresidentialcomplex with 50 families shall install suitable organic waste processing systems to process it within premises.
CFE conditions		

Dual Plumbing system	Condition no. 4: Dual Plumbing system shall be adopted, and separate tanks shall be provided to store fresh water and treated waste water.	Rule 606: Dual plumbing system Rule606.18maybereadfollows In all residential buildings with 50 dwelling units, institutional and commercial projects dual plumbing system for supply of fresh water and treatedwastewatershallbearranged by the developer along with separate storage tanks. The developer shall arrange dual plumbing system as per NBC norms and CPHEEO Manual.
Separate meters for assessing theusageof water for domestic andflushing	Condition no.6: Separate meterswithnecessarypipeline shall be provided for assessing the quantity of water used for domesticandflushing purposes.	Rule606.18(i)mayberead follows Flow meters shall be installed in the dual plumbing system to assess the usage of water for domestic and flushing purposes.

Treatment of Sewage toreuse norms	Conditionno.8: Onsite sewage treatment systems shall ensure treatment as per the latest CPHEEO norms to meet the reuse norms and the treated wastewater shall be reused within the premises.	Rule606.18(ii)maybereadfollows All the STPs installed shall install suitable secondary and tertiary treatment systems to meet the latest CPHEEO reuse norms. The treated wastewater shall be reused for flushing,horticultureand other purposes within the premises.
Topsoil preservation	Conditionno.20:Allthetop Soilexcavatedduring Constructionactivitiesshould Bestoredforusein Horticulture/landscape Developmentwithintheproject site	Rule606:Topsoil preservation Rule606.19maybereadfollows the Developershallpreservethetopsoil Upto30cmdepthandreuseitfor Horticulturepurposes.Acertificate Fromtheapplicantatthetimeof Submissionof applicanttobe submitted.
Parking for visitor vehicles	Conditionno 49: Theproponentshallprovide sufficient parking space for Visitorvehicles.	Conditionno 49: Theproponentshallprovidesufficient Parkingspaceforvisitorvehicles.

Sd/-
Commissioner,
APCRDA.

ఆంధ్ర ప్రదేశ్ రాజధాని ప్రాంత అభివృద్ధి ప్రాధికార సంస్థ

లెనిన్ సెంటర్, గవర్నరుపేట్, విజయవాడ – 520002

నోటీసు

ఫైల్ నెంబర్: MAU61-DP0AMRV(OTH)/39/2025-DP:

APCRDA చట్టం, 2014 సెక్షన్ 39(1) మరియు 41(3) నందు జారి చేసిన అధికారాల ప్రకారం, మరియు APCRDA 45వ అథారిటీ తీర్మానం. 550/2025 Dt: 02.06.2025 ప్రకారం, గౌరవనీయమైన NGTకి సంబంధించి క్యాపిటల్ సిటీ బై లాస్ చట్టాలలో పర్యావరణ క్లియరెన్స్, CFE యొక్క షరతులను చేర్చడంపై జోనింగ్ నిబంధనలకు సవరణల కోసం డ్రాఫ్ట్ నోటిఫికేషన్ ప్రచురించబడింది.

తదనుగుణంగా, ఈ పబ్లిక్ నోటీసును ప్రచురించిన తేదీ నుండి 30 రోజుల వ్యవధిలో పేర్కొన్న నోటిఫికేషన్‌కు సంబంధించి అభ్యంతరాలు/సూచనల కోసం ఆహ్వానించబడింది. గడువు తేదీలోపు స్వీకరించిన అభ్యంతరాలు/సూచనలు పరిశీలించి పరిష్కరింపబడ్డాయి.

కావున కాపిటల్ సిటీ జోనింగ్ రెగ్యులేషన్స్-2016కి, గౌరవనీయమైన NGTకి సంబంధించి, పర్యావరణ క్లియరెన్స్, CFE యొక్క షరతులను ఈ క్రింద పేర్కొన్న మరియు జోడించిన విధంగా, క్యాపిటల్ సిటీ బై లాస్‌లో చేర్చడంపై ప్రతిపాదిత సవరణలు APCRDA చట్టంలోని సెక్షన్ 41(4) ప్రకారం ఈ తేదీ నుండి అమలు జేయబడిందని నోటిఫికేషన్ జారి చేయబడింది.

వివరములు

పర్యావరణ క్లియరెన్స్ పరిస్థితిః

పరిమితి	పరిస్థితి	అమరావతి క్యాపిటల్ సిటీ జోనింగ్ రెగ్యులేషన్లకు ప్రతిపాదిత సవరణ
నీటి నిర్వహణ	ఇసి యొక్క షరతు 6-ప్రతిపాదకుడు వర్షపునీటి సేకరణ నిర్మాణాల నిర్మాణాన్ని నిర్ధారించాలి మరియు ఆ ప్రాంతంలో భారీ వర్షాలను పరిగణనలోకి	రూల్ 606 (1) AP బిల్డింగ్ రూల్స్ 2017 తో సర్దుబాటు చేయండి. రూల్ 606 (1) ను ఈ క్రింది విధంగా చదవవచ్చుః "1. జల వనరులు, రైల్వేలు, విద్యుత్ లైన్లు, విమానాశ్రయం, చమురు/గ్యాస్

	తీసుకోవడం ద్వారా వర్షపునీటి నిల్వ మరియు వినియోగ వ్యవస్థను ప్రోత్సహించాలి. APCRDA & CA యొక్క ఉప చట్టాలలో చేర్చడం ద్వారా ప్రతిపాదకులు వీటిని తప్పనిసరి చేస్తారు.	పైపైన్లు, వారసత్వ నిర్మాణాలు, మతపరమైన నిర్మాణాలు మరియు ఈఐఏ నోటిఫికేషన్ సమీపంలో అభివృద్ధి కార్యకలాపాలను పరిమితం చేస్తూ ఎన్జీటీ జారీ చేసిన అన్ని ప్రస్తుత చట్టాలు/నియమాలు మరియు ఆదేశాలు అన్ని జోన్లలో అనుసరించబడతాయి, ఉదాహరణకు ఎ) వర్షపునీటి సేకరణ నిర్మాణం వినియోగం మరియు ప్లాట్ పరిమాణంతో సంబంధం లేకుండా అన్ని భవనాలకు అందించబడుతుంది. G.O.Ms.No.119, dt: 28/03/2017 మరియు దాని ఉప-తదుపరి సవరణల ద్వారా జారీ చేయబడిన AP బిల్డింగ్ రూల్స్, 2017 ను చూడండి. బి) ఆంధ్రప్రదేశ్ నీరు, భూమి మరియు చెట్ల చట్టం, 2002 లోని నిబంధనలు వర్తించే చోట అటువంటి సైట్లు మరియు పథకాలలో పాటించబడతాయి. సి)రాజధాని నగరం మరియు AGC ప్రాంతంలో అభివృద్ధి అనుమతి దరఖాస్తులు IGBC/ECBC/GRIHA/EDGE నిబంధనలకు అనుగుణంగా ఉండాలి, ఇది శక్తి సామర్థ్యం, వనరులను సముచితంగా వినియోగించుకోవడంలో సహాయపడుతుంది మరియు MAU61-DP0AMRV(OTH)/39/2025-DP I/4275324/2025 స్థిరమైన పునరుత్పాదక శక్తిని ప్రోత్సహిస్తుంది. దీనికి సంబంధించి ఒక సర్టిఫికెట్ దరఖాస్తు సమర్పణ సమయంలో సర్టిఫైడ్ నిపుణుడి నుండి అధికారానికి సమర్పించబడుతుంది. d) 200 చదరపు మీటర్లు మరియు అంతకంటే ఎక్కువ వర్షపాతం ఉన్న ప్లాట్‌లోని అన్ని నివాస, వాణిజ్య, సంస్థాగత అభివృద్ధి. పునర్వినియోగం కోసం నీటి నిల్వ ట్యాంకులు. G.O.Ms.No.119, dt:28/03/2017 ద్వారా జారీ చేయబడిన AP భవన నియమాలు, 2017 మరియు దాని తదుపరి సవరణలను చూడండి.

		రోజుకు కనీసం 15,000 లీటర్లు మరియు అంతకంటే ఎక్కువ నీటిని విడుదల చేసే అన్ని భవనాలు లేదా 25 నివాస యూనిట్లు మరియు అంతకంటే ఎక్కువ ఉన్న ప్రాంగణాలు వ్యర్థ జలాల రీసైక్లింగ్ వ్యవస్థను కలిగి ఉండాలి. రీసైకిల్ చేసిన నీటిని ఉద్యానవన ప్రయోజనాల కోసం మరియు ఫ్లషింగ్ ప్రయోజనాల కోసం ఉపయోగించాలి. దీనికి సంబంధించి ఒక సర్టిఫికెట్‌ను ఎంప్యానెల్డ్ సర్టిఫైడ్ నిపుణుడు సమర్పించాలి.
	EC యొక్క 8వ నిబంధన - ప్రతిపాదకుడు తక్కువ ప్రవాహ ప్లంబింగ్‌ను ప్రోత్సహించాలి సమర్థవంతమైన ఫిక్చర్‌లు, సెన్సార్లు, ఆటో వాల్వ్‌లు, పీడనాన్ని తగ్గించే పరికరాలు టాయిలెట్‌లు, కుళాయిలు ఎరేటర్లు మరియు నీటిని సంరక్షించడానికి షవర్ హెడ్‌లు ఇవి. ప్రతిపాదకుడు ఈ మార్గదర్శకాలను బైలాస్‌లో చేర్చాలి.	నియమం 606 (2) కు జోడించు: NBC మరియు AP భవన నియమాలతో సమ్మతి నియమం 606 (2) ని ఇలా చదవవచ్చు "2. ఈ నిబంధనలలో చేర్చబడని భవనం ఆవశ్యకతలు మరియు ప్రమాణాలు ఆంధ్ర ప్రదేశ్ భవన నియమాలు, 2017 ద్వారా నిర్వహించబడతాయి మరియు జాతీయ భవన నియమావళికి అనుగుణంగా ఉండాలి. "3. డెవలపర్ వాష్ బేసిన్ కుళాయిలు, బాత్ మరియు ఇతర కుళాయిలు, షవర్ హెడ్‌లు మొదలైన వాటిలో తక్కువ ప్రవాహ ప్లంబింగ్ సమర్థవంతమైన ఫిక్చర్‌లు, సెన్సార్‌లు, పీడనం తగ్గించేవి స్థాపించాలి. ఈ విషయంలో సర్టిఫికెట్‌ను ఎంప్యానెల్డ్ సర్టిఫైడ్ నిపుణుడు సమర్పించాలి.
గాలి & శక్తి	EC యొక్క షరతు 11 - ప్రతిపాదకుడు DG సెట్‌లు MoEF & CC ద్వారా పర్యావరణం (రక్షణ) నియమాలలో సూచించబడిన శబ్దం మరియు ఉద్గార నిబంధనలకు అనుగుణంగా ఉండేలా చూసుకోవాలి.	నియమం 606: EP నిబంధనల ప్రకారం MoEFCC నిబంధనలకు కట్టుబడి ఉండటం ఇన్కార్పొరేషన్ నియమం 606.10ని ఈ క్రింది విధంగా చదవవచ్చు "DG సెట్‌లు ఇన్‌స్టాల్ చేయబడినవి పర్యావరణంలో (రక్షణ) నియమాలు లో MoEF & CC సూచించిన శబ్దం మరియు ఉద్గార నిబంధనలకు అనుగుణంగా ఉండాలి. OC కోసం దరఖాస్తు చేస్తున్నప్పుడు GoI యొక్క అధీకృత ఏజెన్సీలచే ఆమోదించబడిన DG సెట్‌లను సమర్పించాలి.
	EC యొక్క షరతు 13 - ప్రతిపాదకుడు అన్ని భవనాల ద్వారా సౌర	నియమం 606: EP నిబంధనల ప్రకారం MoEFCC నిబంధనలకు కట్టుబడి ఉండటం

	ఫలకాలను ఏర్పాటు చేయాలని నిర్ధారించుకోవాలి, దీని కోసం పైకప్పు పైభాగంలో కనీసం 1/3 వంతు కేటాయించాలి. ఇది సౌర హీటర్ల సంస్థాపనకు అదనంగా ఉంటుంది. ప్రతిపాదకుడు ఈ మార్గదర్శకాలను ఉప-చట్టాలలో చేర్చాలి.	ఇన్కార్పొరేషన్ నియమం 606.11ని ఈ క్రింది విధంగా చదవవచ్చు "సోలార్ హీటర్ల సంస్థాపనతో పాటు భవనాల పైకప్పులో కనీసం 1/3 వంతు కేటాయించడం ద్వారా డెవలపర్ సౌర ప్యానెల్లను ఇన్స్టాల్ చేయాలి" అనేది 300 చదరపు మీటర్ల కంటే తక్కువ విస్తీర్ణంలో ఉన్న వ్యక్తిగత నివాస భవనాలు తప్ప అన్ని భవనాలకు తప్పనిసరి.
	EC యొక్క షరతు 14 – ప్రతిపాదకుడు శక్తి సామర్థ్య మార్గదర్శకాలను (శక్తి పరిరక్షణ నిర్మాణ కోడ్) చేర్చాలి. అన్ని మూలధన సముదాయాలు, వాణిజ్య, సంస్థాగత మరియు ప్రధాన నివాస సముదాయాలు గ్రీన్ భవన భావనలను అనుసరించి నిర్మించాలి మరియు శక్తి సామర్థ్యం, తక్కువ కార్బన్ పాదముద్ర, వనరుల పరిరక్షణ మొదలైన వాటిని నిర్ధారించాలి. ప్రతిపాదకుడు శక్తి యొక్క అన్ని పెద్ద వినియోగదారులు పునరుత్పాదక శక్తి ద్వారా వారి డిమాండ్లో ఎక్కువ భాగాన్ని తీర్చాలని మరియు శిలాజ ఇంధనాల వాడకాన్ని నివారించాలని నిర్ధారించుకోవాలి; ప్రతిపాదకుడు వీటిని ఉప-చట్టాలలో చేర్చాలి.	నియమం 606(1) లో ప్రతిపాదించబడిన సవరణ మరియు ఈ క్రింది విధంగా చదవబడింది "CC మరియు AGC ప్రాంతంలోని అభివృద్ధి అనుమతి దరఖాస్తులు IGBC/ECBC/GRIHA/EDGE ని పాటించాలి ఇది శక్తి సామర్థ్యం, వనరుల యొక్క వాంఛనీయ వినియోగం మరియు స్థిరమైన పునరుత్పాదక శక్తిని ప్రోత్సహించడంలో సహాయపడుతుంది. భవన నిర్మాణ అనుమతిని ఆమోదించే సమయంలో ధృవీకరించబడిన నిపుణుడి నుండి ఈ విషయంలో ఒక సర్టిఫికెట్ను అధికారానికి సమర్పించాలి."
ఘన వ్యర్థాలు	EC యొక్క షరతు 20 ప్రతిపాదకుడు ఫ్లై యాష్ను ఉపయోగించాలని నిర్ధారించుకోవాలి. నిర్మాణ ప్రయోజనాల కోసం ఫ్లై యాష్ ఇటుకలు, PPC సిమెంట్, కాంక్రీట్ మొదలైన వాటితో సహా	నియమం 606: MoEF ఫ్లై యాష్ నోటిఫికేషన్లకు అనుగుణంగా నిర్మాణం. ఈ విషయంలో దరఖాస్తుదారుడు OC సమయంలో దరఖాస్తుదారుడు దీనికి సంబంధించిన సర్టిఫికెట్ను సమర్పించాలి.

	లోతట్టు ప్రాంతాలు, రోడ్డు కట్టలను సమం చేయడం / పునరుద్ధరించడం, వరదలు పడిన ప్రాంతాలలో ప్లాట్‌ఫారమ్‌లను పెంచడం మరియు ఫ్లై యాష్ ఆధారిత ఉత్పత్తులను ఉపయోగించడం వంటివి ఫ్లై యాష్‌కు అనుగుణంగా ఉండాలి. పర్యావరణం (రక్షణ) చట్టం కింద MoEF జారీ చేసిన నోటిఫికేషన్. ప్రతిపాదకుడు నిర్మాణ సంస్థలు బై-చట్టాలలో ఫ్లై యాష్ వాడకాన్ని చేర్చాలి.	
జీవావరణ శాస్త్రం & వారసత్వం	EC యొక్క షరతు 13 - అమరావతి రాజధాని నగరం మరియు చుట్టుపక్కల ఉన్న అన్ని పురావస్తు, సాంస్కృతిక మరియు పర్యావరణపరంగా సున్నితమైన ప్రాంతాలు (అనగా నదీముఖద్వారాలు, మడ అడవులు, రాతి తీరాలు, గుహలు మొదలైనవి) తగినంతగా రక్షించబడి సంరక్షించబడాలి. ఉండవల్లి గుహల రక్షణ కోసం ప్రతిపాదకుడు తగిన చర్యలు తీసుకోవాలి. ASI నిబంధనల ప్రకారం ఉండవల్లి గుహల చుట్టూ 100 నుండి 300 మీటర్ల వరకు అభివృద్ధి కార్యకలాపాలు లేని జోన్‌గా ప్రతిపాదకుడు ప్రకటించాలి.	నియమం 606: ASI నోటిఫికేషన్ AMASR చట్టం కింద సమ్మతి విలీన నియమం 606.13 ను ఈ క్రింది విధంగా చదవవచ్చు పురాతన స్మారక చిహ్నాలు మరియు పురావస్తు ప్రదేశాలు మరియు అవశేషాలు చట్టం, 1958 కు విరుద్ధంగా ఎటువంటి అభివృద్ధి కార్యకలాపాలు జరగకూడదు.
	EC యొక్క షరతు 15 & 26 - గ్రీన్ బెల్టుల అభివృద్ధి, గ్రీన్ కారిడార్లు, అవెన్యూ ప్లాంటేషన్లు మొదలైనవి బహుళ ఉపయోగాలు కలిగిన స్థానిక జాతులతో మాత్రమే	నియమం 606: తోటల పెంపకం పచ్చదనంపై APCRDA సలహా కమిటీ మార్గదర్శకాల ప్రకారం లక్షణాలు ఇన్కార్పొరేషన్ నియమం 606.14 ను ఈ క్రింది విధంగా చదవవచ్చు “పచ్చదనంపై APCRDA సలహా కమిటీ

	చేయాలి మరియు నాటకం స్థానిక జాతుల వైవిధ్యాన్ని ప్రభావితం చేయకూడదు మరియు కార్బన్ నిల్వలను పెంచడానికి సహాయపడుతుంది రోడ్ల పక్కన మరియు బహిరంగ ప్రదేశాలలో లోతు పాతుకుపోయిన పెద్ద ఆకులను నాటడం వాయు కాలుష్య కారకాలను సింక్‌లుగా పనిచేసేలా అభివృద్ధి చేయాలి.	మార్గదర్శకాల ప్రకారం డెవలపర్లు బహిరంగ ప్రదేశాలలో స్థానిక మరియు లోతుగా పాతుకుపోయిన చెట్లతో పచ్చదనాన్ని అభివృద్ధి చేయాలి.
విపత్తు నిర్వహణ	EC యొక్క షరతు 2 - ప్రతిపాదకుడు నగరం యొక్క స్థానం (క్లాస్ III భూకంప జోన్) ను పరిగణనలోకి తీసుకొని భూకంప ప్రతిస్పందన నిర్వహణ ప్రణాళికను సిద్ధం చేయాలి. ప్రతిపాదకుడు ఉప-చట్టాలలో (సైస్మిక్ జోన్ III) భవనాల నిర్మాణ రూపకల్పన అవసరాలను చేర్చాలి.	నియమం 606: రాజధాని నగర జోన్‌ను భూకంప నిరోధక జోన్ IIIగా పరిగణించడం నిర్మాణ విశ్లేషణ. నియమం 606.4ని ఇలా చదవవచ్చు "భవనం మరియు నిర్మాణాలు భూకంప నిరోధకతకు అనుగుణంగా రూపొందించబడాలి రాజధాని నగరాన్ని భూకంప నిరోధక జోన్ III మరియు గాలి భారంగా పరిగణించాలి. నిర్మాణ ఇంజనీర్ ఇచ్చిన నిర్మాణ స్థిరత్వ ధృవీకరణ పత్రం భవనాలను భూకంపం మరియు గాలి భారాలకు నిరోధకతను కలిగి ఉండేలా చేయడానికి భవనాల రూపకల్పన మరియు నిర్మాణంలో నిబంధనలను పాటించారని పేర్కొనాలి (వర్తించే నిర్మాణాల విషయంలో)".
నిర్మాణం దశ నియంత్రణలు	EC యొక్క షరతు 2 - ప్రతిపాదకుడు నిర్మాణ దశలో కాలుష్య సమస్యలను తగ్గించడానికి కట్టుబడి ఉన్న విధంగా కింది ఉపశమన చర్యలను నిర్ధారించాలి. పేర్చబడిన లేదా రవాణా చేయబడిన అన్ని వదులుగా ఉన్న పదార్థాలకు టార్పాలిన్లు వంటి తగిన కవరింగ్ అందించాలి.	నియమం 606: పర్యావరణ నిర్వహణ చర్యలు నియమం 606.15 ని ఇలా చదవవచ్చు నిర్మాణ దశలో కాలుష్యాన్ని డెవలపర్ తగ్గించాలి ధూళి అణచివేత మరియు పలాయన ఉద్గార నియంత్రణ చర్యలు, శబ్ద నియంత్రణ. అడ్డంకులను ఉపయోగించి చర్యలు, మఫ్లర్లు, నీటి కాలుష్య నియంత్రణ తాత్కాలిక మురుగునీటి శుద్ధి కోసం STP లను ఏర్పాటు చేయడం ద్వారా చర్యలు

	దుమ్ము ఉత్పత్తి అయ్యే అవకాశం ఉన్న ప్రదేశంలో నీటిని చల్లాలి. ఈ పరికరాల నుండి వాయు ఉద్గారాలు డిజైన్ స్పెసిఫికేషన్లలో నిర్వహించబడేలా నిర్మాణ పరికరాలను క్రమం తప్పకుండా నిర్వహించాలి మరియు సర్వీస్ చేయాలి. యంత్రాలపై ఇన్సులేటింగ్ క్యాప్‌లు మరియు శబ్ద మూలం నుండి నిష్క్రమణ వద్ద సహాయాలు. కంప్రెసర్‌లు, జనరేటర్ మొదలైన పని ప్రదేశాలను చుట్టడానికి సన్నని రబ్బరు / సీసం షీట్ వంటి డంపింగ్ పదార్థాలను ఉపయోగించడం. ఇన్‌లెట్ మరియు అవుట్‌లెట్ మఫ్లర్‌లను అందించాలి. ఇయర్‌మఫ్‌లు కార్మికులకు అందించాలి మరియు కార్మికులు వాటిని ఉపయోగించుకునేలా చేయాలి. రాత్రి సమయంలో శబ్దం కలిగించే కార్యకలాపాలను సాధ్యమైనంత వరకు పరిమితం చేయాలి, దీనివల్ల కార్మికులపై మరియు పొరుగువారిపై పర్యావరణ ప్రభావం తక్కువగా ఉంటుంది.	కార్మిక శిబిరం మరియు బురద నుండి అధీకృత సౌకర్యం వద్ద పారవేయడం, సంబంధిత నిర్వహణ నియమాల ప్రకారం ఘన వ్యర్థాల నిర్వహణ మరియు నీటిని అధీకృత సౌకర్యాలకు అప్పగించడం, భద్రత మరియు సైట్‌లోని కార్మికులకు ప్రాథమిక సౌకర్యాల కోసం పని-నిర్దిష్ట PPE అనుసరించి, పూర్తి చేసిన ధృవీకరణ పత్రంతో పాటు ఆధారాలతో నివేదించాలి. దీనికి సంబంధించి ఒక సర్టిఫికెట్‌ను ఎంపానెల్డ్ సర్టిఫైడ్ నిపుణుడు సమర్పించాలి.

జనరల్ EC షరతులు	EC యొక్క సాధారణ షరతు 2 - పర్యావరణ సమస్యల ఉల్లంఘనకు ప్రతిపాదకుడు ఉప-చట్టాలు/నిబంధనలలో శిక్షా నిబంధనను చేర్చాలి. అన్ని వాటాదారులలో నిరంతర పర్యావరణ అవగాహనను నిర్ధారించడానికి ప్రతిపాదకుడు సరైన అంతర్ దృష్టి యంత్రాంగాన్ని కూడా సృష్టించాలి.	నియమం 606: EC వయోలేషన్లకు చట్టపరమైన అమలు సామర్థ్యం నియమం 606.17 ను క్రింది విధంగా చదవవచ్చు పర్యావరణ పరిస్థితులను ఉల్లంఘించినందుకు శిక్షా నిబంధనలు ఆక్యుపెన్సీ సర్టిఫికేట్ జారీ చేయబడకపోవడానికి దారితీస్తుంది.
నేషనల్ గ్రీన్ ట్రిబ్యునల్ షరతులు		
పరామితి	NGT షరతు	ప్రతిపాదిత సవరణ
ఘన వ్యర్థాలు	షరతు సంఖ్య 5: ప్రతిపాదిత నిర్మాణాలలోని అన్ని బల్క్ మున్సిపల్ ఘన వ్యర్థాల జనరేటర్లు, నివాస మరియు నివాసేతర నిర్మాణాలు, తప్పనిసరిగా వ్యర్థాలను మూలం వద్దే వేరు చేసి, ప్రాంగణంలో కంపోస్టింగ్ లేదా బయో-మీథనేషన్ ద్వారా మొత్తం బయోడిగ్రేడబుల్ వ్యర్థాలను ప్రాసెస్ చేయాలి.	నియమం 606: ఘన వ్యర్థాల నిర్వహణ బల్క్ జనరేటర్ల ద్వారా నియమం 606.16 ని ఇలా చదవవచ్చు బల్క్ జనరేటర్లు (రోజుకు 100 కిలోల ఉత్పత్తి చేసేవి) - వాణిజ్య సముదాయాలు, సంస్థలు మరియు నివాస సముదాయాలు 50 కుటుంబాలు ప్రాంగణంలో ప్రాసెస్ చేయడానికి తగిన సేంద్రీయ వ్యర్థాల ప్రాసెసింగ్ వ్యవస్థలను ఏర్పాటు చేయాలి.
CFE షరతులు		
డ్యూయల్ ప్లంబింగ్ వ్యవస్థ	షరతు సంఖ్య 4: డ్యూయల్ ప్లంబింగ్ వ్యవస్థను అవలంబించాలి మరియు మంచినీటిని నిల్వ చేయడానికి మరియు శుద్ధి చేసిన వ్యర్థ జలాలను నిల్వ చేయడానికి ప్రత్యేక ట్యాంకులు అందించాలి.	నియమం 606: ద్వంద్వ ప్లంబింగ్ వ్యవస్థ నియమం 606.18ని ఇలా చదవవచ్చు 50 నివాస యూనిట్లు, సంస్థాగత మరియు వాణిజ్య ప్రాజెక్టులు కలిగిన అన్ని నివాస భవనాలలో ద్వంద్వ ప్లంబింగ్ మంచినీరు మరియు శుద్ధి చేసిన వ్యర్థ జలాల సరఫరా కోసం వ్యవస్థను డెవలపర్ ప్రత్యేక నిల్వ ట్యాంకులతో పాటు ఏర్పాటు చేయాలి. డెవలపర్ NBC నిబంధనలు మరియు CPHEEO మాన్యువల్ ప్రకారం

		ద్వంద్వ ప్లంబింగ్ వ్యవస్థను ఏర్పాటు చేయాలి.
గృహ నీటి వినియోగాన్ని అంచనా వేయడానికి మరియు ఫ్లషింగ్ కోసం ప్రత్యేక మీటర్లు	షరతు నెం.6: గృహ మరియు ఫ్లషింగ్ ప్రయోజనాల కోసం ఉపయోగించే నీటి పరిమాణాన్ని అంచనా వేయడానికి అవసరమైన పైప్‌లైన్‌తో ప్రత్యేక మీటర్లు అందించబడతాయి.	నియమం 606.18 (i) ని ఇలా చదవవచ్చు గృహ మరియు ఫ్లషింగ్ ప్రయోజనాల కోసం నీటి వినియోగాన్ని అంచనా వేయడానికి ద్వంద్వ ప్లంబింగ్ వ్యవస్థలో ఫ్లో మీటర్లను ఏర్పాటు చేయాలి.
మురుగునీటి శుద్ధి పునర్వినియోగం నిబంధనలు	షరతు సంఖ్య 8: ఆన్‌సైట్ మురుగునీటి శుద్ధి వ్యవస్థలు పునర్వినియోగ నిబంధనలకు అనుగుణంగా తాజా CPHEEO నిబంధనల ప్రకారం శుద్ధిని నిర్ధారించాలి మరియు శుద్ధి చేయబడిన వ్యర్థ జలాలను ప్రాంగణంలోనే తిరిగి ఉపయోగించాలి.	నియమం 606.18 (ii) ని ఇలా చదవవచ్చు స్థాపించబడిన అన్ని STPలు తాజా CPHEEO పునర్వినియోగ నిబంధనలకు అనుగుణంగా తగిన ద్వితీయ మరియు తృతీయ శుద్ధి వ్యవస్థలను ఏర్పాటు చేయాలి. శుద్ధి చేయబడిన వ్యర్థ నీటిని ప్రాంగణంలో ఫ్లషింగ్, ఉద్యానవనం మరియు ఇతర ప్రయోజనాల కోసం తిరిగి ఉపయోగించాలి.
టాప్ నేల సంరక్షణ	షరతు సంఖ్య 20: నిర్మాణ కార్యకలాపాల సమయంలో తవ్విన అన్ని పై మట్టిని ప్రాజెక్ట్ సైట్‌లోని ఉద్యానవన/ప్రకృతి దృశ్యం అభివృద్ధిలో ఉపయోగించడానికి నిల్వ చేయాలి.	నియమం 606: పైన నేల సంరక్షణ నియమం 606.19 ని ఈ క్రింది విధంగా చదవవచ్చు డెవలపర్ పై మట్టిని 30 సెం.మీ లోతు వరకు సంరక్షించి, తోటపని ప్రయోజనాల కోసం తిరిగి ఉపయోగించుకోవాలి. దరఖాస్తుదారు సమర్పించిన సమయంలో దరఖాస్తుదారు నుండి ఒక సర్టిఫికేట్ సమర్పించాలి.
సందర్శకుల వాహనాల పార్కింగ్	షరతు సంఖ్య 49: ప్రతిపాదకుడు సందర్శకుల వాహనాలకు తగినంత పార్కింగ్ స్థలాన్ని అందించాలి.	షరతు సంఖ్య 49: ప్రతిపాదకుడు సందర్శకుల వాహనాలకు తగినంత పార్కింగ్ స్థలాన్ని అందించాలి.

Sd/-
కమీషనర్,
ఏ.పి.సి.ఆర్.డి.ఏ.

ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY (APCRDA)

APCRDA - "Construction of Roads, Drains, Water Supply, Sewerage, Utility Ducts for Power & ICT, Reuse waterline, Avenue Plantation, compatible with trunk infrastructure in Layouts for Land Pooling Schemes for Kondamarajupalem (P), Lingayapalem (P), Uddandarayunipalem (P), Velagapudi (P), Mandadam (P) Villages in Zone-7 Area in Amaravati Capital City, Andhra Pradesh on Lump sum contract (% Percentage Tender) including DLP of 2 Years"

DESIGN BASIS REPORT

ZONE-7

ROADS & STRUCTURES, STREET LIGHTS

aarvee associates

1.1. ROAD NETWORK IN LAND POOLING SCHEME LAYOUTS

The total LPS network of the Capital region has been divided into 13 zones. Each zone consists of some villages which may also come under other zones. The details about the villages under every zone are given in Table 1.1.1. Total road network in the LPS area is shown in Figure 1.1.1.

Table 1.1.1 List of Villages for Zone-wise LPS

S. No.	Zone No.	Villages Covered
1	1A, 1B	Nekkalu, Shakhamuru
2	2A,2B	Anantavaram, Tulluru, Nelapadu, Shakhamuru, Nekkalu
3	3A,3B	Shakhamuru, Nelapadu, Rayapudi & Kondamarajupalem
4	4	Anantavaram, Thulluru, Pichikalapalem
5	5 A, 5B, 5C & 5D	Anantavaram, Thulluru, Pichikalapalem, Dondapadu, Borupalem, Abbarajupalem, Rayapudi, Nelapadu
6	6	Rayapudi & Kondamarajupalem
7	7	Kondamarajupalem, Lingayapalem, Uddandarayanipalem, Velagapudi, Mandadam
8	8	Venkatapalem, Krishnayyapalem, Penumaka, Undavalli
9	9, 9A	Kondamarajupalem, Velagapudi, Malkapuram, Mandadam, Venkatapalem, Krishnayyapalem, Ainavolu, Sakhamuru, Nelapadu
10	10	Ainavolu, Mandadam, Venkatapalem, Krishnayyapalem, Nowluru, Kuragallu
11	11	Undavalli, Penumaka
12	12	Kuragallu, Nowluru, Penumaka, Mangalagiri, Tadepalli (Part), Nidamarru
13	12A	Nidamarru, Kuragallu,
14	AGC	Rayapudi, Lingayapalem, Kondamarajupalem, Nelapadu, Shakamuru

Out of the 13 zones mentioned above, detailed designs, drawings and estimates are prepared. For the remaining two zones the LPS layout detailing is awaited which are to be finalized and hence, the detailed designs could not be taken up. The zone-wise description of road network for the zones for which the detailed designs are taken up are discussed in the subsequent sections.

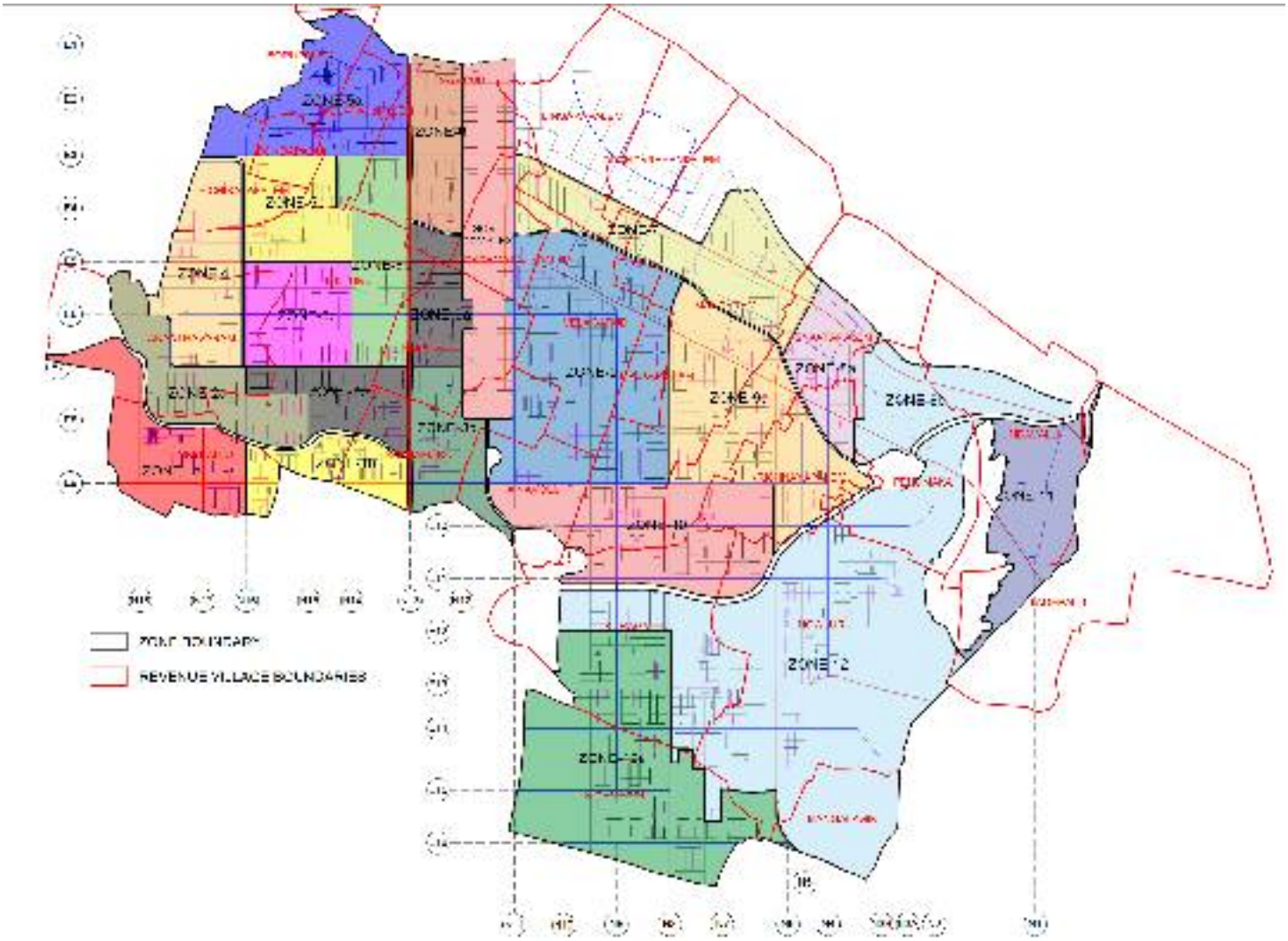


Figure 1.1.1 Village wis road network in the LPS area

1.1.1. ZONE 7

Zone-7 consists of 5 villages Kondamarajupalem, Lingayapalem, Uddandarayanipalem, Velagapudi and Mandadam. It has an optimum mix of land use comprising of industrial, residential mixed use and recreation. The road network in zone -7 is shown in Since the alignment is a green-field, no existing features are identified along the zone-7 villages of LPS. The road network in zone-7 is shown in Figure 1.1.2.

Table 1.1.2 ZONE-7 ROW WISE LENGTHS

Proposed ROW	Lanning	Road length in Km
25m	4 lanes, with Median	22.26
17 m	2 lanes (7 m Carriage way)	37.22
15.6 m	2 lanes (6 m Carriage way)	15.37
12 m	2 lanes (6 m Carriage way)	0.14
Total		74.99

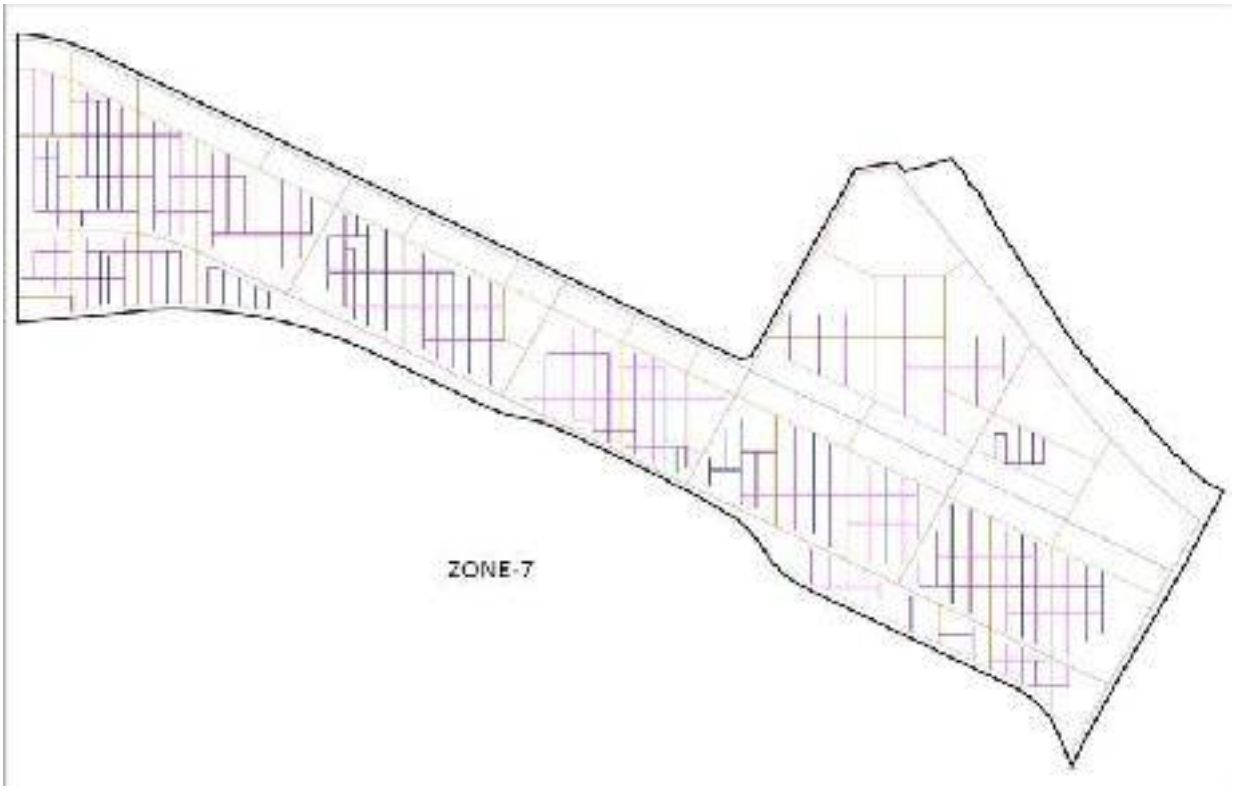


Figure 1.1.2 Road network in Zone 7

1.2. DESIGN BASIS

1.2.1. GENERAL

The basic aim of designing is to identify technically sound, environment-friendly and economically feasible road improvement options for constructing and providing connectivity of the project corridors. This chapter has been structured in a way that deals with the aspects of highway improvement proposals, highway geometric design and design of miscellaneous items.

Design of road sections has been done according to the design standards set for the project and improvements identified at the initial stage of the project.

Based on the various field and map studies and with clear understanding of the master plan, proposed horizontal and vertical designs for all the priority road corridors, intersections and total road network have been carried out.

1.2.2. DESIGN STANDARDS

Highway design is the process whereby the layout of the road in specific terrain is designed to meet the needs of the road users, keeping in view the road function, type and volume of traffic, potential traffic hazards and safety, capital cost, maintenance costs, vehicle operating costs, environment impacts, aesthetics as well as convenience of the road users. The principal geometric features for fulfillment of these objectives are road classification, horizontal alignment, vertical alignment and the typical road cross-sections.

Standards and Technical Specifications applicable for the design and construction of project components are:

- Indian Roads Congress (IRC) Codes and Standards shall invariably be followed.
- Specifications for Road and Bridge Works issued by the Ministry of Road Transport & Highways (MORTH) hereinafter referred to as MORTH or Ministry's Specifications.
- Any other standards referred to in the manual and any supplement issued with the bid document.

For aspects not covered by IRC and BIS, international standard practices, such as, British and American Standards can be adopted.

The Consultants have referred to the latest IRC publications and MORTH circulars regarding design standards in India as well as the international American and Canadian geometric design guidelines. The relevant Indian and international design standards consulted are given in Table 1.2.1.

Table 1.2.1 Main IRC Publications

S. No.	Code/ Document No.	Title of the Publication
1	IRC:5	Standard Specifications and Code of Practice for Road Bridges, Section I – General Features of Design (Eighth Revision)
2	IRC:6	Standard Specifications and Code of Practice for Road Bridges, Section-II Loads and Load Combinations (Seventh Revision)
3	IRC:7	Recommended Practice for Numbering Culverts, Bridges and Tunnels (Second Revision)
4	IRC:11	Recommended Practice for the Design and Layout of Cycle Tracks (First Revision)
5	IRC:30	Standard Letters and Numerals of Different Heights for Use on Highway Signs
6	IRC:35	Code of Practice for Road Markings (Second Revision)
7	IRC:37	Guidelines for the Design of Flexible Pavements (Fourth Revision)
8	IRC:38	Guidelines for Design of Horizontal Curves for Highways and Design Tables (First Revision)
9	IRC:44	Guidelines for Cement Concrete Mix Design for Pavements (Third Revision)
10	IRC:57	Recommended Practice for Sealing of Joints in Concrete Pavements (Second Revision)
11	IRC:58	Guidelines for the Design of Plain Jointed Rigid Pavements for Highways (Fourth Revision) (with CD)
12	IRC:67	Code of Practice for Road Signs (Fourth Revision)
13	IRC:70	Guidelines on Regulation and Control of Mixed Traffic in Urban Areas
14	IRC:78	Standard Specifications and Code of Practice for Road Bridges, Section VII-Foundations and Substructure (Revised Edition)
15	IRC:78 (Part II)	Code of Practice for Limit state Design of Foundations
16	IRC:79	Recommended Practice for Road Delineators (First Revision)
17	IRC:83 (Part I)	Standard Specifications and Code of Practice for Road Bridges, Section IX Bearings, Part I : Roller & Rocker Bearings (Second Revision)
18	IRC:83 (Part II)	Standard Specifications and Code of Practice for Road Bridges, Section : IX – Bearings (Elastomeric Bearings), Part II (Second Revision)
19	IRC:83 (Part III)	Standard Specifications and Code of Practice for Road Bridges, Section IX – Bearings, Part III: POT, PIN, Metallic Guide and Plane Sliding Bearings (First Revision)

S. No.	Code/ Document No.	Title of the Publication
20	IRC:83 (Part IV)	Standard Specifications and Code of Practice for Road Bridges, (Section IX) – Bearings (Spherical and Cylindrical)
21	IRC:86	Geometric Design Standards for Urban Roads and Streets (First Revision)
22	IRC:88	Recommended Practice for Lime Flyash Stabilised Soil Base/Sub-Base in Pavement Construction
23	IRC:93	Guidelines on Design and Installation of Road Traffic Signals
24	IRC:98	Guidelines on Accommodation of Utility Services on Roads in Urban Areas (Second Revision)
25	IRC:99	Guidelines for Traffic Calming Measures in Urban and Rural Areas (First Revision)
26	IRC:103	Guidelines for Pedestrian Facilities (Second Revision)
27	IRC:106	Guidelines for Capacity of Urban Roads in Plain Areas
28	IRC:119	Guidelines for Traffic Safety Barriers
29	IRC:SP:12	Guidelines for Parking Facilities in Urban Roads (First Revision)
30	IRC:SP:13	Guidelines for the Design of Small Bridges and Culverts (Second Revision)
31	IRC:SP:21	Guidelines on Landscaping and Tree Plantation
32	IRC:SP:23	Vertical Curves for Highways
33	IRC:SP:37	Guidelines for Evaluation of Load Carrying Capacity of Bridges (First Revision)
34	IRC:SP:38	Manual for Road Investment Decision Model (with CD)
35	IRC:SP:39	Guidelines on Bulk Bitumen Transportation & Storage Equipment
36	IRC:SP:40	Guidelines on Repair, Strengthening and Rehabilitation of Concrete Bridges (First Revision)
37	IRC:SP:41	Guidelines for the Design of At-Grade Intersections in Rural & Urban Areas
38	IRC:SP:42	Guidelines on Road Drainage (First Revision)
39	IRC:SP:43	Guidelines on Traffic Management Technique for Urban Areas (First Revision)
40	IRC:SP:44	Highway Safety Code
41	IRC:SP:50	Guidelines on Urban Drainage (First Revision)
42	IRC:SP:51	Guidelines for Load Testing of Bridges (First Revision)
43	IRC:SP:62	Guidelines for Design and Construction of Cement Concrete Pavements for Low Volume Roads (First Revision) (with CD)
44	IRC:SP:63	Guidelines for the Use of Interlocking Concrete Block Pavement (First Revision)
45	IRC:SP:64	Guidelines for the Analysis and Design of Cast-in-Place Voided Slab Superstructure (First Revision)

S. No.	Code/ Document No.	Title of the Publication
46	IRC:SP:65	Guidelines for Design and Construction of Segmental Bridges (First Revision)
47	IRC:SP:66	Guidelines for Design of Continuous Bridges (First Revision)
48	IRC:SP:67	Guidelines for Use of External and Unbonded Prestressing Tendons in Bridge Structures
49	IRC:SP:69	Guidelines & Specifications for Expansion Joints (First Revision)
50	IRC:SP:70	Guidelines for the Use of High Performance Concrete (Including Self Compacting Concrete in Bridges) (First Revision)
51	IRC:SP:71	Guidelines for Design and Construction of Precast Pre- tensioned Girders for Bridges (First Revision)
52	IRC:SP:72	Guidelines for the Design of Flexible Pavements for Low Volume Rural Roads (First Revision)
53	IRC:SP:73	Manual of Specifications & Standards for Two Lanning of Highways with Paved Shoulder (Second Revision)
54	IRC:SP:84	Manual of Specifications and Standards for Four Laning of Highways (Second Revision)
55	IRC:SP:85	Guidelines for Variable Message Signs (First Revision)
56	IRC:SP:89	Guidelines for Soil and Granular Material Stabilization Using Cement, Lime and Fly Ash
57	IRC:SP 89(Part II)	Guidelines for the Design of Stabilized Pavements (Part-II)
58	IRC:SP:110	Application of Intelligent Transport System for Urban Roads
59	IRC:SP:114	Guidelines for Seismic Design of Road Bridges
60	IRC:SP:115	Guidelines for Design of Integral Bridges
61	IRC:SP:116	Guidelines for Design and Installation of Gabion Structures
62	IRC:SP:117	Manual on Universal Accessibility for Urban Roads and Streets
63	IRC:SP:119	Manual of Planting and Landscaping of Urban Roads
64	IRC:SP:128	Guidelines for Green Urban Road Manual
65	IRC:SP:131	Guidelines for Design and Evaluation of Public and Non-Motorised Transport Systems for Sustainability
66	MORT&H	Specifications for Road and Bridge Works, 2013 (Fifth Revision)
67	ITDP	Complete Streets Design Workbook

1.2.3. HORIZONTAL ALIGNMENT

The horizontal alignment of the total LPS road network is designed for a speed of 40kmph. All the LPS roads center lines are obtained after prior checking of the utility requirements. The

center lines obtained for each village in every zone have been designated with corresponding RoW.

All the 25 m roads are named as "A" type roads. All 17 m roads are named as "B" type roads. All 15.6 m, 12 m and 9 m roads are named as "C" type, "D" type and "E" type roads respectively.

Since all the roads are almost straight, no provision of super-elevation or horizontal curves for any road has been provided.

1.2.4. VERTICAL ALIGNMENT

The Vertical design of each road in the LPS zone has been carried out by taking into consideration the existing ground profile. All the Roads follow a hierarchy of 25 m, 17 m, 15.6 m, 12 m and 9 m.

FRLs are fixed based on the flood management for these roads, all the roads (25m, 17 m, 15.6 m, 12 m and 9 m). The Finished Road Levels (FRL) of the internal roads are designed in such a way that min gradient of 0.2% is enused for all the roads for effective drainage.

Both summit curves and valley curves were designed as per IRC guidelines. The design parameters for Plain/Rolling terrain are given below in Table 1.2.2.

Table 1.2.2 Lane Design parameters for LPS road network

S. No.	Description	Details
1	Design Speed for all LPS Roads	40 Kmph
2	Camber (Flexible & Rigid)	2.5% & 2%
3	Maximum super-elevation	4%
4	Minimum Stopping Sight Distance (SSD)	45 m
5	Minimum Intermediate Sight Distance (ISD)	90 m
6	Minimum vertical gradient	0.3 %
7	Ruling maximum vertical gradient	4 %
8	Minimum length of vertical curve	20m

1.3. TYPICAL CROSS-SECTIONS

The four main categories of roads proposed in the Master Plan follow well assigned roles of access and mobility through a hierarchical system. These roads are Major Arterial, Arterial, Sub

Arterial and Collector. In addition to these a special sub arterial road for direct access to the main CBD is provided in the plan and is named Seed Capital Access Road. In addition to these roads, local roads and streets will be planned (as part of local area plans/LPS) for direct property access and for localized area wide traffic circulation. Major Arterial roads have a Right-of-Way of 60m, Arterial roads and Sub-Arterial roads have RoW of 50 m and Collector roads have Right-of-Way of 25m. Of the LPS road network, various roads depending on their usage have been classified with reference to the Right-of-ways. Thus, collectors and local streets have been classified as shown in Table 1.3.1.

Table 1.3.1 Summary of Road Network for Land Pooling Scheme (LPS)

S. No.	Type of Road	Right of Way	Road name
1	Collector Roads	25 m	A
2	Local streets	17 m	B
3		15.6 m	C
4		12 m	D
5		9 m	E

1.3.1. 25M ROW

The first category of roads, the highest in hierarchy are Collector Roads. Collector roads functions as the main access road network for residential pockets, commercial and educational institutions, other local activities and buildings. These roads will be utilized by various road users for local circulation as well in addition to the access needs. The typical cross sections are as shown in the figures 1.3.1.

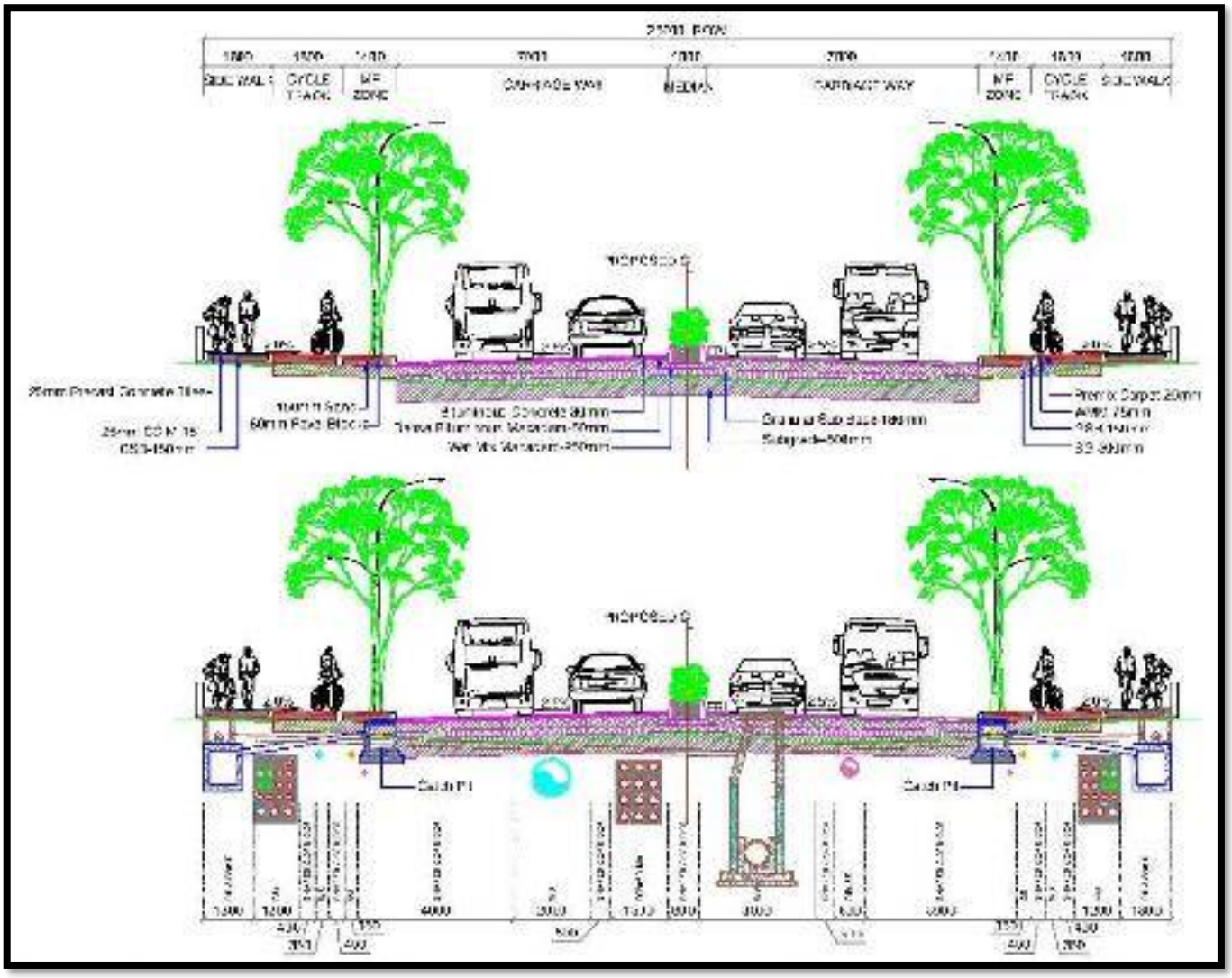


Figure 1.3.1 Typical Cross-section of 25 m ROW

The roads with 25 m RoW is of 4-lane divided carriageway with 7 m carriageway on both the sides and a median of 1 m. Along the carriageway, Multi-functional zone of 1.4 m, cycle track and side walk of 1.8 m each are designed. The pavement composition of every component will be explained in detail in the pavement design chapter. Storm Water Drain has been proposed to be under both the sides of the carriageway which runs all along the length of the road.

1.3.2. 17M ROW ROADS

The roads with 17 m RoW is of 2-lane undivided carriageway of 7m wide for both direction traffic. Along the carriageway, multi-functional zone of 1 m, cycle track and sidewalk of 1.8 m each are designed. 17 m roads are designed as rigid pavement. The pavement composition of

each and every component will be explained in detail in the pavement design chapter. Storm Water Drain has been proposed to be under both the sides of the carriageway which runs all along the length of the road. The typical cross section for 17m ROW roads is as shown below in Figure 1.3.2.

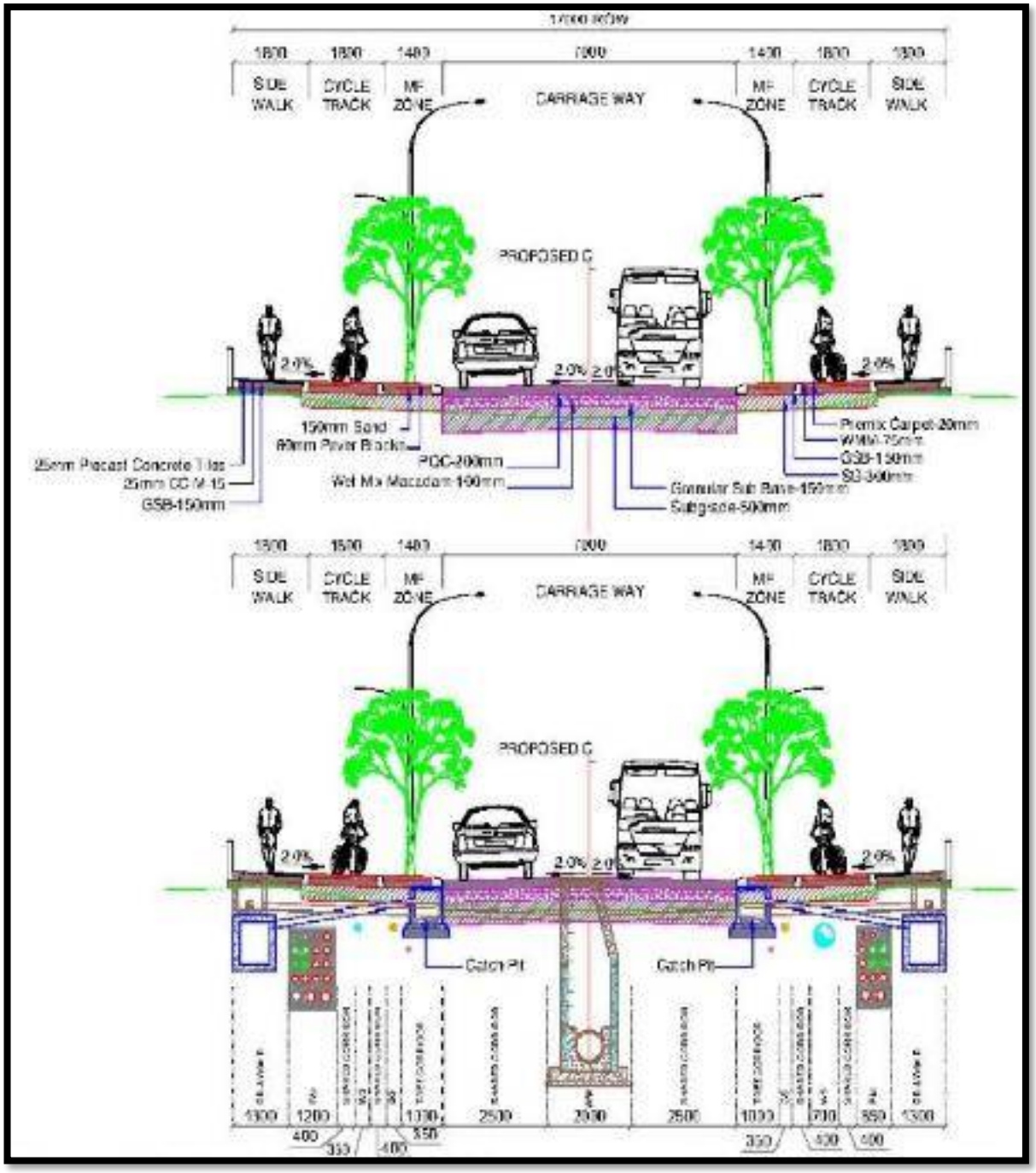


Figure 1.3.2 Typical Cross-section of 17 m ROW

1.3.3. 15.6M ROW ROADS

The roads with 15.6 m RoW is of 2-lane undivided carriageway with single side 6 m carriageway without a median. Along the carriageway, multi-functional zone of 1.4 m, cycle track and sidewalk of 3.4 m are designed. 15.6 m roads are designed as rigid pavement. The pavement composition of every component will be explained in detail in the pavement design chapter. Storm Water Drain has been proposed to be under both the sides of the carriageway which runs all along the length of the road. The typical cross section for 15.6m ROW roads is as shown below in Figure 1.3.3.

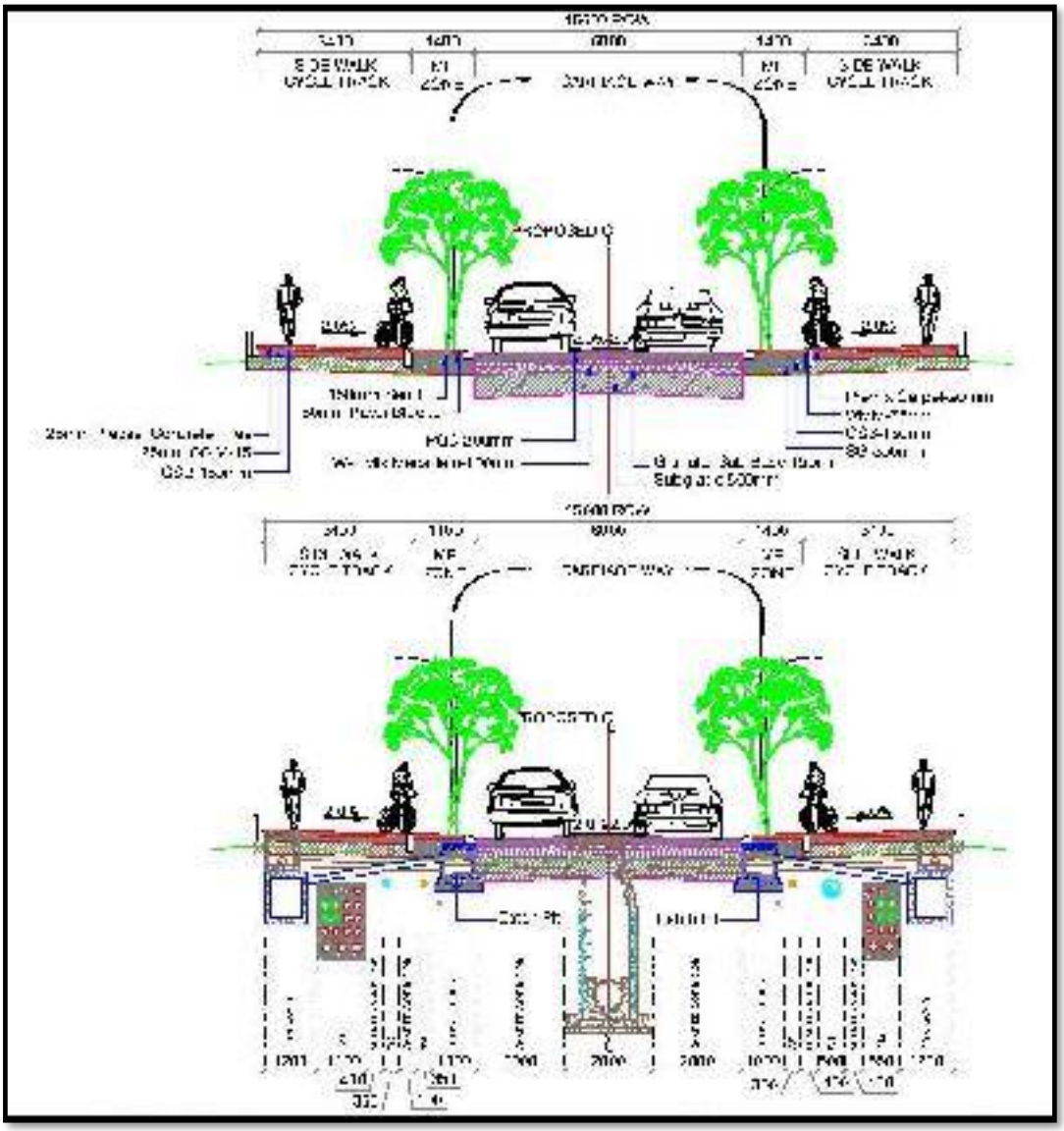


Figure 1.3.3 Typical Cross-section of 15.6 m ROW

1.3.4. 12M ROW ROADS

The roads with 12 m RoW is of 2-lane undivided carriageway with single side 6 m carriageway without a median. Along the carriageway, Multi-functional zone of 1 m and side walk of 2 m are designed. 12 m roads are designed as rigid pavement. The pavement composition of every component will be explained in detail in the pavement design chapter. Storm Water Drain has been proposed to be under the carriageway to single side which runs all along the length of the road. The typical cross section for 12m ROW roads is as shown below in Figure 1.3.4.

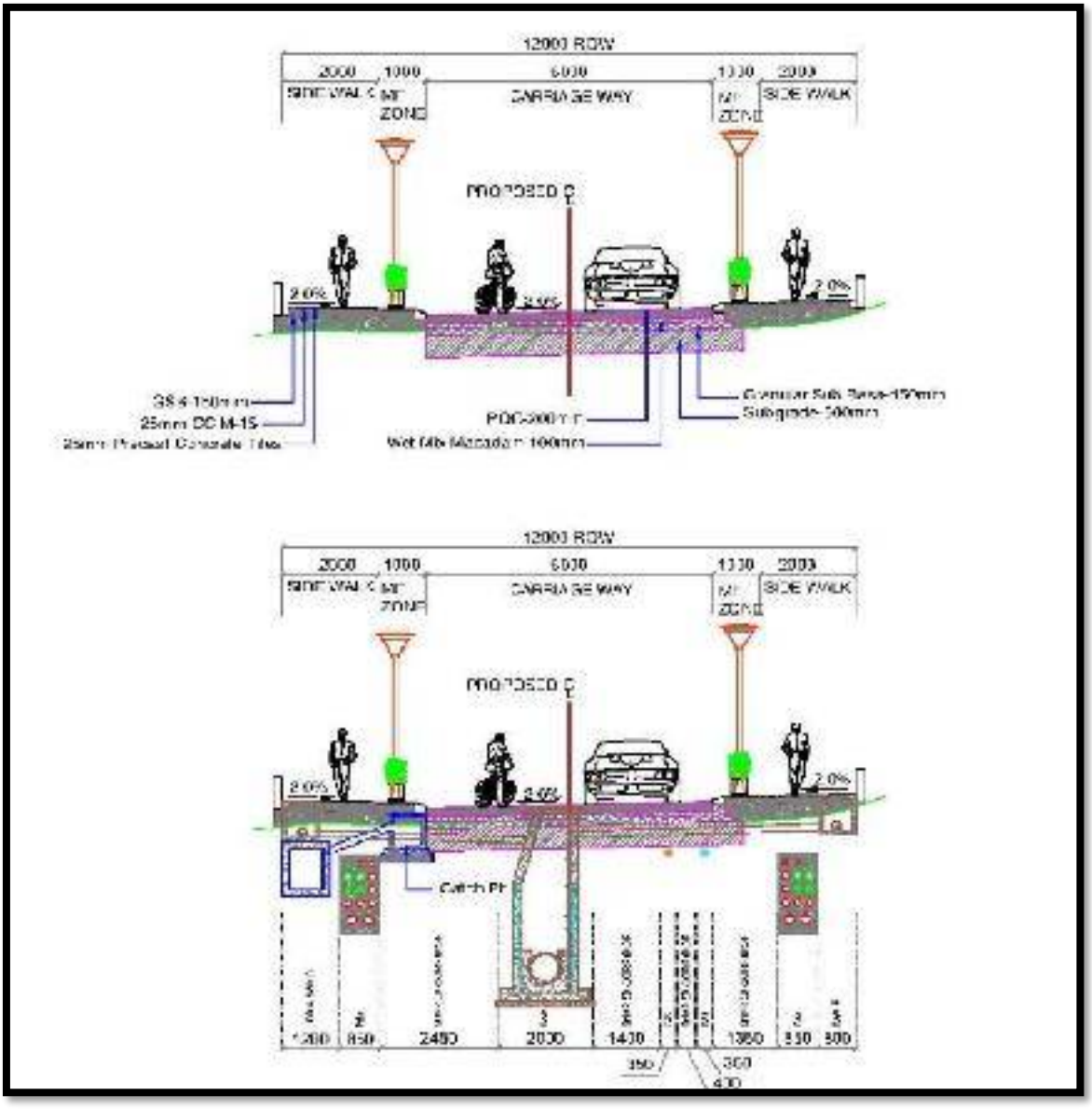


Figure 1.3.4 Typical Cross-section of 12 m ROW

1.3.5. 3D VIEWS OF CROSS-SECTIONS

The cross sections of the roads are prepared for clear identification in 3-Dimensional view. The same has been presented for different roads.

1.3.6. 25 M ROW

The junctions and streetscape plans coming under 25 m RoW are depicted in the below figures.

Figure 1.3.5 3D view of 25 m RoW (a)

Figure 1.3.6 3D view of 25 m RoW (b)

Figure 1.3.7 3D view of 25 m RoW (c)

Figure 1.3.8 3D view of 25 m RoW (d)

1.3.7. 17 M ROW

The junctions and streetscape plans coming under 17 m RoW are depicted in the below figures.

Figure 1.3.9 3D view of 17 m RoW (a)

Figure 1.3.10 3D view of 17 m RoW (b)

Figure 1.3.11 3D view of 17 m RoW (c)

Figure 1.3.12 3D view of 17 m RoW (d)

1.3.8. 15.6 M ROW

The junctions and streetscape plans coming under 15.6 m RoW are depicted in the below figures.

Figure 1.3.13 3D view of 15.6 m RoW (a)

Figure 1.3.14 3D view of 15.6 m RoW (b)

Figure 1.3.15 3D view of 15.6 m RoW (c)

Figure 1.3.16 3D view of 15.6 m RoW (d)

1.3.9. 12 M ROW

The junctions and streetscape plans coming under 12 m RoW are depicted in the below figures.

Figure 1.3.17 3D view of 12 m RoW (a)

Figure 1.3.18 3D view of 12 m RoW (b)

Figure 1.3.19 3D view of 12 m RoW (c)

Figure 1.3.20 3D view of 12 m RoW (d)

1.4. TYPICAL JUNCTION PLANS

The typical junction plans for the whole LPS network have been given in the figures below.

All the junctions within LPS network are designed in such a way that all the features are well connected to other legs of the junctions. The junctions are designed in such a way that out of total, 40% junctions are designed as one with the table tops and remaining 60% junctions are designed as the ones without table tops. Table top provision is a measure of traffic calming. Table tops are provided at the junctions where majority of the land use is residential and are not provided at the junctions where majority of the land use is commercial. This is because, since the pedestrian movement at the residential land use will be comparatively high when compared to that at commercial land use areas, those places are designed as table tops to curb the speeds of the fast-moving vehicles.

Junctions for each RoW have been designed keeping in mind the areas for safe turning of the vehicles. Sufficient turning radius has been provided for every combination of the junction.

1.4.1. 25M – 25M ROW ROAD JUNCTION

Junction at 25 m – 25 m crossing has been designed for a turning radius of 14 m and the swept path analysis has been carried with the adopted turning radius. The turning radius has been confirmed after the satisfactory results of swept path.

Junctions are designed in such a way that they are provided with pram ramps, which provides accessibility for disabled pedestrians.

When both the roads are of 25 m RoW, the plans of the corresponding junctions are as follows. The below figures show the variation in junctions with table tops and junctions without table tops.

Figure – 1.4.1, Figure – 1.4.3 & Figure 1.4.5 shows the typical junction without table tops and Figure – 1.4.2, Figure – 1.4.4 & Figure 1.4.6 shows the typical junction with tabletops for 25 m – 25 m +, T and L junctions respectively.

Figure 1.4.1 25m-25m ROW (+Junction)

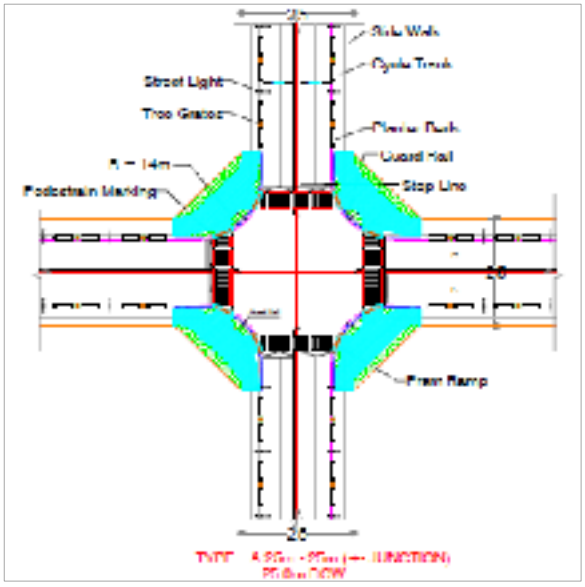


Figure 1.4.2 25m-25m ROW (+ Junction)

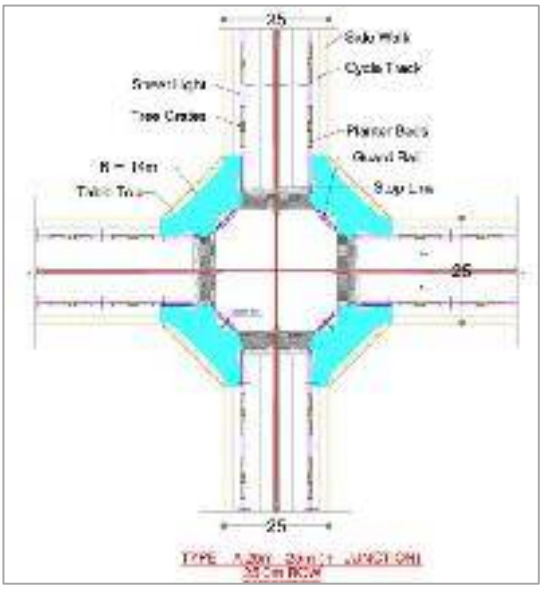


Figure 1.4.3 25m-25m ROW (T Junction)

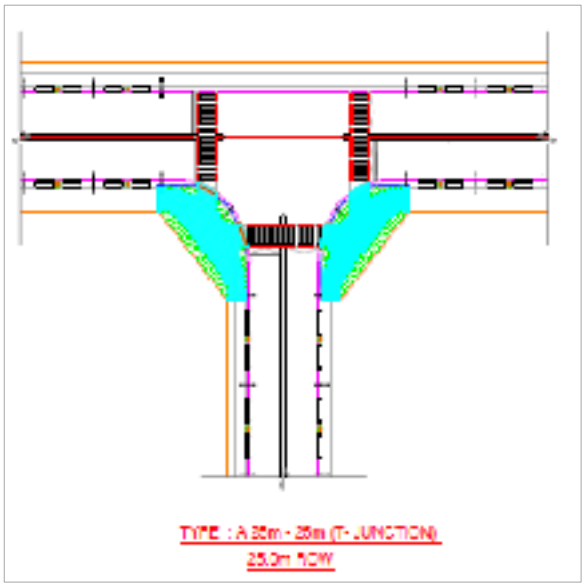


Figure 1.4.4 25m-25m ROW (T Junction)

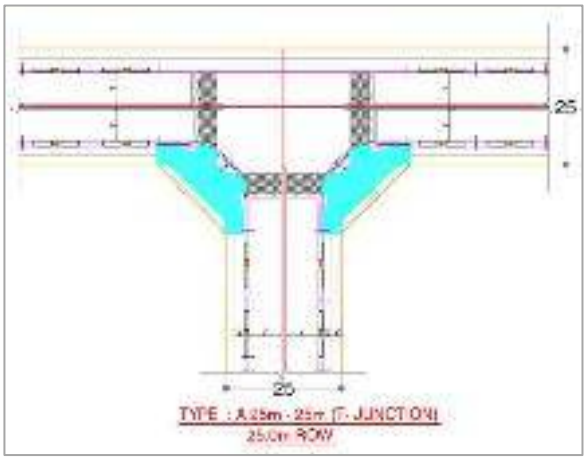


Figure 1.4.5 25m-25m ROW (L Junction)

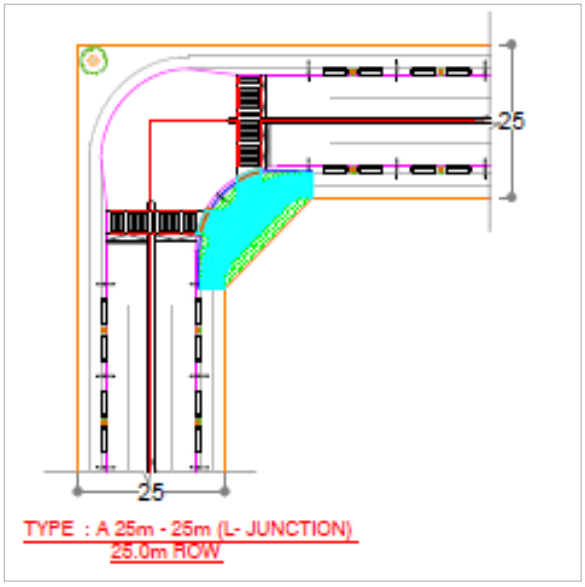
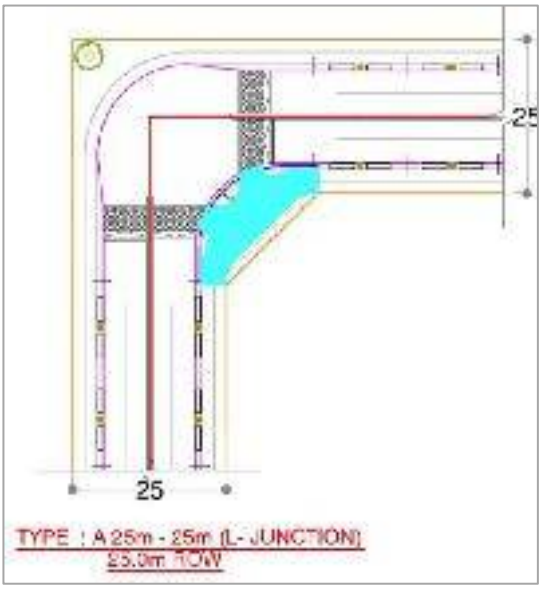


Figure 1.4.6 25m-25m ROW (L Junction)



1.4.2. 25M – 17M ROW ROAD JUNCTION

Junction at 25 m – 17 m crossing has been designed for a turning radius of 8.64 m. Junctions are designed in such a way that they are provided with pram ramps, which provides accessibility for disabled pedestrians.

When the roads are of 25 m RoW and 17 m RoW, the plans of the corresponding junctions are as follows:

Figure – 1.4.7, Figure – 1.4.9 & Figure 1.4.11 shows the typical junction without table tops and Figure – 1.4.8, Figure – 1.4.10 & Figure 1.4.12 shows the typical junction with tabletops for 25 m – 17 m +, T and L junctions respectively.

Figure 1.4.7 25m-17m ROW (+ Junction)

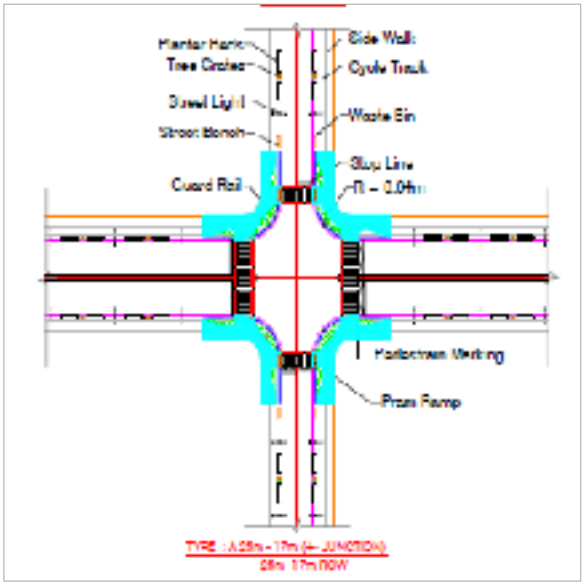


Figure 1.4.8 25m-17m ROW (+ Junction)

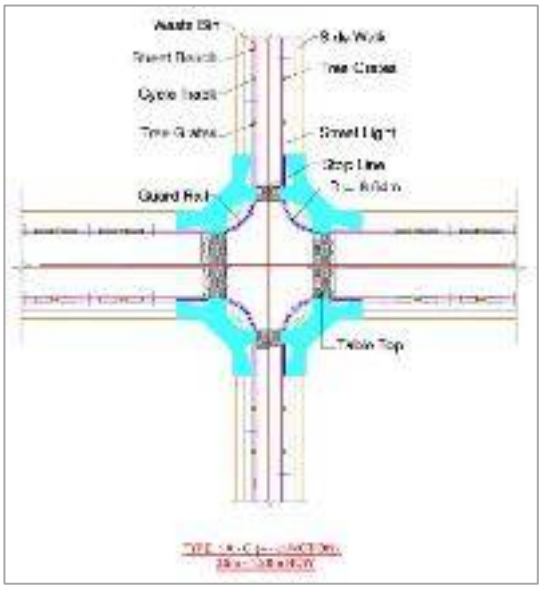


Figure 1.4.9 25m-17m ROW (T Junction)

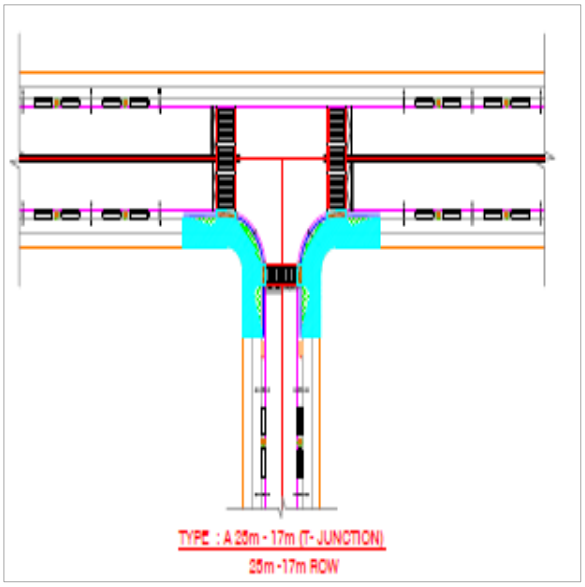


Figure 1.4.10 25m-17m ROW (T Junction)

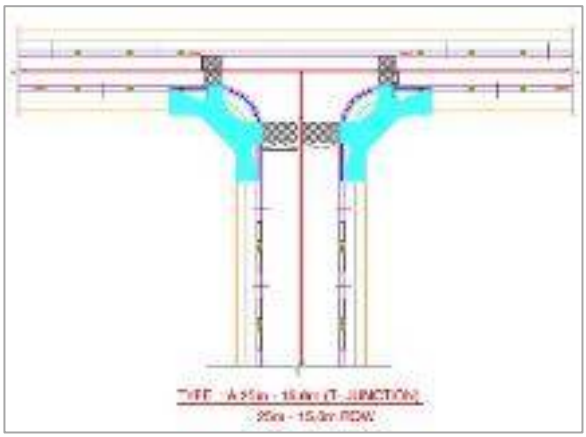


Figure 1.4.11 25m-17m ROW (L Junction)

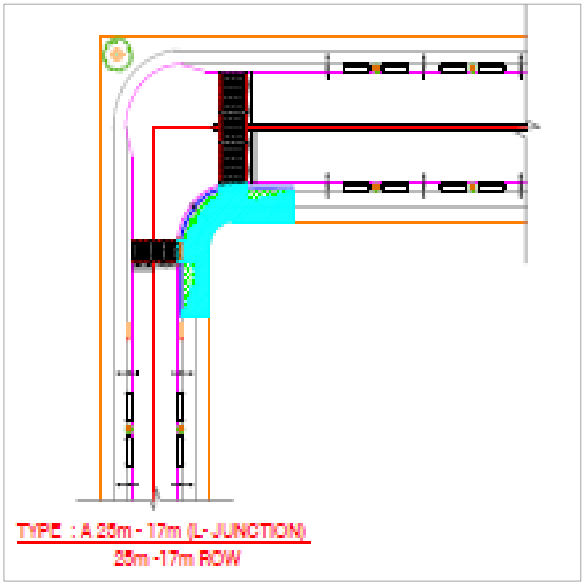
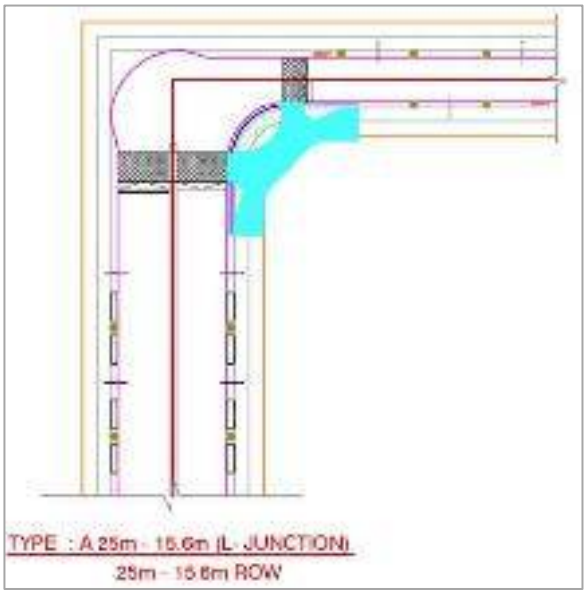


Figure 1.4.12 25m-17m ROW (L Junction)



1.4.3. 25 M –15.6 M ROW ROAD JUNCTION

Junction at 25 m – 15.6 m crossing has been designed for a turning radius of 8.64 m. Junctions are designed in such a way that they are provided with pram ramps, which provides accessibility for disabled pedestrians.

When the roads are 25m RoW and 15.6m RoW, the plans of the corresponding junctions are as follows:

Figure – 1.4.13, Figure – 1.4.15 & Figure 1.4.17 shows the typical junction without table tops and Figure – 1.4.14, Figure – 1.4.16 & Figure 1.4.18 shows the typical junction with table tops for 25 m – 15.6 m +, T and L junctions respectively.

Figure 1.4.13 25m-15.6m ROW (+ Junction)

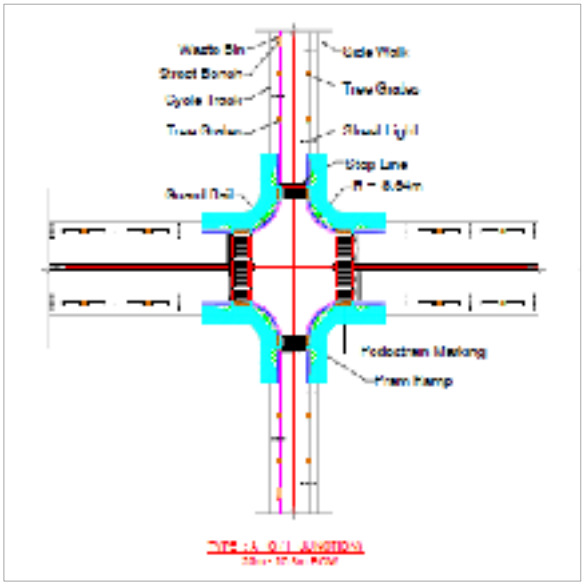


Figure 1.4.14 25m-15.6m ROW (+ Junction)

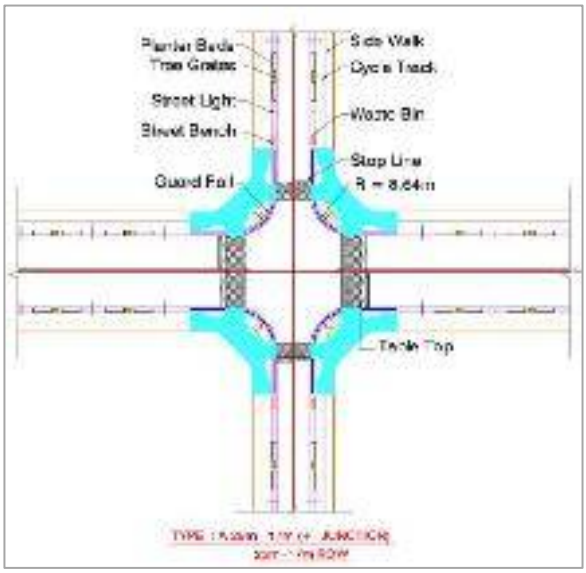


Figure 1.4.15 25m-15.6m ROW (T-Junction)

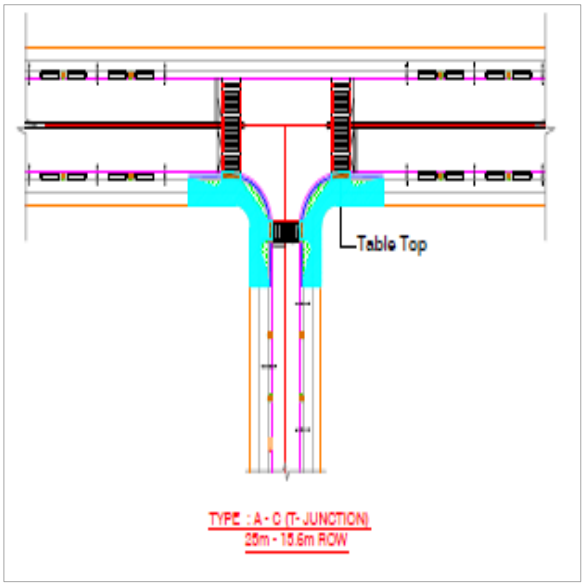


Figure 1.4.16 25m-15.6m ROW(T-Junction)

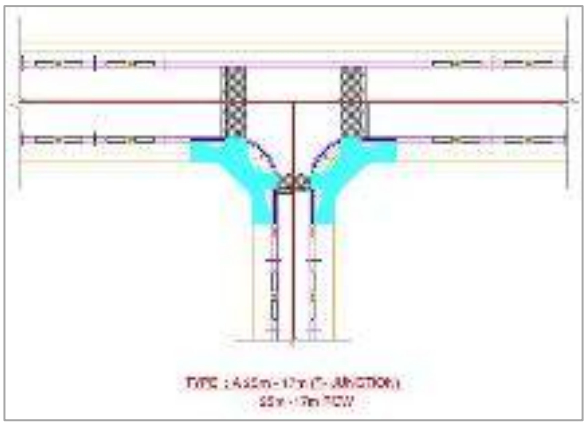


Figure 1.4.17 25m-15.6m ROW(L-Junction)

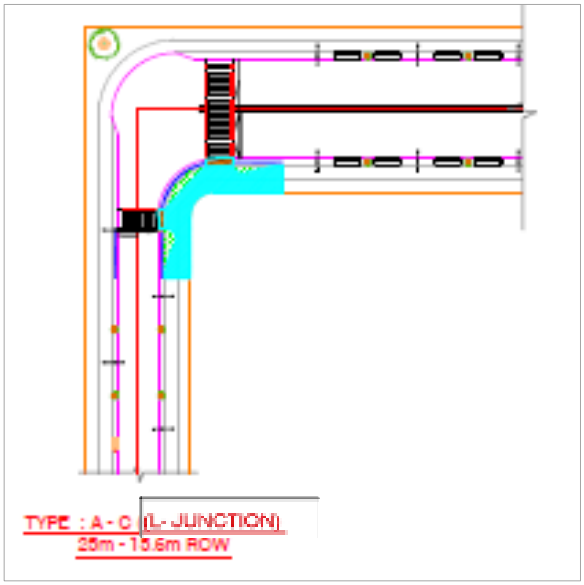
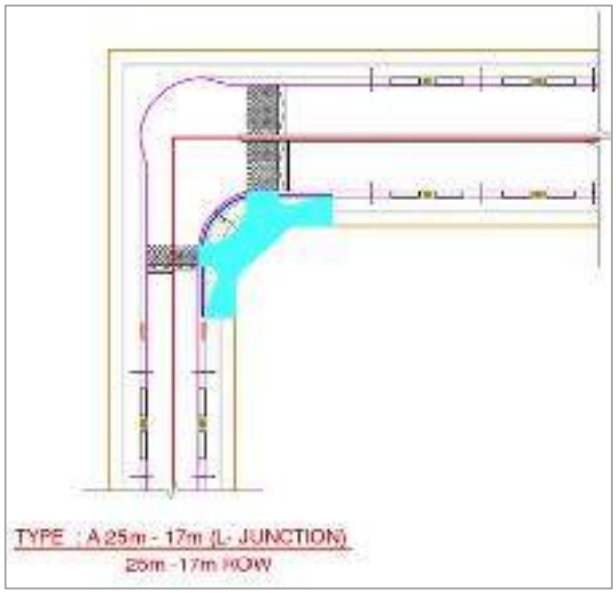


Figure 1.4.18 25m-15.6m ROW (L Junction)



1.4.4. 25 M –12 M ROW ROAD JUNCTION

Junction at 25 m – 12 m crossing has been designed for a turning radius of 8.64 m. Junctions are designed in such a way that they are provided with pram ramps, which provides accessibility for disabled pedestrians.

When the roads of 25 m RoW meets the roads of 12 m RoW, the plan of the corresponding junction is as follows: Figure – 1.4.19, Figure – 1.4.21 & Figure 1.4.23 shows the typical junction without table tops and Figure – 1.4.20, Figure – 1.4.22 & Figure 1.4.24 shows the typical junction with table tops for 25 m – 12 m +, T and L junctions respectively.

Figure 1.4.19 25m-12m ROW (+ Junction)

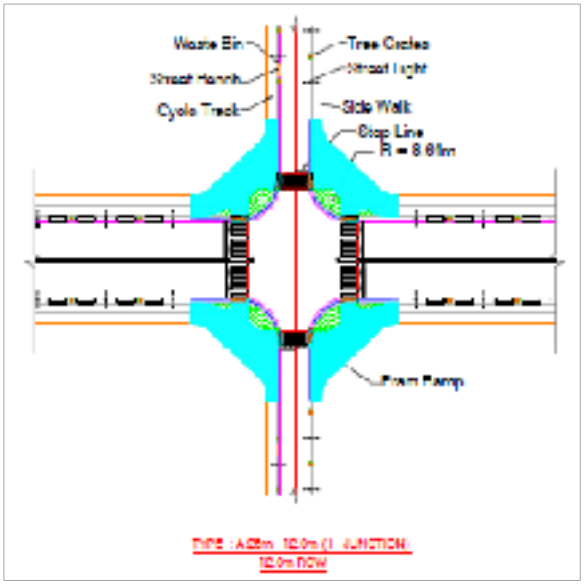


Figure 1.4.20 25m-12m ROW (+ Junction)

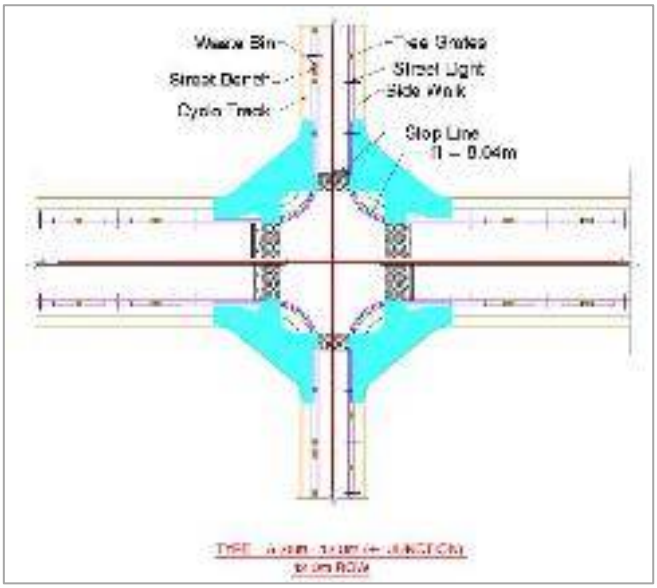


Figure 1.4.21 25m-12m ROW (T Junction)

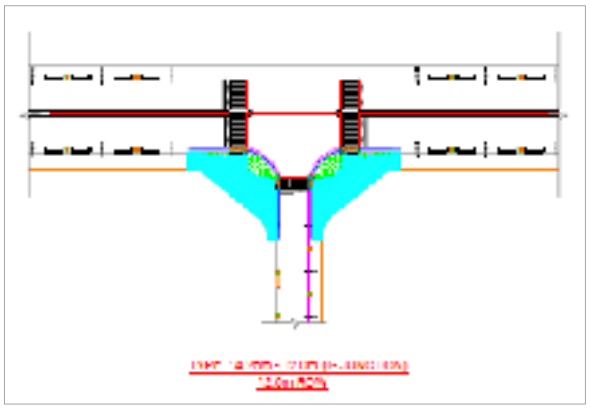


Figure 1.4.22 25m-12m ROW (T-junction)

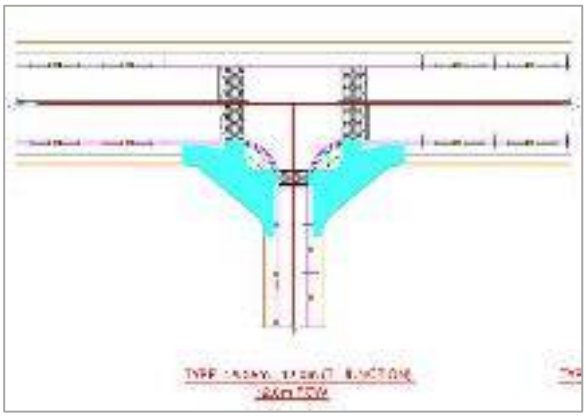


Figure 1.4.23 25m-12m ROW (L Junction)

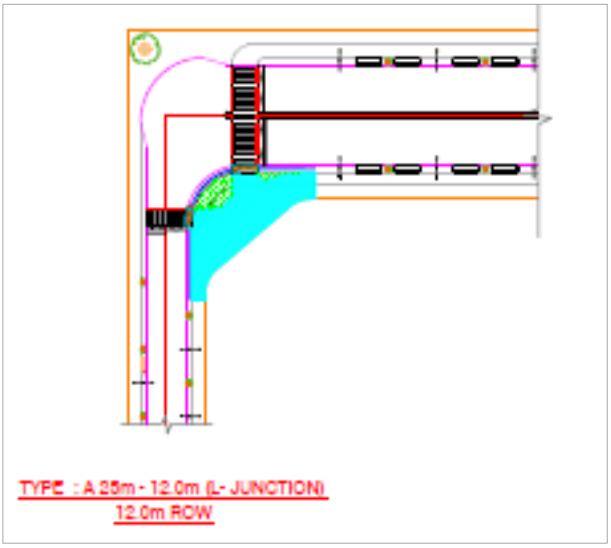
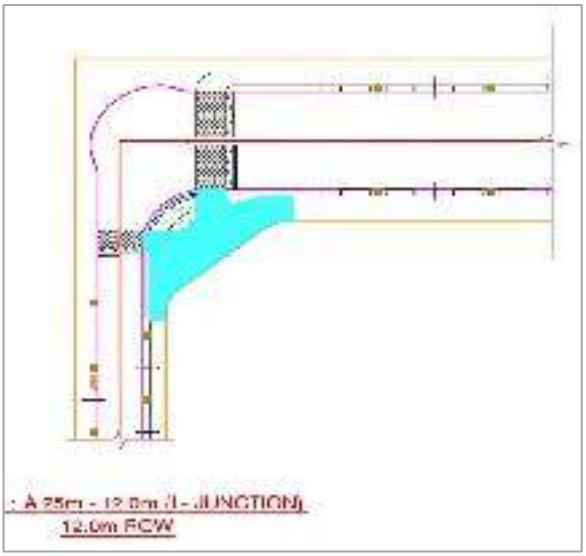


Figure 1.4.24 25m-12m ROW (L Junction)



1.4.5. 17 M –17 M ROW ROAD JUNCTION

Junction at 17 m – 17 m crossing has been designed for a turning radius of 8.64 m. Junctions are designed in such a way that they are provided with pram ramps, which provides accessibility for disabled pedestrians.

When the roads of 17 m RoW meets the roads of 17 m RoW, the plan of the corresponding junction with bulb-out is as follows:

Figure – 1.4.25, Figure – 1.4.27 & Figure 1.4.29 shows the typical junction without table tops and Figure – 1.4.26, Figure – 1.4.28 & Figure 1.4.30 shows the typical junction with tabletops for 17 m – 17 m +, T and L junctions respectively.

Figure 1.4.25 17m-17m ROW (+ Junction)

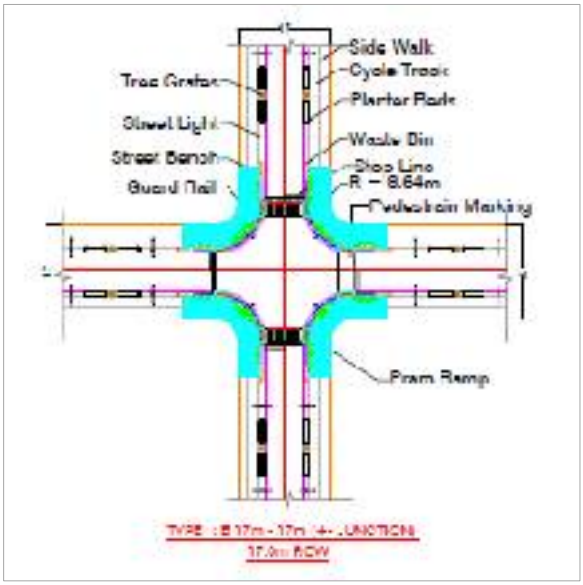


Figure 1.4.26 17m-17m ROW (+ Junction)

Figure 1.4.27 17m-17m ROW (T Junction)

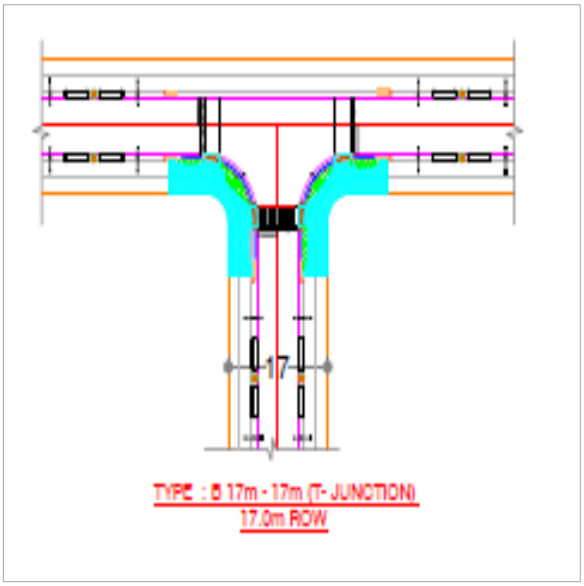


Figure 1.4.28 17m-17m ROW (T Junction)

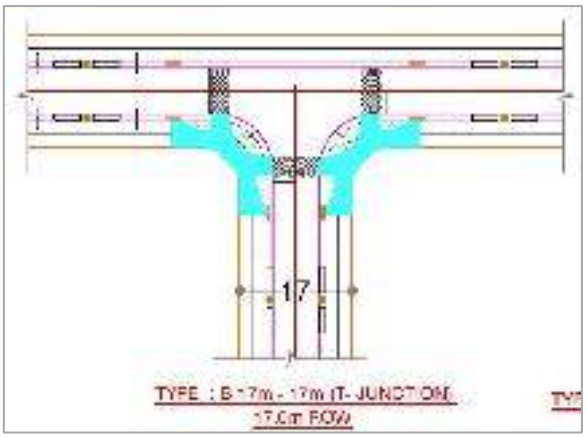


Figure 1.4.29 17m-17m ROW (L Junction)

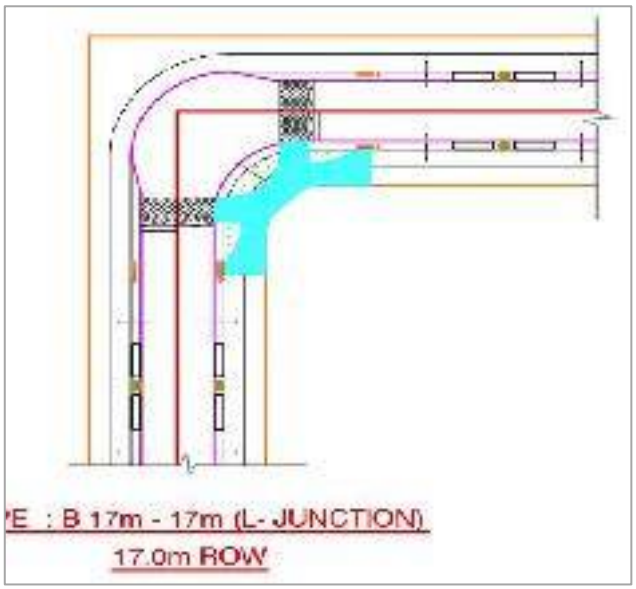
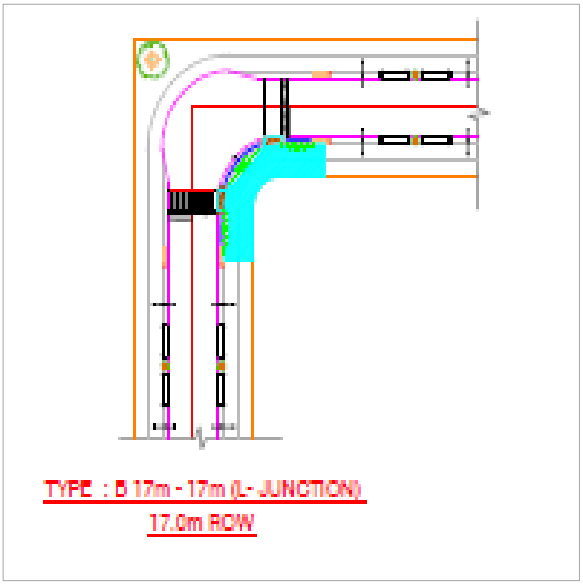


Figure 1.4.30 17m-17m ROW (L Junction)



1.4.6. 17 M –15.6 M ROW ROAD JUNCTION

Junction at 17 m – 15.6 m crossing has been designed for a turning radius of 8.64 m. Junctions are designed in such a way that they are provided with pram ramps, which provides accessibility for disabled pedestrians.

When the roads of 17 m RoW meets the roads of 15.6 m RoW, the plan of the corresponding junction without bulb-out is as follows:

Figure – 1.4.31, Figure – 1.4.33 & Figure 1.4.35 shows the typical junction without table tops and Figure – 1.4.32, Figure – 1.4.34 & Figure 1.4.36 shows the typical junction with table tops for 17 m – 15.6 m +, T and L junctions respectively.

Figure 1.4.31 17m-15.6m ROW (+ Junction)

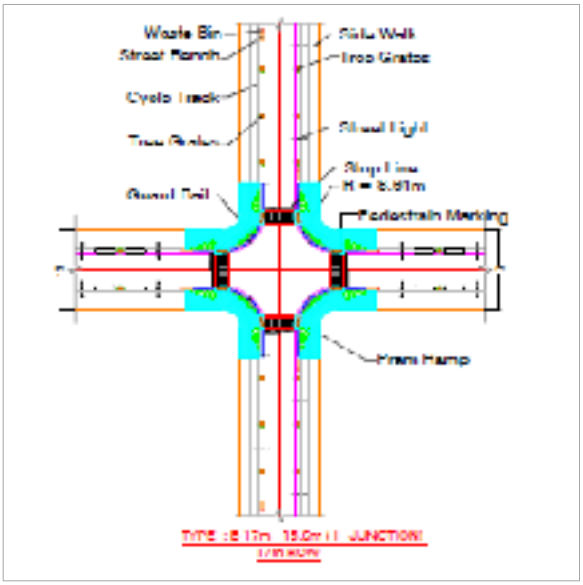


Figure 1.4.32 17m-15.6m ROW (+ Junction)

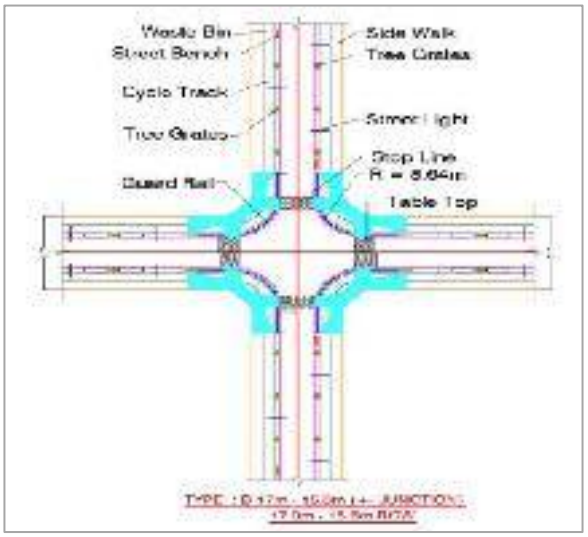


Figure 1.4.33 17m-15.6m ROW (T Junction)

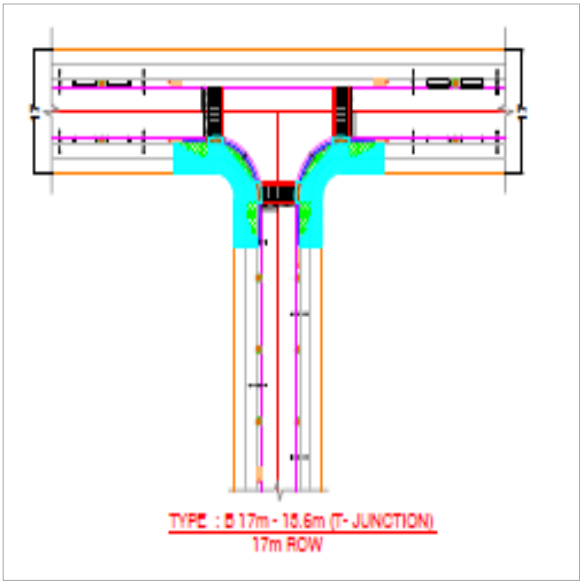


Figure 1.4.34 17m-15.6m ROW (T Junction)

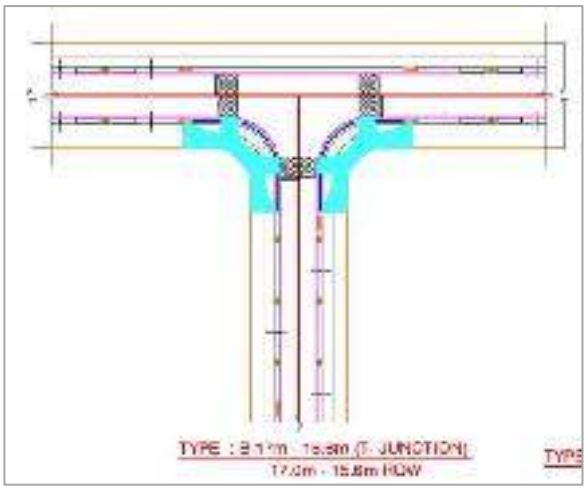


Figure 1.4.35 17m-15.6m ROW (L Junction)

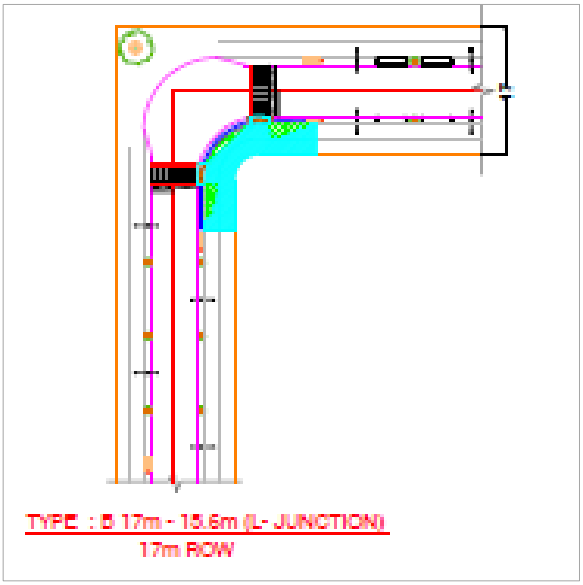
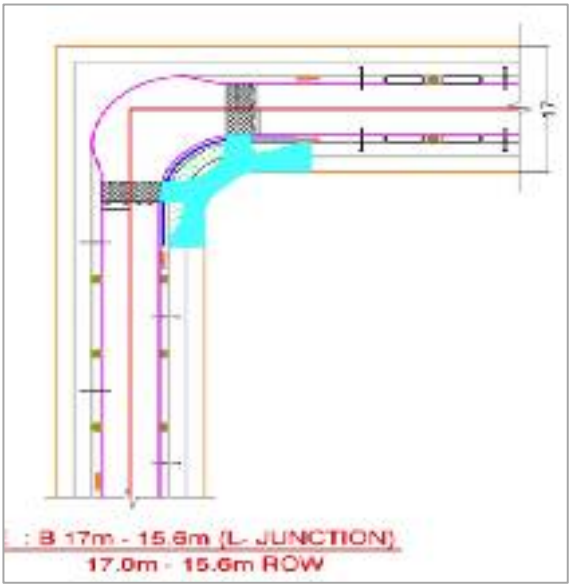


Figure 1.4.36 17m-15.6m ROW (L Junction)



1.4.7. 17 M –12 M ROW ROAD JUNCTION

Junction at 17 m – 12 m crossing has been designed for a turning radius of 8.64 m. Junctions are designed in such a way that they are provided with pram ramps, which provides accessibility for disabled pedestrians. When the roads of 17 m RoW meet the roads of 12 m RoW, the plan of the corresponding junction is as follows:

Figure – 1.4.37, Figure – 1.4.39 & Figure 1.4.41 shows the typical junction without table tops and Figure – 1.4.38, Figure – 1.4.40 & Figure 1.4.42 shows the typical junction with table tops for 17 m – 12 m +, T and L junctions respectively.

Figure 1.4.37 17m-12m ROW (+ Junction)

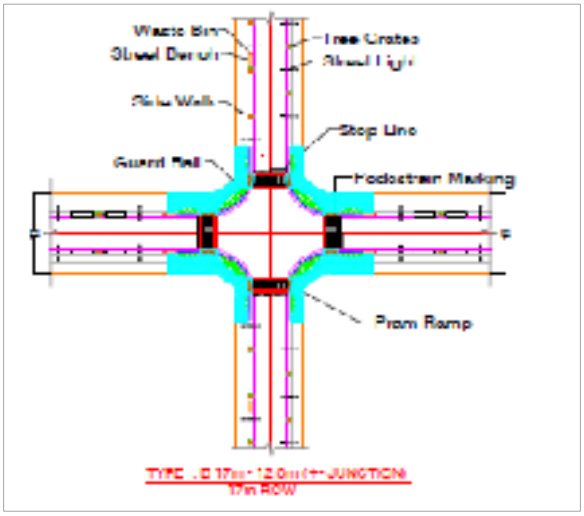


Figure 1.4.38 17m-12m ROW (+ Junction)

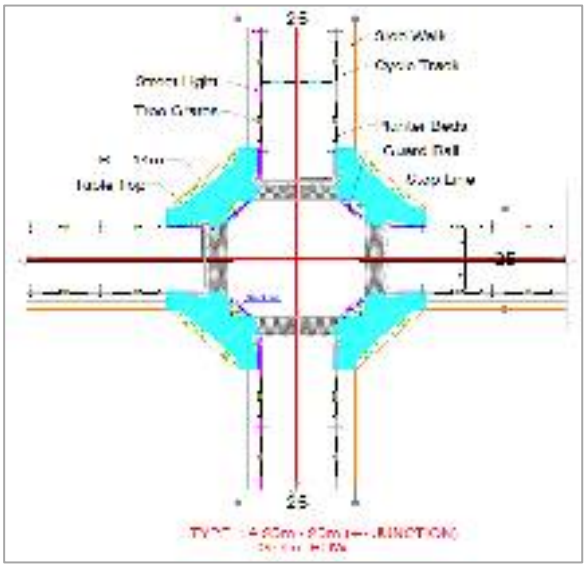


Figure 1.4.39 17m-12m ROW (T Junction)

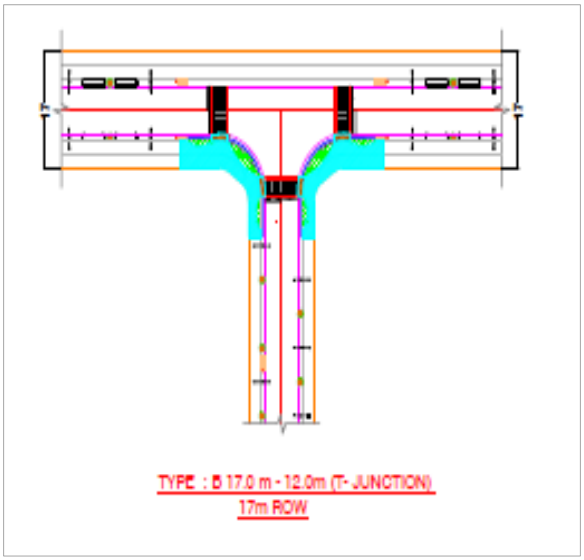


Figure 1.4.40 17m-12m ROW (T Junction)

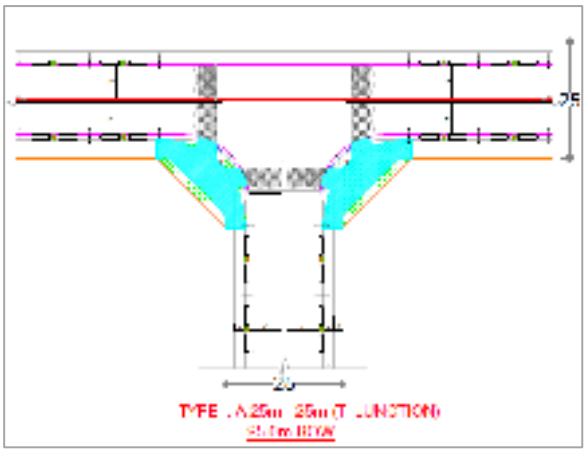


Figure 1.4.41 17m-12m ROW (L Junction)

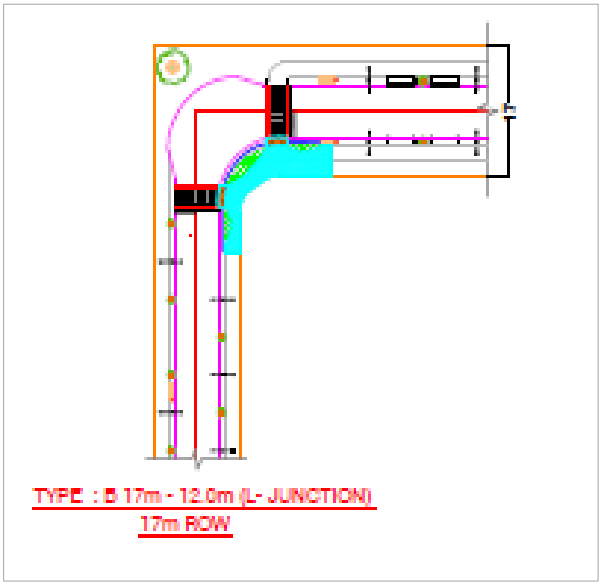
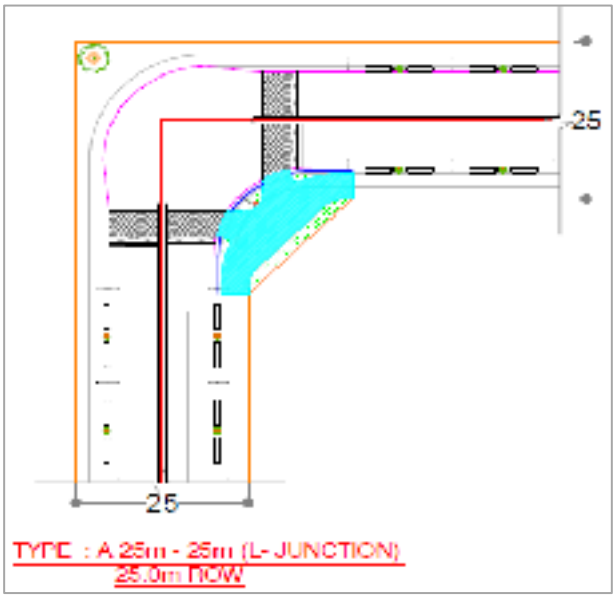


Figure 1.4.42 17m-12m ROW (L Junction)



1.4.8. 15.6 M –15.6 M ROW ROAD JUNCTION

Junction at 15.6 m – 15.6 m crossing has been designed for a turning radius of 8.64m. Junctions are designed in such a way that they are provided with pram ramps, which provides accessibility for disabled pedestrians. When the roads of 15.6 m RoW meet the roads of 15.6 m RoW, the plan of the corresponding junction without bulb out is as follows:

Figure – 1.4.43, Figure – 1.4.45 & Figure 1.4.47 shows the typical junction without table tops and Figure – 1.4.44, Figure – 1.4.46 & Figure 1.4.48 shows the typical junction with table tops for 15.6 m – 15.6 m +, T and L junctions respectively.

Figure 1.4.43 15.6m-15.6m ROW (+ Junction)

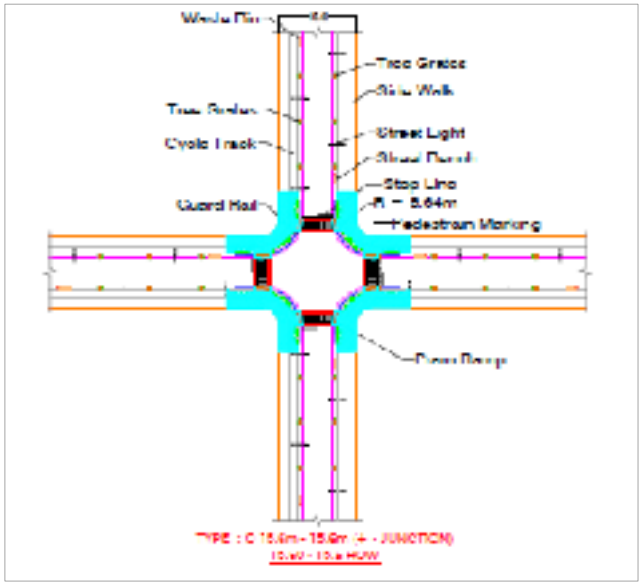


Figure 1.4.44 15.6m-15.6m ROW (+ Junction)

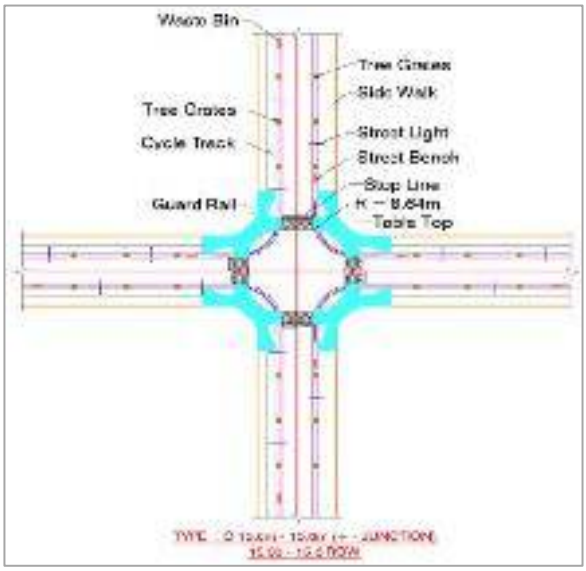


Figure 1.4.45 15.6m-15.6m ROW (T Junction)

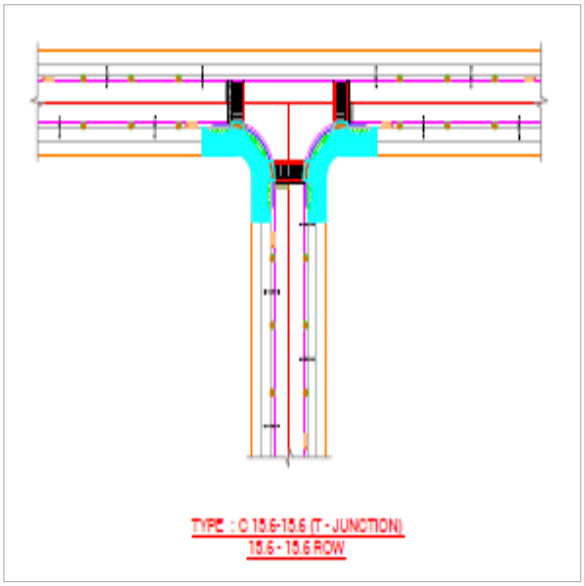


Figure 1.4.46 15.6m-15.6m ROW (T Junction)

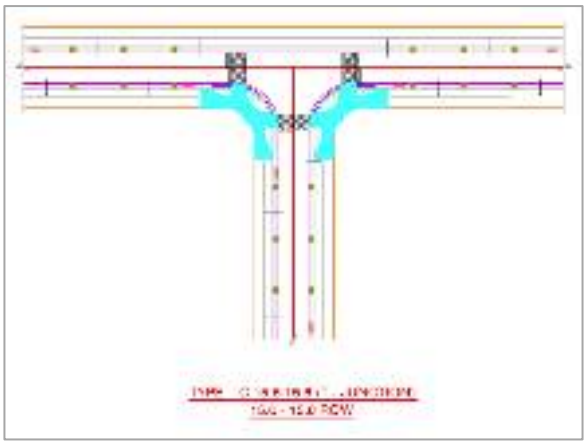


Figure 1.4.47 15.6m-15.6m ROW (L Junction)

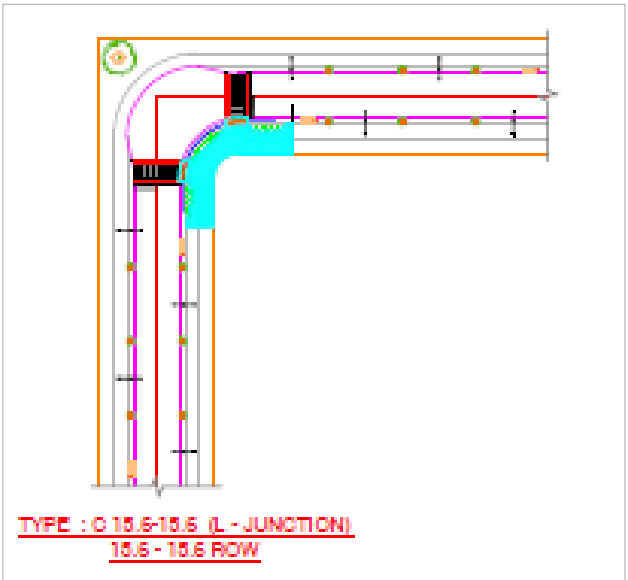
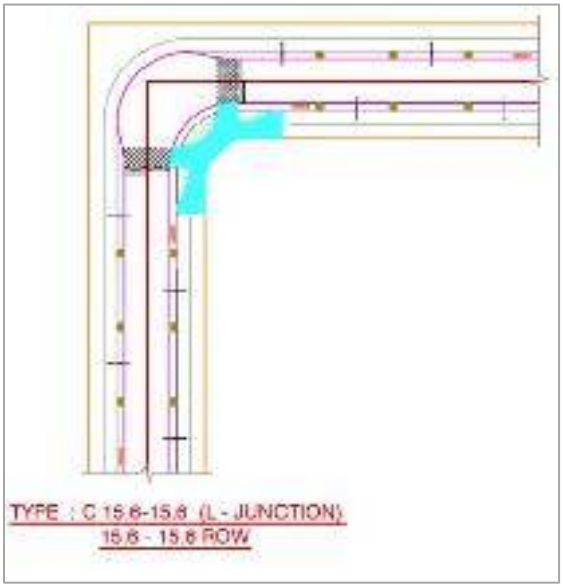


Figure 1.4.48 15.6m-15.6m ROW (L Junction)



1.4.9. 15.6 M –12 M ROW ROAD JUNCTION

Junction at 15.6 m – 12 m crossing has been designed for a turning radius of 8.64 m. Junctions are designed in such a way that they are provided with pram ramps, which provides accessibility for disabled pedestrians. When the roads of 15.6 m RoW meet the roads of 12 m RoW, the plan of the corresponding junction is as follows:

Figure – 1.4.49, Figure – 1.4.51 & Figure 1.4.53 shows the typical junction without table tops and Figure – 1.4.50, Figure – 1.4.52 & Figure 1.4.54 shows the typical junction with table tops for 15.6 m – 12 m +, T and L junctions respectively.

Figure 1.4.49 15.6m-12mROW (+-Junction)

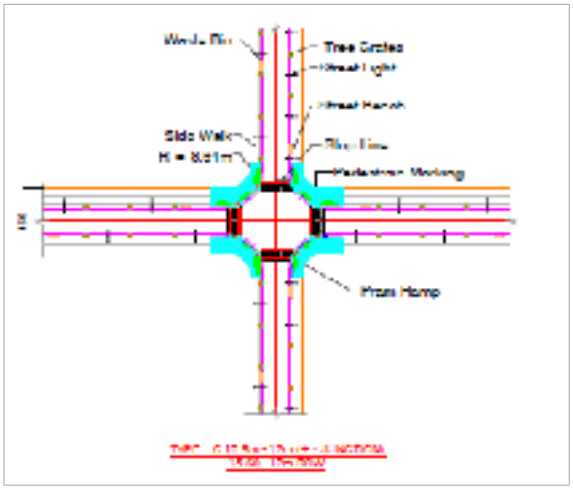


Figure 1.4.50 15.6m-12mROW (+-Junction)

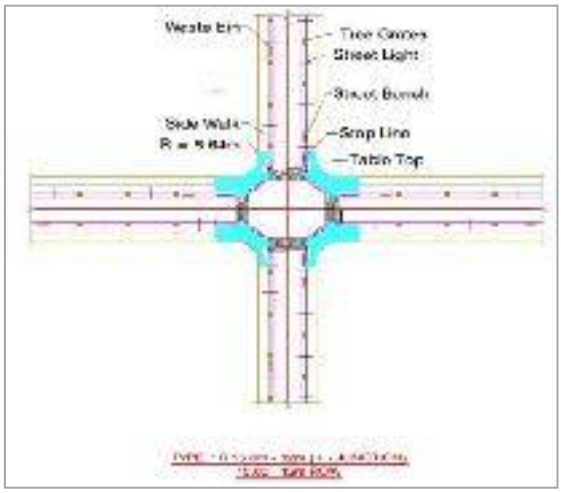


Figure 1.4.51 15.6m-12m ROW (T Junction)

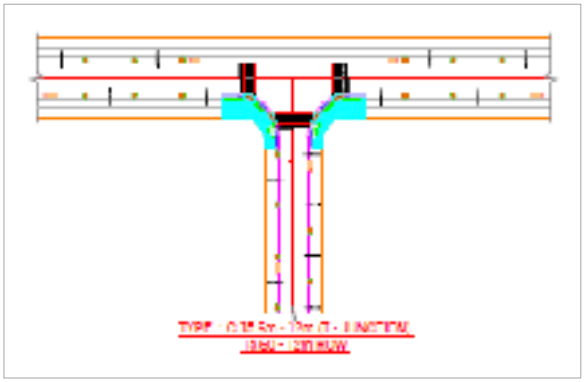


Figure 1.4.52 15.6m-12m ROW (T Junction)

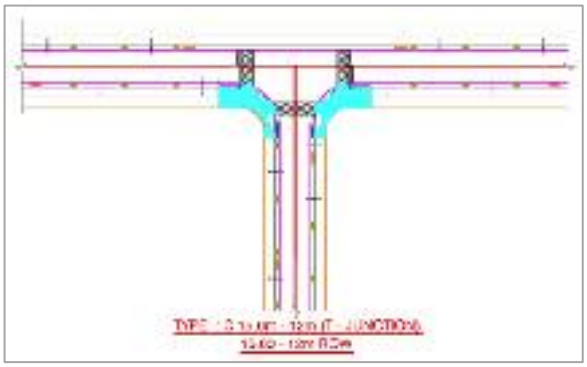


Figure 1.4.53 15.6m-12m ROW (L Junction)

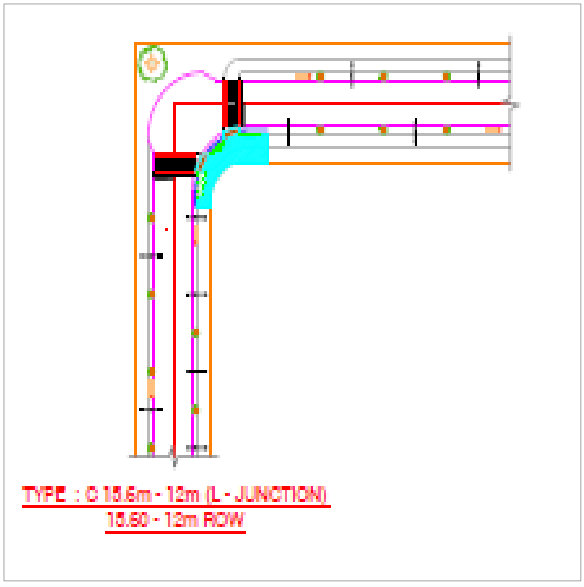
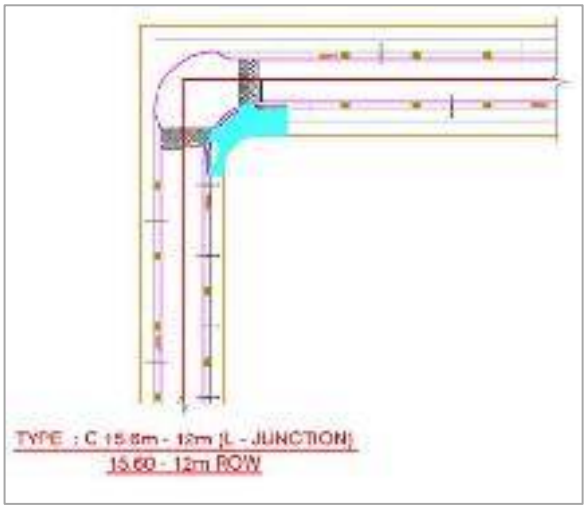


Figure 1.4.54 15.6m-12m ROW (L Junction)



1.4.10. 12 M –12 M ROW ROAD JUNCTION

Junction at 12 m – 12 m crossing has been designed for a turning radius of 8.64 m. Junctions are designed in such a way that they are provided with pram ramps, which provides accessibility for disabled pedestrians. When the roads of 12 m RoW meet the roads of 12 m RoW, the plan of the corresponding junction is as follows:

Figure – 1.4.55, Figure – 1.4.57 & Figure 1.4.59 shows the typical junction without table tops and Figure – 1.4.56, Figure – 1.4.58 & Figure 1.4.60 shows the typical junction with table tops for 12 m – 12 m +, T and L junctions respectively.

Figure 1.4.55 12m-12m ROW (+ Junction)

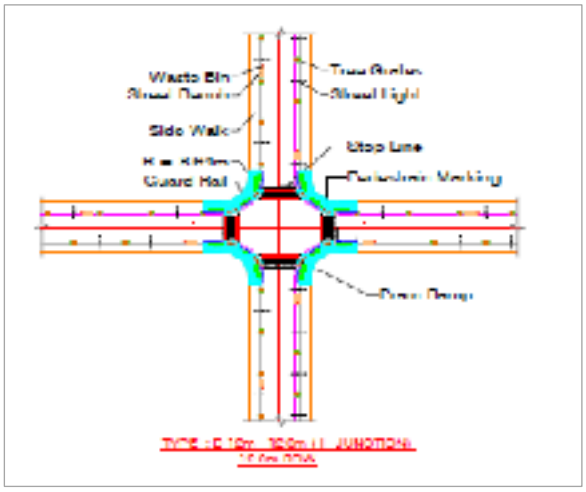


Figure 1.4.56 12m-12m ROW (+ Junction)

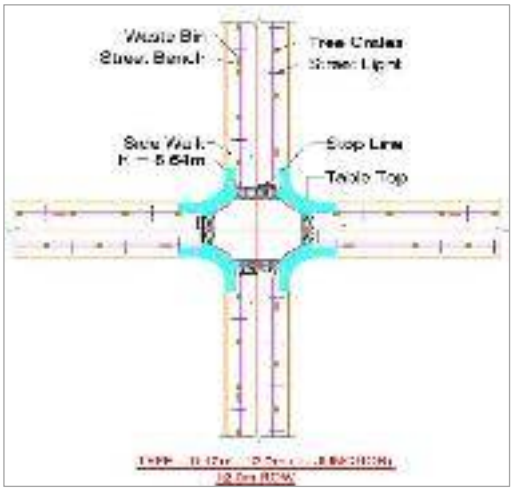


Figure 1.4.57 12m-12m ROW (T Junction)

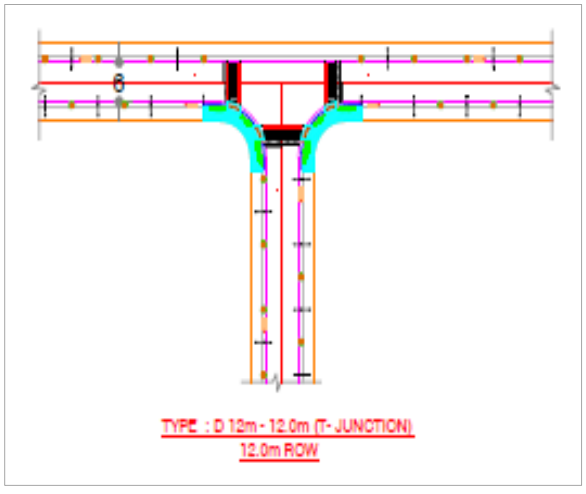


Figure 1.4.58 12m-12m ROW (T Junction)

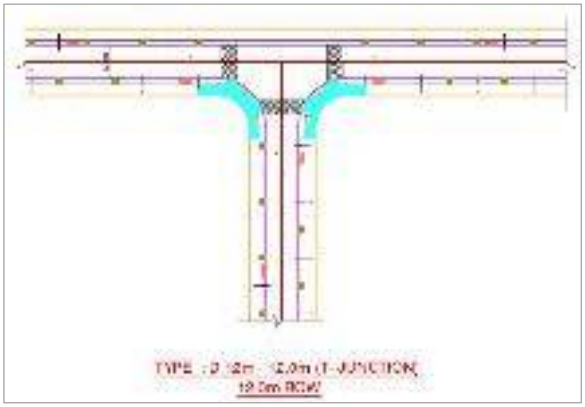


Figure 1.4.59 12m-12m ROW (L Junction)

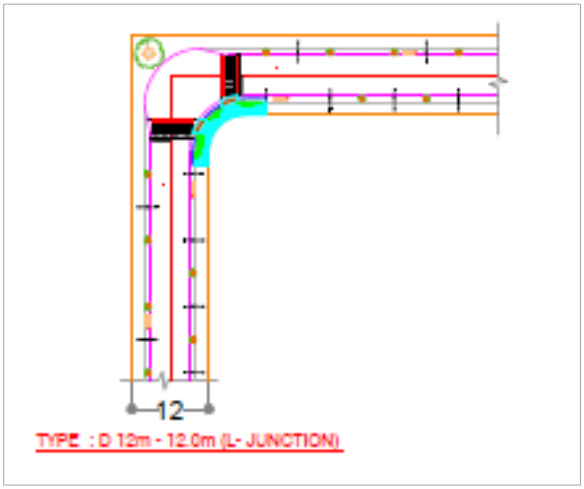
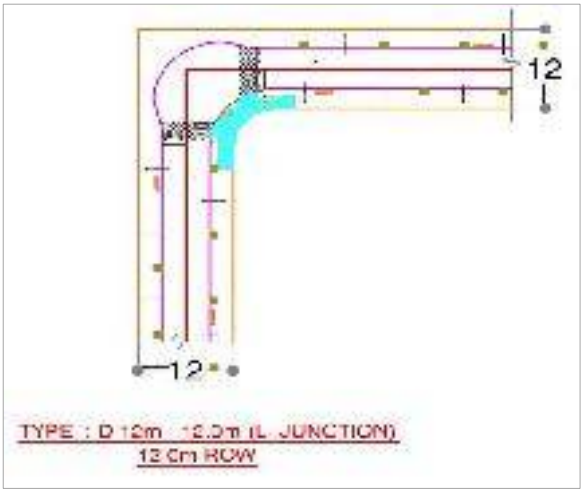


Figure 1.4.60 12m-12m ROW (L Junction)



1.5. PAVEMENT DESIGN

1.5.1. PAVEMENT DESIGN OBJECTIVE

Pavement is the most significant component of a road and therefore its design strengths must be assured to support the projected traffic loading throughout the design period. The Objective is to determine the total thickness of the pavement structure as well as thickness of individual structural layer components. Design strength of pavement must be adequate to support the projected traffic loading throughout the operation period.

1.5.2. DESIGN GUIDELINES

New pavements shall be designed in accordance with IRC: 37 or any other international standard method/guidelines, subject to the condition that the overall pavement composition shall not be less than the minimum requirement specified in IRC: 37. Rigid pavement shall be designed for a period of not less than 30 years, in accordance with the method prescribed in IRC: 58.

1.5.3. PAVEMENT DESIGN

All the LPS roads are classified as per Right-of-Way (ROW) and are designated as 25 m, 17 m, 15.6 m, 12 m and 9 m. Of these roads, 25 m RoW roads are designed as flexible pavement and other roads are designed as rigid pavement.

1.5.4. DESIGN INPUTS

1.5.4.1. TRAFFIC AND SUB-GRADE CHARACTERISTICS

Since the road network of LPS falls in green-field and there is no traffic, the pavement design has been carried out by assuming some of the design factors like traffic, MSA etc.

Expecting the feature traffic on proposed roads in LPS Zones were designed for minimum of 5 MSA for flexible pavement and 150CVPD for rigid pavement. The effective CBR of the soil considered for the LPS roads is around 7%.

1.5.5. DESIGN OF 25 M ROADS

Since these types of roads are designed for flexible pavement and as per the inputs, values are adopted from IRC: 37 Since the alignment is green-field, the anticipated traffic is more of non-commercial vehicles than commercial vehicles as the road network passes through the residential areas. Comparatively high volume of traffic is likely to ply on these roads when compared to other roads. The flexible pavement of these roads has been designed with inputs as CBR and MSA.

As per IRC: 37, crest thickness and pavement composition for the effective CBR of 7% and design MSA of 5 has been taken from the following (plate-5) figure 1.5.1.

Figure 1.5.1 Crest Thickness and Pavement Composition for 7% CBR of and 5 MSA

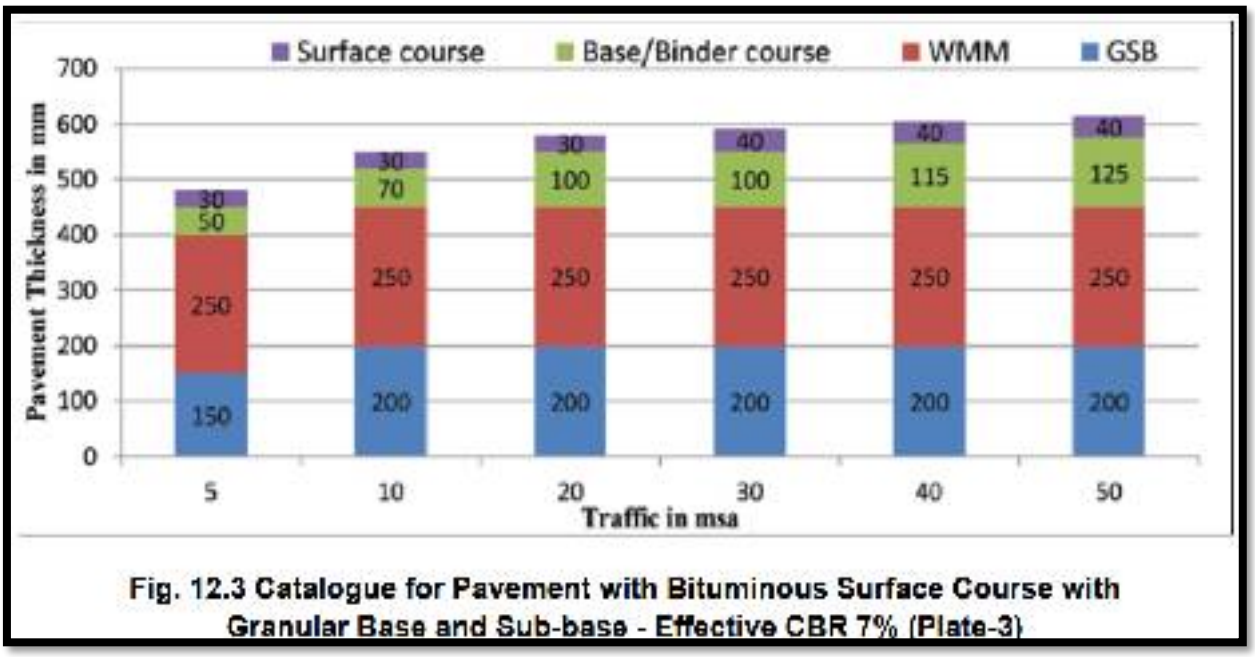


Fig. 12.3 Catalogue for Pavement with Bituminous Surface Course with Granular Base and Sub-base - Effective CBR 7% (Plate-3)

From the figure 1.5.1, for 5 MSA and 7% CBR, the pavement thickness of various layers has been designed considering these values as minimum. Thus, the BC layer should be provided with a minimum thickness of 25 mm and 30 mm has been provided. DBM of 50 mm and since WMM has been adopted as base material, the same has to be provided with a thickness of 250 mm. As per above plate 150mm granular sub-base adequate. However, GFC have been approved for 180 mm based previous version of IRC 37-2012, same is retained. Subgrade will be 500 mm thickness.

1.5.6. DESIGN OF 17 M, 15.6 M, 12 M AND 9 M ROADS

Apart from 25 m roads, all the other roads are treated as low-volume since very less amount of traffic is anticipated on these roads and these are connected to higher volume roads following the hierarchy. These roads are designed for the traffic of 150 CVPD. Low volume roads are designed as per IRC: SP:62-2014. Pavement composition for the designed roads is PQC layer laid over WMM base and granular sub-base which rests over the subgrade. The top layer of the rigid pavement shall be designed as PQC layer with grade of concrete not less than M40.

1.5.6.1. DESIGN INPUTS

Since the road network of LPS falls in green-field and no existing traffic can be present, the pavement design has been carried out by assuming some of the design factors like traffic, MSA etc.

Inputs:

Design effective CBR: 7%

Design traffic: 150 CVPD

From the clause *3.5* and table-3.1 of IRC: SP: 62-2014, modulus of subgrade reaction for the effective CBR of 7% is 48 MPa/m. From the clause *3.6.3* of IRC: SP: 62-2014, the effective k values over granular and cementitious sub-bases for the thickness of 150 mm to 200 mm have been taken as 58 Mpa/m for granular sub base and 96 MPa/m for cementitious sub base. Since the roads are treated as low-volume, the design wheel load coming on the pavement is relatively lesser when compared to conventional pavements. A design wheel load of 50 kN has been adopted for the design. The pavement has been designed in such a way considering that the traffic is between 50 and 150 CVPD (Commercial Vehicles Per Day). Since the traffic considered is between 50 and 150 CVPD, the combined stresses due to 50 kN dual wheel load and

temperature gradient are to be calculated. Table-4.1 of IRC: SP: 62-2014 recommends the temperature differential for concrete slabs for all the states over the country. From the table, it has been observed that for the 150-mm slab thickness, temperature differential for Andhra Pradesh is 17.3 ^{0}C. For 200 mm thickness, the temperature differential is 19 ^{0}C and for 250 mm thickness, it is 20.3^{0}C.

A trial thickness of PQC 200 mm, WMM 100 mm, GSB 150 mm and sub-grade of 500 mm has been adopted for these roads.

Edge load stresses are computed for these roads with the inputs available and the same is compared with the 90-day modulus of rupture of concrete.

Equation 4.2 of IRC: SP: 62-2014 has been used to compute the load stress in the edge region.

$$\sigma_e = \frac{0.803P}{h^2}\left[4\log\left(\frac{l}{a}\right) + 0.666\left(\frac{a}{l}\right) - 0.034\right]$$

Edge load stress (MPa/m) has been computed using the following equation where P is the single wheel load (N), h is the slab thickness (mm), l is the radius of relative stiffness (mm) and a is the radius of equivalent circular area (mm).

Since this equation is valid only for the circular area, a slight modification has been observed with the formula. The radius of equivalent circular contact area has been computed using the below equation.

$$a = \sqrt{\frac{0.8521P_d}{p\pi} + \frac{S_d}{\pi}\left(\frac{P_d}{0.5227p}\right)^{\frac{1}{2}}}$$

This equation gives the curling stresses in which 't', the linear part of the temperature gradient, is 0.667 of the temperature differential given in the table-4.1 of IRC: SP: 62-2014 (19 ^{0}C in this case).

For the trail thickness of 200mm PQC, 100 mm WMM, 150 mm GSB and 500 mm of subgrade, the stresses computed are less than the 90-day modulus of rupture of concrete. Thus, the thicknesses adopted for all these roads can be adopted as safe for the design MSA and design effective CBR. Thus, the pavement design details of LPS roads are given in Table 1.5.2.

Table 1.5.1 Pavement types for different roads

TRoad type	Main Carriageway	Cycle track	Sidewalk
25 m ROW	Flexible	Premix carpet	Rigid (concrete tiles)
17 m ROW	Rigid – Pavement Quality Concrete (PQC)	Flexible	Rigid (concrete tiles)
15.6 m ROW	Rigid – Pavement Quality Concrete (PQC)	Flexible	Rigid (concrete tiles)
12 m ROW	Rigid – Pavement Quality Concrete (PQC)	-	Rigid (concrete tiles)

Table 1.5.2 Pavement Design Details for LPS Roads

Flexible pavement – 25 m RoW	Rigid pavement – 17 m, 15.6 m & 12 m RoW
BC – 30 mm	PQC – 200 mm
DBM – 50 mm	WMM – 100 mm
WMM – 250 mm	GSB – 150 mm
GSB – 180 mm	Subgrade – 500 mm
Subgrade – 500 mm	

1.6. STREET SCAPING COMPONENTS

1.6.1. PROVISION OF CYCLE TRACKS / NMT INFRASTRUCTURE

Good cycle tracks are continuous and provide for uninterrupted movement. They are physically separated from the main carriageway to ensure both comfort and safety, and are protected from encroachment by parked vehicles, pedestrians, and street vendors.

The cycle is a core mode of urban transport. Cycles offer low-cost, pollution-free mobility and occupy only a fifth as much driving and parking space as automobiles. Due to the lack of physical separation of motorized and non-motorized vehicles, cyclists face inconvenience and safety hazards from faster moving traffic. Therefore, the provision of safe and convenient infrastructure is essential to attract new users. Where motor vehicle lanes are saturated, cycling in a segregated track is often faster than using a private motor vehicle.

Efficient cycle tracks are safe, convenient, continuous, and direct. On streets with high-speed traffic, cycle tracks can reduce conflicts between cycles and motor vehicles.

1.6.1.1. SALIENT FEATURES OF CYCLE TRACKS

- A minimum width of 1.7 m for Two-way movement.
- Continuity to allow for reasonable speeds.
- Continuous shade through tree cover
- Elevation above the carriageway (e.g., +150 mm) that allows for storm water runoff.
- A buffer of 0.5 m between the cycle track and parking areas or the carriageway
- At property access points, the cycle track remains at the same level and vehicle access is provided by a ramp in the buffer.

Cycle track runs all along the carriageway and provides access to the plots. They are well connected with the public transport stations. Cycle track is designed with a composition of 20mm premix carpet, 75mm WMM, 150mm GSB and 300mm subgrade.

1.6.2. PROVISION OF SIDE WALKS / PEDESTRIAN WALKWAY

Good footpaths promote safe and comfortable pedestrian mobility. Together with other elements, such as furniture and landscaping, they constitute the primary public space of a city and are accessible to all users, regardless of age, gender, or special needs. Good footpaths are inviting spaces where people can meet, talk, sit, and eat. A significant proportion of trips, especially those below 2 km, are carried out on foot.

Comfort, continuity, and safety are the governing criteria for the design of pedestrian facilities. Footpaths should be provided on all streets, except on traffic calmed (12m & 9m) small streets.

Of all the roads, a minimum pedestrian sidewalk of 1.6 m is provided all along the carriageway.

1.6.2.1. SIDEWALKS ARE INCORPORATED WITH THE FOLLOWING FEATURES

- A continuous unobstructed minimum width of 1.6 m
- No breaks or obstructions at property entrances and side streets
- Continuous shade through tree cover
- No railings or barriers that prevent sideways movement on and off the footpath.

- Elevation over the carriageway (e.g., +150 mm) and adequate cross slope for storm water runoff. At the same time, the elevation should be low enough for pedestrians to step onto and off the footpath easily.

1.6.3. PROVISION OF PLANTATION STRIPS

Multi-Functional Zone has been proposed for the provision of landscaping along the roads. The MF zone has been provided with various components like tree grates, planter beds, street benches, street bins, streetlights etc.

Landscaping improves the livability of the streets. It plays a functional role in providing shade to pedestrians, cyclists and public transport passengers. It also enhances the aesthetic qualities of streets.

Effective greening with street trees reduces the street temperature, making it comfortable for people to walk even during summer afternoons. This is especially important in places with a humid climate or harsh daytime sun. On a larger scale, plants keep a city cool by reducing the urban heat island effect.

Trees also capture dust and remove glare. During storms, they reduce wind velocity. Additionally, trees can help reduce vehicle speeds by reducing the actual or the perceived width of a street. Landscaping can beautify a street, providing an umbrella canopy and adding colours, fragrances, and textures. The potentially varied character of flora along a street can make it a more memorable space. A well-designed landscape promotes a sense of ownership among nearby residents or shop owners such that they contribute towards its upkeep. Finally, landscaping can incorporate fruit bearing and medicinal or religious trees and shrubs.

Out of these, planter beds and tree gratings are proposed with varied spacings for varied RoW of roads. Details of each and every RoW road have been discussed in the report.

Street furniture in the MF zone is proposed in such a way that one tree grate is planned in between 2 planter beds. So, 1 tree grate and 2 planter beds make a combination of one unit of plantation strip. This plantation strip spacing varies for different RoW roads.

For 25 m RoW and 17 m RoW, planter beds are spaced at 2 m intervals. The dimension of the planter beds is given as 4 m * 1 m, where the length of the planter bed is 4 m and width 1 m.

Tree gratings are spaced at 15 m interval for 25 m roads, at 12 m interval for 17 m roads and at 10 m interval for 15.6 m, 12 m and 9 m roads.

Tree grates are designed in such a way that the maximum outer dimension is 0.45 m * 0.45 m for all roads except 9 m, whereas for 9 m it is designed as 0.36 m * 0.36 m.

Following list of suggested species proposed for Amaravati Project are mentioned below:

- Lawn and Lagerstroemia, Bignonia, Pagoda
- Hangfong red and Tecoma ghadichodi drawf/Plumeria Dwarf
- Tabebuia Avalanda and Almanda Dwarf Palms, Bottle brush
- Lawn, Datepalm and Neerium
- Golden Trumphet Tree and Podranea ricasoliana/Nerium petite salmon
- Cardia, Euphorbia milii
- Palms & Muria exotica/gulhinia
- Bignonia and Boginvillea.

AP Greening and Beautification Corporation may be contacted for finalising spices for each zone. The plant survival rate is poor in case plants borrowed from the local nurseries. Hence, it is suggested that nursery to be established in the vicinity of Zone.

1.6.4. SMART STREET LIGHTING WITH CENTRALIZED CONTROL AND MONITORING SYSTEM (CCMS)

Streetlights are provided after the plantation strip unit and the combination gets repeated all along the road. Streetlights are placed at 30 m spacing for 25 m roads. They are provided at 30 m spacing for 17 m roads, at 30 m spacing for 15.6 m roads, at 20 m spacing for 12 m.

Smart street lighting refers to a modern, energy-efficient system that uses advanced technologies such as sensors, wireless communication, and automation to manage and optimize street lighting in urban areas. Centralized Control and Monitoring System (CCMS) plays a key role in integrating and managing these smart streetlights, enabling municipalities to monitor, control, and optimize street lighting operations more efficiently. Components of Smart Street Lighting with CCMS

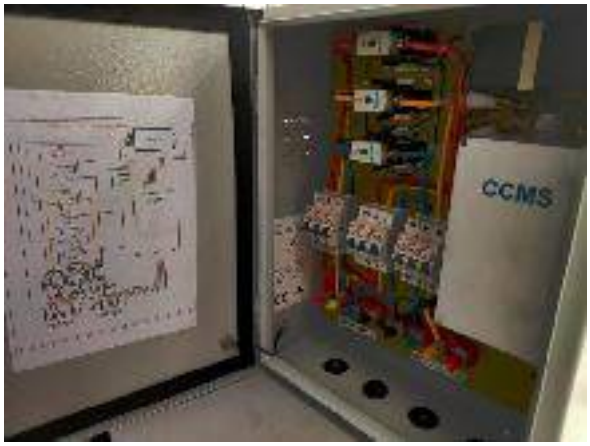
1. LED Street Lights: The core of a smart street lighting system is the use of energy-efficient LED lights. These lights consume significantly less power compared to traditional incandescent or fluorescent streetlamps. LEDs have longer lifespans, which reduces maintenance costs.
2. Sensors: Each streetlight is typically equipped with sensors, motion, and environmental conditions (such as temperature and humidity
3. Centralized Control and Monitoring System (CCMS): The CCMS is the heart of the smart street lighting infrastructure. It is a software platform that provides a centralized hub for managing and controlling the entire street lighting network. Key features of CCMS include:

- Real-time Monitoring: Allows operators to monitor the status of each feeder pillar,
- including power consumption, operational status, and faults.

- Remote Control: Enables operators to remotely turn them on/off based on various parameters such as time of day or traffic conditions.
- Fault Detection and Reporting: CCMS automatically detects faulty streetlights (e.g., outages, dimming, or malfunctions) and sends alerts to maintenance teams, reducing downtime and ensuring quick repairs.
- Data Analytics and Reporting: The system collects data on energy usage, operational performance, and other metrics, enabling data-driven decisions to optimize lighting and energy consumption.
- Predictive Maintenance: Using historical data and machine learning algorithms, the CCMS can predict potential failures before they happen, allowing for proactive maintenance.

4. Communication Networks: A reliable communication network is crucial for the operation of smart street lighting. This network allows all streetlights and sensors to send data to the CCMS in real-time. Common communication technologies used are

- 5G/4G Networks: Used for real-time high-speed data transfer in cities with advanced infrastructure.



1.6.5. PROVISION OF STREET FURNITURE

In addition to street lighting following items to be provisioned in the street scaping along proposed roads.

- Granite Benches at appropriate locations for short resting residents.
- Bollards at suitable locations to arrest the motorised vehicles.
- Suitable stone art gallery may be installed at intersections to make the proposed city more attractive.
- Water fountains can improve air quality by releasing negative ions into the air. These ions help purify the air, removing pollutants and allergens. It is suggested that water fountains to be installed at intersections locations. Reuse water to be used for these fountains.

- Protective mesh on bridges over Canal/Vagu locations to be provided to curb the garbage dumping in the water bodies.
- Guard rails shall be confined to junctions at the traffic islands to retain the landscape/plantation from animal menace.
- Rumble Strips/Speed Breakers shall be provided at locations demanding reduction of speeds which include approaches of important junctions, Highways.

1.6.6. TABLE TOP CROSSING

Raised tabletop crossings to be provided at slip roads with minimum 20 seconds signal to allow pedestrian and cyclists to cross the road safely and comfortably at same level.

Figure 1.6.1 Table Top Crossing

1.6.7. TRAFFIC SIGNS, ROAD MARKING and ROAD STUDS

TRAFFIC SIGNS:

Sign boards are provided all along the roads as per the provision given in IRC 67.

Informative sign boards of size 450x750 mm, Junction boards of size 1500x1050 mm, Route marker signs of 450x600 mm, Cautionary/warning sign boards of 600mm equilateral triangle, Mandatory/ Regulatory sign boards of size 600mm circle, stop sign of octagon size 600 mm, Mandatory (Give way sign Boards) of size 600 mm equilateral triangle are provided all along the project stretch.

ROAD MARKING:

Road Markings perform an important function of guiding and controlling traffic on a highway. The markings serve as a psychological barrier and thus help to signify the delineation of traffic path and its lateral clearance from traffic hazards facilitating safe movement. Further, the road markings channelize the pedestrians and cyclists movement into safe location and in effect, provide for an extension of the side walk/cycle track across the roadway. Road markings are therefore, indispensable to ensure smooth and orderly flow of traffic and for promoting road safety.

Notwithstanding some limitations, such as poor visibility when dusty or wet or obliteration by snow the frequent renewals of road markings have the advantage of conveying the required information to the road user without distracting the attention of the driver from the carriageway. Unlike road signs, the road markings are not likely to be obscured and are not pruned to vandalism.

While some markings are provided in conjunction with road signs, most markings are provided independently. Road markings normally include longitudinal markings, transverse markings, text and symbols etc. on the road surfaces.

ROAD STUDS:

Retroreflective road marking on pavement and cycle track shall be provided as per IRC SP 35.

Retro-reflective studs are used to supplement longitudinal/transverse reflectorized road markings, which would improve visibility in nighttime and adverse weather conditions. Road studs are also used across the carriageway to serve as Speed Arrestor coupled with eschewing warning through the creation of the rumbling sensation to the user. Series of such road reflector studs are to be laid in advance of junction/crossings/end of the flyover section wherein road crashes are prevalent.

The Clause 804 of 'Specification for Road and Bridge Works" by the Ministry of Road Transport & Highways (MORTH) and ASTM D4280-04 shall be referred for technical specifications of road studs.

The performance of road studs depends upon the amount of light from vehicle head lamps reflected back towards the source.

Installation of various types of road studs on pavement shall be as per IRC 35 and after approval from the Authority.

FLEXIBLE MEDIAN MARKER (FMM):

Flexible Median Marker (FMM) should be used for improving median visibility during dark hours. Use of Median Marker provides safety against collision happening with medians during nighttime or severe weather. Flexible Median Markers shall be provided with fluorescent yellow colour retro reflective sheeting Type XI as per IRC:67. Flexible Median Marker shall be of tough, high impact resistant, injection-moulded, thermoplastic body with property of flexibility to provide high durability and U shape structure having rebound/bounce back property. In addition to median, FMM shall be installed on vertical face of bridge parapet for better nighttime visibility.

FMM shall be installed in the median and bridge parapets as per IRC 79.

1.6.8. BRIDGES

Of the total LPS network, it has been observed that there are some locations where the roads are crossing some water bodies and are proposed as bridges. Since these bridges are observed in the vicinity of border of some of the zones, they are designated to be taken in either any of the zone. Thus, a total of 25 bridges have been observed among all the zones of LPS.

No Major bridges proposed in this zone for construction.

Andhra Pradesh Capital Region Development Authority (APCRDA)

NIT NO: XX/XX/XXX

Name of the Work: **WORLD BANK & ADB financed Amaravati Capital City Development Program related *[INSERT PROJECT NAME]* on Lump sum contract (Percentage Tender).**

ISSUED ON: DD.MM.YYYY

Standard Bidding Document

Table of Contents

NOTICE INVITING TENDER (NIT) 3

PART 1 – BIDDING PROCEDURES 7

SECTION I - INSTRUCTIONS TO BIDDERS (ITB) 8

SECTION II - BID DATA SHEET (BDS) 25

SECTION III - EVALUATION AND QUALIFICATION CRITERIA 39

SECTION IV - BIDDING FORMS 47

SECTION V - FRAUD AND CORRUPTION 87

PART 2 – WORKS' REQUIREMENTS 94

SECTION VI - WORKS' REQUIREMENTS 95

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS 162

SECTION VII - GENERAL CONDITIONS OF CONTRACT (GCC) 163

SECTION VIII - PARTICULAR CONDITIONS OF CONTRACT (PCC) 195

SECTION IX - CONTRACT FORMS 224

Notice Inviting Tender (NIT)

ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY

(APCRDA)

NIT No. NIT No. XX/XXXX/ Dated: DD.MM.YYYY

(Bidding Process with AP e-Procurement)

Department	ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY (APCRDA)
Tender Number	NIT No. XX/XXXX/ Dated: DD.MM.YYYY
Tender Subject	**WORLD BANK & ADB financed Amaravati Capital City Development Program related [INSERT PROJECT NAME] on Lump sum contract (Percentage Tender).**
Financing Declaration	The Employer has received financing from the World Bank (WB) and Asian Development Bank (ADB) toward the Amaravati Integrated Urban Development Program (P507508) and Amaravati Inclusive and Sustainable Capital City Development Program (58395-001) respectively. A Part of this financing will be used for payments under the Contract named above and is within the Program Expenditure Framework.
Estimated Contract Value (ECV)	Rs. _____ Crores
Period of Completion of Work	__ Months
Period of Defect Liability Period (DLP)	__ Months from the date of completion of work.
Form of Contract	Lump Sum (Percentage Tender)
Tender Type	National Competitive Tender through AP E-procurement

	portal [*https://apeprocurement.gov.in*]
Eligible Class of Bidders and additional references	1. Special Class Civil registration in the Government contracts registered with Government of Andhra Pradesh 2. The valid Registrations being considered from the above are with reference to the applicable GO's, on the eligibility for participation in this tendering process
Category of Registration	Special Class with Government of Andhra Pradesh
Bid Validity	90 days from the date of Bid submission
Bid Security and Uploading of Documents	1. The Bidder has to submit the Bid Security amounting to **1% of the Estimated Contract Value (ECV)**. 2. The payment shall be made by way of NEFT/RTGS or by irrevocable bank guarantee/ Insurance Surety Bond with validity period of 180 days from the last date of bid submission from any Govt. Banks/ Nationalized Banks/ Public Sector Banks/ Scheduled banks in the prescribed format in favor of Andhra Pradesh Capital Region Development Authority (APCRDA) represented by its Commissioner: Name of the Bank–Union Bank of India, Account Number: 034310100081181 IFSC Code: UBIN0803430 Branch Address-Labbipet branch, Vijayawada, Andhra Pradesh – 520010. Beneficiary Name: Andhra Pradesh Capital Region Development Authority (APCRDA) 3. The bidder shall also upload the remittance details with proof for counter verification with the bank of the employer. 4. If any successful bidder fails to submit the original hard copies of Online Payment receipts/BG/ Insurance Surety Bond towards EMD/ Security Deposit within the stipulated time, the bid will be treated as invalid. 5. Besides this, the Department shall invoke all processes of law including criminal prosecution of such defaulting bidder as an act of extreme deterrence to avoid delays in the tender process for execution of the development schemes taken up by the Government. The information to this extent will

	be displayed on the e-procurement platform website. 6. The banker should be informed that the Bank Guarantee should not be revoked without official consent in writing of the Employer.
Transaction Fee:	@ 0.03% of ECV (estimated contract value) with a cap of Rs.10,000/- (Rupees ten thousand only) for all works with ECV upto Rs.50 crores, and Rs.25,000/- (Rupees twenty five thousand only) for works with ECV above Rs.50 crores plus applicable Taxes to be paid online at the time of bid submission electronically.
BID processing fee	Rs. _____ Online payment in favour of Andhra Pradesh Capital Region Development Authority (APCRDA), Vijayawada. (Non-refundable)
Bid Document Downloading Start Date	DD.MM.YYYY
Bid Document Downloading Close Date	DD.MM.YYYY @ 14:00 Hrs
Pre-Bid Meeting Date	DD.MM.YYYY @ 11:00 Hrs @ APCRDA Office, Vijayawada.
Bid Submission Due Date and time	DD.MM.YYYY @15:00 Hrs
Due date for Submission of hardcopies of uploaded BG/ Insurance Surety Bond for Bid security	DD.MM.YYYY @16:00 Hrs
Opening of Technical Bid	DD.MM.YYYY @16:00 Hrs
Opening of Financial Bid	DD.MM.YYYY @ 16:00 Hrs
Probable date of Issue of LOA	DD.MM.YYYY
Tentative date of implementation	DD.MM.YYYY
Place of bid opening	O/o Commissioner, APCRDA, Lenin

	center, Governorpet,Vijayawada-520002.
Officer Inviting Bids	*The Commissioner, APCRDA, (Lenin Centre, Governor-pet, Vijayawada), Andhra Pradesh, through the Chief Engineer - infra, APCRDA, as the Tender Initiating Authority (TIA), representing the Governor of Andhra Pradesh*
Address	O/o Commissioner, APCRDA, Lenin Centre, Governorpet, Vijayawada-520002.
Contact Person until submission of bids	Chief Engineer _____, APCRDA << Add Mail ID of the concerned chief engineer >>
Point of Contact (POC) for procurement related grievances	Engineer-in-Charge, APCRDA mail: proc.complaints@apcrda.org
Note	The bidder has to upload the scanned copy of online transfer acknowledgment /Bank Guarantee/ Insurance Surety Bond along with the bid.

PART 1 – BIDDING PROCEDURES

Section I - Instructions to Bidders (ITB)

A. General

1. Scope of Bid	1.1.1. In connection with the Notice Inviting Tender (NIT)**, Bidding Document**, specified in the Bid Data Sheet (BDS), the Employer, as specified in the BDS, issues this Bidding document for the provision of Works as specified in Section VI: Works' Requirements**. The name, and NIT identification number of** this Bidding Document are specified in the **BDS**. 1.2. Throughout this bidding document: 1.2.1. the term **"in writing"** means communicated in written form (e.g. by mail, e-mail, fax, including, if specified **in the BDS**, distributed or received through electronic-procurement system used by the Employer) with proof of receipt; 1.2.2. if the context so requires, **"singular"** means **"plural'** and vice versa; 1.2.3. "**Bid**" means "Tender" and vice versa; 1.2.4. **"Day"** means calendar day, unless otherwise specified in **BDS** 1.2.5. the term "Employer", Tender Inviting Authority, and Department or Authority are used interchangeably;
2. Sources of Funds	2.1 The Borrower or Recipient (hereinafter called "Borrower") **specified in the BDS** has received financing (hereinafter called "funds") from the International Bank for Reconstruction and Development and Asian Development Bank (hereinafter called "the Banks") in an amount **specified in the BDS**, toward the project **named in the BDS**. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this bidding document are issued. 2.2 Payment by the Bank will be subject, in all respects, to the terms and conditions of the Loan (or other financing) Agreement. No party other than the Borrower shall derive any rights from the Loan (or other financing) Agreement or have any claim to the proceeds of the Loan (or other financing).
3. Fraud and Corruption	3.1 The World Bank and ADB require compliance with their Anti-Corruption Guidelines and its prevailing sanctions policies and procedures as set forth in Section V. 3.2 In further pursuance of this policy, bidders shall permit and shall cause their agents (whether declared or not), subcontractors, sub-consultants, service providers,

	suppliers, and their personnel, to permit the World Bank and ADB to inspect all accounts, records and other documents relating to any initial selection process, prequalification process, bid submission, proposal submission, and contract performance (in the case of award), and to have them audited by auditors appointed by the Banks.
4. Eligible Bidders	4.1 A Bidder may be a firm that is a private entity, or a joint venture (JV), under an existing agreement, or with the intent to constitute a legally-enforceable joint venture, unless otherwise specified in the BDS. Bids submitted by a JV when permitted shall comply with the following requirements: a) The maximum number of members in the Joint Venture shall be as specified in the BDS; b) the bid shall include all the information listed in Bidders Qualification Forms for all the Members; c) the bid and, in case of a successful bid, the Agreement, shall be signed so as to be legally binding on all members; d) one of the members shall be nominated as being in charge, and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the members; e) the member in charge shall be authorized to incur liabilities and receive instructions for and on behalf of any and all members of the joint venture and the entire execution of the contract, including payment, shall be done exclusively with the member in charge; f) all members of the joint venture shall be jointly and severally liable for the execution of the entire Contract in accordance with the Contract terms, and a statement to this effect shall be included in the authorization mentioned under (d) above, as well as in the bid and in the Agreement [in case of a successful bid]; g) the joint venture agreement should indicate precisely the role of all members of JV in respect of planning, design, construction equipment, key personnel, work execution, and financing of the project. All members of JV should have active participation in the execution during the currency of the contract. This should not be varied/ modified subsequently without prior approval of the Employer; and h) the joint venture agreement should be registered in the place specified in BDS so as to be legally valid and binding on members. 4.2 A Bidder shall not have a conflict of interest. Any Bidder found to have a conflict of interest shall be disqualified. A

	Bidder may be considered to have a conflict of interest for the purpose of this Bidding process, if the Bidder: a) directly or indirectly controls, is controlled by or is under common control with another Bidder; or b) receives or has received any direct or indirect subsidy from another Bidder; or c) has the same legal representative as another Bidder; or d) has a relationship with another Bidder, directly or through common third parties, that puts it in a position to influence the Bid of another Bidder, or influence the decisions of the Employer regarding this Bidding process; or e) or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the Bid; or f) or any of its affiliates has been hired (or is proposed to be hired) by the Employer or Borrower as Engineer for the Contract implementation; or g) would be providing goods, works, or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of the project specified in the BDS ITB 1.1 that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm; or h) has a close business or family relationship with a professional staff of the Borrower (or of the project implementing agency, or of a recipient of a part of the loan) who: (i) are directly or indirectly involved in the preparation of the Bidding document or specifications of the Contract, and/or the Bid evaluation process of such Contract; or (ii) would be involved in the implementation or supervision of such Contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to the Bank throughout the Bidding process and execution of the Contract. 4.3 A firm that is a Bidder (either individually or as a JV member) shall not participate in more than one Bid. This includes participation as a subcontractor in other Bids. Such participation shall result in the disqualification of all Bids in which the firm is involved. A firm that is not a bidder or a JV member may participate as a subcontractor in more than one bid. 4.4 A Bidder may have the nationality of any country, subject to the restrictions pursuant to ITB 4.8. A Bidder shall be deemed to have the nationality of a country if the Bidder is

	constituted, incorporated or registered in and operates in conformity with the provisions of the laws of that country, as evidenced by its articles of incorporation (or equivalent documents of constitution or association) and its registration documents, as the case may be. This criterion also shall apply to the determination of the nationality of proposed subcontractors or sub-consultants for any part of the Contract including related Services. 4.5 A Bidder that has been sanctioned by the Bank, pursuant to the Bank's Anti-Corruption Guidelines, in accordance with its prevailing sanctions policies and procedures as set forth in the WBG's Sanctions Framework as described in Section V paragraph 2.2 d., shall be ineligible to be prequalified for, initially selected for, bid for, propose for, or be awarded a Bank-financed contract or benefit from a Bank-financed contract, financially or otherwise, during such period of time as the Bank shall have determined. The list of debarred firms and individuals is available at the electronic address specified in the BDS. 4.6 DELETED 4.7 A Bidder shall not be under suspension from Bidding by the Employer as the result of the operation of a Bid–Securing or Proposal-Securing Declaration. 4.8 Firms and individuals may be ineligible if so indicated in Section V and (a) as a matter of law or official regulations, the Borrower's country prohibits commercial relations with that country, provided that the Bank is satisfied that such exclusion does not preclude effective competition for the supply of goods or the contracting of works or services required; or (b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's country prohibits any import of goods or contracting of works or services from that country, or any payments to any country, person, or entity in that country. When the Works are implemented across jurisdictional boundaries (and more than one country is a Borrower, and is involved in the procurement), then exclusion of a firm or individual on the basis of ITB 4.8 (a) above by any country may be applied to that procurement across other countries involved, if the Bank and the Borrowers involved in the procurement agree. 4.9 A Bidder shall provide such documentary evidence of eligibility satisfactory to the Employer, as the Employer shall reasonably request.
5. Eligible Materials, Equipment, and	5.1 The materials, equipment and services to be supplied under the Contract may have their origin in any country subject to the restrictions in the Employer's country. At the

Services	Employer's request, Bidders may be required to provide evidence of the origin of materials, equipment and services.
B. Contents of Bidding Document	
6. Sections of Bidding Document	6.1 The Bidding document consists of Part I, II, and III, which includes all the sections specified below, and which should be read in conjunction with any Addenda issued in accordance with ITB 8. **PART I: Bidding Procedures** - Section I - Instructions to Bidders (ITB) - Section II - Bid Data Sheet (BDS) - Section III - Evaluation and Qualification Criteria - Section IV - Bidding Forms - Section V - Fraud and Corruption **PART II: Works Requirements** - Section VI - Works' Requirements **PART III: Conditions of Contract and Contract Forms** - Section VII - General Conditions of Contract (GCC) - Section VIII – Particular Conditions of Contract (PCC) - Section IX - Contract Forms 6.2 The Notice Inviting Tender issued by the employer shall be considered to be a part of the Bidding Documents. 6.3 Unless obtained directly from the **AP eProcurement portal as mentioned in the BDS**, the Employer is not responsible for the completeness of the Bidding Documents, responses to requests for clarification, the minutes of the Pre-Bid meeting (if any), or Addenda to the Bidding Documents in accordance with ITB 8. In case of any contradiction, documents obtained directly from the Employer shall prevail. 6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Documents and to furnish with its bid all information and documentation as is required by the Bidding Documents.
7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting	7.1 A Bidder requiring any clarification of the Bidding document shall contact the Employer in writing at the Employer's address specified **in the BDS** or raise its enquiries during the pre-Bid meeting if provided for in accordance with ITB 7.4. The Employer will respond in writing to any request for clarification. The Employer shall promptly publish its response on the AP e-procurement portal. Should the clarification result in changes to the essential elements of the Bidding document, the Employer

	shall amend the Bidding document following the procedure under ITB 8 and ITB 22.2. 7.2 The Bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself, on its own responsibility, all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense. 7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection. 7.4 If so specified **in the BDS**, the Bidder's designated representative is invited to attend a pre-Bid meeting and/or a Site of Works visit. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage. 7.5 Submission of a bid by a bidder implies that the bidder has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to them by the Government and local conditions and other factors having a bearing on the execution of the work. 7.6 Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.
8. Amendment of Bidding Document	8.1 At any time prior to the deadline for submission of bids, the Employer may amend the Bidding Documents by issuing corrigenda/addenda. 8.2 Any corrigendum/ addendum issued shall be part of the Bidding Documents and shall be deemed to have been communicated to all bidders. The Employer shall also promptly publish the addendum on the Employer's eProcurement portal as specified in **ITB 6.3** and in accordance with **ITB 7.1**. 8.3 To give Bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer at its own discretion may extend the deadline for the submission of bids, pursuant to **ITB 22.2**
C. Preparation of Bids	

9. Cost of Bidding	9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall not be responsible or liable for those costs, regardless of the conduct or outcome of the Bidding process.
10. Language of Bid	10.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer, shall be written in the language specified in the **BDS**. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the **BDS**, in which case, for purposes of interpretation of the Bid, such translation shall govern.
11. Documents Comprising the Bid	The Bid shall comprise two Parts, namely the Technical Part and the Financial Part. These two Parts shall be submitted simultaneously. 11.1 The Technical Bid shall comprise the following: a) Letter of Bid and Appendix to Bid, in accordance with ITB 12; b) Form 1 - Bidder information form c) Form 2 - Historical Contract Non-Performance, Pending Litigation and Litigation History d) Completed schedules (Statement I to X) as required, including priced Bill of Quantities, in accordance with ITB 12 and 14; e) Bid security in accordance with ITB 19.1; f) Written confirmation authorizing signatory of the Bid to commit the Bidder, in accordance with ITB 20.1; g) Documentary evidence in accordance with ITB 17 establishing the Bidder's continued qualified status or, if post-qualification applies, as specified in accordance with ITB 4, the bidder's qualifications to perform the contract if its Bid is accepted; h) Technical Proposal in accordance with ITB 16; i) Any other document required in BDS. 11.2 The Financial Part shall contain the following: a) Price Bid : prepared in accordance with ITB 14; and any other document required in the BDS. (Scanned copy of the filled Price Bid form to be uploaded while quoting the percentage quote at the e-procurement portal) 11.3 The Technical Part shall not include any information related to the Bid price. Where material financial information related

	to the Bid price is contained in the Technical Part the Bid shall be declared non-responsive.
12. Letter of Bid and Schedules	12.1 The Letter of Bid and other documents, shall be prepared using the relevant forms furnished in Section IV Bidding Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITB 20.2. All blank spaces shall be filled in with the information requested.
13. Alternative Bids	NOT ALLOWED
14. Bid Prices and Discounts	14.1 The prices and discounts (including any price reduction) quoted by the Bidder in the Letter of Bid and in the Bill of Quantities shall conform to the requirements specified below. 14.2 **Bill of Quantities** for the works are annexed at **Schedule – A** and the bid offer accompanies the tender document as **Part II: Works' requirements**. It shall be explicitly understood that with regard to the correctness or completeness of this **Part II: Works' requirements** which is liable to alterations by omissions, deductions or additions at the discretion of the Engineer-in-charge or as set forth in the conditions of the contract. The **Schedule - A** shall contain the items of work indicated as part – A and provisions as part –B. a) The percentage excess/less rates/at-par quoted by the bidder shall be applicable only to part –A. However, the provisions contained in the part –B will be operated basing on the conditions provided in the bid Document. The bidders will have to state clearly their willingness to execute the work at certain specific percentage of excess or less or at par of the ECV indicated in Part-A at the space provided therein in Schedule 'A'. The bidder should, however, quote their lump-sum tender based on this schedule of quantities. The bidder should quote their offer as an overall tender percentage. The overall tender percentage should be written both in words and figures in the price bid document uploaded to the e-procurement portal. The bid offers i.e., percentage shall be written both in figures and words legibly and free from erasures, over writings or corrections of figures. Corrections where unavoidable should be made by crossing out and rewriting duly initializing with date. b) The Schedule –A (or Price-bid) contains not only the quantities but also the rates worked out by the employer and the amount for each item and total value of the estimated contract. The bidder should workout their own rates keeping in view the work, site conditions and quote their overall tender percentage with which the bidder

	intends to execute the work. 14.3 The price to be quoted in the Letter of Bid, in accordance with ITB 12.1, shall be the total price of the Bid, excluding any discounts offered (if relevant). 14.4 The Bidder shall quote any discounts and the methodology for their application in the Letter of Bid, in accordance with ITB 12.1. 14.5 Unless otherwise **specified in the BDS** and the Contract, the price quoted by the bidder are subject to adjustment during the performance of the contract in accordance with the provisions of the Conditions of Contract. 14.6 All duties, taxes, and other levies payable by the bidder as per State / Central Government rules, shall be excluded in the tender percentage quoted by the Bidder, keeping in view the reimbursable amounts specified in Part-B of Price bid. 14.7 DELETED 14.8 Tenders which are less beyond minus 25% (<-25%) of the ECV (Estimate Contract Value), a bank guarantee/ demand draft/ Insurance Surety Bond for the difference between the tendered amount and 75% of estimate contract value should be taken over and above other guarantee, which would be released after the completion of work along with other bank guarantee.
15. Currencies of Bid and Payment	15.1 The currency of the bid and the currency of payments shall be **Indian Rupees**
16. Documents Comprising the Technical Proposal	16.1 The Bidder shall furnish a Technical Proposal as **specified in BDS** including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section IV – Bidding Form, in sufficient detail to demonstrate the adequacy of the Bidder's proposal to meet the work requirements and the completion time.
17. Documents Establishing the Qualifications of the Bidder	17.1 To demonstrate that the bidder meets the Qualification requirement as mentioned in **Notice Inviting Tender** & **Section III: Evaluation and Qualification Criteria**, the bidder shall provide in the information using the forms provided in **Section IV: Bidding Forms**. 17.2 DELETED 17.3 Any change in the structure or formation of a Bidder after being prequalified and invited to Bid shall be subject to the written approval of the employer prior to the deadline for submission of Bids. Such approval shall be denied if (i) a Bidder proposes to associate with a disqualified Bidder or in case of a disqualified joint venture, any of its members; (ii) as a consequence of the change, the Bidder no longer

	substantially meets the qualification criteria set forth in Section III, Qualification Criteria and Requirements; or (iii) in the opinion of the employer, the change may result in a substantial reduction in competition. Any such change should be submitted to the employer not later than fourteen (14) days after the date of the Invitation for Bids.
18. Period of Validity of Bids	18.1 Bids shall remain valid for the period **specified in the BDS** after the bid submission deadline date prescribed by the Employer in accordance with **ITB 22.1.** A bid valid for a shorter period shall be rejected by the Employer as non-responsive. 18.2 In exceptional circumstances, prior to the expiration of the bid validity period, the employer may request Bidders to extend the period of validity of their bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 19, it shall also be extended for twenty (20) days beyond the deadline of the extended validity period. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its bid.
19. Bid Security	19.1 The Bidder shall furnish, as part of its Bid, a Bid Security as specified **in the BDS**, in the amount and currency specified **in the BDS.** 19.2 If a bid security is specified pursuant to ITB 19.1, the bid security shall be a demand guarantee in any of the following forms at the Bidder's option: a) Online through E-Procurement portal b) an unconditional irrevocable guarantee issued by a bank (National or Scheduled Bank) or financial institution; c) Insurance Surety Bond 19.3 In the case of a bank guarantee/ Insurance Surety Bond, the bid security shall be submitted either using the Bid Security Form included in **Section IV, Bidding Forms**, or in another substantially similar format approved by the employer prior to bid submission. The bid security shall be valid for 180 days from the last date prescribed for submission of tenders, or beyond any period of extension if requested under ITB 18.2. Any deviation in Bid Security with regard to amount, validity and format shall be considered as material deviation and bid shall be summarily rejected. 19.4 If a bid security is specified pursuant to ITB 19.1, any bid not accompanied by a substantially responsive bid security shall be rejected by the Employer as non-responsive. 19.5 If a bid security is specified pursuant to ITB 19.1, the bid security of unsuccessful Bidders shall be returned as

	promptly as possible upon the successful Bidder's signing the Contract and furnishing the performance security pursuant to **ITB 41** & **ITB 42**. 19.6 The bid security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security Pursuant to **ITB 42**. 19.7 The bid security may be forfeited: a) If a Bidder withdraws/modifies/substitutes its bid during the period of bid validity specified by the Bidder on the Letter of Bid, or any extension thereto provided by the Bidder; or b) If the successful Bidder fails to: (i) Sign the Contract in accordance with ITB 41; or (ii) Furnish a performance security, the Environmental and Social (ES) Performance Security, in accordance with ITB 42. c) In case of any false information/document submitted by bidder; d) Failure on part of successful bidder to submit the original hard copies of all uploaded documents, within the time period specified by the employer. e) In case there is mismatch / variation between the original copies of certificates submitted and the scanned copy of certificates uploaded at the time of tender submission
20. Format and Signing of Bid	20.1 The Bidder shall prepare the Bid as per details given in ITB 21. 20.2 Bidders shall mark as "CONFIDENTIAL" information in their Bids which is confidential to their business 20.3 The Bid shall be signed by a person duly authorized to sign onbehalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be uploaded along with the Bid. 20.4 In case the Bidder is a JV, the Bid shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives. Documents establishing authority to sign the bid on behalf of the JV shall be uploaded along with the bid.
D. Submission and Opening of Bids	
21. Submission of bids	21.1 Bids must be submitted electronically using the system specified **in the BDS**. Bidders shall follow the electronic Bid submission procedures specified **in the BDS** 21.2 After submission of bid online, the bidders shall submit

	the originals hard copies of uploaded Bid Security to the Authority within the period as specified in the **BDS** either personally or through courier or by post within the due date. The employer shall not take any responsibility for any delay or non-receipt. If any of the documents furnished by the bidder is found to be false/fabricated/bogus, the bidder is liable for blacklisting, forfeiture of the Bid Security (EMD), cancellation of work and criminal prosecution. 21.3 The bidder is requested to get a confirmed acknowledgement from the Employer as a proof of the Hardcopies submission of EMD to avoid any discrepancy. The bidder has to attach the required documents after uploading the same as required by Tender Inviting Authority in its tender conditions.
22. Deadline for Submission of Bids	22.1 **When so specified in the BDS**, bidders have to submit their bids electronically. Bidders submitting bids electronically shall follow the electronic bid submission procedures **specified in the BDS**. Bids must submit their bid online (electronically) no later than the date and time specified in the BDS & NIT. 22.2 The employer may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Documents in accordance with ITB 8, in which case all rights and obligations of the employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.
23. Late Bids	23.1 Submission of Tenders shall be closed on e-procurement portal indicated in **BDS** at the date & time of submission prescribed in **NIT & BDS** after which no tender shall be accepted. It shall be the responsibility of the bidder to ensure that their bid is submitted online on the e-procurement portal before the deadline of submission. Employer will not be responsible for non-receipt of tender documents due to any delay and/or loss etc.
24. Withdrawal, Substitution, and Modification of Bids	24.1 Bidders may modify their bids by using the appropriate option for bid modification on e-procurement portal, before the deadline for submission of bids. For this the bidder need not make any additional payment towards the cost of bid document. For bid modification and consequential re-submission, the bidder is not required to withdraw their bid submitted earlier. The last modified bid submitted by the bidder within the bid submission time shall be considered as the bid. For this purpose, modification/withdrawal by other means will not be accepted. In online system of bid submission, the modification and consequential re-submission of bids is allowed any number of times. A bidder may withdraw their bid by using the appropriate

	option for bid withdrawal, before the deadline for submission of bids, however, if the bid is withdrawn, re-submission of the bid is not allowed (or allowed if specified in BDS). 24.2 No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Bid or any extension thereof.
25. Bid Opening	25.1 Except in the cases specified in ITB 22, electronic bid opening procedures required if electronic bidding is permitted in accordance with **ITB 21.1**, shall be as specified in the **BDS**. 25.2 The Technical Bids of all bidders who have submitted a valid tender security and cost of tender document shall be opened in the presence of representatives of bidders who choose to attend on date & time as mentioned in **NIT** and **BDS** in the office of the employer. Bidders may visit e-procurement portal to know latest Technical Opening information after completion of opening process. If such nominated date for opening of Tender is subsequently declared as a Public Holiday by the employer, the next official working day shall be deemed as the date of opening of Technical bid. The bid of any bidder who has not complied with one or more of the foregoing instructions may not be considered. 25.3 A date, time and venue will be notified to those technically successful Bidders for opening of their Price Bids in the official website of the employer. The opening of Price Bids shall be done in presence of respective representatives of those technically successful Bidders who choose to be present. The employer will not entertain any query or clarification from Bidders who fail to qualify at any stage of the Selection Process.
E. Evaluation and Comparison of Bids	
26. Confidentiality	26.1 Information relating to the evaluation of bids and recommendation of contract award shall not be disclosed to Bidders or any other persons not officially concerned with the bidding process until information on Contract award is communicated to all Bidders in accordance with **ITB 40.** 26.2 Any attempt by a Bidder to influence the employer in the evaluation of the bids or Contract award decisions may result in the rejection of its bid. 26.3 Notwithstanding ITB 26.2, from the time of bid opening to the time of Contract award, if a Bidder wishes to contact the employer on any matter related to the bidding process,

	it shall do so in writing.
27. Clarification of Bids	27.1 To assist in the examination, evaluation, and comparison of the bids, and qualification of the Bidders, the employer may, at its discretion, ask any Bidder for a clarification of its bid, given a reasonable time for a response. Any clarification submitted by a Bidder that is not in response to a request by the employer shall not be considered. The employer's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the employer in the evaluation of the bids, in accordance with ITB 31. 27.2 If a Bidder does not provide clarifications of its bid by the date and time set in the employer's request for clarification, its bid may be rejected.
28. Deviations, Reservations, and Omissions	28.1 During the evaluation of Bids, the following definitions apply: a) "Deviation" is a departure from the requirements specified in the Bidding document; b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding document; and c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding document.
29. Determination of Responsiveness	29.1 The Employer's determination of a Bid's responsiveness is to be based on the contents of the Bid itself, as defined in ITB 12 29.2 A substantially responsive bid is one that meets the requirements of the Bidding Documents without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that, If accepted, would: i. Affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or ii. Limit in any substantial way, inconsistent with the Bidding Documents, the employer's rights or the Bidder's obligations under the proposed Contract; or iii. If rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive bids. 29.3 The employer shall examine the technical aspects of the bid submitted in accordance with ITB 17. 29.4 If a Bid is not substantially responsive to the requirements of the Bidding document, it shall be rejected by the Employer and may not subsequently be made responsive

	by correction of the material deviation, reservation, or omission.
30. Nonmaterial Nonconformities	30.1 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid which do not constitute a material deviation, reservation or omission. 30.2 Provided that a Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the price or substance of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid. 30.3 Provided that a Bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or nonconforming item or component in the manner specified in the BDS.
31. Correction of Arithmetical Errors	31.1 The e-procurement system automatically calculates the total amount from unit rates and quantities and the system also automatically populates the amount in words from the amount in figures and therefore there is no scope of discrepancy and need for arithmetic correction.
32. Conversion to Single Currency	32.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into Indian Rupees Only.
33. Margin of Preference	33.1 **DELETED**
34. Subcontractors	34.1 Unless otherwise stated in the BDS, the Employer does not intend to execute any specific elements of the Works by subcontractors selected in advance by the Employer. 34.2 The subcontractor's qualifications shall not be used by the Bidder to qualify for the Works unless their specialized parts of the Works were previously designated by the Employer in the BDS as can be met by subcontractors referred to hereafter as 'Specialized Subcontractors', in which case, the qualifications of the Specialized Subcontractors proposed by the Bidder may be added to the qualifications. 34.3 Bidders may propose subcontracting up to the percentage of total value of contracts or the volume of works as specified in the BDS. Subcontractors proposed by the Bidder shall be fully qualified for their parts of the Works.

35. Evaluation of Bids	35.1 The employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted. 35.2 To evaluate a price bid, the employer shall consider the following: a) The bid price b) price adjustment due to discounts offered in accordance with ITB c) The additional evaluation factors as specified in Section III, Evaluation and Qualification Criteria; 35.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation. 35.4 If the bid, which results in the lowest Evaluated Bid Price, is seriously unbalanced or front loaded in the opinion of the employer, the employer may require the Bidder to produce detailed price analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, taking into consideration the schedule of estimated Contract payments, the employer may require that the amount of the performance security be increased at the expense of the Bidder to a level sufficient to protect the employer against financial loss in the event of default of the successful Bidder under the Contract.
36. Comparison of Bids	36.1 The Employer shall compare the evaluated costs of all substantially responsive Bids established in accordance with ITB 35.2 to determine the Bid that has the lowest evaluated cost
37. Qualification of the Bidder	37.1 The employer shall determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated and substantially responsive bid either continues to meet (if prequalification applies) or meets (if post qualification applies) the qualifying criteria specified in Section III, Evaluation and Qualification Criteria. 37.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 17.1. 37.3 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the bid.
38. Employer's Right to Accept Any	38.1 The employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any

Bid, and to reject any or All Bids	time prior to contract award, without thereby incurring any liability to Bidders. In case of annulment, all bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.
F. Award of Contract	
39. Award Criteria	39.1 Subject to ITB 38.1, the employer shall award the Contract to the Bidder who has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.
40. Notification of Award	40.1 Prior to the date of expiry of the bid validity, the Employer shall notify the successful Bidder, in writing, that its Bid has been accepted. The notification of award (hereinafter and in the Conditions of Contract and Contract Forms called the "Letter of Acceptance") shall specify the sum that the Employer will pay the Contractor in consideration of the execution of the Contract (hereinafter and in the Conditions of Contract and Contract Forms called "the Contract Price"). 40.2 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.
41. Signing of Contract	41.1 The Employer shall send to the successful Bidder the Letter of Acceptance including the Contract Agreement 41.2 The successful Bidder shall sign, date and return to the Employer, the Contract Agreement within Fourteen (14) days of its receipt. 41.3 If the Successful bidder fails to sign the Contract Agreement, the contract Registration will be suspended for a period of One year duly forfeiting the Bid Security as per G.O.Ms.No.259, T.R&B (Roads-V) Dept., and dt.6.9.2008.
42. Performance Security	42.1 The successful Bidder shall, for the performance of its obligations hereunder during the Construction Period, furnish the Performance Security for an amount equal to 2.5 per cent of the bid amount/contract value in the shape of unconditional and irrevocable Bank Guarantee/ Insurance Surety Bond valid until 60 days after the completion of DLP period. 42.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security.
43. Procurement related complaints	- The point of contact and procedure for procurement related complaints are specified in the **BDS**

Section II - Bid Data Sheet (BDS)

A. General

ITB 1.1	**NIT No: XX/2024** **Name of the Work: WORLD BANK & ADB financed Amaravati Capital City Development Program related [INSERT PROJECT NAME] on Lump sum contract (Percentage Tender).**
ITB 1.2	Also add: "**ES**" means Environmental and Social (E&S): E&S broadly encompasses the identification, management, and mitigation of environmental and social risks and impacts associated with development projects; "**Sexual Exploitation and Abuse" "(SEA)"** means the following: **Sexual Exploitation** is defined as any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another. **Sexual Abuse** is defined as the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions; "**Sexual Harassment**" "(SH)" is defined as unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature by the Contractor's Personnel with other Contractor's or Employer's Personnel;
ITB 2.1	The Employer has received financing from the World Bank (WB) and Asian Development Bank (ADB) toward the Amaravati Integrated Urban Development Program (P507508) and Amaravati Inclusive and Sustainable Capital City Development Program (58395-001) respectively. A Part of this financing will be used for payments under the Contract named above and is within the Program Expenditure Framework. **Please refer the below links for the program details** WB Program link: https://projects.worldbank.org/en/projects-operations/project-detail/P507508 ADB Program link: https://www.adb.org/projects/58395-001/main
ITB 4.1	The following are added to ITB 4.1: - The Bidder should have a Special Class Civil registration in the Government contracts registered with Government of Andhra Pradesh

ITB 4.1 (a)	- Joint Venture: **not allowed** - If JV allowed, maximum number of members in the JV shall be: **NA**
ITB 4.2 (f)	The clause shall be read as "The bidder - or any of its affiliates has been hired (or is proposed to be hired) by the Employer or Borrower as Engineer for the Contract implementation; or - has a retired officer of the Govt. of AP or Govt. of India executing works is disqualified from tendering for a period of two years from the date of retirement without the prior permission of the Government. - The bidder himself or any of their employees is found to be Gazetted Officer who retired from Government Service and had not obtained permission from the Government for accepting the contractor's employment within a period of 2 years from the date of their retirement. - The bidder or any of their employees is found at any time after award of contract, to be such a person who had not obtained the permission of the Government as aforesaid before submission of the tender or engagement in the bidder's service. - Bidder shall have a conflict of interest if in the division/circle any of their relatives are employed in the rank of Assistant Engineer or Assistant Executive Engineer and above on the Engineering side and Divisional Accounts Officer and above on the administrative side. The bidder shall intimate the names of the persons who are working with them in any capacity or subsequently employed. The bidder shall also furnish a list of Gazetted/Non-Gazetted State Government employees related to them. Failure to furnish such information, Bidder is liable to be removed from the list of approved contractors and their contract is liable for cancellation. *Note: Near relatives include sons, step sons, daughters, step daughters, son-in-law, daughter-in-law, brother-in-law, sister-in-law, brothers, sisters, father, mother, wife, husband, father-in-law, mother-in-law, nephew, niece, uncle, aunt, cousins and any person residing with or dependent on the contractor.*
ITB 4.5	**The clause shall be read as** • A Bidder that has been sanctioned and/or under ongoing investigation by the World Bank, pursuant to the World Bank's and Asian Development Bank's Anti-Corruption

	Guidelines, and in accordance with their prevailing sanctions policies and procedures as set forth in Section V, shall be ineligible to be prequalified for, initially selected for, bid for, propose for, or be awarded a World Bank and ADB-financed contract or benefit from a World Bank and ADB-financed contract, financially or otherwise, during such period of time as the World Bank shall have determined. The list of debarred firms and individuals is available at the electronic address. WB: https://www.worldbank.org/debarr ADB: https://lnadbg4.adb.org/oga0009p.nsf • A firm will not be eligible to participate in any procurement activities while under temporary suspension or debarment by ADB pursuant to its Anticorruption Policy (see ITB-2), whether such debarment was directly imposed by ADB, or enforced by ADB pursuant to the Agreement for Mutual Enforcement of Debarment Decisions. A bid from a temporarily suspended or debarred firm will be rejected and such bid may be in breach of debarment conditions, thereby subject to further ADB's investigation. • Even though the bidders meet the above Eligibility Requirements, they are subject to be disqualified if they are o blacklisted by any Central/State Government Institutions/World Bank/ ADB. An undertaking (self-certificate) in this regard that the bidder hasn't been blacklisted by any Central/State Government institutions/ World Bank/ ADB must be submitted. o found to have misled or made false representation in the forms, statements submitted in proof of the qualification requirements of record of poor performance such as abandoning works not properly completed in the contract, inordinate delays in completions, litigation history and or financial

	failures and / or participated in the previous tendering for the same works and had quoted unreasonably high bid prices, in the preceding 10 (ten) financial years. In addition to the above, even while execution of the work, if found that the Bidder had produced false/fake certificates of experiengce, the Bidder will be blacklisted, and work will be taken over invoking clause 60 (a) of Preliminary Specifications to Andhra Pradesh Standard Specifications
B. Contents of Bidding Document	
ITB 6.1	also includes: Design Basis Report (Section VI – Works' Requirement)
ITB 6.3	Electronic procurement portal: AP eProcurement Portal: www.apeprocurement.gov.in
ITB 7.1	For Clarification purposes, only, the Employer's address is: Contact Person: **CHIEF ENGINEER – _____- APCRDA** **Kind Attn: [INSERT CHIEF ENGINEER NAME]** Email Address: **[INSERT CHIEF ENGINEER EMAIL]** Physical Address: Street Address : APCRDA OFFICE Floor/Room number: LENIN CENTER, GOVERNERPET City : VIJAYAWADA ZIP Code : 520002 Country : INDIA Queries must necessarily provide: Clause no., Clause & Query and should be submitted to the above address in writing before 5PM of the date of pre-bid meeting. Submissions made after such cutoff time shall not be entertained.
ITB 7.3	In addition to ITB 7.3, the following shall be inserted: **Site Visit:** NB: The Bidder shall acknowledge and confirm that it has undertaken an independent due diligence audit of all aspects of the Project, including but not limited to technical and financial viability, legal framework, structure, demand for, growth and forecasts for project facilities in the region, and on the basis of its independent satisfaction hereby submits the bid and in the event of LOA/LOI/PO issued, to execute the Project in accordance with the terms and conditions of this Agreement.

	No Subsequent Claims After submission of the bid with undertaking supra and after Letter of Acceptance issued, no Bidder can claim that the Site Visit and other studies are not properly made. It is deemed for all purposes that the Site Visit and other studies have been properly conducted by the Bidder with all Technical Assistance required at their cost and with their men, and having proper understanding of the conditions present and future with reference thereto in taking up the project including for construction, operation and maintenance if any for entire contract period, for nothing contra is left open to raise". The bidder shall mention while submitting the bid that the site visit is properly conducted.
ITB 7.4	A Pre-Bid meeting shall take place at the following date, time and place: Date: DD.MM.YYYY Time: 11.00 Hrs Address: LENIN CENTER, GOVERNERPET Street Address: APCRDA OFFICE Floor/Room number: City : VIJAYAWADA ZIP Code : 520002 Country : INDIA
ITB 8.4	Amendments/Corrigendum shall be published at www.apeprocurement.gov.in;
C. Preparation of Bids	
ITB 9.1	**Bid Transaction Fee:** @ 0.03% of ECV (estimated contract value) with a cap of Rs.10,000/- (Rupees ten thousand only) for all works with ECV upto Rs.50 crores, and Rs.25,000/- (Rupees twenty five thousand only) for works with ECV above Rs.50 crores plus applicable Taxes to be paid online at the time of bid submission electronically. **Cost of bid processing fee:** Rs 20,000/- Online payment in favour of Andhra Pradesh Capital Region Development Authority (APCRDA), Vijayawada. (Non-Refundable)
ITB 10.1	The language of the Bid is: English All correspondence exchange shall be in English language.
ITB 11.1	Additionally, The Bidder shall submit a declaration that bidder is

	not disqualified by the WB/ADB for non-compliance with SEA/SH obligations in the Declaration form (Annex - 2 & 3). The Bidder shall submit a declaration that bidder is not disqualified by the WB/ADB for non-compliance with ES performance in the Declaration form (Annex - 1). The Bidder shall submit the following additional documents in its Bid: **Management Strategies and Implementation Plans (MSIP) to manage the (ES) risks t**he Bidder shall submit Management Strategies and Implementation Plans (MSIP) prepared as per the E&S Policy (Appendix I and Appendix II of Part VI – Works' Requirement) to manage the Environmental and Social (ES) risks. The Contractor shall not carry out mobilization to Site (e.g. clearance for haul roads, site accesses and work site establishment, geotechnical investigations or investigations to select ancillary features such as quarries and borrow pits) unless the Engineer gives consent, a consent that shall not be unreasonably delayed, to the measures the Contractor proposes to manage the environmental and social risks and impacts, which at a minimum shall include applicable Management Strategies and Implementation Plans (MSIPs) and applying the Code of Conduct for Contractor's Personnel submitted as part of the Proposal and agreed as part of the Contract. The Contractor shall submit, to the Engineer for Review, any additional MSIPs as are necessary to manage the ES risks and impacts of ongoing Works. (e.g. excavation, earth works, bridge and structure works, stream and road diversions, quarrying or extraction of materials, concrete batching and asphalt manufacture). These MSIPs collectively comprise the Contractor's Environmental and Social Management Plan (C-ESMP). The C-ESMP shall be prepared considering the E & S requirements mentioned in Appendix I and Appendix II of part VI. The Works shall be commenced only with prior approval of C- ESMP by the PMC and Employer (ESMU). The Contractor shall review the C-ESMP, periodically (but not less than every six (6) months), and update it as required to ensure that it contains measures appropriate to the Works. The updated C-ESMP shall be submitted to the Engineer for Review. The C-ESMP shall be part of the Contractor's Documents.
ITB 16.1	Technical Proposal of the Bidder, shall cover the following: a) Bidder's understanding and comprehension of the Works. b) Bidder's Approach & Methodology for execution of Works. c) Bidder's Outline Quality Control & Assurance Plan. d) Bidder's Management Strategies and Implementation Plans (MSIP).

	e) Bidder's Programme for execution of Work. f) Bidder's Logistic Plan for execution of Work. g) Bidder's Organization Chart for executing the Works. h) Bidder's deployment of Plant & Machinery. i) Bidder's plan for procurement of key materials. j) Bidder's plan for engaging Associated Agencies for specialized components of work. Following points may be considered and included in the Technical Proposal of the Bidder: a) Approach & Methodology for execution of Works: The Methodology for execution of works shall also cover the Excavation options / methods as the water table at some locations is at 2-3 m below the existing ground level. b) Curing procedures and methods proposed to be used shall also be included in the Methodology for execution of Works. c) Types and details of Scaffoldings & Shuttering proposed to be used for the execution of Works shall be included in the Logistics Plan. d) The Outline Quality Control & Assurance Plan shall contain sufficient information to demonstrate clearly the proposed method of achieving the Bidder's quality objectives with regard to the requirements of the Contract. e) Outline Social, Safety, Health and Environment Plan which shall contain sufficient information to demonstrate clearly the Bidder's proposals for achieving effective and efficient safety, health & environment procedures. The Outline Safety, Health and Environment Plan should include an outline of the safety procedures and regulations to be developed and the mechanism by which they will be implemented for ensuring safety as per the requirements of Contract. f) Tender Programme shall indicate how the Bidder intends to organize and carry out the works and achieve stages and complete the whole of the works by the completion dates. The Tender Programme or Programmes shall be developed as a critical path network using suitable software. The network must be fully resourced. The Tender Programme shall include procurement periods of major material, offsite production/ prefabrication, temporary construction, etc. g) The Tender Programme shall be accompanied by a narrative statement that shall describe Programme activities, assumptions and logic, and highlight the Bidder's perception of the major constraints and critical areas of concern in the organization, construction and completion of the Works h) The Bidder shall submit organization chart showing areas of responsibility, relative seniorities and lines of reporting. i) The Bidder shall preferably submit their plan for engaging

	specialized agencies for items specified. Note: While the bidders will be required to submit the above, the selected bidder will present their plan which will be reviewed and approved by APCRDA. At the time of approval, all required synchronization issues will be addressed.
ITB 18.1	The bid validity period shall be **NINETY (90)** days.
ITB 19.1	i. The Bidder has to submit the Bid Security amounting to **1% of the Estimated Contract Value (ECV)** Which shall be the only way of NEFT/RTGS or if by irrevocable bank guarantee/ Insurance Surety Bonds with validity period of 180 days from the last date of bid submission from any Govt. Banks/ Nationalized Banks/ Public Sector Banks/ Scheduled banks in the prescribed format in favor of Andhra Pradesh Capital Region Development Authority (APCRDA) represented by its Commissioner: Name of the Bank–Union Bank of India, Account Number: 034310100081181 IFSC Code: UBIN0803430 Branch Address-Labbipet branch, Vijayawada, Andhra Pradesh – 520010. Beneficiary Name: Andhra Pradesh Capital Region Development Authority (APCRDA) ii. The bidder shall also upload the remittance details with proof for counter verification with the bank of the employer. iii. If any successful bidder fails to submit the original hard copies of Online Payment receipts/BG/ Insurance Surety Bond towards EMD/ Security Deposit within the stipulated time, the bid will be treated as invalid. iv. Besides this, the Department shall invoke all processes of law including criminal prosecution of such defaulting bidder as an act of extreme deterrence to avoid delays in the tender process for execution of the development schemes taken up by the Government. The information to this extent will be displayed on the e-procurement platform website. v. The banker should be informed that the Bank Guarantee/ Insurance Surety Bond should not be revoked without official consent in writing of the Employer.
ITB 19.7 (d)	DELETED
D. Submission and Opening of Bids	
ITB 21.1	Web link of the E-tendering portal:

	http://www.apeprocurement.gov.in/ Bidders must submit their bids **ELECTRONICALLY**. **The deadline for bid submission is as mentioned in NIT.** In case of submitting bids electronically, the electronic bidding submission procedures shall be as included in the below link: https://apeprocurement.gov.in/contractors-faqs.html For **Hard copy submission purposes,** only, the Employer's address is: **Attention : [INSERT CHIEF ENGINEER NAME],** **CHIEF ENGINEER –[_____]** **APCRDA** Street Address : **APCRDA OFFICE,** Floor/Room number : **LENIN CENTER, GOVERNERPET** City : **VIJAYAWADA** ZIP Code **520002** Country : **INDIA** • The tendering process is online at the electronic procurement market place of Government of A.P., that is, www.apeprocurement.gov.in. The tender documents can only be obtained online. Tender will be submitted online on the electronic procurement market place of Government of A.P., that is, www.apeprocurement.gov.in • The bidders need to register on the electronic procurement market place of Government of A.P., that is, www.apeprocurement.gov.in. On registration on the "e" procurement market place they will be provided with a user ID and password by the system using which they can submit their tender on line. • For registration and online tender submission Bidders may contact HELP DESK of M/S Vupadhi Techno Services Pvt. Ltd. www.apeprocurement.gov.in or https://tender.apeprocurement.gov.in • While registering on the AP e-procurement market place, bidders need to scan and upload the required documents as per the tender requirements on to their profile. • The AP e-procurement market place provides an online self-service registration facility to such contractors who are already registered with respective participating department for supply of specified goods and services. • The bidders may contact the Chief Engineer, APCRDA for any information on the tender and 'e'-procurement. • Digital Certificate Authentication: The bidder shall authenticate the Bid with their Digital Certificate for submitting the Bid electronically on ap e-procurement platform and the bids not authenticated by digital certificate of the Bidder will not be accepted on ape-procurement

	platform. The authorized signatory of the intending Bidder, as per the Power of Attorney (PoA) must have a valid digital signature. The Bidder shall upload their tender using digital signatures of the authorized signatory as per the PoA only. The tenders uploaded without being authenticated by the digital signature of authorized signatory will not be accepted on the ape-procurement platform. All the Bidders need to obtain Digital Signature Certificate from APTS. For obtaining Digital Signature Certificate, please contact: Andhra Pradesh Technology Services Limited, Vijayawada. The authorized signatory of the intending bidder as per the Power of Attorney (PoA) must sign each page of its submission before scanning the same and uploading on e-procurement portal. The Bidder shall sign on the statements, documents, certificates uploaded by them accepting responsibility for their correctness / authenticity.
ITB 22.1	DD.MM.YYYY at 1500 Hrs
ITB 25.1	The Bid opening shall take place at: Street Address : **APCRDA OFFICE,** Floor/Room number : **LENIN CENTER, GOVERNERPET** City : **VIJAYAWADA** ZIP Code **520002** Country : **INDIA** Date: DD.MM.YYYY at 1600 Hrs
E. Evaluation and Comparison of Bids	
ITB 30	Non- Material & Non-Conformities **shall not be** permitted
ITB 34	- The total value of works to be awarded on sub-contracting shall not exceed *[insert work-specific required percentage, not exceeding 50%]* of the contract value. - There is no right for the bidder to sub-contract any part of the contract works without the employer's permission. If the bidders desires to sub-contract any part of the work during execution, the bidder shall submit in writing the necessity of sub-contracting of any part of the contract work, subject to the ceiling of *[insert work-specific required percentage, not exceeding 50%]* in all, along with the name of the proposed Sub-Contractor, details of qualification, experience and valid registration and as to the proposed Sub-Contractor gets eligibility from suitable class for such sub-contract work and that the contractor has verified and found genuine-ness of the proposed sub-contractors information. - The Tender Accepting Authority before awarding of works on sub-contracting (subject to total sub-contracting of not more than *[insert work-specific required percentage, not*

	exceeding 50%] of the contract value either to one or more sub-contractors) shall verify the genuineness of the proposed Sub-Contractor`s qualification and other eligibility criteria. - If the Sub-Contractor satisfies the qualification and other eligibility criteria with reference to the criteria of prime contractor in proportion to the value of work proposed to be sub-contracted, the bidder may seek approval from the Concerned Technical Committee. - After approval by the Technical Committee for any such Sub-Contracting, the Tender Accepting Authority can permit such Sub-Contracting within the ceilings. - The extent of sub-contract shall be added to the experience of the sub-contractor and to that extent deducted from that of the main contractor while issuing the experience certificate. - It is the responsibility of the main contractor to clear any liabilities that may arise from the portion of the work executed by the sub-contractor until the completion of the contract work, the end of the defect liability period, and the end of any operation and maintenance period, if any, specified in the contract.
ITB 35.1	Evaluation of Technical Bid: i. All the bids will be verified to check if each bid is accompanied by a valid bid security in the required amount and in an acceptable form. Bids that are not accompanied by the valid tender security shall be rejected and will not be evaluated further. ii. APCRDA will determine whether each bid is responsive to the requirements of the Bid Documents i.e. to check the bid if it conforms to all terms, conditions and specifications of the bid document. In case of any inconformity, the tender shall be disqualified and rejected. The decision ofAPCRDA as to which tenders are not substantially responsive shall be final. iii. Tenders having any material deviation or reservation as detailed in ITB 28 and 29 shall be disqualified and rejected. **Technical Evaluation** – This evaluation will be done to check the adequacy of Bidders' Technical capability and will include an assessment of the Bidder's past work experience in executing similar nature of works, their financial strength and technical capacity to mobilize key equipment and personnel for the contract along with adequacy of Technical Proposal. The Evaluation of Technical Proposal shall be carried out as per the methodology given in Section III: Evaluation Criteria. To become eligible for shortlisting for opening of Price Bid, the Bidder must meet the pre-qualification requirement stated in the Tender Documents.
ITB 42.1 (a)	The successful Bidder shall also, for the performance of its E&S obligations hereunder during the Construction Period, furnish the

	E&S Performance Security for an amount equal to 0.1 per cent of the bid amount/contract value in the shape of unconditional and irrevocable Bank Guarantee/ Insurance Surety Bond valid until 60 days after the completion of DLP period. The E&S Performance Security shall be over and above the Performance Security mentioned under ITB 42.1.
ITB 43	If a Bidder wishes to make a Procurement-related Complaint/ Appeal, the Bidder shall submit its complaint following these procedures, In Writing (by the quickest means available, such as by email or fax), Procurement Related Grievances For the attention: Additional Commissioner (Admin) Employer: APCRDA Email address: proc.complaints@apcrda.org *[https://crda.ap.gov.in/]* (b) In summary, a Procurement-related Complaint/ Appeal may challenge any of the following : 1. the terms of this Tender / Request for Proposal; 2. the Employer's decision to exclude a Bidder / Consultant from the procurement process prior to the award of contract; and 3. the Employer's decision to award the contract. Appellate Authority : Secretary, MA&UD, Government of Andhra Pradesh Procedure for Filing an Appeal: - An appeal must be filed within 7 days from the date of the decision being appealed. - The appeal must be submitted in writing to the Appellate Authority, clearly stating the grounds for the appeal. - The appellant must provide copies of all relevant documents, including the original decision, supporting evidence, and any other relevant materials. - The Appellate Authority shall acknowledge receipt of the appeal and inform the appellant of the date and time for the hearing. - The Appellate Authority may conduct a hearing to consider the appeal. Both parties may present their arguments and evidence. - The Appellate Authority shall issue a written decision within 15 days of the hearing. The decision shall be final and binding on both parties.

	An appeal may be filed on any of the above if: - The original decision was based on incorrect facts or evidence. - The original decision was contrary to law or AP procurement guidelines. - The original decision was arbitrary, capricious, or unreasonable. - The original decision was biased or prejudiced. **<u>Procedure for post contract award:</u>** Modes of Settlement of claims/ disputes & place of exclusive jurisdiction: If any claim, dispute or disagreement of any kind whatsoever arises between the contractor and the employer, in connection with or arising out of or touching upon this Contract, including without prejudice to the generality of the foregoing, any question regarding its existence, validity, termination, or execution, whether before or after the termination, abandonment or breach of this Contract ("Dispute"), the Parties will seek to resolve the Dispute by mutual consultation within 15(fifteen) days from the occurrence of such Dispute and written representation given for it on behalf of the employer to the contractor or by the contractor to the employer, Lenin Centre, Governor pet, Vijayawada, AP. If the Parties fail to resolve the Dispute by mutual consultation within said 15 days' time, then, the provisions of Clause below will apply. SETTLEMENT OF CLAIMS: All disputes or difference arising of or relating to the Contract shall be referred for Evaluation and Negotiation as follows: a) Claims up to a value of Rupees 10,000/- by Superintending Engineer, APCRDA b) Claims above Rs. 10,000/- and up to Rupees 50,000/- by Chief Engineer, APCRDA c) Settlement of Claims above Rs. 50,000/- Appellate Authority. In the event of failure to resolve the dispute by the Superintending Engineer and / or Chief Engineer of APCRDA within the said 15 days of bringing it to their notice respectively, such disputes shall be referred to the Appellate Authority for resolution. The Appellate Authority for the purpose of this contract is the Secretary, MA&UD, Government of Andhra Pradesh may seek technical advice from the independent technical advisor

	The Appellate Authority shall have exclusive jurisdiction to hear and resolve any disputes between the parties, and its decision shall be binding and final, subject to any legal rights of appeal. If any Dispute is not resolved by the Parties within 15(fifteen) days of the appeal to the Appellate Authority, the contractor has to approach a Civil Court of competent jurisdiction by way of Civil suit and not by arbitration.

Section III - Evaluation and Qualification Criteria

This Section contains all the criteria that the employer shall use to evaluate bids and qualify Bidders. In accordance with ITB 34 and ITB 36, no other factors, methods or criteria shall beused. The Bidder shall provide all the information requested in the forms included in SectionIV, Bidding Forms.

Eligibility and Qualification Criteria				Compliance Requirements				Documentation
No.	Subject	Requirement		Single Entity	Joint Venture (existing or intended) where permitted			Submission Requirements
					All members Combined	Each Member	At least one Member	
			1. Eligibility					
1.1	**Nationality**	Nationality in accordance with ITB 4.4		Must meet requirement	N/A	N/A	N/A	FORM - 1
1.2	**Conflict of Interest**	No conflicts of interest in accordance with ITB 4.2		Must meet requirement	N/A	N/A	N/A	Letter of Bid
1.3	**Eligibility**	Not having been declared ineligible by the World Bank and the Asian Development Bank, as described in ITB 4.5.		Must meet requirement	N/A	N/A	N/A	Letter of Bid
1.5	**United Nations resolution or Borrower's country law**	Not having been excluded as a result of prohibition in the Borrower's country laws or official regulations against commercial relations with the Bidder's country, or by an act of compliance with UN Security Council resolution, both in accordance with ITB 4.8 and Section V.		Must meet requirement	N/A	N/A	N/A	FORM - 1
2. Historical Contract Non-Performance								
2.1	**History of Non-**	Non-performance of a contract[1] did not		Must meet	N/A	N/A	N/A	Form -2

[1] Nonperformance, as decided by the Employer, shall include all contracts where (a) nonperformance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Nonperformance shall not include contracts where Employers decision was overruled by the dispute resolution mechanism. Nonperformance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted.

Eligibility and Qualification Criteria				Compliance Requirements				Documentation
No.	Subject	Requirement		Single Entity	Joint Venture (existing or intended) where permitted			Submission Requirements
					All members Combined	Each Member	At least one Member	
	Performing Contracts	occur as a result of contractor default since last 10 Financial years. (From FY 2014-15 to FY 2023-24)		requirement[4 & 5]				
2.2	**Suspension Based on Execution of Bid/ Proposal Securing Declaration by the Employer or withdrawal of the Bid within Bid validity period**	Not under suspension based on execution of a Bid/ Proposal Securing Declaration pursuant to ITB 4.7		Must meet requirement	N/A	N/A	N/A	Letter of Bid
2.3	**Pending Litigation**	Bidder's financial position and prospective long term profitability sound according to criteria established in 3.1 below and assuming that all pending litigation will be resolved against the Bidder		Must meet requirement	N/A	N/A	N/A	Form – 2
2.4	**Litigation History**	No consistent history of court/arbitral award decisions against the Bidder[2] since 1st April 2019		Must meet requirement	N/A	N/A	N/A	Form – 2
2.5	**Declaration: Environmental and Social(E&S) past performance**	Declare any civil work contracts that have been suspended or terminated and/or performance security called by an employer for reasons related to the non-		Must make the declaration. Where there are Specialized Sub-	N/A	N/A	N/A	Annex-1

[2] The Bidder shall provide accurate information on the Letter of Bid about any litigation or arbitration resulting from contracts completed or ongoing under its execution over the last five years. A consistent history of court/arbitral awards against the Bidder or any member of a joint venture may result in disqualifying the Bidder.

Eligibility and Qualification Criteria				Compliance Requirements				Documentation
No.	Subject	Requirement		Single Entity	Joint Venture (existing or intended) where permitted			Submission Requirements
					All members Combined	Each Member	At least one Member	
		compliance of any environmental, or social, or health or safety requirements or regulations in the past Ten Financial Years[3].		contractor/s, the Specialized Sub-contractor/s must also make the declaration.				
2.6	**Sexual Exploitation and Abuse (SEA) and/or Sexual Harassment (SH) Performance Declaration by Contractor and Subcontractor**	At the time of Contract Award, not subject to disqualification by the Bank for non-compliance with SEA/ SH obligations		Must meet requirement(including each subcontractor proposed by the Bidder)	N/A	N/A	N/A	
		If the Bidder had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations, the Bidder shall either (i) provide evidence of an arbitral award on the disqualification made in its favour; or (ii) demonstrate that it has adequate capacity and commitment to comply with SEA/SH prevention and response obligations; or (iii) provide evidence that it has already demonstrated such capacity and commitment on another Bank financed works contract.		Must meet requirement (including each subcontractor proposed by the Bidder)	N/A	N/A	N/A	Annex 2 & 3
3. Financial Situation and Performance								
3.1	**Financial Capabilities**	(i) Liquid assets/credit facilities/Solvency certificates from any Nationalized/ Scheduled Bank or Net Worth Certificate issued by CA for not less than Rs. _____ Cr.		Must meet requirement	N/A	N/A	N/A	Statement VIII, with attachments

[3] The Employer may use this information to seek further information or clarifications in carrying out its due diligence.

Eligibility and Qualification Criteria				Compliance Requirements				Documentation
No.	Subject	Requirement		Single Entity	Joint Venture (existing or intended) where permitted			Submission Requirements
					All members Combined	Each Member	At least one Member	
4. Experience								
4.1 (a)	**General Construction & Contract Management Experience**	Satisfactorily completed as Prime Contractor similar works of cost not less than Rs. _____Cr in any one financial year during the last Ten financial years i.e. from 01-04- 2014 to 31-03-2024 updated by giving 10% simple weightage per year to bring them to Financial Year 2024 - 2025 considering the completed works in Central/State Government departments (or) Central/State Autonomous Bodies (or) Central/State Public Sector. *If work(s) submitted by the Bidder were carried out as a Prime Contractor of a Joint Venture, the cost considered for evaluation shall be the overall cost of such work(s) multiplied by the percentage share of such prime contractor in the JV. **Similar Works means**: Construction of [INSERT SIMILAR WORK] during the last Ten financial years i.e. from 01-04-2014 to 31-03-2024. These projects should comprise of roads and at least one component out of storm water, water supply, wastewater, ducts for power & ICT.	Must meet requirement	N/A	N/A	N/A	Statement II

<table>
<tr><th colspan="3">Eligibility and Qualification Criteria</th><th colspan="4">Compliance Requirements</th><th>Documentation</th></tr>
<tr><th rowspan="2">No.</th><th rowspan="2">Subject</th><th rowspan="2">Requirement</th><th rowspan="2">Single Entity</th><th colspan="3">Joint Venture (existing or intended) where permitted</th><th rowspan="2">Submission Requirements</th></tr>
<tr><th>All members Combined</th><th>Each Member</th><th>At least one Member</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4.1 (b)</td><td>Specific Construction & Contract Management Experience</td><td>Satisfactorily executed the following items of works (Physical Quantities) in any one financial year during the last Ten financial years i.e. from 01-04-2014 to 31-03-2024:
<table><tr><th>Item</th><th>Min. Requirement</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>1.</td><td>Must meet requirements</td><td>N/A</td><td>N/A</td><td>N/A</td><td>Statement III</td></tr>
<tr><td></td><td colspan="7"></td></tr>
<tr><td>4.1 (c)</td><td colspan="7">Bid Capacity (Statement X):
Bidders who meet the minimum qualification criteria will be qualified only if their available bid capacity for construction work is equal to or more than the total bid value of the work. The available bid capacity will be calculated as under:

Assessed Available bid capacity = (A*N*2-B)

Where,</td></tr>
</table>

Eligibility and Qualification Criteria				Compliance Requirements				Documentation
No.	Subject	Requirement		Single Entity	Joint Venture (existing or intended) where permitted			Submission Requirements
					All members Combined	Each Member	At least one Member	
	A = Maximum value of Civil Engineering works executed in any one financial year during the last five financial years. Financial Turnover and cost of completed works of previous years shall be given weightage of 10% per year bring them to current price level i.e. the financial year in which bids are invited. N = Number of years prescribed for completion of the works for which bids are invited (period up to 6 months to be taken as half-year and more than 6 months as one year). B = Value, at the current price level, of existing commitments on on-going works to be completed during the period of completion of the works for which bids are invited. Note: the statements in Section IV showing the value of existing commitments of on-going works as well as the stipulated period of completion remaining for each of the works listed should be certified by a statutory auditor or CA or countersigned by the Engineer in charge, not below the rank of an Executive Engineer or equivalent.							
4.2 (d)	In case, the Employer floats 'n' number of concurrent tender documents for works projects in Amaravati, Andhra Pradesh, the below would be the Bid Capacity calculation: 1. All the bidders shall have the option to Bid for more than one of these concurrent TENDERs. 2. The evaluation of the submissions made by the bidders for the 'n' tender documents shall be undertaken in parallel as per the procedure laid below. 3. The technical qualification of all the bidders participating in the 'n' tenders, irrespective of their participation in one or more than one tender shall be undertaken based on the technical submissions made by the firm as per the terms set in the tender. 4. In case any bidder submits bid for more than one tender and is identified as L1 in any of the tenders as per the process laid in 3(ii) above, the Available Bid Capacity assessment of such bidder shall be re-assessed before opening the financial bid of such bidder in the tender for which the financial bid is next scheduled for opening (if any). 5. Such re-assessment of the Available Bid Capacity shall be undertaken as described below: Any given Bidder is L1 in any of the 'n' tenders: For the n^{th} tender Bid Capacity calculation, all the previous (n-1) tenders' L1 value where the said bidder is the L1 bidder, will be considered as part of Bidder's "existing commitments and on-going works to be completed (b value)".							

Technical Requirements

1. The Bidder should possess the minimum Key Critical Equipment and Key Technical personnel as prescribed in the Section III. However, the Bidder shall note that these are minimum requirements & bidder shall deploy whatsoever resources required for completion of work as per contract.

S. No.	Equipment	No
1.	[INSERT PROJECT SPECIFIC EQUIPMENT]	[INSERT COUNT]
2.	[INSERT PROJECT SPECIFIC EQUIPMENT]	[INSERT COUNT]
3.	[INSERT PROJECT SPECIFIC EQUIPMENT]	[INSERT COUNT]
4.	[INSERT PROJECT SPECIFIC EQUIPMENT]	[INSERT COUNT]

2. These are minimum requirements; contractor shall deploy personnel as required by the Project to ensure completion of the work in accordance with the contract.

S. No	Personnel Position and required Qualification cum Experience	No.
1.	[ADD PROJECT SPECIFIC POSITIONS AND THEIR REQUIRED QUALIFICATION CUM EXPERIENCE]	[INSERT COUNT]
2.	[ADD PROJECT SPECIFIC POSITIONS AND THEIR REQUIRED QUALIFICATION CUM EXPERIENCE]	[INSERT COUNT]
3.	[ADD PROJECT SPECIFIC POSITIONS AND THEIR REQUIRED QUALIFICATION CUM EXPERIENCE]	[INSERT COUNT]
4.	[ADD PROJECT SPECIFIC POSITIONS AND THEIR REQUIRED QUALIFICATION CUM EXPERIENCE]	[INSERT COUNT]

Note: 1. The bidder shall submit the proof of availability of adequate design and execution engineers to carry out the given scope of works. The Bidder shall also submit the proposed organization chart along with Staff deployment schedule along with the tender.

Section IV - Bidding Forms

Check List to accompany the Tender

The bidder shall furnish the following particulars in the formats provided online and supported documentary evidence shall be uploaded.

S. No	Description	Submitted	Page No.(see Note below)
1	2	3	4
1.	Letter of bid (including certificate and declaration)	Yes / No	
2.	Form 1 - Bidder Information Form	Yes / No	
3.	Form 2 - Historical Contract Non-Performance, Pending Litigation and Litigation History	Yes / No	
4.	Annual Financial turnover in the last 10 financial years in the Bidder's name in Statement-I with supporting certificates.	Yes / No	
5.	Details of similar works completed as Prime Contractor during the last ten financial Years in Statement-II with supporting certificates.	Yes / No	
6.	Details of Projects satisfactorily completed in statement - III	Yes / No	
7.	Details of bidder in Statement-IV	Yes / No	
8.	Availability of critical equipment in Statement –V.	Yes / No	
9.	Availability of Key personnel in Statement. VI.	Yes / No	
10.	Litigation history in Statement –VII.	Yes / No	
11.	Financial Situation and Performance - Proof of liquid assets in the shape of Solvency certificates etc., for the required amount as per Statement VIII	Yes / No	
12.	Proposed Work Plan and Methodology as per Statement IX	Yes / No	
13.	Calculation of Bid capacity as per Statement X	Yes / No	
14.	Format 1 & 2 - Form of Bid Security	Yes / No	
15.	Format 3 – Power of Attorney	Yes / No	
16.	Environmental and Social Performance Declaration (Annex 1)	Yes / No	
17.	Sexual Exploitation and Abuse (SEA) and/or Sexual Harassment Performance Declaration (Annex 2)	Yes / No	
18.	Sexual Exploitation and Abuse (SEA) and/or Sexual Harassment Performance Declaration for Subcontractors (Annex 3)	Yes / No	
19.	Management Strategies and Implementation Plans (MSIP)	Yes / No	
20.	Financial Part - Price bid (shall not be included in Technical Part)	Yes / No	
21.	List of any other certificates enclosed	Yes / No	

Notes:-

1. All the statements copy of the certificates, documents etc., shall be given page numbers on the right corner of each certificate, which will be indicated in column (4) against each item. The statements furnished shall be in the formats appended to the tender document.
2. The information shall be filled-in by the Bidder in the checklist and statements I to X, for the purposes of verification as well as evaluation of the Bidder's Compliance to the qualification criteria as provided in the Tender document.

DECLARATION

I / WE..... have gone through carefully all the Tender conditions and solemnly declare that I / we will abide by any penal action such as disqualification or blacklisting or determination of contract or any other action deemed fit, taken by, the Department against us, if it is found that the statements, documents, certificates produced by us are false / fabricated.

I / WE hereby declare that I / WE have not been blacklisted / debarred / Suspended / demoted in any department in Andhra Pradesh or in any State or the Government of India or World Bank or Asian Development Bank, due to any reasons.

I / WE hereby declare that I/We have not been suspended or terminated and/or performance security called by an employer for reasons related to the non-compliance of any environmental, or social (including sexual exploitation and abuse (SEA) and gender based violence (GBV) or health or safety requirements or safeguard in the past five years.

I / WE hereby declare that I/We will ensure that the personnel employed by us sign and comply with the Code of Conduct (E&S) throughout the contract duration.

Signature of the Bidder

LETTER OF BID

Date: ……

To
The COMMISSIONER
APCRDA
Vijayawada, Andhra Pradesh

Sir,

- I / We do hereby tender and if this tender be accepted, undertake to execute the following work viz. **As specified in NIT** as shown in the drawings and described in the specifications deposited in the Office of the Commissioner, APCRDA, VIJAWADA with such variations by way of alterations or additions to, and omissions from the said works and method ofpayment as provided for in the "Conditions of the Contract".

- I/We agree to execute the work when the lump sum payment under the terms of the agreement.

- I/We have quoted Percentage excess or less on E.C.V. / Lump-sum, both in words & figures. In case of any discrepancy between the Percentage excess or less on ECV, in words and figures, the rates quoted words only shall prevail.

- I/We agreed to keep the offer in this tender valid a period of Three month(s) mentioned in the tender notice and not to modify the whole or any part of it for any reason within above period. If the tender is withdrawn by me/us for any reasons whatsoever, the earnest moneypaid by me/us will be forfeited to Government

- I/We hereby distinctly and expressly, declare and acknowledge that, before the submission of my/our tender I/We have carefully followed the instructions in the tender notice and thatI/We have made such examination of the Contract documents and the plans, specifications and of the location where the said work is to be done, and such investigation of the work required to be done, and in regard to the material required to be furnished as to enable me/us to thoroughly understand the intention of same and the requirements, covenants, agreements, stipulations and restrictions contained in the contract, and in the said plans and specifications and distinctly agree that I/We will not hereafter make any claim ordemand upon the Employer/ Government/ Municipal based upon or arising out of any alleged misunderstanding or misconception /or mistake on my/or our part of the said requirement, covenants, agreements, stipulations, restrictions and conditions.

- I/WE shall not assign the contractor or sublet any portion of the same. In case if it becomes necessary such subletting with the permission of the tender inviting authority in terms of Conditions of Contract.

- If upon written intimation to me/us by the tender inviting authority Office, I/We fail to attend

the said office on the date herein fixed or if upon intimation being given to me/us by the Authority or acceptance of my/our tender, and if I/We fail to make the EMD or to enter into the required agreement as defined in Conditions of Contract, then I/We agree the forfeiture of the bid security. Any notice required to be served on me/us here under shall be sufficiently served on me/us if delivered to me/us hereunder shall be sufficiently served on me/us if delivered to me/us personally or forwarded to me/us by post to (registered or ordinary) or left at my/our address given herein. Such notice shall if sent by post be deemed to have been served on me/us at the time wherein due course of post it would be delivered at the address to which it is sent.

- I/WE fully understand that the written agreement to be entered into between me/us and Authority shall be the foundation of the rights of the both the parties and the contract shall not be deemed to be complete until the agreement has first been signed by me/us and then by the proper officer authorized to enter into contract on behalf of Government.

- I/WE agree to pay the transaction fee as per G.O.Ms.13 dated 05.07.2006 in favour of M/s. APTS, Vijayawada towards transaction fee on e-procurement and hand over the same to CHIEF ENGINEER – _____ APCRDA, Vijayawada at the time of submission of EMD. Another amount of 0.04% of ECV (estimated contract value) with a cap of Rs. 10,000 (Rupees Ten thousand only) for all works with ECV up to Rs.50 Crores, and Rs. 25,000/- (Rupees Twenty-five thousand only) for works with ECV above Rs.50 Crores, should be paid online in favour of Managing Director, APTS Vijayawada, at the time of conclusion of agreement if work is awarded to me/us.

  I AM/WE ARE authorized to sign and my/our designation is given below:

Name of the Bidder: *[*insert complete name of person signing the Bid*]

Name of the person duly authorized to sign the Bid on behalf of the Bidder:**[*insert complete name of person duly authorized to sign the Bid*]

Title of the person signing the Bid: [*insert complete title of the person signing the Bid*]

Signature of the person named above: [*insert signature of person whose name and capacity are shown above*]

Date signed [*insert date of signing*] **day of** [*insert month*], [*insert year*]

**: Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid

BIDDER'S CERTIFICATE.

- I/WE hereby declare that I/We have perused in detail and examined closely the Conditions of Contract, all clauses of the preliminary specifications with all amendments and have either examined all the standards specifications or will examine all the standard specifications for items for which I/We tender, before I/We submit such tender and agree to be bound and comply with all such specificationsfor this agreement which I/We execute in the APCRDA.

- I/WE certify that I/We have inspected the site of the work before quoting my Price, I/We have satisfied about the quality, availability and transport facilities for stones,sand and other materials.*

- I/WE am/are prepared to furnish detailed data in support of all my quoted rates, if and when called upon to do so without any reservations.

- I/WE hereby declare that I/We will pay an additional security deposit in terms of conditions, the difference between 75% of ECV Value and my/out tender amount, in case if my / our offer is less than (-)25%.

- I/WE hereby declare that I am/we are accepting for the defect liability period as 24 months.

- I / WE declare that I / WE will procure the required construction materials including earth and use for the work after approval of the Authority's Representative. The responsibility for arranging and obtaining the land for borrowing or exploitation in any other way shall rest with me/us for the materials for construction, I / WE shall ensure smooth and un-interrupted supply of materials.

- I / WE declare that the responsibility for arranging and obtaining the land for disposal of spoil/soil not useful for construction purposes shall rest with me/us.

- I / WE declare that I/WE shall not claim any compensation or any payment forthe land so arranged for disposal of soil and the land for borrow area. My/our quoted percentage Price are inclusive of the land so arranged and I/We will hand over the land so arranged for disposal of soil to, the department after completionof work.

- I / WE declare that I / WE will not claim any extra amount towards any material used for the work other than the quoted works.

- I / WE declare that I / WE will execute the work as per the milestone programme,and if I / WE fail to complete the work as per the mile stone programme I abide bythe condition to recover liquidated damages as per the tender conditions.
- I / WE declare that I / WE will abide for settlement of disputes as per the tenderconditions.

* Note: The bidder shall provide evidence of the site visit by attaching images of the site, including GPS location, date, and time stamps. The concerned Chief Engineer of the Work will facilitate the prospective bidders for the visit to the proposed site of work. As a proof of site visit, the bidders shall

upload the photographs with geographical coordinates and certificate attested by the Chief Engineer without fail.

DECLARATION OF THE BIDDER.

I/WE have not been blacklisted by any department in Andhra Pradesh/ Government of India/ World Bank/ ADB, due to any reasons.

I/WE have not been demoted to the next lower category for not filing the tenders after buying the tender schedules in a whole year and my/our registration has not been cancelled for a similar default in two consecutive years.

I/WE agree to disqualify me/us for any wrong declaration in respect of the above and to summarily reject my/our tender.

I/WE have not misled or made false representation in the forms, statements submitted in proof of the qualification requirements of record of poor performance such as abandoning works not properly completed in the contract, inordinate delays in completions, litigation history and or financial failures and / or participated in the previous tendering for the same works and had quoted unreasonably high bid prices, in the preceding 10 (ten) financial years.

I / WE hereby declare that I/We have not been suspended or terminated and/or performance security called by an employer for reasons related to the non-compliance of any environmental, or social (including sexual exploitation and abuse (SEA) and gender based violence (GBV) or health or safety requirements or safeguard in the past five years.

I / WE hereby declare that I/We will ensure that the personnel employed by us sign and comply with the Code of Conduct (E&S) throughout the contract duration.

We acknowledge that we have read and understand ADB's Anticorruption Policy (1998) and Integrity Principles and Guidelines (2015), both as amended from time to time.

"Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract, are not subject to, or not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the Asian Development Bank or a debarment imposed by the Asian Development Bank in accordance with the Agreement for Mutual Enforcement of Debarment Decisions between the Asian Development Bank and other development banks[4].

We have checked all the parties mentioned in the declaration above against ADB's published sanctions list accessed via https://www.adb.org/who-we-are/integrity/sanctions.

Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any

[4] These institutions include African Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank, and the World Bank Group. According to paragraph 9 of the Agreement, other international financial institutions may join upon the consent of all Participating Institutions and signature of a Letter of Adherence by the international financial institution substantially in the form provided (Annex B to the Agreement). Upon adherence, such international financial institution shall become a Participating Institution for purposes of the Agreement. Bidders are advised to check www.adb.org/integrity for updates."

Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract, are not under ongoing investigation and/or sanctions proceedings by the Asian Development Bank or any multilateral development bank.
If under ongoing investigation and/or sanctions proceedings by the Asian Development Bank or any multilateral development bank, please state details:
Name of the multilateral development bank: _____
Reason for the ongoing investigation / allegations: _____

Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the Contract, are not temporarily suspended, debarred, declared ineligible, or subject to any national and/or international sanctions by any country, any international organization, any multilateral development bank and other donor agency.
If so temporarily suspended, debarred, declared ineligible, or subject to any national and/or international sanctions by any country, any international organization, any multilateral development bank and other donor agency, please state details (as applicable to each Joint Venture partner, their respective direct or indirect shareholders, directors, key officers, key personnel, associate, parent company, affiliate, subsidiaries, Subcontractors, consultants, subconsultants, manufacturers, service providers and/or Suppliers):

(i) Name of Institution: _____

(ii) Period of the temporary suspension, debarment, ineligibility, or national or international sanction [start and end date]: _____

(iii) Reason for the temporary suspension, debarment, ineligibility, or national or international sanction: _____

At any time following submission of our Bid, we shall permit, and shall cause our Joint Venture partners, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract to permit ADB or its representative to inspect our site, assets, accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB. We understand that failure of this obligation may constitute obstructive practice that may result in debarment and/or contract termination.

Address of the Bidder:

Phone No.:
Fax/mail .:

BIDDER.

Note: If the tender is made by an individual, it shall be signed with their full name and their address shall be given. If it is made by a firm, it shall be signed with the co- partnership name by a member of the firm, who shall also sign their own name, and the name and address of each member of the firm shall be given, if the tender is made by a corporation it shall be signed by a duly authorized officer who shall produce with their tender satisfactory evidence of their authorization. Such tendering corporation may be required before the contract is executed, to furnish evidence of its corporate existence. Tenders signed on behalf of G.P.A. holder will be rejected.

FORM - 1

Bidder Information Form

Date: _____
Tender No. and title: _____
Page _____of _____pages

Bidder's name
In case of Joint Venture (JV), name of each member:
Bidder's actual or intended country of registration: *[indicate country of Constitution]*
Bidder's actual or intended year of incorporation:
Bidder's legal address [in country of registration]:
Bidder's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above, in accordance with ITB 4.4. ☐ In case of JV, letter of intent to form JV or JV agreement, in accordance with ITB 4.1. ☐ In case of state-owned enterprise or institution, in accordance with ITB 4.6 documents establishing: • Legal and financial autonomy • Operation under commercial law • Establishing that the Bidder is not under the supervision of the Employer 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.
All legal documents including:

i	PAN Card - (Income Tax)	Contractor/ Firm should produce copy of PAN Card
ii	Copies of Income Tax Returns	Contractor/ Firm should furnish IT Returns of last 5 years

	iii	Copies of GST Tax Returns	Contractor/ Firm should furnish latest GST clearance
	iv	GST Registration	Contractor/Firm should produce copy of GST registration
	v	Contractor's Registration certificate	Copy of Contractors Valid Registration under Special Class with Government of Andhra Pradesh.

Form – 2
Historical Contract Non-Performance, Pending Litigation and Litigation History

Bidder's Name: _____
Date: _____
JV Member's Name_____
TENDER No. and title: _____
Page _____of _____pages

Non-Performed Contracts in accordance with Section III, Evaluation and Qualification Criteria			
☐ Contract non-performance did not occur since 1st January *[insert year]* ☐ Contract(s) not performed since 1st January *[insert year]*			
Year	**Non-performed portion of contract**	**Contract Identification**	**Total Contract Amount (current value)**
[insert year]	*[insert amount and percentage]*	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for nonperformance: *[indicate main reason(s)]*	*[insert amount]*
Pending Litigation, in accordance with Section III, Evaluation and Qualification Criteria			
☐ No pending litigation ☐ Pending litigation.			

Year of dispute	Amount in dispute by the contractor (INR)	Amount claimed by the Employer (INR)	Contract Identification	Total Contract Amount (INR),
			Contract Identification: _____ Name of Employer: _____ Address of Employer: _____ Matter in dispute: _____ Party who initiated the dispute: ____ Status of dispute: _____	
			Contract Identification: Name of Employer: Address of Employer: Matter in dispute: Party who initiated the dispute: Status of dispute:	

Litigation History in accordance with Section III, Evaluation and Qualification Criteria

☐ No Litigation History
☐ Litigation History

Year of award	Outcome as percentage of Net Worth	Contract Identification	Total Contract Amount (INR),
[insert year]	*[insert percentage]*	Contract Identification: [indicate complete contract name, number, and any other identification] Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Matter in dispute: *[indicate main issues in dispute]* Party who initiated the dispute: *[indicate "Employer" or "Contractor"]* Reason(s) for Litigation and award decision *[indicate main reason(s)]*	*[insert amount]*

STATEMENT – I: Annual Financial turnover

Sl. No.	Financial Year	Value in Rs.
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Notes:

a. Attach copies of Audited Balance Sheet certified by Statutory Auditor/CA

Signature of the Bidder

STATEMENT – II: Details of similar nature of works completed during the last ten financial years.

Sl. No	Name of the work	Address of Agt. Concluding Authority	Agreement No. & dated.	Value of Contract	Stipulated period of completion	Actual date of completion	Value of work done year wise during the last 'ten' years.									
							1st Year	2nd Year	3rd Year	4th Year	5th year	6th year	7th year	8th year	9th year	10th year
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Attach certificates issued by the Executive Engineer concerned and countersigned by the Superintendent Engineer / Chief Engineer of State Government or equivalent in cadre for Central / any state govt. / public undertakings showing work wise / year wise value of work done and date of completion.

Signature of the Bidder

STATEMENT – III: Criterion for satisfactorily completed projects

Sl. No.	Project	Key Components/ Description of the Project	Start Date	Stipulated Date of completion	Actual Date of Completion	Value of Work	Prime Quantity Executed (with units)

Attach certificates issued by the Executive Engineer concerned and countersigned by the Superintendent Engineer / Chief Engineer of State Government or equivalent in cadre for Central / any state govt. / public undertakings showing work wise / year wise value of work done and date of completion.

Signature of the Bidder

STATEMENT – IV: Details of Bidder

1. Details of Bidder
   a) Name
   b) Country of incorporation
   c) Address of the corporate headquarters and its branch office(s), if any, inIndia:
   d) Date of incorporation and/ or commencement of business

2. Brief description of the Company including details of its main lines of businessand proposed role and responsibilities in this Project:

3. Details of individual(s) who will serve as the point of contact/ communication forthe Employer:
   a) Name
   b) Designation
   c) Company
   d) Address
   e) Telephone number
   f) E-mail address
   g) Fax Number

4. Particulars of the Authorised Signatory of the Bidder
   a) Name
   b) Designation
   c) Address
   d) Telephone number
   e) Fax Number

Name of Bidder:

No.	Criteria	Yes	No
1.	Has the Bidder been barred by the [Central/ State] Government, or any entity controlled by it or World Bank or ADB, from participating in any project (BOT, EPC or otherwise).		
2.	If the answer to 1 is yes, does the bar subsist as on the date of Bid.		

5. The updated following information of the Bidder:

Name of Applicant:

Sl. No	Criteria	Yes/No
1	Updated details of on-going process of blacklisting ifso, under any contract with Authority / Government/ World Bank/ ADB on the Bidder.	

6. A Statement by the Bidder disclosing material non-performance or contractual non-compliance in past projects, contractual disputes and litigation/ arbitration in the recentpast is given below (Attach extra sheets, if necessary):

Signature of the Bidder

STATEMENT V: Availability of Critical Equipment

The Bidder should furnish the information required below, regarding the availability of the equipment, required for construction / quality control.

Sl. No.	Details of Equipment	Number required	Number		
			Owned	Leased	To be procured
1	2	3	4	5	6

Note: On Key and Critical Equipment:
The Key and Critical Equipment must be either owned with proof of owning (registration with RTA and the like) or leased with proof of such lease (the period of lease must be with right of renewal and for complete period of contract with such extended periods if any in future for any contingency and till completion, on Rs.100/- Stamp paper duly executed and notarized).

Signature of the Bidder

A declaration regarding the equipment owned shall be produced by the Bidder on a non-judicial stamp paper of Rs.....as below.

DECLARATION

"I ……. do hereby solemnly affirm and declare that I /we own the following equipment for using on the subject work and declare that I / We will abide by any action such as disqualification or determination of Contract or blacklisting or any action deemed fit, if the department detects at any stage that I/we do not possess the equipment listed below.

Sl. No.	Details of each Equipment	Year of purchase	Regn. Number	Capacity	Any other data.	Is it in working condition
1	2	3	4	5	6	7

STATEMENT – VI: Availability of Key Personnel

Qualification and experience of Key Personnel proposed to be deployed for execution of the Contract.

Sl. No	Name	Designation	Qualification	Total Experience	Working with the Bidder since.
1	2	3	4	5	6

The Key Personnel must be on full time basis on-ground for the work on hand and shall not be engaged for other works also. Among those at least 20% must have Quality Control Experience.

Signature of the Bidder

STATEMENT – VII: Information on litigation history in which Bidder is the Petitioner

S. No	Case No. / Year	Court where filed.	Subject Matter / Prayer in the case	Respondents i.e. Competent Authority	Present Stage
1	2	3	4	5	6

Signature of the Bidder

STATEMENT VIII: Financial Situation and Performance

Bidder's Name:

Date:

Financial data

Type of Financial information in(currency)	**Historic information for previous 5 years preceding the year of tender call, (amount in currency, currency, exchange rate, INR equivalent)**				
	Year 1	**Year 2**	**Year 3**	**Year4**	**Year 5**
Statement of Financial Position (Information from Balance Sheet)					
Total Assets (TA)					
Total Liabilities (TL)					
Total Equity/Net Worth (NW)					
Current Assets (CA)					
Current Liabilities (CL)					
Working Capital (WC)					
Information from Income Statement					
Total Revenue (TR)					
Profits Before Taxes (PBT)					
Cash Flow Information					
Cash Flow from OperatingActivities					

Sources of Finance

Specify sources of finance to meet the cash flow requirements on works currently inprogress and for future contract commitments.

No.	Source of finance	Amount (INR equivalent)
1		
2		
3		

2. Financial documents

The Bidder and its parties shall provide copies of financial statements for *five (5)* years pursuant Section III, Evaluation and Qualifications Criteria, Sub-factor 3.1. The financial statements shall:

(a) Reflect the financial situation of the Bidder, and not an affiliated entity (such as parentcompany or group member).

(b) Be independently audited or certified in accordance with local legislation.

(c) Be complete, including all notes to the financial statements.

(d) Correspond to accounting periods already completed and audited.

Attached are copies of financial statements[1] for the *five (5)* years required above; andcomplying with the requirements

Signature of the Bidder

If the most recent set of financial statements is for a period earlier than 12 months from the date of bid, thereason for this should be justified.

STATEMENT IX: Work Plan and Methodology

Insert proposed methodology, program of construction, equipment deployment plan duly supported with broad calculations justifying capability of execution and completion of work including following details:

a) Bidders' appreciation of the Project
b) Bidders' organization setup for the Project
c) Management of Design & Engineering services
d) Site Logistics & Plan for temporary infrastructure
e) Construction methodology
f) Proposed deployment of key personnel
g) Proposed deployment of Construction equipment
h) Proposed construction schedule
i) Quality control & Assurance system
j) Proposed source of material
k) Safety Plan (EHS Management Plan)
l) Management Strategies and Implementation Plans (MSIP) to manage the (ES) risks

Signature of the Bidder

STATEMENT X: Bid Capacity Calculation

Information required to evaluate the BID Capacity:

Other Eligibility conditions (on Bid capacity/ Qualification criteria of bidders) shall include Bidder shall also fulfil the eligibility criteria such that their available Bid capacity is more than the approximate Estimated Project Cost indicated in this RFP.

The available Bid capacity will be calculated as under: Assessed Average Bid Capacity=[(3 x A x N) – B] - which shall be more than the ECV, Where:

A= Maximum value of Civil Engineering works executed in any one financial year during last 5 financial years (01-04-2014 to 31-03-2024) updated by giving 10% simple weightage per year to bring them to Financial Year 2024 - 2025 considering the completed as well as works in progress which shall be certified by the Chartered Accountant.

N= Number of years prescribed for completion of work for which Bid is invited

B= Value at current price level of existing commitments and ongoing works to be completed during the period of works for which bids are invited.

Without compliance to the above, the calculation shown by the bidder simply on bid capacity cannot be considered but for rejection of bid on the said requirement".

In case the bidder submits that there are no existing commitments and ongoing works anywhere in the country, the bidder shall file an affidavit to that effect duly notarized with undertaking for criminal prosecution if anything found in the affidavit information is untrue besides right of the employer to terminate the contract and for other legal recourse.

Without compliance to the above, the calculation shown by the bidder simply on bid capacity cannot be considered but for rejection of bid on the said requirement".

ASSESSED AVAILABLE BID CAPACITY = (A*N*2 – B)

Where,

N= Number of years prescribed for completion of work for which Bid is invited.

A = Maximum value of Civil Engineering works executed in any one year during last 5 years (01-04-2014 to 31-03-2024) updated by giving 10% simple weightage per year to bring them to Financial Year 2024 - 2025 considering the completed as well as works in progress.

To calculate the value of "A"

1. A table containing value of Civil Engineering Works in respect to Projects (EPC Contract / Item Rate Contract / Lumpsum Contract / Construction works) undertaken by the Bidder

during the last 10 years is as follows:

2.

Sl.No	**Year**	Value of Civil Engineering Works undertaken w.r.t Projects(Rs. in Crores)
1	2023-24/2023	
2	2022-23/2022	
3	2021-22/2021	
4	2020-21/2020	
5	2019-20/2019	
6	2018-19/2018	
7	2017-18/2017	
8	2016-17/2016	
9	2015-16/2015	
10	2014-15/2014	

3. Maximum value of projects that have been undertaken during the F.Y. _____ out of the last 5 years and value thereof is Rs. Crores (Rupees). Further, value updated to the price level of the year indicated below:

Rs._ _ _ _ _ _ _ _ _ _ _ _ _ Crores x _ _ _ _ _ _ _ _ _ _ _ (*Updation Factor*) = Rs._ _ _ _ _ _ _ _ _ _ _ Crores (Rupees_ _ _ _ _ _ _ _ _ _ _ _ _

To calculate the value of "B"

A table containing value of all the existing commitments and on-going works to be completed during the next 3 years is as follows:

Sl. No.	**Name of Project/ Work**	**Percentageof participation of Bidder in the project**	**Dater of start / appointed date of project**	**Value of contract as per Agreement /LOA**	**Value of work completed**	**Balance value of work tobe completed**	**Anticipated date of completion**	**Balance value of work at 2024-25 price level**
				Rs. in Crores	Rs. in Crores	Rs. in Crores		Rs. in Crores
1	**2**	**3**	**4**	**5**	**6**	**7= (5-6)**	**8**	**9 =(3x7)**

The Statement showing the value of all existing commitments and ongoing works as well as the stipulated period of completion remaining for each of the works mentioned above is verified from the certificate issued that has been countersigned by the Employer or its Engineer-in-charge not below the rank of Executive Engineer/ Superintending Engineer/ Chief Engineer or equivalent in respect of EPC/Item-rate Projects or Concessionaire/ Authorised Signatory of SPV in respect of BOT Projects. No awarded / ongoing works has been left in the aforesaid statement which has been awarded to M/s……individually / and other member M/s …….. and M/s....., as on bid due date of this NIT.

……. ……. Signature, name and designation of Authorised Signatory For and on behalf of ……(*Name of the* Bidder)	…… …… Name of the Statutory Auditor's firm/**Chartered Accountant**: Seal of the audit firm/**Chartered Accountant**: (Signature, name and designation and Membership No. of authorised signatory)

Date:

Place:

FORMAT 1 - FORM OF BID SECURITY – Option 1 - Demand Guarantee

Beneficiary :_____
Invitation for Bids No :_____
Date :_____
BID GUARANTEE No. : _____
Guarantor : _____

1. We have been informed that_____(hereinafter called "the Applicant") has submitted or will submit to the Beneficiary its bid (hereinafter called "the Bid") for the execution of_____under Invitation for Bids No._____ ("the NIT no.").

2. Furthermore, we understand that, according to the Beneficiary's conditions, bids must be supported by a bid guarantee.

3. At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (_____) upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:

    a. Has withdrawn its Bid during the period of bid validity set forth in the Applicant's Letter of Bid ("the Bid Validity Period"), or any extension thereto provided by the Applicant; or

    b. Having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Applicant, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the performance security, in accordance with the Instructions to Bidders ("ITB") of the Beneficiary's bidding document.

4. This guarantee will expire: (a) if the Applicant is the successful bidder, upon our receipt of copies of the Contract Agreement signed by the Applicant and the EMD issued to the Beneficiary in relation to such Contract Agreement; or (b) if the Applicant is not the successful bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the bidding process; or (ii) thirty days after the end of the Bid Validity Period.

5. Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

[signature(s)

FORMAT 2 - FORM OF BID SECURITY – Option 2 – Insurance Surety Bond

(To be executed on Non-Judicial Stamp Paper of Appropriate value)

Insurance Surety Bond No.....

Date:……

(Name of Contract)

To: (Name and address of Employer)

WHEREAS (name of Bidder) (hereinafter called "the Bidder") has submitted its Bid dated (date of bid) for the performance of the above named Contract (hereinafter called "the Bid")

KNOW ALL PERSONS by these present that We (name of Insurance Company) of..... (address of Insurance Company) (hereinafter called "the Surety"), are bound unto Andhra Pradesh Capital Region Development Authority (APCRDA) (hereinafter called "the Employer") for the sum of..... (amount), for which payment well and truly to be made to the said Employer, the Surety binds itself, its successors and assigns by these presents.

THE CONDITIONS of this obligation are as follows:

1. If the Bidder (a) withdraws or modifies its Bid during the period of bid validity, or (b) adopts corrupt or collusive or coercive or fraudulent practices.

2. If the Bidder, having been notified of the acceptance of its Bid by the Employer during the period of bid validity.

(a) fails or refuses to sign the Contract Agreement when required, or

(b) fails or refuses to submit the performance security in accordance with the Tender Documents.

We undertake to pay to the Employer up to the above amount upon receipt of its first written demand, without the Employer having to substantiate its demand, provided that in its demand the Employer will mention that the amount claimed by it is due, owing to the occurrence of one or both of the two above-named CONDITIONS, and specifying the occurred condition or conditions.

The Surety declares that this Insurance Surety Bond is issued by the…….. (name of Insurance Company) as per the applicable rules and regulations of Insurance Regulatory Development Authority of India (IRDAI).

This Insurance Surety Bond will remain in force up to and including (date 90 days after the period of bid validity), and any demand in respect thereof must reach the Surety not later than the above date.

For and on behalf of the Insurance Company

_____

in the capacity of

_____

—

Common Seal of the Insurance Company with complete address including Tel. Nos./e-Mail Id.

Staff Authority No. of the officer of the Insurance Company/Signatory

INSTRUCTIONS FOR EXECUTION OF INSURANCE SURETY BOND FOR EARNEST MONEY DEPOSIT

1. Insurance Surety Bond for Earnest Money Deposit should be executed on non-judicial Stamp papers of requisite value in accordance with the stamp Act if applicable to that particular state of Indian Union country of executing Insurance Company, where executed. In case the same is issued by an International Insurance Company (it should be registered under insurance Act 1938 or as amended from time to time and approved by the Insurance Regulatory Development Authority of India (IRDAI)) the law prevalent in the country of execution shall prevail for the purpose of Stamp Duty on the Insurance Surety Bond. However, in such a case, the Insurance Surety Bond for Earnest Money Deposit shall be got confirmed by the Bidder through any Indian Scheduled/Nationalized Insurance Company.
2. The executing officers of the Insurance Surety Bond for Earnest Money Deposit/Bid Security shall clearly indicate in (block letters) their name, designation, Power of Attorney No./Signing Power No. as well as telephone/ fax numbers with full correspondence address of the issuing Guarantee etc.
3. Each page of the Insurance Surety Bond for Earnest Money Deposit shall be duty signed/initialled by the executing officers and the last page shall be signed in full, indicating the particulars as aforesaid (sub-para 2) under the seal of the Insurance Company
4. Stamp paper shall be purchased in the name of Insurance Company counting the Insurance Surety Bond, after the date 'Notice Inviting Tender', not more than six months prior to execution/issuance of the Insurance Surety Bond. The name of the purchaser should appear at the back side of stamp paper in the Vendors Sing. The issuing insurance Company shall be requested independently for verification/confirmation of the Insurance Surety Bond issued, non-confirmation of which may lead to rejection of 'Insurance Surety Bond'.
5. Irrevocable, valid and fully enforceable Insurance Surety Bond in favour of the Employer (Name of Employer) issued by any Insurance Company registered under insurance Ac amended from time to time and approved by the insurance Regulatory Development Authority of India (IRDA) in Indian currency (INR) only is acceptable to the Employer.
6. Insurance Surety and for Bid security/EMD in original shall be submitted along with the Bid. However, the issuing Insurance Company shall submit an unstamped duplicate copy of Insurance Surety Bond directly by registered post (A.D.) to the Employer (authority inviting tenders) with forwarding letter.

FORMAT 3 - FORM OF POWER OF ATTORNEY

Power of Attorney for signing of Bid Know all men by these presents, We, ... (Name of the firm and address of the registered office) do hereby irrevocably constitute, nominate, appoint and authorize Mr. / Ms (Name), son/daughter/wife of.....and presently residing at ....., who is presently employed with us and holding the position of . . . . . , as our true and lawful attorney (hereinafter referred to as the "Attorney") to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our bid for Name of Bid [insert: Name of Bid from Bid data sheet] proposed by (the "Authority") including but not limited to signing and submission of all applications, bids and other documents and writings, participate in bidders' and other conferences and providing information / responses to the Authority, representing us in all matters before the Authority, signing and execution of all contracts including the Agreement and undertakings consequent to acceptance of our bid, and generally dealing with the Authority in all matters in connection with or relating to or arising out of our bid for the said Scheme and/or upon award thereof to us and/or till the entering into of the Agreement with the Authority.

AND we hereby agree to ratify and confirm all acts, deeds and things done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us.

IN WITNESS WHEREOF WE, ..., THE ABOVE NAMED PRINCIPAL HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS.....DAY OF ....., 20….

For. . . . . .
..

(Signature, name, designation and address)

Witnesses:

1.

2.

Accepted

Notarized

(Signature, name, designation and address of the Attorney)

Notes:

The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.

The Power of Attorney should be executed on a non-judicial stamp paper of Rs.100 (Hundred) and duly notarized by a notary public.

Wherever required, the Bidder should submit for verification the extract of the charter documents and documents such as a board or shareholder's resolution/ power of attorney in favour of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the Bidder.

Note: Power of attorney duly stamped, registered or notarized as per the Indian laws and laws of AP Government

Annex 1

Environmental and Social Performance Declaration

[This form should be used only if the information submitted at the time of prequalification requires updating. The following table shall be filled in for the Bidder, each member of a Joint Venture and each Specialized Subcontractor]

Bidder's Name: *[insert full name]*
Date: *[insert day, month, year]*
Joint Venture Member's or Specialized Subcontractor's Name: *[insert full name]*
NIT No. and title: *[insert NIT number and title]*
Page *[insert page number]* of *[insert total number]* pages

Environmental and Social Performance Declaration in accordance with Section III, Qualification Criteria, and Requirements of the Prequalification document			
☐ **No suspension or termination of contract**: An employer has not suspended or terminated a contract and/or called the performance security for a contract for reasons related to Environmental and Social (ES) performance since the date specified in Section III, Qualification Criteria, and Requirements, Sub-Factor 2.5. ☐ **Declaration of suspension or termination of contract**: The following contract(s) has/have been suspended or terminated and/or Performance Security called by an employer(s) for reasons related to Environmental and Social (ES) performance since the date specified in Section III, Qualification Criteria, and Requirements, Sub-Factor 2.5. Details are described below:			
Year	**Suspended or terminated portion of contract**	**Contract Identification**	**Total Contract Amount (INR)**
[insert year]	*[insert amount and percentage]*	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for suspension or termination: *[indicate main reason(s) e.g., gender-based violence; sexual exploitation or sexual abuse breaches]*	*[insert amount]*
[insert year]	*[insert amount and percentage]*	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for suspension or termination: *[indicate main reason(s)]*	*[insert amount]*
…	…	*[list all applicable contracts]*	…
Performance Security called by an employer(s) for reasons related to ES performance			

Year	Contract Identification	Total Contract Amount (INR)
[insert year]	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for calling of performance security: *[indicate main reason(s) e.g., gender-based violence; sexual exploitation or sexual abuse breaches]*	*[insert amount]*

Name of Contractor's Personnel: [insert name]
Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: (day month year): _____

Annex 2

Sexual Exploitation and Abuse (SEA) and/or Sexual Harassment (SH) Performance Declaration

[The following table shall be filled in by the Bidder, each member of a Joint Venture and each subcontractor proposed by the Bidder]

Bidder's Name: *[insert full name]*
Date: *[insert day, month, year]*
Joint Venture Member's or Subcontractor's Name: *[insert full name]*
NIT No. and title: *[insert NIT number and title]*
Page *[insert page number]* of *[insert total number]* pages

SEA and/or SH Declaration in accordance with Section III, Qualification Criteria, and Requirements
We: ¨ (a) have not been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations ¨ (b) are subject to disqualification by the Bank for non-compliance with SEA/ SH obligations ¨ (c) had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations. An arbitral award on the disqualification case has been made in our favor. ¨ (d) had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations for a period of two years. We have subsequently demonstrated that we have adequate capacity and commitment to comply with SEA/ SH obligations. ¨ (e) had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations for a period of two years. We have attached evidence demonstrating that we have adequate capacity and commitment to comply with SEA/ SH obligations.
[*If (c) above is applicable, attach evidence of an arbitral award reversing the findings on the issues underlying the disqualification.]*
[If (d) or (e) above are applicable, provide the following information:]
Period of disqualification: From: _____ To: _____
If previously provided on another Bank financed works contract, details of evidence that demonstrated adequate capacity and commitment to comply with SEA/ SH obligations (**as per (d) above)** Name of Employer: _____ Name of Project: _____ Contract description: _____ Brief summary of evidence provided: _____ _____ Contact Information: (Tel, email, name of contact person): _____ _____

As an alternative to the evidence under (d), other evidence demonstrating adequate capacity and commitment to comply with SEA/ SH obligations (**as per (e) above)** *[attach details as appropriate]*.

Name of Contractor's Personnel: [insert name]
Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: (day month year): _____

Annex 3

Sexual Exploitation and Abuse (SEA) and/or Sexual Harassment Performance Declaration for Subcontractors

[The following table shall be filled in by each subcontractor proposed by the Contractor, that was not named in the Contract]

Subcontractor's Name: *[insert full name]*
Date: *[insert day, month, year]*

Contract reference *[insert contract reference]*
Page *[insert page number]* of *[insert total number]* pages

SEA and/or SH Declaration
We: ¨ (a) have not been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations. ¨ (b) are subject to disqualification by the Bank for non-compliance with SEA/ SH obligations. ¨ (c) had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations. An arbitral award on the disqualification case has been made in our favor. ¨ (d) had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations for a period of two years. We have subsequently demonstrated that we have adequate capacity and commitment to comply with SEA /SH obligations. ¨ (e) had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations for a period of two years. We have attached specific evidence demonstrating that we have adequate capacity and commitment to comply with SEA and SH obligations.
[*If (c) above is applicable, attach evidence of an arbitral award reversing the findings on the issues underlying the disqualification.]*
[If (d) or (e) above are applicable, provide the following information:]
Period of disqualification: From: _____ To: _____
If previously provided on another Bank financed works contract, details of evidence that demonstrated adequate capacity and commitment to comply with SEA/SH obligations (**as per (d) above)** Name of Employer: _____ Name of Project: _____ Contract description: _____ Brief summary of evidence provided: _____ _____ Contact Information: (Tel, email, name of contact person): _____ _____
As an alternative to the evidence under (d), other evidence demonstrating adequate capacity and commitment to comply with SEA/SH obligations (**as per (e) above))** *[attach details as*

appropriate].

Name of the Subcontractor_____

Name of the person duly authorized to sign on behalf of the Subcontractor_____

Title of the person signing on behalf of the Subcontractor_____

Signature of the person named above_____

Date signed _____ day of _____, _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date signed _____ day of _____, _____

PART – 2
PRICE BID

Name of Work: WORLD BANK & ADB financed Amaravati Capital City Development Program related [INSERT PROJECT NAME] on Lump sum contract (Percentage Tender).

Estimated contract value (in figures & words) : Rs – [ENTER AMOUNT] /-([ENTER AMOUNT IN WORDS)

I/We do hereby express my willingness to execute the aforesaid work as per the conditions, standards, specifications, rules, regulations, etc., stipulated in the tenderdocuments. a) at an overall tender percentage of ……% (in figures) ……. (in words) Excess/less over estimated value or at Estimate rates.

***Note: This form is indicative and is to be submitted electronically on the e-procurement portal only. The bid document to be uploaded in the technical submission must not include this form. If the filled price bid is submitted as part of the technical submission, the bid will be treated invalid.**

Signature of the Bidder

Section V - Fraud and Corruption

The World Bank's Guidelines on Preventing and Combating Fraud and Corruption in Program for Results Financing dated February 1, 2012 and revised July 10, 2015 (hereinafter, "WB Guidelines") will be applicable to this contract as provided at Sub Section A of the Section V of tender document) and may be accessed at https://www.worldbank.org/en/programs/program-for-results-financing#3

ADB's Guidelines to Prevent or Mitigate Fraud, Corruption, and Other Prohibited Activities in Results-Based Lending for Programs (hereinafter "ADB Guidelines") as provided at Sub Section B of the Section V of tender document, will be applicable to this contract.

Where applicable, the ADB Guidelines and the WB Guidelines will be collectively called "Anti-corruption Guidelines".

1. It is the Employer's policy to require that bidders, suppliers, contractors and their agents (whether declared or not), sub-contractors, sub-consultants, service providers or suppliers, and any personnel thereof, observe the highest standard of ethics during the procurement and execution of the contracts[5]. The employer:
    a. defines "Prohibited Practice" to comprise of any or all the following terms collectively
        i. Corrupt practice means (i) The offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of any person connected with the Selection Process (for avoidance of doubt, offering of employment to or employing or engaging in any manner whatsoever, directly or indirectly, any official of the Authority who is or has been associated in any manner, directly or indirectly with the Selection Process or the LOA or has dealt with matters concerning the Agreement or arising there from, before or after the execution thereof, at any time prior to the expiry of one year from the date such official resigns or retires from or otherwise ceases to be in the service of the Authority, shall be deemed to constitute influencing the actions of a person connected with the Selection Process); Or (ii) Save and except as permitted under the Clauses relating to Bid Security (EMD)/Performance security of this Bidding Document as provided herein, engaging in any manner whatsoever, whether during the Selection Process or after the issue of the LOA or after the execution of the Agreement, as the case may be, any person in respect of any matter relating to the Project or the LOA or the Agreement, who at any time has been or is a legal, financial, or technical consultant/ adviser of the Authority in relation to any matter concerning the Project;
        ii. Fraudulent practice means a misrepresentation or omission of facts or disclosure of incomplete facts, in order to influence the Selection Process;
        iii. Coercive practice means impairing or harming or threatening to impair or harm, directly or indirectly, any persons or property to influence any person's participation or action in the Selection Process;

[5] In this context, any action to influence the procurement process or contract execution for undue advantage is improper

iv. Undesirable practice means establishing contact with any person connected with or employed or engaged by the Authority with the objective of canvassing, lobbying or in any manner influencing or attempting to influence the Selection Process;

v. Restrictive practice means forming a cartel or arriving at any understanding or arrangement among Bidders with the objective of restricting or manipulating a full and fair competition in the Selection Process.

b. will reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in prohibited practices in competing for the contract in question; and

c. will blacklist bidder or individual, including declaring ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the Consultant has, directly or through an agent, engaged in prohibited practices in bidding for, or in executing, a contract of the employer.

d. Besides above, the Government of Andhra Pradesh, the World Bank, the Asian Development Bank anti-corruption guidelines will apply to this Contract. Please refer to below for the same.

e. The bidders participating to the Program activities shall submit a self-declaration stating that the firm is not subject to ineligibility or has not been sanctioned under (i) the World Bank system of debarment and cross-debarment and/or

(ii) ADB's Debarment and Suspension Register.

f. The list of ineligible firms or individuals may be accessed at the following websites:

https://www.worldbank.org/debarr

https://lnadbg4.adb.org/oga0009p.nsf

Anti-Corruption Guidelines

Definitions
'ADB': Asian Development Bank
'ADB Guidelines': ADB's Guidelines to Prevent or Mitigate Fraud, Corruption, and Other Prohibited Activities in Results-Based Lending for Programs
'World Bank': means the International Bank for Reconstruction and Development (IBRD) or the International Development Association (IDA).
'WB Guidelines': World Bank's Guidelines on Preventing and Combating Fraud and Corruption in Program for Results Financing dated February 1, 2012 and revised July 10, 2015
'Anticorruption Guidelines': collective term for the ADB Guidelines and WB Guidelines.

These guidelines shall be in the Procurement Document (Tender) and also be part of the resultant Contract agreement.

Sub-Section A

Guidelines on Preventing and Combating Fraud and Corruption in Program-for-Results Financing' dated February 1, 2012 and revised on July 10, 2015 (the Anti-Corruption Guidelines (WORLD BANK)

https://www.worldbank.org/en/programs/program-for-results-financing#3)

1. These Guidelines address Fraud and Corruption (as defined in paragraph 5) that may occur in connection with the preparation and implementation of programs financed, in whole or in part, by the International Bank for Reconstruction and Development (IBRD) or the International Development Association (IDA) through Program-for-Results Financing. They set out the general principles, requirements, and sanctions applicable to such programs.

2. The Loan Agreement providing for the Loan governs the legal relationships between the Borrower and the Bank with respect to the Program for which the Loan is made. The responsibility for the implementation of the Program under the Loan Agreement, including the primary responsibility for preventing and combating Fraud and Corruption, rests with the Borrower. The Bank, for its part, has a fiduciary duty under its Articles of Agreement to "make arrangements to ensure that the proceeds of any loan are used only for the purposes for which the loan was granted, with due attention to considerations of economy and efficiency and without regard to political or other non-economic influences or considerations." These Guidelines constitute an important element of those arrangements and are made applicable to the preparation and implementation of the Program as provided in the Loan Agreement.

3. Recognizing that Fraud and Corruption leads to wasted resources and undermines development effectiveness, the Bank and the Borrower agree that all individuals and entities participating in the Program must observe the highest standard of ethics and, specifically, that all such persons and entities must take all appropriate measures to prevent and combat Fraud and Corruption, and refrain from engaging in Fraud and Corruption, in connection with the Program. In furtherance of these principles and purposes, the Bank and the Borrower further agree and commit to undertaking the actions set out in these Guidelines for the purpose of preventing and combating Fraud and Corruption in connection with the Program.

Definitions of Practices constituting Fraud and Corruption

4. These Guidelines address the following defined practices in connection with the Program:

(a) A "corrupt practice" is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party.
(b) A "fraudulent practice" is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation.
(c) A "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party.
(d) A "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party.
(e) An "obstructive practice" is (i) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive, or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or (ii) acts

intended to materially impede the exercise of the Bank's contractual rights of audit or access to information.

5. The above practices, as so defined, are referred to collectively in these Guidelines as "Fraud and Corruption."

Borrower Actions to Prevent and Combat Fraud and Corruption in connection with the Program

6. In furtherance of the above-stated purpose and general principles, except as otherwise agreed in writing by the Borrower and the Bank, the Borrower:

(a) takes all appropriate measures to ensure that the Program is carried out in accordance with these Guidelines;
(b) takes all appropriate measures to prevent Fraud and Corruption in connection with the Program, including (but not limited to) adopting and implementing appropriate fiduciary and administrative practices and institutional arrangements;
(c) promptly informs the Bank of all credible and material allegations or other indications of Fraud and Corruption in connection with the Program that come to its attention, together with the investigative and other actions that the Borrower proposes to take with respect thereto;
(d) unless otherwise agreed by the Borrower and the Bank with respect to a particular case, takes timely and appropriate action to investigate such allegations and indications; reports to the Bank on the actions taken in any such investigation, at such intervals as may be agreed between the Borrower and the Bank; and, promptly upon the completion of any such investigation, reports to the Bank the findings thereof;
(e) if the Borrower or the Bank determines that any person or entity has engaged in Fraud and Corruption in connection with the Program, takes timely and appropriate action, satisfactory to the Bank, to remedy or otherwise address the situation and prevent its recurrence; provided that nothing in this sub-paragraph (e) or in sub-paragraph (d) above obligates the Borrower to take action in direct contradiction of the applicable law of the Member Country;
(f) cooperates fully with representatives of the Bank in any inquiry conducted by the Bank into allegations or other indications of Fraud and Corruption in connection with the Program, and takes all appropriate measures to ensure the full cooperation of relevant persons and entities subject to the Borrower's jurisdiction in such inquiry; and
(g) ensures that any person or entity debarred or suspended by the Bank is not awarded a contract under or otherwise allowed to participate in the Program during the period of such debarment or suspension.

Sanctions and Related Actions by the Bank in cases of Fraud and Corruption

7. In furtherance of the above-stated purpose and general principles, except as otherwise agreed in writing by the Borrower and the Bank, the Bank:

(a) promptly informs the Borrower of all credible and material allegations or other indications of Fraud and Corruption in connection with the Program that come to its attention, consistent with Bank policies and procedures.

(b) in cases where the Bank determines it necessary to do so to fulfill its fiduciary duty, may conduct an inquiry into such allegations or other indications, independently of or in collaboration with the Borrower.

(c) reports to the Borrower on the outcome of any such inquiry; and

(d) may sanction any individual or entity other than the Member Country if at any time the Bank determines that such individual or entity has engaged in Fraud and Corruption in connection with the Program or any other Bank-financed activity or is otherwise subject to sanction pursuant to its prevailing policies and procedures.

Miscellaneous

8. For avoidance of doubt, nothing in these Guidelines is intended to restrict or otherwise affect the Member Country's sovereign right to investigate, prosecute or take any other action in furtherance of its own laws and regulations. Any inquiries conducted by the Bank pursuant to these Guidelines are administrative in nature, for the purpose of determining compliance with the Bank's policies, directives and procedures. Inquiries include, but are not limited to, the review of relevant accounts, records and other documents, and interviews with relevant persons.

9. Without prejudice to any provision hereof, if any action to be taken by the Borrower under these Guidelines may conflict with requirements of the applicable laws and regulations of the Member Country, the Bank and the Borrower will consult with a view to identifying and agreeing on alternative actions that will avoid such conflict while ensuring compliance herewith.

10. The provisions of these Guidelines do not limit any other rights, remedies or obligations of the Bank or the Borrower under the Loan Agreement or any other document to which the Bank and the Borrower are both parties.

Sub-Section B

ADB Guidelines To Prevent Or Mitigate Fraud, Corruption, And Other Prohibited Activities In Results-Based Lending For Programs (To Prevent Or Mitigate Fraud, Corruption, And Other Prohibited Activities In Results-Based Lending For Programs (The ADB Guidelines)

A. Purpose and General Principles

1. The developing member country (DMC) is responsible for the implementation of programs supported by results-based lending (RBL). The Asian Development Bank (ADB) has a fiduciary responsibility to ensure that its loans and other forms of financing are used only for the purposes for which they were granted, in accordance with the Agreement Establishing the Asian Development Bank (the Charter).[6] To uphold that obligation, ADB presents these guidelines to prevent or mitigate fraud, corruption, and other prohibited activities[7] (referred to as 'integrity violations' in ADB's Investigation and Enforcement Framework,[8] 2024 as amended from time to time, or IEF for brevity, in RBL operations financed in whole or in part by ADB. These guidelines build upon the legal obligations presented in the loan agreement and apply to operations funded by RBL.[9]

2. These guidelines do not limit any other rights, remedies, or obligations of ADB or the DMC under the loan agreement or any other agreement to which the ADB and the DMC are both parties.

[6] ADB. 1966. Agreement Establishing the Asian Development Bank.
[7] These are referred to as "integrity violations" in ADB's Investigation and Enforcement Framework, 2024 as amended from time to time.
[8] Formerly Integrity Principles and Guidelines, 2015 as amended from time to time, or 'IPG' for brevity
[9] ADB may support a part (or a slice) of a government program or the entire government program through RBL. The program or the part that is supported by the RBL is referred to as the RBL program.

3. All persons and entities participating in the programs are bound by ADB's Anticorruption Policy (1998, as amended to date) and the IEF. As such, they must observe the highest ethical standards; take all appropriate measures to prevent or mitigate fraud, corruption, and other integrity violations; and refrain from engaging in such actions in connection with the programs.

B. Definitions

4. These guidelines address the following practices as defined by ADB.

i. A "corrupt practice" is the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party.
ii. A "fraudulent practice" is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit, or to avoid an obligation.
iii. A "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party.
iv. A "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party.

5. In addition, ADB may investigate conflicts of interest and abuse, as well as other integrity violations enumerated and defined in the IEF:

i. A "conflict of interest" is a situation in which a party has interests that could improperly influence a party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations. To the extent that conflicts of interest may provide an unfair competitive advantage or compromise the integrity of financial and governance systems, conflicted persons and entities must be excluded from participating in relevant program activities.
ii. "Abuse" is theft, waste, or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard.

C. Developing Member Country's Actions to Prevent Fraud, Corruption, and Other Integrity Violations in Results-Based Lending for Programs

6. Unless otherwise agreed in writing by the DMC and ADB, the DMC will take timely and appropriate measures to

i. ensure that the program is carried out in accordance with these guidelines;
ii. avoid conflicts of interest in the program;
iii. prevent fraud, corruption, and other integrity violations from occurring in the program, including adopting, implementing, and enforcing appropriate fiduciary and administrative practices and institutional arrangements to ensure that the proceeds of the loan are used only for the purposes for which the loan was approved;
iv. promptly inform ADB of allegations of fraud, corruption, and other integrity violations found or alleged related to a program;
v. investigate allegations of fraud, corruption, and other integrity violations and report preliminary and final findings of investigations to ADB;
vi. respond to, mitigate, and remedy fraud, corruption, or other integrity violations that are found to have occurred in a program and prevent its occurrence;

vii. cooperate fully with ADB in any ADB investigation into allegations of fraud, corruption, and other integrity violations related to the program; and take all appropriate measures to ensure the full cooperation of relevant persons and entities subject to the DMC's jurisdiction in such investigation, including allowing ADB to meet with relevant persons and to inspect all of their relevant accounts, records, and other documents and have them audited by or on behalf of ADB; and

viii. ensure that persons or entities sanctioned or suspended by ADB do not participate in RBL programs in violation of their sanction or suspension.

D. ADB's Actions to Prevent Fraud, Corruption, and Other Integrity Violations in Results-Based Lending for Programs

7. Unless otherwise agreed in writing by the DMC and ADB, ADB will;

i. inform the DMC of credible and material allegations of fraud, corruption, and other integrity violations related to a program, consistent with ADB's policies and procedures;

ii. have the right to investigate allegations, in accordance with the IEF, independently or in collaboration with the DMC, including meeting with relevant persons and inspecting all of their relevant accounts, records, and other documents and having them audited by or on behalf of ADB;

iii. inform the DMC of the outcome of any investigation, consistent with ADB policies and procedures;

iv. have the right to impose sanction and other remedial action on any individual or entity for engaging in corrupt, fraudulent, collusive, and coercive practices, or to suspend any individual or entity during an investigation, in accordance with ADB's policies and procedures; sanctions and suspensions may result in that party's exclusion from an RBL- financed activity or any other ADB-related activity indefinitely or for a stated period;[10]

v. assess ways to respond pursuant to the Anticorruption Policy and other ADB policies and procedures, and may refer the case to appropriate authorities of a concerned DMC, if investigative findings indicate that a government official has engaged in fraud, corruption, and other integrity violations related to a program; and

vi. recognize sanctions determined by other multilateral development banks in accordance with the Agreement for Mutual Enforcement of Debarment Decisions.[11]

[10] Pursuant to ADB's Investigation and Enforcement Framework (2024, as amended from time to time), If a debarred or suspended party has ongoing contracts financed or administered by ADB, its debarment or suspension will generally not affect existing contractual obligations. However, it will require OAI endorsement of any contract variation. Accordingly, the party is required to inform the executing or implementing agency, as relevant, of its debarment or suspension, and that OAI's endorsement is required for a contract variation.

[11] ADB. 2010. Agreement for Mutual Enforcement of Debarment Decisions

PART 2 – WORKS' REQUIREMENTS

Section VI - Works' Requirements

Scope of Works

Name of the Work: WORLD BANK & ADB financed Amaravati Capital City Development Program related [INSERT PROJECT NAME] on Lump sum contract (Percentage Tender).

Brief Description of the work:

1) Acronyms:

a) RoW: Right of Way
b) PCC: Plain Cement Concrete
c) RCC: Reinforced Cement Concrete
d) IRC: Indian Road Congress
e) FRL: Finished Road Level
f) GFC: Good For Construction
g) GIS: Geographic Information System
h) HDPE: High-Density Polyethylene
i) DWC-PE–SN: Double Wall Corrugated Polyethylene - Stiffness Nominal
j) IPS: Intermediate Pumping Station
k) CPHEEO: Central Public Health and Environmental Engineering Organisation
l) DI: Ductile Iron
m) ICT: Information and Communications Technology
n) MORTH: Ministry of Road Transport and Highways
o) BIS: Bureau of Indian Standards
p) ISO: International Organization for Standardization
q) NAC: National Academy of Construction

2) Introduction:

In keeping with the aspiration of the Government of Andhra Pradesh to build the "Peoples' Capital", the land procurement mechanism has been designed to be voluntary and is based on consensual process of land pooling. Land pooling mechanism is mainly adopted for development of the Amaravati Capital City area, wherein, the land parcels owned by individuals or group of Employers are legally consolidated by transfer of ownership rights to the authority, which later transfers the ownership of a part of the land back to the land Employers and balance land proposed to be used for undertaking of development of such areas.

The broad objective of the scheme is to provide fair compensation to the land Employers for residential purposes or commercial activities in exchange of pooling of their agriculture lands. This is in sync with the overall vision of Amravati to be a "People's Capital" and involving people in the development process. Accordingly, the Government have issued the "Andhra Pradesh Land Pooling Scheme".

In pursuance of developing the capital city region, APCRDA has decided to prepare a Smart Integrated Infrastructure works encompassing the Capital City of an area of 217 sq. km which also

includes the development of Tier-II infrastructure for 17000 acres of returnablelands under Land Pooling Scheme.

The Development of [PROJECT NAME] . The Summary of scope for [PROJECT NAME] is as follows

S.No.	Description	Scope
1	[ADD SCOPE DESCRIPTION]	[SCOPE QUANTITY]
2	[ADD SCOPE DESCRIPTION]	[SCOPE QUANTITY]
3	[ADD SCOPE DESCRIPTION]	[SCOPE QUANTITY]
4	[ADD SCOPE DESCRIPTION]	[SCOPE QUANTITY]

The following are the key component to be developed in the [PROJECT NAME] but are not limited to below:

[INSERT DETAILED SCOPE FOR THE PROJECT]

The successful bidder shall complete the work within the stipulated period of completion of __ Months.

Where required, on advice of Employer , the contractor shall carry out detailed soil investigation , geo tech survey and designs in case of balance jobs/ certain pockets of work where in , reconfirmation of stability need to be satisfied. The contractor shall evolve economical and cost effective design for such jobs for which the indicative drawings will be furnished. The contractor shall follow relevant IRC/MORTH/CPHEEO/BIS/ISO/ NEC (National Electric Code)/IE rules/CEI (Chief Electrical Inspectorate) to GoAP/EEC/MID-EC/IEC/NBC/NIDM Guide lines/ ECBC norms including all the state of the art Green features applicable for Infrastructure projects and in conformity with best National & International practices. They have to carry out designing and analysis in the latest versions of design software. Analysis using 3D modelling & NAVIS/Revit(BIM)/ other equivalent platform shall be done by the contractor considering the sequence of the utility crossings like storm water, water supply, sewer, power & ICT ducts etc.

The Contractor shall get the designs and clash analysis proof checked by Indian Institute of Technology Chennai/Hyderabad/Mumbai/Delhi Or another accredited consultant, agreed by the Employer (the "Proof Consultant", the payment to proof consultant shall be done by contractor). The Proof Consultant shall proof check the detailed calculations, drawings and designs, which have been submitted by the contractor. The Contractor shall agree to incorporate any value engineering suggestions made by the PMC/Department/Proof Consultant. The contractor thereupon shall prepare good for construction drawings for approval of PMC/Department and works shall be carried out accordingly.

On completion of work, the Contractor shall submit 6 sets of as built drawings in hard copies and soft copies. The Contractor shall construct and Commission the Work in accordance with the specifications and Drawings. The bidder shall use state of the art software and submit the drawings and designs in the required formats (Geographic Information System (GIS) format or geotagged data..,). Contractor must integrate GIS-based monitoring and reporting systems for real-time updates on project progress, ensuring transparency and efficiency

ECV arrived (Excluding reimbursable items as shown in Part "B" of Schedule A) based on SoR of _____year, with OPC @ Rs. _____ per MT (Excluding GST) as per SoR of _____ Year and Fe-500/Fe-500D@ _____ per MT (Excluding GST) & Fe-415 Steel @Rs._____ per MT (Excluding GST), HSCR Steel bars @ Rs. _____ per MT

(Excluding GST), Mild Steel _____/- per MT (Excluding GST), M.S. Plates @ Rs. _____/- per MT (Excluding GST) as of _____ 2024 year. [TO BE UPDATED AS PER PROJECT REQUIREMENTS]

SCHEDULE -A

Bill of Quantities and Price Bid

Part A: Bill of Quantities:
Attached as Annexure (Will be uploaded in e-procurement)

Part B: Reimbursables (INR in Crores)

1	Seigniorage Charges of all works	[INSERT AMOUNT]
2	Extra @ 100% on Seigniorage Charges towards consideration amount	[INSERT AMOUNT]
3	Extra @ 2% on Seigniorage Charges towards MERIT	[INSERT AMOUNT]
4	Extra @ 30% on Seigniorage Charges towards DMF	[INSERT AMOUNT]
5	NAC @ 0.1% on Part A & B (1+2+3+4)	[INSERT AMOUNT]
6	GST @18% on Part A & B (1+2+3+4+5)	[INSERT AMOUNT]

Technical Specifications

(Annexure enclosed)

Environmental and Social (ES) requirements

SCHEDULE: ENVIRONMENTAL COMPLIANCE BY THE POTENTIAL CONTRACTORS

Table 1: List of Statutory Permissions to be obtained by the Contractors

S. No.	Statutory permission	Regulatory authority
1	Approval of Base Camp Plan	APCRDA/ ADC/ PMC
2	Land lease deed for base camp	State Govt.
3	Consent to Establish (CTE) for Plants establishment	APPCB
4	Consent to Operate (CTO) for Plants operation	APPCB
5	Explosive Licence	Chief Controller of Explosives dept.
6	Authorisation for Storage of Hazardous Chemicals	Chief Controller of Explosives dept.
7	Authorisation for Storage of Hazardous Waste	APSPCB
8	Quarry lease deed and permission	State Mines and Geology Dept.
9	Consent to Operate (CTO) for Crusher Plant operation	APPCB
10	NOC for withdrawal of ground water	State Ground Water Board
11	NOC for withdrawal of surface water	State Irrigation dept.
12	Labour licence	Labour Commissioner
13	Pollution Under Control certificates for construction vehicles	Authorised Emission Testing Centre
14	Environmental monitoring testing	Authorised testing lab
15	Soil Borrow Area approval	APCRDA/ ADC/ PMC
16	Waste Management Plan	APCRDA/ ADC/ PMC

Table 2: List of Applicable Labour Laws for Compliance

S. No	Name of Laws
1	Workman Compensation Act,1923
2	Payment of Gratuity Act,1972
3	Employees PF and Miscellaneous Provision Act,1952 (since amended)
4	Maternity Benefit Act,1961
5	Sexual Harassment of Woman at the work place(Prevention, Prohibition and Redressal) Act,2013
6	Contract Labour (Regulation and Abolition) Act,1970
7	Minimum Wage Act,1948
8	Payment of Wages Act,1936
9	Equal Remuneration Act,1976
10	Payment of Bonus Act,1965
11	Industrial Disputes Act,1947
12	Industrial Employment (Standing Order) Act,1946

13	Trade Union Act,1926
14	Child Labour(Provision and Regulation)Act,1986
15	Inter-state migrant workmen's (Regulation of employment & conditions of services) Act,1979
16	The Building and Other Construction works (Regulation of Employment and Conditions of service), Act,1996 and the cess Act of 1996
17	Factories Act,1948
18	Bonded Labour system(Abolition) Act,1976
19	Employer's Liability Act,1938
20	The Personal Injuries(Compensation Insurance) Act,1963

Table 3: Other Requirements to Comply

1	Accident Incident Register
2	First Aid Box & Register
3	Tool-Box Talk register
4	Awareness training programme on Environment & Safety
5	Approved HSMP
6	Fire Extinguishers
7	Medical Check-up
8	Emergency Response Plan
9	Wages register

Appendix I

ENVIRONMENTAL AND SOCIAL (ES) REQUIREMENTS

Environment and Social Policy

Purpose:

The purpose of the E & S policy is to ensure that all the capital city development works conform to the statutory requirements of the applicable environment and social laws, the E & S requirements of the funding agencies. The E & S policy is a guidance document for the management of environment and social aspects associated with the development works.

Objective:

The objective is to conserve, maintain and strive for enhancement of the quality of the natural resources, culture and socio-economic conditions of the people in the project area by identification of the critical areas, potential impacts, risks and preventing and mitigating impacts and associated risks through management plans and budget with timelines.

Applicability:

The E & S Policy implementation is binding on the Contractors, Sub contractors, PMCs, PgMC, third party contractors associated/engaged in the capital city works. All the persons/firms/institutions on which the E & S policy is binding hereon addressed as party/parties.

Policy

The PIU is committed and will ensure the implementation of the environment clearance conditions, Hon'ble NGT directions issued for the capital city and interlinked projects by incorporation of the relevant conditions in the designs, bill of quantities (BoQ), applicable E & S provisions of the statutory laws, Environment clearance, NGT directions, funding agencies in the Bid documents & contractual agreements with budget allocation for implementation of the E & S provisions in the BoQ.

Wherever applicable, the concerned party shall obtain prior clearances/permissions under the EIA notification, Consents under the Water (Prevention and Control of pollution) Act & Air (Prevention and Control of pollution) Act, Authorisation under the Hazardous waste management rules, Solid Waste Management Rules, C & D waste management rules, Bio Medical waste management rules, AP WALTA act. Further, the conditions of the clearances shall be implemented by integration with designs and BoQs, ESMPs.

Wherever applicable, the concerned party shall obtain prior NOCs from the State Ground Water Board, State Disaster Response and Fire Services Department, Archaeological Survey of India, Labour Department, Petroleum and Explosives Safety Organisation, River Conservator, Forest Department, State Mines and Geology Department, NHAI and other departments. Further, the conditions of the clearances shall be implemented by integration with designs and BoQs, ESMPs.

Wherever applicable, it shall be ensured that under respective labour laws all the registration/license requirements for the firm, workers, migrant workers specific to the project work shall be obtained.

The Contractor with prior approval shall implement Workers code of conduct, site specific Contractors- Environment social management plan considering the E & S policy, ESMP given by the

APCRDA/ADCL, incorporating the conditions of the bid documents. The site specific C-ESMP shall cover the management aspects related to traffic and material transportation from source, waste water, air pollution, solid wastes, hazardous wastes, Grievances, OHS, community health and safety, labour management and recruitment, labour camps.

Wherever applicable, as per the relevant provisions of the labours, all the construction sites, labour camps, shall have basic amenities (sanitary toilets, potable water, water supply for domestic usage, bath rooms, and wash areas) for all the personnel, amenities to women and creche for children, temporary bachelor and family type housing as applicable with minimum room sizes within secured premises, street lighting, sanitation arrangements, common kitchen supplied with environment friendly fuels, rest areas and dining areas, first aid room with basic facilities for patients, first aid kits and female nurse, Ambulance, Safety signages, Site level display boards with information on project/safety/SEA/SH/emergency contacts, Barricades around the project site, Periodic doctor visits for health checkup with onsite qualified and experienced officer/specialists for grievances, Environment, Social, OHS. The contractors shall make MoUs with local Hospitals for emergency issues.

The Contractor is responsible to register all the workers engaged for an agreed work in the capital city under the applicable labour laws. Contractor shall get basic health check-up done of all registered workers prior to commencement of works to know the prevailing diseases, fitness to work. The workers including women shall be given be awareness on occupational hazards, risks and shall be trained on PPE, amenities in the site, gender aspects, SEA/SH, workers Code of conduct, first aid, site specific emergency plans, emergency contacts, Grievance cell and redressal mechanism. Accident Insurance shall be taken for all the workers.

The Contractor shall maintain all registers under labour laws, documents, monitoring reports for all the management plans and shall report to the APCRDA/ADCL. Failing to implement the E & S policy, ESMPs, Statutory obligations and failure to maintain updated data and reporting shall be considered as non-compliance and will be penalised as per the provisions. Failing to obtain necessary statutory permissions/NoCs prior to the commencement of project shall be considered violation and penal clauses under the relevant laws/rules shall be applied.

The PIU is committed to provide a safe working environment for all personnel in the capital city and shall ensure the safety of the workers from Sexual Harassment, Sexual Exploitation and Abuse, Gender based violence on women and child (under the age of 18 years) in the work places, labour camp and in nearby communities. Periodic awareness programmes on the SEA/SH, GBV shall be undertaken by the PIU to the Contractors/Sub Contractors/PMCs/PgMC/nearby communities and reviewed. The workers shall be given awareness on the SEA/SH/GBV punishments under the laws, Sexually Transmitted Diseases, grievance cell arrangements specific to project, grievance officers.

Stakeholders in the capital city shall be informed prior to the commencement of the works about the Phase wise development of projects, Potential Environment & Social impacts, Mitigation measures incorporated in the bid documents and BoQ, Potential labour influx and arrangements obligated to the contractor, measures to prevent SEA/SH/GBV.

Further, the PIU with the help of internal staff, line departments, agencies like SERP of state government and if needed external agencies like NGOs will engage periodically with the women SHGs, adolescent girls, differently abled, vulnerable sections to consider and address their issues during the project execution. PIU grievance cell will be headed by Women officers and on regular basis visit the labour camps to interact with the workers to review the SEA/SH/GBV measures incorporated and practiced in the project site and interact with women workers to know the grievances.

All the Wastes – Domestic, Plastics, Construction and Demolition Waste, Hazardous, Batteries, E Wastes shall be managed and disposed scientifically. All the project sites including labour camps shall have arrangements for collection of wastes, segregation of wastes, temporary storage. The contractors shall handover the relevant stream of wastes to the authorised recyclers/facilities. As instructed, if needed certain wastes shall be deposited at the intermediate collection centers. Records related to total wastes generated, segregated streams and quantities disposed shall be maintained and reported for all kinds of wastes. Proof of evidence for the disposal shall be maintained and reported.

Measures for the prevention, control, mitigation of the pollutants and emissions from all the project activities shall be taken up to ensure that the air (includes noise) quality is maintained for the safety and well-being of the personnel and communities. The vehicles, DG sets which meet the Bharat stage IV norms with PUC certification, Noise generating equipment with silencers/acoustic enclosures shall be used or site/area level appropriate dust, pollution, noise attenuation measures shall be taken up, recorded and reported.

All the prohibited chemicals by the Government, prohibited /regulated under international convention on hazardous chemicals or any global treaty under climate change etc to which India is a signatory shall be prevented/regulated from usage in the capital city works.

All the water bodies including the ground water shall be conserved and protected. No waste/material in any form shall be discharged/dumped in the water bodies to prevent pollution and disturbances to the ecology.

The sewage generated in the capital city shall be treated to the reuse standards and shall be used for the greenery development and maintenance, cleaning, fire fighting, industrial purposes, District cooling. Appropriate technologies shall be adopted to achieve the treated to reuse standards. The treatment quality shall be monitored.

The contractors/PMCs/PgMCs shall ensure that all the works have appropriate onsite facilities for the scientific management of the waste water, construction runoffs, spillages, leakages, treated waste water. The details on waste water generation from all activities, treated and recycled, disposal location along with quality shall be recorded and reported.

Source of water shall be from surface sources and ground water usage shall be with prior permission from the appropriate authority and subject to the clearance conditions issued for the project. Water shall be treated to the IS 10500 standards with appropriate treatment facilities. Water conservation measures shall be incorporated in all practicable item of works in the estimates for the capital city works. Flow meters as per the norms and CPHEEO guidelines, EC conditions shall be considered to account and audit the water usage.

Water for the construction activities and the details of the water source, quantities shall be recorded and reported. Water quality must be ensured prior to its application. Details of water quality reports shall be maintained and reported. Water conservation measures shall be incorporated in the C – ESMP and with prior approval from the engineering wing, latest technologies can be used to reduce water requirements for the construction activities.

Energy requirements during construction stage and operation stages shall be optimised by using BEE minimum 3 star rated equipment/appliances.

The top soil of 30 cm depth shall be excavated and stored in the designated location or within the project boundary as instructed by the PIU. The Top soil shall be used for the development of the greenery in the capital city area. The excavated soils below 30 cm shall be stored separately and shall be used within the capital city for the raising the levels of the sites and for filling in low lying areas.

The contractor shall undertake environment monitoring of surface water, ground water, soil, noise, air on monthly basis within the project site and shall submit the reports.

The PMCs, PgMC shall on periodic basis review and report the implementation of the E & S policy.

The Contractor shall submit C- ESMP considering all the mandatory E & S requirements during the contract period and while considering payment to the invoices, the details of the trainings undertaken, pollution control measures taken up, results of the monitoring, evidences of the registers maintained, waste management, water procured for dust control, PUC of the vehicles, amenities in the site and the operational status, air pollution and noise pollution control measures, traffic control measures, permissions/NoCs/ insurance for the workers/health check up/accidents/grievances etc shall be submitted to the ESMU. For Each invoice, on certification from the ESMU, work bill proportionate to recommended amount of allocated 1 % for the ESMP shall only be released.

The Contractor shall submit a Quarterly Environmental and Social Compliance Report to the Employer with the following indicative items:

- Progress in implementing the Contractor Environmental and Social Management Plan (C-ESMP).
- Key activities undertaken to address environmental impacts and social concerns.
- Status of compliance with environmental and social safeguards, including mitigation measures.
- Any incidents of non-compliance and corrective actions taken.
- Updates on community engagement, grievance redressal, and adherence to Gender-Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH) guidelines.

Appendix II

ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN

A. Guidelines for Preparation of Environment and Social management plan

Project Activities:

The project activities may include permissions form the regulatory bodies, clearance of the ground, excavation of the top soil, excavation beyond top soil, other modifications to the existing natural and cultural assets, various onsite tests for surface/subsurface profile required for construction, material transportation from source through existing roads/ roads passing through the settlements, loading and unloading activities, stocking of materials, heavy vehicles/machinery activities, use of generator sets, storage of chemical/fuels, influx of labor, labor camps with minimum amenities, generation of sewage/sludge/septage, generation of solid waste including C&D waste and hazardous wastes, collection, transportation and disposal of liquid and solid wastes, transportation of the top soils/excavated soils to the designated locations, onsite safety, trainings, Grievances, Gender issues, Reinstatement/restoration of all establishments etc.

Need for Environment and Social Management Plan (ESMP):

The above activities include the preconstruction, construction and decommissioning works and these activities clearly indicate disturbances/modifications in the existing project site, additional traffic load and introduction of heavy vehicles during entire project duration, influx of population in the form of workers, employees, visitors etc, movement of materials, chemicals, fuels, generation of wastes and their disposal.

All these aspects certainly create impacts if they are not planned and managed scientifically. The possible areas of the impacts are due to changes in water bodies, soils, Air and in the settlements near to the project areas. Therefore an environment and social management plan is requisite.

Environmental & Social Impacts

Mandatory Implementation of ESMP

- *Capital City Project issued with an Environmental Clearance and has mandated conditions related to Environmental and Social management, which is binding in all aspects in the capital city.*
- *NGT directions were issued on the capital city project which is binding in all aspects of environmental protection.*

- *The funding agencies have mandated the implementation of Environmental & Social Management Plan.*

Therefore, there is a need for Project-specific ESMP (C-ESMP) to be submitted by the Contractor for approval prior to commencement of works at site.

a) the Contractor shall not carry out any Works, including mobilization and/or pre-construction activities (e.g. site accesses and work site establishment, geotechnical investigations or investigations to select ancillary features such as quarries and borrow pits), till the appropriate measures are in place to address environmental, social, health and safety risks and impacts.
b) The Contractor shall apply the Management Strategies and Implementation Plans and Code of Conduct, submitted as part of the Bid and agreed as part of the Contract.
c) The Contractor shall submit, on a continuing basis, for the ESMU's prior approval, such supplementary Management Strategies and Implementation Plans as are necessary to manage the ESHS risks and impacts of ongoing works. These Management Strategies and Implementation Plans collectively comprise the Contractor's Environmental and Social Management Plan (C-ESMP). Project-specific ESMP (C-ESMP) to be submitted by the Contractor for approval prior to commencement of works at site (e.g. excavation, earth works, bridge and structure works, stream and road diversions, quarrying or extraction of materials, concrete batching and asphalt manufacture).
d) The approved C-ESMP shall be reviewed, periodically (but not less than every six (6) months), and updated in a timely manner, as required, by the Contractor to ensure that it contains measures appropriate to the Works activities to be undertaken. The updated C-ESMP shall be subject to prior approval by the ESMU.

C-ESMP shall include/consider

a. ESMP incorporated in the bid document
b. Recommendations of the funding agencies,

The following Management Strategies and Implementation Plans (MSIP) shall be considered by the Contractor to incorporate in the C-ESMP:

- *Traffic management plan to ensure smooth traffic flow around the worksites and the safety of local communities from construction traffic Strategy for the protection of workers and community from construction-related hazards*
- *Pollution prevention (wastewater, air and noise emissions) and management*
- *A waste management strategy for proper collection and disposal of waste*
- *Strategy to address labor influx impacts on the local communities*
- *Gender-based violence and sexual exploitation and abuse prevention and response action plan*
- *Emergency response plan and early warning system*
- *E&S Requirements Section Of The Bid Document*

Further, the C-ESMP shall include the following Management Plans:

- *OHS Management Plan*
- *CHS Management Plan*
- *Waste Management Plan.*
- *Wastewater Discharge Management Plan*
- *Air And Noise Emissions Management Plan*

- *Hazardous Material Management And Spill Control Plan*
- *Workers Accommodation Plan*
- *Management Of Labor Influx And Facilities For Foreign Workers*
- *Labor Recruitment Procedures And Labor Management*
- *Traffic Management Plan Including Transport Of Materials From Quarries*
- *Training Plan for E&S Risks, Including HIV/AIDS, SEA, and GBV.*
- *Emergency Response plan*
- *Grievance Redressal Mechanism (GRM)*
- *SOPs, as provided by the Employer*
- *Demobilization plan after completion of works.*
- *SEA/SH Action Plan (will include, but not be limited to, details for:*
    - *Reporting of SEA/SH Incidents: The Bidder must immediately inform the Engineer (or project gender/GBV focal point) of any SEA/SH allegations or incidents, ensuring confidentiality. The report should include the type of allegation (sexual exploitation, abuse, or harassment), and the gender and age of the affected person. The bidder must also notify the Engineer of any such incidents occurring on Sub-consultants' or suppliers' premises related to the Works. Sub-consultants and suppliers are required to promptly inform the bidder of any SEA/SH incidents.*
    - *Training of bidder's Personnel: The bidder must provide appropriate training and sensitization on the prohibition of SEA and SH to relevant personnel, including sub-consultants*

All projects shall consider the conditions of the Capital city EC. Further building projects shall also consider conditions of interlinked project EC.
EIA, EMPs shall be referred for the aspects related to Safety, Plantation, Water and Energy conservation etc .
The above mentioned ECs, EIAs, EMPs are displayed on APCRDA website.

c. Zone of influence

A minimum buffer zone upto 500m from all proposed work activities shall be considered as *Zone of influence* in preparation of C-ESMP in addition to the above aspects.

Sensitive areas:

- Educational Institutions (Anganwadis, Schools, Colleges, Universities etc), Health facilities, other public and semi-public areas-Courts, Legislative Assembly etc)
- Cultural Properties such as Temples, Church, Maszid etc
- Water Bodies:
    - Surface water bodies (Rivers, Ponds, Lakes etc) and
    - Ground water bodies (Bore wells, Hand pumps etc)
- Habitations
- Existing Trees, Parks
- Forest Area
- Historical & Archeological/Religious monuments

- Places of Tourist importance

Critical Infrastructure:

- Underground water supply lines and other pipelines/cable network
- Substations/WTPs/Existing lift irrigation schemes & Supply lines

Other aspects:

- It shall also consider establishment of Construction Camp, Labour Camp and Construction Plants (Hot Mix Plant, RMC/Batching Plant, WMM Plant etc) as per the project needs.
- It shall also consider the material transport routes to the project site.
- It shall also consider material (top soil, excavated soil, C&D waste and other wastes) transportation, routes from the project site to the designated locations
- Nearest project activities

d. Environmental aspects shall be considered in preparation of the C- ESMP

- Ground water table in the project area
- Proximity and HFL in the nearest stream/water body

Meteorological (nearest station data)

- Predominant wind direction and speed in the context of anticipated impact on the downwind direction,
- Maximum Hourly Rainfall in the mandal
- Min and Max Temperatures in the mandal

B. ENVIRONMENT & SOCIAL MANAGEMENT PLAN (ESMP)

The Amaravati capital city project environmental clearance has been issued on 9.10.2015 and amended on 11.6.2018 by State Environment Impact Assessment Authority, AP, MoEF& CC.

All the capital city works shall be taken up in compliance to the conditions of the Environment clearance and therefore an indicative ESMP is attached, and it shall be followed. All the environmental laws and latest standards applicable and instructed shall be adopted to meet the overall project goals. The contractors shall comply with the EC and Amended EC conditions.

The contractors, sub-contractors, third – parties associated with the capital city contractual works shall ensure that all the applicable environment clearance conditions are adhered at the project level. This includes labour camps and potential areas of environment impacts.

Contractors associated with project works shall prepare and submit project level environment and social management plan, Health and safety management plan, Waste management plan, Traffic management plan, emergency response plan. The details of its implementation, related documentation shall be reported to the APCRDA on periodic basis and as instructed.

As part of implementation of the ESMP, health and safety, periodic monitoring of environment parameters shall be done within the project boundary, labour camps and potential environment impacts areas.Arrangements like availability of relevant E & S technical personnel in project team, having tie -ups with NABL certified labs, budget allocation for implementing the above stated management plans shall be done by the contractor.

All the registers required under the labour laws, environment monitoring data, Training, ESMPs, Organisation policies etc shall be made available in the construction sites.

The C – ESMP shall be prepared considering the EIA/EMP of the capital city and project specific EMP, RAP and RPF.

Environmental Social Management Plan (ESMP) during Pre-Construction and Infrastructure Development
1.GeneralRequirements

Sl.No	Procedure/practices	Description	Responsibility
1.1	Building and Other Construction Workers (Regulation of Employment and working Conditions) Act, 1996). The building & Other Construction Worker's welfare Cess Act, 1996	This act is applicable for those construction activity whose cost is more than Rs. 10,00,000. Since the project cost is above 10 lakhs, the Act is applicable to this project. All rules and procedure under this rule should be followed as 1. Registration of establishment under this Act. 2. Registration of building workers under this Act. 3.Provision of health and Safety measures for the construction workers in conformity with ILO convention No. 167 concerning safety and Health in construction.	Contractor
I.2	Safety officer	Any activity which is carried out by 500 or more workers, appointment of a Safety officer is required under the BoCW Act 1996.	Contractor
1.3	Temporary shelter	The housing for construction workers may be in the form of temporary structures to be removed after the completion of the project. Construction camps and temporary labour sheds shall be located away from the construction site. Construction camps shall be provided for construction personnel to avoid indiscriminate dispersed settlement of construction workers and labourers.	Contractor

		Provision shall be made for the temporary housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc.	
1.4	Medical Services, First Aid, Sanitation	Provide First –Aid box at suitable locations. This First –Aid box should be approved by consulting physician. Facility for the treatment of injured person should be predefined. Telephone no. of physicians, hospitals or ambulances shall be available in the Labour camp and construction site. Potable drinking water in sufficient quantities should be available at site. Adequate no. of sanitary toilet facilities should be arranged at site.	Contractor

2.Occupational Safety

Sl.No	Aspect	Impact	Proposed Mitigation measures	Responsibility
2.1	Personnel protection equipment	Personnel protection	Necessary approved work place and occupation specific PPE like helmet, eye protective wear, safety belt, shoes, gloves, jackets, ear plugs, masks should be provided to workers and personnel in the site. Arrange training & awareness program for the effective use of PPE.	Contractor
2.2	Site preparation	Accessibility	Accessible roads to the site should be safely and properly marked for any danger points like slippage, deep hole, and mud. They should be identified and barricaded.	Contractor
		Entry	Prevent unauthorized entry into the project site. Prevent unauthorized persons access to identified danger points.	Contractor
		Site Levelling	Maximize reuse of Topsoil (30 cm) for greenery development within project site. Details of used and Excess unutilized top soil stocks shall be submitted to the Authority. Maximize reuse of the excavated soil within the project area for leveling purpose.	Contractor
		Excavation activities	All excavation activities shall be done in a planned way. All excavated areas shall be barricaded to prevent accidents.	Contractor
2.3	Spillage of oil and lubricant	Soil Contamination and slippage	Leak proof containers will be used for storage and transportation to prevent any slippages and contamination of soil, surface and ground water. An oil trap should be provided in the drainage line to prevent contamination from accidental spillage of oil. The floors of oil/ grease handling area and	Contractor

			the drains to collect floor washings shall be impervious.	
2.4	Sign, Signals and Barricades	Precaution measures	Display of relevant informative/safety/hazard sign boards, symbols and accident prevention tags shall be done at all necessary locations and to further compliance of safety norms.	Contractor
2.5	Material Storage, Handling, Disposal	Falling hazards	All material stored in stacks, in racks shall be secured to prevent from sliding, falling or collapse. Aisles and passageways in the stores shall be kept clear and in good condition. Necessary sign boards shall be displayed.	Contractor
2.6	Hand and Power Tool	Cutting, shearing, electric shock	Hand tools should be serviced regularly. Ensure that all portable hand tools are periodically tested and certified. Ensure that all power tools, belts, gears, shaft, pulleys, sprockets, spindles, drums, fly wheels, and chains are properly guarded. All electric power operation tools/equipment are provided with earthing or double insulated.	Contractor
2.7	Ladders and Scaffoldings	Falling from height	Ensure that all ladders and Scaffoldings are in good and safe condition. Ensure that Scaffolds should be capable of supporting at least four times their maximum intended load. Ensure that footing or anchorage for scaffolds are sound, rigid and capable of bearing maximum intended load without settling or displacement. Ensure that ropes, slings, hangers, platforms, and other supporting parts of two point suspended scaffolding are in proper position. Inspection of these supporting equipment shall be done before every installation.	Contractor
2.8	Cranes, Derricks, Hoists, Elevators, Conveyors	Breaking, physical hazard	It shall be ensured that rated load capacity, recommended operating speeds, and special hazard warnings are displayed on all equipment and they shall be visible from equipment/machine operator's cabin. Equipment should be tested /inspected annually and the records of servicing/repairs shall be maintained. It shall be ensured that before leaving a crane unattended, its boom should be lowered to the ground level. The carrying load should not exceed the Safe working load.	Contractor
2.9	Floor and Wall opening	Fall from height	Ensure that all openings in floor and wall are properly guarded with standard railings and sign boards.	Contractor

			Ensure that open platforms located two meter or above the ground or floor levels should be guarded by standard railing.	
2.10	Welding and Cutting	Toxic gas inhalation, Explosion in the gas Cylinder	Ensure that certified and trained personnel are deployed for these activities. Appropriate PPE for eye and face protection are supplied and used by the personnel deployed for this activity. Ensure that cutting & welding fumes concentration are not exceeding the TLV by ensuring necessary mechanical ventilation system to exhaust the toxic gases. Ensure that all compressed gas cylinder secured are in an upright position at all time. Ensure that Arc frames of all Arc welding and cutting machine are grounded. Arc torch should be inspected for any leaking from shut off valves, hose couplings, and tip connection before starting the job.	Contractor
2.11	Electrical equipment and connection	Electrical Shock	Live part of all electric equipment should be guarded against accidental contact. Ground Fault circuit interrupters should be used to protect the user. Path of cable from Circuit should be safe and free from any heat radiation, sharp edges etc. Polarity of the conductor should be correct.	Contractor
2.12	Traffic/Vehicle management	Noise and emission	Effective traffic management plan will be implemented to ensure proper movement of vehicles and prevent traffic delays in and around the project area. Vehicle Parking areas should be clear and marked. The keys of the all-unattended vehicle should be kept with driver. Restrict unnecessary blowing of horn. Sign boards shall be displayed as required. Ensure that only vehicles with valid PUC certificates are operated.	Contractor
2.13	Occupational health	Worker health	All the labourers to be engaged for construction works shall be screened for to find out health conditions and only healthy individuals shall be permitted to work. Periodic health check-up of construction workers shall be done.	Contractor

3. Air Pollution and Prevention

Sl.No	Aspect	Impact	Proposed Mitigation measures	Responsibility
3.1	Particulate	Impact on humans	DG sets shall be used only as power back.	Contractor

	emission, fugitive dust, gaseous emissions from construction activity emergency/ temporary use of DG sets, traffic movement	and environment	Only Approved D.G. sets shall be used. Stack shall be arranged to prevent ground level concentrations from the emissions. More emphasis should be given on deployment of vehicles with valid Pollution Under Control (PUC) certificates for all vehicles deployed by contractor, sub-contractor, third party agencies. Gas based DG sets, Mobile solar power supplying systems shall be given priority as a power back up. As a last resort, Low sulphur diesel type diesel generator sets should be used during emergency periods in construction phase.	
3.2	Unpaved roads	Fugitive dust, impact of human health and environment	Dust suppression measures shall be taken up in all potential areas of fugitive dust emissions. Ready-Mix concrete shall be used. Batching plant to be established away from the settlement area as per the guidelines of the PCB. Water fogging around the openly stocked material or barricading shall be erected around the openly stored material stocks as per the site engineer's instructions. Contractor shall submit details on dust and emission control, monitoring and implementation in ESMP. Personnel working in potential dust and gas emission areas shall be provided with face masks. Trucks used for material transportation which lead to fugitive dust emissions shall be covered. Water fogging or sprinkling shall be done at all locations where dust generation is anticipated.	Contractor
3.3	Exhaust emissions from vehicle movements	Fugitive dust, impact of human health and environment	Vehicles permitted as per the BS norms under each category and with valid PUC certificates only shall be used for construction activities.	Contractor

4- Ambient Noise and vibration

Sl.No	Aspect	Impact	Proposed Mitigation measures	Responsibility
4.1	Temporary increases in noise levels at the nearest residential receptors and mixed use area	Impact on nearest residents and workers	Use low noise certified equipment/machines wherever possible. Ensure vehicles, equipment and machinery are properly maintained, especially the engine exhaust silencers. Ensure that all rotary driven construction	Contractor

			equipment has appropriate noise suppression devices installed and is well maintained. Machinery should be turned off when not in use in all practicable cases. Make use of screening for high noise activities. Mechanics will be staffed in the construction site to ensure maintenance of the construction equipment and noise suppression devices. It shall be ensured that construction personnel working near noise generating activities use ear plugs and earmuffs. Diesel generator sets during construction phase shall have acoustic enclosures and shall conform to Environment (Protection) Rules, 1986 prescribed for air and noise emission standards.	
4.2	Pile and foundation construction, road construction, operation of machinery like compressors, compactors, concrete plant, cranes etc. as well as transportation of vehicles.	Impact on workers in high noise level areas.	Noise protection equipments such as noise shields for high noise producing equipments shall be arranged. PPEs like ear muffs/plugs to workers shall be provided during construction activities. Efforts shall be made to restrict use noise levels to standards during construction hours.	Contractor
4.3	Vibrations are caused due to heavy dumpers, and construction machineries	Impact on workers.	Vibration dampening tools shall be used and workers deployed to such works shall be for limited hours.	Contractor

5- Land environment

Sl.No	Aspect	Impact	Proposed Mitigation measures	Responsibility
5.1	Construction of approach roads	Impact on land environment- soil erosion	Prior to construction activities, the top soil up to 30 cm depth shall be excavated and stored separately. Top soil shall be utilized for landscaping activities.	Contractor
5.2	Dumping of construction spoils (plastics, glass, fiber insulation, roofing, steel piping)	Impact on land environment	The construction and demolition waste shall be stored separately within the project site. The C & D wastes shall be reused within the site for filling and levelling purposes as instructed by Site Engineer. The details of the C& D waste generated and, stocked utilized shall be maintained and submitted to the authority. The waste generated from the construction sites and labour camps shall be segregated	Contractor

			into biodegradable, recyclables, hazardous, biomedical wastes and stored separately within the project site. The details of the wastes generated and disposed for each type of wastes shall be maintained and submitted to the authority. The segregated wastes shall be handed over to the authorized recyclers and certificate of handing over/disposal shall be maintained. The asbestos waste from demolition debris, if any, shall be separated and shall be to authorized dealers of Hazardous Wastes. Earth material generated from excavation shall be stored separately and use it as filling material during site development. The construction debris and surplus excavated material shall be disposed off by mechanical transport in suitable pre-identified stocking areas to prevent land degradation and water logging due to indiscriminate dumping in unauthorized areas.	

6- Water quality Management

Sl.No	Aspect	Impact	Proposed Mitigation measures	Responsibility
6.1	Site excavations	Land/ water body contamination	It shall be ensured that excavated material obtained prior construction and during construction be stored separately. It shall be ensured that the excavated material obtained during construction period is not polluted prior to its reuse for any filling purposes/greenery development. All such contaminated soils shall be disposed as per the instructions of the Authority.	Contractor
6.2	Accidental spills of paints, oils, grease or other materials	Impacts on surface water quality and land environment.	It shall be ensured to prevent soil and surface and ground water contamination by spillage of oil/ grease, leakages by usage of oil traps, non-permeable floors/mats, leak proof containers for storage and transportation. Segregation of waste oils and lubricants generated during maintenance of construction equipment and disposing them to authorized agencies shall be ensured. Construction workers will be given awareness about the impacts due to spillage of hazardous/toxic materials and proper training shall be imparted for proper handling, storage, and disposal of hazardous or toxic materials.	Contractor
6.3	Sewage generation	Soil and water contamination	Sanitary toilet facilities to be provided in the labour camps and construction sites.	Contractor

			The toilets provided may be bio- toilets or the sewage shall be treated on site by providing biodigesters, packaged STPs, septic tanks. Sludge shall be cleared off using septic cleaners and handed over to the near by FSTP or STPs. the certificates from the relevant authority at FSTP /STP shall be collected and maintained. The treated waste water shall be reused for greenery within labour camps or supplied to landscaping contractor for maintaining existing greenery in the city.	
6.4	Water Usage	Surface and Ground Water	Water usage during construction shall be optimized to avoid any wastage. NoC shall be obtained for usage of ground water and subject to the conditions of the Environment clearance.	Contractor
6.5	Alteration of drainage characteristics (including dewatering) and modification of the storm water flow and recharge regime.	Surface and Ground water regime	Any modification of drainage shall be done with prior approval of the Authority and proper drainage arrangements shall be done to ensure that runoffs leading to the drain and discharges from upstream do not inundate the site or cause flooding in upstream. If required as per design, Provide a temporary or alternative pathway for storm water drainage during the construction phase considering drain capacity, flow characteristics during peak flow. Prevent the closure/disturbance in the natural run-off pathways. It shall be ensured to reduce the requirement of dewatering and excavate below the water table through careful design of the final land elevations. Plan for disposal of ground waters must be submitted if dewatering is required. Monitoring of Groundwater quality shall be done.	Contractor

7- Use of Natural resources

Sl.No	Aspect	Impact	Proposed Mitigation measures	Responsibility
7.1	Natural resources	Impact on ecology	Avoid the wastage of natural resources such as water, fuel etc. Building construction should be planned in an environment friendly manner to promote conservation of natural resources.	Contractor

8- Hazardous Substances

Sl.No	Aspect	Impact	Proposed Mitigation measures	Responsibility
8.1	Use of Solvent/Painting/ all types of batteries	Health hazard	Appropriate PPE shall be provided to workers engaged for Painting and varnishing activity. Hazardous material should be collected and stored separately. The materials shall be handed over to authorized handlers for dispose in secured landfill.	Contractor
8.2	Minor accidental releases and spills of hazardous materials during construction	Soil and ground water contamination	Develop a comprehensive Spill Prevention and Containment Plan to ensure safe onsite storage of hazardous materials, handling and containment of accidental spills and releases. The plan shall also address the transfer and disposal of spilled materials as hazardous waste and mitigating measures documented to contain any spills. Further, the contractor shall continually monitor and re-evaluate the effectiveness of the plan. Implement standard procedures of CPCB for the transportation, vehicles to be used, to minimize as much as possible potential release/spills related to the bad condition of the materials (valves, pumps in the trucks, etc). Pre-casting of concrete structure shall be done on paved areas, with enough extent and gradient to prevent spillage of concrete or cement onto bare soil. It shall be ensured to keep the amounts of stored hazardous materials to a minimum and always within controlled areas. During construction, designate an offsite fuel distribution facility (for construction and transportation vehicles and equipment) and ensure that facility is equipped with spill containment and prevention measures including integrity tested double wall storage tanks, distribution lines and equipment. If due to project requirements, the re-fueling of construction vehicles and equipment needs to take place on the site, a fuel storage and distribution facility with appropriate spill containment and prevention measures should be built as part of the facilities. Develop and initiate a groundwater monitoring programme to monitor groundwater quality Applicable permissions from the PESO shall be obtained for such fuel storage	Contractor

			facilities.	
8.3	Minor accidental releases and spill during occasional maintenance of construction equipment and vehicles	Soil and ground water contamination	The site will have a designated site for the maintenance of vehicles and construction equipment. The maintenance area will have a comprehensive spill prevention and containment plan to ensure the safe handling and containment of accidental spills and releases, onsite storage of hazardous materials and the transfer and disposal of spilled materials. It shall be ensured to continually monitor and re-evaluate the effectiveness of the plan. Keep onsite vehicle and equipment maintenance activities to a minimum or within the appropriate designated maintenance areas. Only emergency repairs (such as those needed to stop a spill of hazardous material) should be conducted outside the maintenance area. Washing of concrete mixers and trucks should only take place on paved or lined areas with appropriate wastewater collection measures. It is recommended that the wastewater generated during washing of concrete mixers and trucks be given sufficient time to allow for the settlement of solids, prior to its treatment and/or disposal. Treatment of the remaining wastewater should take into consideration its pH and dissolved solids load and shall be disposed off as per the instructions of the Authority.	Contractor

9- Ecology and Biodiversity

Sl.No	Aspect	Impact	Proposed Mitigation measures	Responsibility
9.1	Removal of vegetation and potential foraging sites for nocturnal animals	Impact on ecology	Land based works should have to be assessed in relation to the following issues: The impact on vegetation within the footprint of the operational site. The impact on vegetation at locations which are to be used as temporary compounds or storage areas. The effects of construction on other aspects of terrestrial ecology. The removal of existing vegetation should be minimized. The project site and labour camp shall be planted with local species to serve ecological needs.	Contractor
9.2	Effects of dust & noise from earth moving, vehicle	Impact on ecology	Only vehicles as per the BS norms under each category shall be permitted for construction activities.	Contractor

	movements, etc. on vegetation and fauna onsite or adjacent to the site		Further, Vehicles with valid PIUC shall only be used. Other measures like to ensure transportation of materials through paved roads and minimizing off road driving shall be implemented.	

10- Hazard

Sl.No	Aspect	Impact	Proposed Mitigation measures	Responsibility
10.1	Seismicity	Impact of structure	Project falls under the seismic zone-III. Seismic factor shall be considered in design of all structures.	Contractor
10.2	Fire and explosion hazards	Impact on Structure	Preparation and implementation of an Emergency Management Plan and a Communication Plan. Plan shall include both onsite and off site emergencies. Plan shall be prepared in consultation with local authorities and potentially affected communities.	Contractor

11-Social

Sl.No	Aspect	Impact	Proposed Mitigation measures	Responsibility
11.1	Reduction in number of Immigrant workers post peak.	Decreased income.	Arrange workshop with the community to inform them about project activities and potential employment opportunities. An appropriate decommissioning plan should be developed and implemented. Conducting focus groups or workshops with local workers and community to gauge feedback from workers and the community on expectations towards employment opportunities and project duration.	Contractor
11.2	Immigrant workers separated from their families	Impact of immigrant workers	The workers shall be allowed to exercise their rights related to working hours and weekly offs, public holidays, festivals as per the labour normsto enable the workers to have free time.	Contractor
11.3	Incidence of disease transmission between the workers and the population of the local communities.	Social health	Employee counselling, health screening, health and cultural training and vaccination programmes shall be taken up for the workers. Pre-employment inoculation for locally prevailing contagious diseases shall be done for workers in consultation with local health department. Develop health policy and procedures, awareness and prevention programmes, integratedprogramme addressing the health and social implications; Management of workers accommodation in ways that reduce risky behaviors, including provision of recreational facilities may be considered.	Contractor

			A health survey campaign to collect data on the most common communicable diseases in the area is recommended. Tracking and monitoring of incidence rates throughout project implementation would provide valuable information for the design of health programs. The requirement to monitor and screen for communicable diseases is incorporated into the contractor's contract and the ESMP to be submitted by the contractor. The PIU/operator should enforce and audit against the contract. Commitment to health education and support of local programmes to control the spread of communicable diseases is recommended.	
11.4	Potential increase in road traffic accidents	Social health Impact	Management and vehicle standards should be specified and safety measures should be implemented. A road transport safety programme should be developed and implemented over the lifetime of the project. Supporting regional road safety programmes and providing input into management of the road network can further reduce the impact of the development. Coordinate with the local authorities to promote traffic safety and coordination on transport is recommended. This coordination should be included in the stakeholder consultation program.	Contractor
11.5	Arrangements at work site	Grievance redressal	The contractor should ensure that a grievance cell is arranged within the project site for addressing all general grievances from both internal and external stakeholders.	Contractor
		Communication with local communities	The contractor shall intimate in prior, to the nearby communities, about the project plans, schedule and associated activities, about established GRM for general and gender issues.	Contractor

12.Gender Sensitive approach

Sl.No	Aspect	Impact	Proposed Mitigation measures	Responsibility
12.1	Arrangements at work site	Employment to local women, Minimum wages, accommodation and arrangements	• The contractor may encourage employment opportunities to the qualified local women in possible areas of the contractual works taken up in capital city. • The contractor must assure minimum wages for women as per the existing legal framework • The contractor must take all measures applicable as per labour laws to prevent and mitigate any gender-based violence. • Separate and secured accommodation	Contractor

			should be provided to families within labour camps. • Women must be given separate dedicated facilities like toilets, bathrooms, and wash areas at the construction site and residential zone. • The construction site should have a crèche as per applicable laws. The crèche should have screens for breastfeeding mothers. Only trained female supervisors should be deployed in crèche. • Government-run Anganwadi centres (day-care centres) are available across the planned Amaravati city area with more being built. Pregnant women will be nurtured and children under the age of 4 will be taken care of during the day while the mothers are at work. The contractor must facilitate all affected parties on-site to avail of this facility. • All the areas in the labour camps and construction sites should be provided with proper lighting with power backup.	
		Health camps	• A female nurse should be available in the first aid area. • In the absence of a female nurse, first aid for a woman should only be done in presence of other male or female person acquainted to injured person. • A female doctor should be arranged in the labour camp as part of regular health check-ups for women workers	Contractor
		Security	• Security persons should be arranged at labour camps and construction sites to ensure women safety.	Contractor
		Awareness and grievances	• The contractor should regularly impart awareness to all workers on gender concerns and rights like equal pay for similar work, payment of wages, working hours, holidays, nutrition, safety, health issues, sexual harassment at workplace, and the grievance cell. • The contractor should conduct awareness programs on various provisions of the sexual harassment at workplace act. • Enforce BOCW Act (Building and other construction workers act) strictly to create a safe and secure environment for women workers. • A grievance cell should be arranged within the project site. Suitable arrangements like grievance drop box, separate register for gender issues, phone numbers of the CRDA officials, local police, local sub-center should be made available within the project site. • A grievance day should be arranged for workers at each project once in two weeks. The grievance day should be	Contractor

			conducted by a team with at-least two officials and contractor side personnel. One female person should be part of the team.	
		Signage	• Necessary signage in pictures and lettering in local language and Hindi should be provided at all amenities in labour camps and construction sites. • Signage should include information related to sexual harassment and maximum punishments as per the sections of the Indian penal act. Such signage should be displayed in labour camps and construction sites.	Contractor

C. INDICATIVE LIST OF ITEMS UNDER ESMP

• The following are the indicative activities (but not limited) that need to be complied by the contractor during the contract duration. On award of work, the contractor shall work out a C-ESMP in line with labour laws and other regulatory guidelines along with the quantities of each of these indicated activities (which should be sufficient for effective implementation of the C-ESMP and other E&S clauses mentioned in the bid document) and submit for approval of PMC/Employer The modalities of monitoring these activities is to be jointly finalised by Employer/contractor.
• During periodical inspection, in case of necessity, on direction of Employer, the contractor shall provide additional quantities and activities.
• The payment for all these activities shall be made out of provisional sum. The payments are subjected to scrutiny and approval of all the activities done at site.
• The total payment for these activities/additional/new for the entire project duration shall be within ceiling amount of 1%.
• The contractor shall also, for the performance of its E&S obligations hereunder during the Construction Period, furnish the Performance Security for an amount equal to 0.1 per cent of the bid amount/contract value in the shape of unconditional and irrevocable Bank Guarantee/ Insurance Surety Bond valid until 60 days after the completion of work. This E&S Performance Security shall be over and above the Performance Security mentioned above.

Sl No	Component	Description of the item
1	**Permissions-Clearances/Consents/NoC/ Authorisation/license etc**	The contractor shall ensure that permissions from the regulatory bodies are obtained for Hot mix plant, RMC plant, Crusher, Quarries, Borrow areas, Tree cutting, Water for construction purposes, hazardous wastes, Biomedical wastes etc
		Licences, insurance for the labour (local and migrant), Registration for specific work under labour laws
2	**Labour camps as per the applicable National/State laws and quantity as per the personnel**	Temporary shelter for workers considering the local climate- Bachelor accomodation with secured room with adequate space, ventilation, lights, fans , Bedding
		Temporary shelter for workers considering the local climate - family accomodation with secured room with adequate space, ventilation, lights, fans, Bedding
		Provide meals at a reasonable cost or free of charge to its Contractor's Personnel per shift in a Dining area and ensure minimum nutritional requirements
		Secured and Sanitary toilets/ Bio toilets with lights - for Men 1 pan for 25 persons
		Secured and Sanitary toilets/ Bio toilets with lights - for Women 1 pan for 25 persons
		Secured bathroom for Men with Water supply and lights
		Secured bathroom rooms for Women with Water supply and lights
		Common Washareas
		Separate Washareas for women in labour camps
		Common Kitchen with ventilation, lights, storage racks for raw materials

		Supply of Environment friendly fuels for Kitchen
		Common Dining Area with ventilation, fans and lights
		Appropriate water storage units for supply of water for domestic usage to the camp
		Appropriate water storage units for supply of potable water for domestic usage to the camp
		Creche for children
		Sanitation and Housekeeping activities within the camp includes periodic cleaning of over head tanks, toilets, sweeping, Disinfection
		Dustbins of appropriate capacities for wet (Blue) and dry (Green) wastes and disposal at designated locations
		Pest control measures
		Onsite sewage treatment facilities/ Mobile STP
		Sludge/septage removal and disposal at the designated locations
		Powerback up - Gas based Gensets with accoustic enclosure with stacks as per CPCB air and noise emission standards.
		Water treatment unit for supplying potable water considering the raw water source
		Water Supply line for potable water to kitchen and to water disposal points near rooms
		Fencing around the labour camp to secure the workers and to prevent entry of stray animals
		Security personnel
		Signages in the labour camps on the safety, code of conduct, sanitation, SEA/SH
		Camp level area lighting
		Store space for the workers to buy daily needs
		First Aid kits within labour camps
		Proper ventilated Health check rooms with chairs, tables, atleast two beds, screens
		Fire control equipment
		Ambulance shall be available in the project site
		Arrange visiting doctor for periodic consultations and tieup with nearest superspeciality hospital for emergency treatments
		Arrange female nurse in the First aid room
		Medical Check Up - The Contractor shall organise medical check-ups carried out by a doctor for all Contractor's Personnel prior to the initial mobilisation to the Project Area for diagnosis of any disease conditions, fitness level and later on quarterly basis to check general health condition fitness for the work.

		Common room for trainings/general meetings/Grievance redressal meetings with chairs, tables, lights and fans
		Open drains within the camp site for storm water drainage
		Transportation of workers between labour camps and work sites
3	**Supply of work specific PPE to the workers and personnel on site as per the National standards**	Safety Jackets with reflective coating and water proofing
		Supply of work specific Safety helmets considering work place hazards related to electrical, falling objects
		Supply of work specific Safety shoes considering work place hazards related to sharp objects on floor/ground, electrical, slippage, thermal conditions in the work areas
		Supply of work specific Safety gloves considering work place hazards related to sharp objects, handling wet materials, chemicals, mechanical tools, electrical, slippage, thermal
		Supply of Safety ear plugs to all workers in a radius of 100' distance from noise sources
		Supply of Safety Masks of Minimum FFP 2 type or equivalent in all areas of potential sources of Dust, fumes from welding, emissions from vehicles
		Supply safety belt for the person working at heights
		Suitable safety apparatus for personnel working in confined spaces
		Safety Eye protective wear
4	**Traffic management in consideration to the applicable guidelines, IRC, APCRDA instructions and local police**	All the vehicles deployed shall meet emission norms as per applicable rules.
		All the vehicles deployed shall have valid PUC certificate
		The loaded vehicles with material shall be covered with Tarpaulins
		Tyre wash facility shall be provided in construction site
		Speed limit boards shall be displayed along the haulage routes within 2km from the site
		Speed limiting barriers and speed bumps shall be arranged along the haulage routes within 2km from the site including in the nearest settlements
		Deployment of flag men in the nearest settlement and on the approach road to the site for management of traffic during peak hours
		Display no honking sign boards near to the senstitive receptors in the nearest settlement
		Display warning sign boards to alert public on construction zone, unauthorised entry, heavy vehicluar movement

		Arrange informative display boards with project information and directions to site along the haulage routes
5	**Environmental Monitoring as per the CPCB guidelines and IS standards by the NABL accrediated lab**	Surface water quality analysis for the parameters mentioned in IS 2296 on quarterly basis in the nearest water bodies
		Ground Water quality analysis for the IS 10500 parameters on Quarterly basis in project site, labour camps and nearest habitation
		Potable water quality analysis for IS 10500 parameters on monthly basis
		Noise levels during day peak work hours on monthly basis 1. The Construction site 2. Within 500 m on haulage road to construction site 3. In nearest settlements during peak hours 4. labour camps 5. Near to Hotmix plant/RMC plant/ DG sets
		Noise levels during Night work hours on monthly basis 1. The Construction site 2. Within 500 m on haulage road to construction site 3. In nearest settlements during peak hours 4. labour camps 5. Near to Hotmix plant/RMC plant/ DG sets
		Soil Quality analysis as per the ICAR recommended parameters on Quarterly basis in the construction site, site surroundings, labour camp surroundings
		Regular internal monitoring of minimum Lighting Lux levels in work areas and maintenance of records
		Ambient Air Quality Monitoring on monthly basis for the parameters So2, No2, PM10, PM2.5, O3, CO, VoC 1. The Construction site 2. Within 500 m on haulage road to construction site 3. Downwind side in nearest settlements during peak hours 4. labour camps
		Additional parameters under Air, Water, Soil in case of any polluting events noticed
6	**Occupational, Health and Safety as per the applicable labour laws/GIIP**	Arrange the Hard MS/GI Sheet barricading upto 7 m height around the construction site to reduce the fugitive emissions to the surrounding area
		Arrange adequate area lighting in the construction site, haulage routes, surrounding the construction site during night/low light conditions
		Arrange adequate lighting inside the under construction building to enable both day and nigth working conditions
		Supplying and fixing of cautionary and informative signs boards on Safety of the workers in all work areas
		Provide work specific arrangements for personnel to prevent trip, slip and falls hazards

		Arrange fall protection arrangements for the scaffolding, along the stairs, floor edge
		Walking Surfaces or boards at height should be of sound construction and to be provided with safety rails and safety belts
		Arrangement for head protection around the builiding from falling objects and with necessary signages
		Arrangement of Vibration Control Damping tools shall be used
		Arrangement of Adequate safety barricades near heavy machinery considering the radial movement
		Arrangement of Adequate safety barricades with retro reflective stickering near excavated areas
		Arrangement of Personnel near heavy machinery to control and guide movement with appropriate tools like flags/hand held batons appropriate to day/night conditions
		Arrangement of warning signage boards -with emergency contacts, site E & S officer contact, Grievance officer contact
		Arrangement of Fire fighting equipment shall be arranged in the construction site and near to the fuel storage and handling area
		Arrnagement of Measures to prevent water stagnation and mosquito breeding
		Arranegement of basic amenities in the construction site - secured and sanitary toilets for men and women, drinking water, rest areas, food, first aid etc.
		Arrangement of Pest control measures in the construction site
7	**Signage and display boards as per the E & S requirements**	Make arrangement to Display Grievance Redressal Boards with project information along the Projects
		Arrangement of warning signage boards -with emergency contacts, site E & S officer contact, Grievance officer contact, list of trained first aiders with contacts
		Display informative board on GBV, SEA/SH and punishment under the law
8	**Waste Management as per the CPHEEO/CPCB guidelines and GIIP (Good International Industry Practices)**	Arrangement of dust bins within the construction sites for collection of wet and dry wastes
		Onsite arrangement of space with shelter, spill control kits, impermeable floor and drain, collection pits for collecting, segregation and temporary storage of wastes into the streams -e waste, batteries, used oils, contaminated soils/materials, plastics, empty cement bags, used chemical cans, electrical wastes, steel cutting, plumbing wastes, glass, Tyres or any other hazardous wastes etc
		Space for temporary storage of bulk wastes like C & D wastes and other wastes

		Transportation of C & D wastes to the designated location
		Transportation of Top soil upto 30cm depth to the designated location
		Transportation of excavated soils other than topsoil to the designated location
		Transportation of other recyclable wastes to the designated collection location
		Arrangement with Authorised dealer/facility to hand over the biomedical wastes
		Hazardous waste (Used oil etc) handing over to the APPCB authorised recyclers/ TSDF by providing disposal certificates
		The sludge and septage shall be cleared through a authorised operator in the region and shall be ensured for disposal in nearest STP/FSTP or authroised dealer/facility
9	**Insurance**	The contractor shall take Public liability insurance if any material under the PLI act is handled.
10	**Mitigation Measures as per the relevant applicable standards and guidelines**	Arrangement of truck/s mounted with water fogging guns to control dust in the construction site, labour camp, along haulage routes and in nearest settlement and water sprinkling along roads wherever applicable.
		Arrange Oil, Grease & Sludge Separator in all applicable areas such as vehicle bay, vehicle Garrage, fuel storage areas, fuel handling areas
		Silt Fencing along the drains or at the sedimenatation ponds in construction site to Protect water bodies
		Minimum onsite treatment systems for the effluents from the batching plant as per the consent conditions of PCB/GIIP
		Arrangement of Noise Barriers near all potential noise sources and as per the site conditions
		Arrangement of site specific measures to protect adjacent properties from dust and air pollution
		Arrangement of appropriate site specific measures to indicate and prevent any flooding conditions
		For power back up in all practicable cases arrange solar panel based supplies during emergencies in the construction site with stacks
		For power back up in all practicable cases arrange gas based gensets as a power back during emergencies in the construction site with stacks
		DG sets for powerback (to be used only) if gas based and solar based arrangements are not feasible and DG sets to have stacks to limit ground level concentrations
		Existing trees to be translocated

		Topsoil excavated during construction activities shall be used for horticulture/landscape development within the project site.
		The contractor shall arrange adequate drains to ensure drainage of storm water during monsoons
11	**Capacity building Trainings/Workshops/Awareness Programs**	Training sessions for his personnel in two-folds: introductory sessions for starting work at the Project Area, and technical training as required in relation to the execution of the works
		Training for the workers on Contractor Environment, Health & Safety Management plan, Code of conduct, GBV/SEA/SH, Occupational safety
		Awareness on HIV/AIDS, Pandemics such as COVID-19 & Medical Camps
		Fire fighting, Mock Drills
		First Aid Training, CPR Testing
12	**Rehabilitation & Reinstatement of Sites at the Closure of the Project**	Site rehabilitation - Rehabilitate all Project Areas and landscapes disturbed by the works, to their original condition where possible upon completion of construction and prior to the provisional acceptance of the works. Close collaboration with all statutory stakeholders will be conducted in cooperation with the Employer during the reinstatement. This will include all temporarily acquired sites including borrow areas, quarry areas, camp site, storage areas, diversions, etc.
13	**Social Aspects**	Formation and fucntioning of Internal compliants committee for gender related issues as per the POSH act
		Provide temporary safe access to individual properties/ settlements /activity areas in case of disturbance to regular routes.
		Formation and functioning of grievance redressal cell
		Consultations with stakeholders as and when required to prevent social conflicts due to labour influx

Note: The above list is not exhaustive. The environment and social setup specific to project and the ESMP in Bid Document, E & S policy shall be considered in the C - ESMP.

Contractor's Representative and Key Personnel

These are minimum requirements; contractor shall deploy personnel as required by the Project to ensure completion of the work in accordance with the contract.

The Key Personnel must be on full time basis for the work on hand and shall not be engaged for other works also. Among those at least 20% must have Quality Control Experience.

Key Personnel:

S. No	Personnel Position and required Qualification cum Experience	No.
1.	[ADD PROJECT SPECIFIC POSITIONS AND THEIR REQUIRED QUALIFICATION CUM EXPERIENCE]	[INSERT COUNT]
2.	[ADD PROJECT SPECIFIC POSITIONS AND THEIR REQUIRED QUALIFICATION CUM EXPERIENCE]	[INSERT COUNT]
3.	[ADD PROJECT SPECIFIC POSITIONS AND THEIR REQUIRED QUALIFICATION CUM EXPERIENCE]	[INSERT COUNT]
4.	[ADD PROJECT SPECIFIC POSITIONS AND THEIR REQUIRED QUALIFICATION CUM EXPERIENCE]	[INSERT COUNT]

Note: The bidder shall submit the proof of availability of adequate design and execution Engineers to carry out the given scope of works. The Bidder shall also submit the proposed organization chart along with Staff deployment schedule along with the tender.

Design Basis Report

(Annexure enclosed)

Drawings

(Annexure enclosed)

Supplementary Information

1.	**Coordination and Site Cooperation** - The Contractor shall conduct their work in a manner that does not interfere with or hinder the progress of work being performed by other Contractors. The Contractor shall arrange their work and workspace to avoid interference with the operations of other Contractors, ensuring a coordinated and acceptable approach. - The Contractor shall cooperate with and provide necessary facilities to associated contractors and other agencies working on the site to facilitate the smooth execution of the work. This includes: o Allowing the use of existing scaffolding, toilets, sheds, and other facilities. o Coordinating their work with other Contractors to avoid conflicts and ensure efficient project execution. o Providing control lines and benchmarks to associated Contractors. o Providing electricity and water at mutually agreed rates. o Providing hoist and crane facilities for lifting materials at mutually agreed rates. o Coordinating with other Contractors for leaving inserts, making chases, and aligning services on-site. o Adjusting work schedules and site activities in consultation with the PMC and Engineer-in-Charge and other Contractors to ensure overall schedule completion. o Resolving disputes with other Contractors amicably. The Engineer-in-Charge shall not be involved as an intermediary or arbitrator. The Contractor shall indemnify the Department against any claims arising from such disputes. - The contractor may also refer to the IFC EHS and EBRD workers accommodation guidelines and implement the same.
2.	**Contractor's design obligations:** - The Contractor shall evolve economical and cost effective design for the balance works/ certain pockets as per the indicative drawings supplied to them duly following relevant IRC/ MoST/ CPHEEO/ BIS/ ISO/ NEC (National Electric Code)/ IE rules/ CEI (Chief Electrical Inspectorate) to GoAP/ EEC/ MID-EC/ IEC/ NBC/ NIDM Guidelines/ ECBC norms including all the state of the art Green features applicable for Infrastructure projects and in conformity with best National & International practices. They must carry out designing and analysis in the latest versions of design software. - The Contractor shall get the designs proof checked as per necessity or as suggested by the Employer by Indian Institute of Technology Chennai

	/Hyderabad/Mumbai/Delhi Or another accredited consultant, agreed by the Employer (the "Proof Consultant"). The Proof Consultant shall proof check the detailed calculations, drawings and designs, which have been submitted by the successful Bidder. The Contractor shall agree to incorporate any value engineering suggestions made by the PMC/Department. On completion of work, the Contractor shall submit 6 sets of as built drawings in hard copies and soft copies. The Contractor shall construct and Commission the Work in accordance with the specifications and Drawings. The bidder shall use state of the art software and submit the drawings and designs in the required formats. - 3D modelling & NAVIS/ other equivalent platform work for Clash Analysis shall be done using a standard software by the contractor considering the sequence of the utility crossings like storm water, water supply, sewer, power & ICT ducts etc. - After approval of the designs, 3D modelling & NAVIS/ other equivalent platform work for Clash Analysis using a standard software by the contractor considering the sequence of the utility crossings like storm water, water supply, sewer, power & ICT ducts etc, by the competent authority. The successful bidder based on the approved design followed with 3D modelling and clash analysis shall submit Good for construction (GFC) drawings for approval by the competent authority based on which the execution shall be done.
3.	**Diversion of streams / Vagus / Drains:** - The contractor shall at all-time carry out construction of cross drainage works in a manner creating least interference to the natural flow of water while consistent with the satisfactory execution of work. A temporary diversion shall be formed by the contractor at their cost where necessary. No payment shall be made for this work. - Separate payment for bailing out sub-soils, water drainage or locked up rain water for diversion, shoring, foundations, bailing of pumping water either from excavation of soils from foundations or such other incidental will be paid. The borrow pits are also to be de-watered by the contractor himself at their expense, if that should be found necessary. - The work of diversion arrangements should be carefully planned and prepared by the contractor and forwarded to the Executive Engineer technically substantiating the proposals and approval of the Executive Engineer obtained for execution. - The contractor has to arrange for bailing out water, protection to the work in progress and the portion of works already completed and safety measures for men and materials and all necessary arrangements to complete the work. **Power Supply.** - The contractor shall make their own arrangements for obtaining power from the Electricity dept., at their own cost. The contractor shall pay the bills of Electricity Department for the cost of power consumed by them. - The contractor shall satisfy all the conditions and rules required as per Indian Electricity Act 1910 and under Rule-45 (I) of the Indian Electricity Rules, 1956

	as amended from time to time and other pertinent rules. - The power shall be used for bonafide departmental work only. **Ramps:** - Ramps required during execution may be formed wherever necessary and same are to be removed after completion of the work. No separate payment will be made for this purpose.
4.	A site order book shall be maintained on the site and it shall be the property of the Employer and the Contractor shall promptly sign orders given therein by the Engineer or their authorized representative and comply with them. The compliance shall be reported by Contractor to the Engineer in good time so that it can be checked. The blank site order book with machine numbered pages in quadruplicate with perforated sheet for three copies to be detached will be provided by the Engineer for this purpose. Whenever any instructions are written in the site order book, the Contractor will be supplied the first carbon copy.
5.	**Precautionary measures:** - Contractor shall take all precautionary measures to avoid any damage to adjoining property. All necessary arrangement shall be made at their own cost. The contractor shall take all precautions to prevent their workmen and employees from removing and damaging any Flora (plant/vegetation) from the campus/site. - The contractor shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night, speed limit boards, red flags, red lights and providing barriers. The Contractor shall be responsible for all damages and accidents caused to work due to negligence on their part. In case of any accident of the laborers/ contractual staff, the entire responsibility will rest on the contractor and any compensation under such circumstances, if becomes payable, shall be entirely borne by the contractor. - The contractor, their authorized representative, workmen etc. shall strictly observe orders pertaining to fire precautions prevailing in the area. The Contractor shall take all necessary precautions to prevent any nuisance or inconvenience to the Employers, tenants or occupants of the adjacent properties and to the public in general. The Contractor shall use such methodology and equipment's for execution of the work, so as to cause minimum environmental pollution of any kind during construction, to have minimum construction time and minimum inconvenience public in general, etc. The Contractor shall take all precautions to prevent any pollution of streams and waterways. All waste or superfluous materials shall be carted away by the Contractor, entirely to the satisfaction of the Engineer-in-Charge. Utmost care shall be taken to keep the noise level to the barest minimum so that no disturbance as far as possible is caused. No claim whatsoever on account of site constraints mentioned above or any other site constraints not specifically stated here, shall be entertained from the Contractor
6.	**Safety measures:** - The issue of construction safety & standards has gained utmost importance in recent times. This subject is to be dealt with in an integrated manner with an approach to developing and establishing a safety culture at work sites. Broadly, its components are: o Creating awareness.

	o Education. o Training. o Implementation. o Enforcement measures - All workers of contractor and associate agencies, invariably and at all the times, must follow all safety norms, adopt safe construction practices and use all required safety gadgets in their working throughout the project duration. - The contractor shall issue Photo Identity Cards with unique numbers containing salient information of workers for the labour & their staff. The Contractor shall monitor and achieve the objectives of construction safety continuously, progressively and through affirmative action, and shall oversee implementation of safety program over the entire construction period.
7.	**Warning / Caution Boards:** All temporary warning / caution boards / glow signage display such as "Construction Work in Progress", "Keep Away", "No Parking", Diversions & protective Barricades etc. shall be provided and displayed during day time by the Contractor, wherever required and as directed by the Engineer-in-Charge. These glow signage and red lights shall be suitably illuminated during night also. The Contractor shall be solely responsible for damage and accident caused, if any, due to negligence on their part. Also the Contractor shall ensure that no hindrance, as far as possible, is caused to general traffic during execution of the work. This signage shall be dismantled & taken away by the Contractor after the completion of work, only after approval of the Engineer – in – Charge. Nothing extra shall be payable on this account.
8.	**Sign Boards** - The Contractor shall provide and erect a display board of size and shape as required and paint over it, in a legible and workman like manner, the details about the salient features of the project, as required by the Engineer-in-Charge. The Contractor shall fabricate and put up a sign board in an approved location and to an approved design indicating name of the project, PM / Employer, architects, structural consultants, Department etc. besides providing space for names of other Contractors, Associate contractors and specialized agencies. Nothing extra shall be payable on this account. - A display board shall be kept at site which would list the names of workers, teams andagencies following safety program in the best manner. This would be updated weekly. - Necessary protective and safety equipment's shall be provided to the Site Engineer, Supervisory staff, labour and technical staff of the contractor by the Contractor at their own cost and used at site. No inflammable materials including P.O.L shall be allowed to be stored in huge quantity at site. Only limited quantity of P.O.L may be allowed to be stored at site subject to the compliance of all rules / instructions issued by the relevant authorities and as per the direction of Engineer -in- Charge in this regard. Also all precautions and safety measures shall be taken by the Contractor for safe handling of the P.O.L products stored at site. All consequences on account of unsafe handling of P.O.L shall be borne by the Contractor.
9.	**Quality control Lab:** Establishment of Quality Control Laboratory: The contractor shall establish a quality control laboratory, at the site of work, equipped with calibrated equipment (as per list given below) to perform field tests, batch wise, for various materials, then and there

itself, as per quality plan and standards. The Contractor shall provide necessary Office accommodation to the staff of Employer/Employer's representative in quality control lab

The following equipment, including but not limited to, should be made available at site by the contractorfor testing of materials, samples, cubes etc.,

LIST OF ESSENTIAL LABORATORY EQUIPMENTS.	
SIEVES: IS Standard Sieves of all required sizes shall be made available at the Quality control lab	
FOR SOILS AND AGGREGATES	
1) Riffle Box for 40mm	2 No.s
2) Riffle Box for 20mm	2 No.s
3) Atterberg Limits (liquid and plastic limits) determination apparatus – Casegrande apparatus	1 Set
4) Atterberg Limits (liquid and plastic limits) determination apparatus – Cone penetration apparatus	1 Set
5) Modified compaction apparatus with all accessories	2 Sets
6) Dry density test apparatus (sand replacement apparatus – Medium & large size cylinders	3 Sets each with all accessories
7) California Bearing Ratio test apparatus (5 T capacity with all accessories)	
Lab	1 Set
Field	1 Set
8) CBR moulds with all accessories	6 sets min. (Tripad, Dial gauges of 0.01LC & Surcharge weights - 5kg and 2.5kg)
9) Rapid Moisturemeter with chemicals	4 Sets
10) Specific Gravity bottles (pycnometer apparatus)	3 sets. with all accessories
11)Specific Gravity bottle	
50ml capacity	2 Sets
100ml capacity	2 Sets
12)Soil Hydrometer	1 Set
13)Triaxial apparatus with all accessories	1 Set
14) Plate Bearing Test apparatus with accessories	1 Set
15) Aggregate Crushing apparatus with all accessories	1 Set

16) Aggregate Impact Testing apparatus with all accessories	1 Set
17) Los Angeles Abrasion apparatus with all accessories	
18) Density Basket	1 Set
19) Length & Thickness Gauges (Flakiness & Elongation index apparatus)	2 Sets
20) Mechanical Sieve Shaker with 300mm & 450mm dia. adopters for corresponding sieves)	1 Set
21) Densitometer (or alternate testing tools as per relevant IS codes with approval from Engineer-in-charge are permissible)	1 Set
22) Water Tank for CBR moulds soaking (6 ft X 3 ft X 1.5 ft)	1 No.
23) Bulk Density Cylinders	15 Ltrs. & 3 Ltrs.
Standard Proctor moulds	1000 cc (2 no.s)
Modified Proctor moulds	2500 cc (2 no.s)
Pycnometer bottles	4 no.s
Straight Cutting Edges	12" – 2 no.s
Proving Rings	20 KN, 10 KN, 30 KN
Plnger Dial Guages (0-25 mm)	6 no.s
FOR CEMENT & CONCRETE WORKS.	
1) Vicat apparatus with all accessories	1 Set
2) Lechatelier apparatus – for soundness test	1 Set
3) Compression Testing Machine – 200 T capacity	1 Set
4) Flexural Strength Testing Machine	1 Set
5) Cement Mortar Cube Vibrator	1 Set
6) Vibrating Table – 500mm X 500mm	1 Set
7) Concrete Cube Moulds – 150mmX150mmX150mm	48 Nos. min
8) Mortar Cube Moulds – 70.6mmX70.6mmX70.6mm	24 Nos. min
9) Slump Cone apparatus with all accessories	4 Sets
10) Scoops – Big&Small	2 Nos. + 2 Nos.

11)Trowels - Big&Small	2 Nos. + 2 Nos.
12) Laboratory Mixer about 1 cft	1 No.
13)Water Tank for curing – 15 ft X 6 ft X 3ft.	1 No.
14)Ennore Sand – Gr.I, Gr.II and Gr.III	3 Bags each.
FOR BITUMINOUS MIXTURES	
1) Universal Penetrometer automatic type	1 No.
2) Ring and Ball apparatus electrically heated	1 No.
3) Standard Tar-Viscometer electrically heated with 4mm & 10mm cup and valve	1 No.
4) Flash & Fire point Apparatus (Pensky-Marten closed tester apparatus)	1 No.
5) Ductility Testing apparatus electrically operated	1 No.
6) Marshall Stability Test apparatus with all accessories	1 No.
7) Marshall Moulds	18 Nos
8) Centrifuge Bitumen Extractor electrically operated	1 No.
9) 3 m Straight edge with dip measuring wedge	1 No.
10) Camber Board	1 No.
11) Core cutting machine with 100mm dia. diamond cutting edge	1 No.
12) Vacuum pump	1 No.
13) Marshal Mould Compactor	1 No.
14) Prime / Tack coat Trays	(2+2) sets
15) Rain guage	1 Set
16) Stove & Pan	1 No.
Standard Weights	500 g, 1 Kg, 2Kg, 5Kg, 10Kg, 20 kg, 50Kg
Weight Box	1gm to 200 g
GENERAL EQUIPMENTS	
1) Thermostatically Controlled Drying Ovens Controlled at 105^0 – 110^0C +/- 1^0C and Range 40^0 – 250^0C +/- 1^0C	2 Nos.(Big&Small)
2) Thermostatically Controlled Water Bath Range 0 – 100^0C +/- 2^0C	1 No.
3) Weighing Machines	

250 kg capacity, sensitivity 100g	1 No.
50 kg capacity, sensitivity 10 g	2 Nos.
25 kg capacity, sensitivity 10 g	2 Nos.
10 kg capacity, sensitivity 1 g (electrical)	2 Nos.
5 kg capacity, sensitivity 0.1 g (electrical)	1 No.
1 kg capacity, sensitivity 0.01 g (electrical)	1 No.
200 g capacity, sensitivity 0.001 g	1 No.
4) Stop Watch – 0.5 sec sensitivity	2 Nos.
5) Distillation apparatus with all accessories	1 Set
6) P_H Testing kit	1 Set
7) Water testing kit	1 Set
8) Thermometers	
Glass thermometers, range 0 – 250^0C	4 Nos.
Steel thermometers, range 0 – 300^0C	4 Nos.
Distance thermometer, range 0 – 250^0C	4 Nos.
9) Glass wares	
Measuring jars – 100ml to 1000ml capacity	3 nos. Each
Conical Flasks – 500ml capacity	2 Nos.
Pipettes	2 Nos.
Burettes with stand	2 Nos.
Funnels	2 Nos.
Beakers – 500ml and 250ml capacity	2 Nos. Each
GMM Flask	2 Ltrs. & 5 Ltrs.
10) Wash Bottles	
11) Trays	
750mm X 600mm X 60mm	6 Nos.
450mm X 300mm X 60mm	6 Nos.
300mm X 250mm X 40mm	6 Nos.
12) Sampling Tins with lid	
100mm dia	48 Nos.
50 mm dia.	48 Nos.

	13) Vernier Calipers	1 No.
	14) Digital Vernier Calipers	1 No.
	15) Measuring Tap – 5m	2 Nos.
	16) Thickness gauge	1 No.
	17) French Curves	1 Set
	18) Gas stove, kadai, scoops, 2lb hammers, wooden hammers, chisels and glosses.	
	19) Digital Thermo Hygrometer	1 No.
	20) Micro meters 0 – 250 mm	1 No.
CHEMICALS: All required chemicals shall be made available at the Quality control lab		
REAGENTS: All required reagents shall be made available at the Quality control lab		
OTHERS		
	1) Filter papers – whatman 40 – 60.	
	2) Litmus papers – Blue & Red.	

Calibration of Equipment: All the equipment maintained by the contractor at site shall be calibrated from time to time according to the calibration frequency mentioned, with calibrations traceable to National Standards. Records for proof of such calibrations done for each instrument, with instrument number shall be maintained by the contractor and shall be made available for verification / counter signature by the Engineer-in-charge. Proper storage, handling and use of these instruments shall be ensured so that their calibration does not get disturbed due to weather factors etc., Frequency of the calibration shall be as decided by the Engineer-in-charge.

Quality Registers:
The contractor shall maintain the Quality Test Registers at site in the format specified and record therein the results of all the tests conducted. The relevant reports of the tests conducted shall be maintained in a separate file.

Return of Site documents:
All the site records/ documents mentioned therein shall be returned to the Engineer- in-charge in full shape after the satisfactory completion of the work who in turn will hand over to the department.

10.	**Water Supply:** The Contractor has to make their own arrangements for water suitable and required for the work and to the colonies and work sites, which are to be established by the Contractor.
11.	i. **Electrical Power:** a. The Contractors will have to make their own arrangements for drawing electric power from the nearest power line after obtaining permission from the APSPDCL at their own cost for construction purpose. In case of failure of electricity, the Contractor has to make alternative

	arrangements for supply of electricity by Diesel Generator sets of suitable capacity at place of work. If the supply is arranged by the Department, necessary charges shall have to be paid based on the assessed rates. b. The contractor will pay the bills of Electricity Board for the cost of power consumed by them. c. The contractor shall satisfy all the conditions and rules required as per Indian Electricity Act 1910 and under rule –45(I) of the Indian Electricity Rules, 1956 as amended from time to time and other pertinent rules. The power shall be used for bonafide Departmental works only.
12.	i. **Electric Power for Domestic Supply:** a. The contractor has to make their own arrangements for the supply of electric powerfor domestic purposes and the charges for this purpose have to be paid by them at the rates as fixed by the Andhra Pradesh State Electricity Board from time to time. ii. The contractor will have to make their own arrangements to lay and maintain the necessary distribution lines and wiring for the camp at their own cost. The layout andthe methods of laying the lines and wiring shall have the prior approval of the **Employer/Employer's representative**. All camp area shall be properly electrified. All lines, streets, approaches for the camp etc., shall be sufficiently lighted for the safety of staff and labour of the contractor, at the cost of the Contractor and it will be subject to the approval of the **Employer/Employer's representative**.
13.	**Land for Contractor's use:** - The contractor will be permitted to use Government land for execution of work. The contractor shall have to make their own arrangements for acquiring and clearing the site, leveling, providing drainage and other facilities for labour staff colonies, site office, work-shop or stores and for related activities. The Contractor shall apply to the Department within a reasonable time after the award of the contract and atleast 30 - days in advance of its use, the details of land required by them for the work at site and the land required for their camp and should any private land which has not been acquired, be required by the contractor for their use. The same may be acquired by the contractor at their own cost by private negotiations and no claim shall be admissible to them on this account. **1.** The Department reserves the right to refuse permission for use of any government land for which no claim or compensation shall be admissible to the contractor. The contractor shall, however, not be required to pay cost or any rent for the Government land given to them.
14.	**Surrender of Occupied Land:** i. The Government land as here in before mentioned shall be surrendered to the **Employer/Employer's representative** within seven days, after issue of completioncertificate. Also no land shall be held by the contractor longer than the Engineer- in-Charge shall deem necessary and the contractor shall on the receipt of due notice from the **Employer/Employer's representative**, vacate and surrender the land which the Engineer-in-Charge may certify as no longer required by the Contractor for the purpose of the work. The contractor shall make good to the satisfaction of the **Employer/Employer's representative** any damage to areas, which they have to return or to other property or land handed over to them for purpose of this work. Temporary structures may beerected

	by the contractor for storage sheds, offices, residences etc., for non- commercial use, with the permission of the **Employer/Employer's representative** on the land handed over to them at their own cost. At the completion of the work these structures shall be dismantled site cleared and handed over to the **Employer/Employer's representative**. The land required for providing amenities will be given free of cost from Government lands if available otherwise the contractor shall have to make their own arrangements.
15.	**Contractor not to dispose of Spoil etc.:-** The contractor shall not dispose of or remove except for the purpose of fulfillment of this contract, sand, stone, clay ballast, earth, trees and shrubs or other materials obtained in the excavation made or lying on the site of the work, and all such materials and produce shall remain property of the Government. The Department may upon request from the contractor, or if so stipulated in the conditions of the contract allow the contractor to use any of the above materials for the works either free of cost or after payment as may be specifically mentioned or considered necessary during the execution of the work.
16.	**Roads:** i. In addition to existing public roads and roads Constructed by Government, if any, in work area all additional approach roads inside work area and camp required by the Contractor shall be constructed and maintained by them at their own cost. The layout design, construction and maintenance etc. of the roads shall be subject to the approval of the **Employer/Employer's representative**. The contractor shall permit the use of these roads by the Government free of charge. ii. It is possible that work at, or in the vicinity of the work site will be performed by the Government or by other contractors engaged in work for the Government during the contract period. The contractor shall without charge permit the government and such other contractor and other workmen to use the access facilities including roads and other facilities, constructed and acquired by the contractor for use in the performance of the works. iii. The contractor's heavy construction traffic or tracked equipment shall not traverse any public roads or bridges unless the contractor has made arrangement with the authority concerned. In case contractor's heavy construction traffic or tracked equipment is not allowed to traverse any public roads or bridges and the contractor is required to make some alternative arrangements, no claim on this account shall be entertained. iv. The contractor is cautioned to take necessary precautions in transportation of construction materials to avoid accidents.
17.	**Payment for Camp Construction:** No payment will be made to the contractor for construction, operation and maintenance of camp and other camp facilities and the entire cost of such work shall be deemed to have been included in the tendered rate for the various items of work in the schedule of quantities and bids.
18.	**Explosive and Fuel Storage Tanks:** No explosive shall be stored within ½ (half) KM of the limit of the camp sites. The storage of gasoline and other fuel oils or of Butane, Propane and other liquefied petroleum gases, shall confirm to the regulations of Andhra Pradesh State Government and Government of India. The tanks, above ground and having capacity in excess of 2000 liters, shall not be located within the camp area, nor within 200m, of any building.
19.	**Labour:** i. The contractor shall, make their own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and

	transport. Labour importation and amenities to labour and contractor's staff shall be to the contractor's account. Their quoted percentage shall include the expenditure towards importation of labour amenities to labour and staff; The contractor shall, if required by the Employer/Employer's representative, deliver to the Employer/Employer's representative a written in detail, is such form and at such intervals as the Employer/Employer's representative may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the contractor on the Site and such information respecting Contractor's Equipment as the Employer/Employer's representative may require**.**
20.	**Transportation of Labour:** i. The contractor shall make their own arrangement for the daily transportation of thelabour and staff from labour camps colonies to the work spot and no labour or staffof the contractor shall stay at the work spot. No extra payment will be made to thecontractor for the above transportation of the labour and their quoted percentage tothe work shall include the transportation charges of labour from colonies to work spot and back. The contractor will at all times duly observe the provisions of employment of children Act XXVI of 1938 and any enactment or modification of the same and will not employ or permit any person to do any work for the purpose under the provisions of this agreement in contravention of said Act. The contractor here by agrees to indemnify the department from and against all claims, penalties which may be suffered by the department or any person employed by the department byany default on the part of the contractor in the observance and performance of theprovisions of the employment of children Act. XXVI of 1938 or any enactment or modification of the same.
21.	**Safety Measures:** i. The contractor shall take necessary precautions for safety of the workers and preserving their health while working in such jobs, which require special protectionand precautions. The following are some of the measures listed but they are not exhaustive, and contractor shall add to and augment these precautions on their own initiative where necessary and shall comply with directions issued by the **Employer/Employer's representative** or on their behalf from time to time and at alltimes. a. Providing protective footwear to worker's situations like mixing and placing of mortar or concrete sand in quarries and places where the work is done under much wet conditions. b. Providing protective head gear to workers at places like underground excavations to protect them against rock falls. c. Providing masks to workers at granulates or at other locations where too much fine dust is floating about and sprinkling water at frequent intervals by water hoses on all stone crushing area and storage bins abate to dust. d. Getting the workers in such jobs periodically examined for chest trouble due to too much breathing into fine dust. e. Taking such normal precautions like fencing and lightening in excavation of trenches, not allowing rolls and metal parts of useless timber spread around, making danger areas for blasting providing whistles etc. f. Supply work men with proper belts, ropes etc., when working in precarious slopes etc. g. Avoiding uninsulated electrical wire etc., as they would electrocute the works. h. Taking necessary steps towards training the workers concerned on the

	machinery before they are allowed to handle them independently and taking all necessary precautions in around the areas where machines hoists and similar units are working.
22.	**Fair Wage Clause:** i. The contractor shall pay not less than fair wages to laborer's engaged by them on thework. ii. "Fair" wages mean wages whether for time of piecework notified by the Government from time in the area in which the work is situated. iii. The contractor shall, not with-standing the revisions of any contract to the contrary, cause to be paid to the labour, in directly engaged on the work including any labour engaged by the sub-contractor in connection with the said work, as if the labourers had been directly employed by them. iv. In respect of labour directly or indirectly employed in the works for the purpose ofthe contractors part of the agreement the contractor shall comply with the rules and regulations on the maintenance of suitable records prescribed for this purposefrom time to time by the Government. They shall maintain their accounts and voucherson the payment of wages to the labourers to the satisfaction of the **Employer/Employer's representative.** v. The **Employer/Employer's representative** shall have the right to call for such record as required to satisfy himself on the payment of fair wages to the labourersand shall have the right to deduct from the contract amount a suitable amount formaking good the loss suffered by the worker or workers by reason of the "fair wages" clause to the workers. vi. The contractor shall be primarily liable for all payments to be made and for the observance of the regulations framed by the Govt. from time to time without prejudice to their right to claim indemnity from their sub-contractors. vii. As per contract labour (Regulation and abolition) Act. 1970 the contractor has to produce the license obtained from the licensing officers of the labour department along with the tender or at the time of agreement. viii. Any violation of the conditions above shall be deemed to be a breach of their contract. ix. Equal wages are to be paid for both men and women if the nature of work is sameand similar. The contractor shall arrange for the recruitment of skilled and unskilled labour localand imported to the extent necessary to complete the work within the agreed period as directed by the **Employer/Employer's representative** in writing.
23.	**Compliance with Labour Regulations:** i. During continuance of the contract, the contractor and their sub-contractors shall abide at all times by all existing labour enactment and rules made there under, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notifications that may be issued under any labour law in future either by the State or the Central Government or the local authority and also applicable labour regulations, health and sanitary arrangements for workmen, insurance and other benefits. Salient features of some of the major labour laws that are applicable to construction industry are given below. The contractor shall keep the Department indemnified in case any action is taken against Department by the competent authority on account of contravention of any of the provisions of any Act or rules made there-under, regulations or notifications including amendments. If the Department is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or

	for non- observance of the provision stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the contractor, the Engineer-in-charge /Department shall have the right to deduct any money due to the contractor including their amount of performance security. The Department/Engineer-in-Charge shall also have right to recover from the contractor any sum required or estimated to be required for making good the loss or damage suffered by the Department. The employees of the Contractor and the Sub-contractor in no case shall be treated as the employees of the Department at any point of time.
24.	**Work during night or on Sundays and holidays** i. The works can be allowed to be carried out during night, Sundays or authorized holidays in order to enable them to meet the schedule targets and the work shall requireMORT&H round the clock working keeping in view: ii. The provisions of relevant labour laws being adhered to: **a.** Adequate lighting, supervision and safety measures are established to the satisfaction of the **Employer/Employer's representative** and **b.** The construction programme given by the Contractor and agreed upon by the **Employer/Employer's representative** envisages such night working or working during Sundays or authorized holidays. The construction programme given by the Contractor and agreed upon by the **Employer/ Employer's representative** envisages such night working or working during Sundays or authorised holidays.
25.	**Protection of adjoining premises:** The contractor shall protect adjoining sites against structural, decorative and other damages that could be caused by the execution of these works and make good at their cost any such damages.
26.	**Layout of materials stacks:** The contractor shall deposit materials for the purpose of the work on such parts only of the ground as may be approved by the **Employer/ Employer's representative** before starting work. A detailed survey, clearly indicating position and areas where materials shall be stacked and sheds built is to be conducted by the contractor at their own cost and only after obtaining necessary approval of the plan for use of sites by the **Employer/ Employer's representative**, the Contractor can use the sites accordingly.
27.	**Use of blasting materials:** Procurement of blasting materials and its storage is the responsibility of the contractor.The contractor shall engage licensed blaster for blasting operation. The contractor is to act in accordance with Indian Explosive Act and other rules prevailing, during the execution of work. It is the responsibility of the contractor to see, that works by otheragencies in the vicinity are not hampered, in such cases if any claim is made by other agencies that should be borne by the contractor. Carriage of blasting materials, from the magazine to the work site, is the responsibility of the contractor.
28.	**Plant and Equipment:** i. The contractor shall have sufficient plant, equipment and labour and shall work such hours and shifts as may be necessary to maintain the progress on the work as per the approval progress schedule. The working and shifts hours shall comply with the Govt.Regulations in force. ii. It is to expressly and clearly understood that contractor shall make their own arrangements to equip himself with all machinery and special tools and plant for the speedy and proper execution of the work and the department does not undertake responsibility towards their supply.

	iii. The department shall supply such of the machinery that may be available on hire basis,but their supply cannot be demanded as matter of right and no delay in progress can be attributed to such non-supply of the plant by the department and the department cannot be made liable for any damage to the contractor. The Contractor shall be responsible for safe custody of the departmental machinery supplied to them (which willbe delivered to contractor at the machinery yard at site of work) and they have to make good all damages and losses if any other than fire, wear and tear to bring it to the conditions that existed at the time of issue to the contractor before handing over the same to the department. The hire charges for the machinery handed over to the contractor will be recovered at the rate prevalent at the time of supply. The contractor will have to execute supplemental agreement with Executive Engineer at the time of supply of the machinery. iv. The acceptance of departmental machinery on hire is optional to the contractor.
29.	**Provisions of Health and Sanitation:** i. The contractor shall implement the sanitary and watch and ward rules and regulationsfor all forces employed under this contract and if the Contractor fails to enforce theserules, the **Employer/ Employer's representative** may enforce them at the expenses ofthe Contractor. The contractor's special attention is invited to clause 37, 38, 39 and 51 of the preliminary specification to the A.P.S.S. and they are required to provide at their own expenses the following amenities to the satisfaction of Engineer-in-charge concerned. ii. **First Aid:** At the work site there shall be maintained in a readily accessible place, firstaid appliances and medicine including adequate supply of sterilized dressing and sterilized cotton wool. The appliance shall be kept in good order. They shall be placed under the charge of a responsible person, who shall be readily available during workinghours. iii. **Drinking water:** Water of good quality for drinking purpose shall be provided for the worker on a scaleof not less than 2 gallons per head per day. Where drinking water is obtained from an intermittent public water supply each work site shall be provided with a storage tank, where such drinking water shall be stored. Every water supply storage shall be at a distance of not less than 10 M. from any latrine drain or other source of pollution where water has to be drained. Any existing well, which is within such proximity of any latrine, drain or other source ofpollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be dust and water proof. A reliable pump shall be fitted to each inner well. The trap door shall be keep lockedand opened only for inspection or cleaning which shall be done at least once a month. iv. **Washing and bathing place:** Adequate washing and bathing places shall be provided separately for men and women. Such place shall be keep clean and well drained, bathing or washing should not be allowed in or near any drinking water well. v. **Latrine and Urinals:** There shall be provided within the area of all work site latrines and urinals in an accessible place to men and women separately. For each of them shall be on the following scales or the scale as directed by Engineer-in-charge in any case. a. Where the number of persons employed does not exceed 50– 2 b. Where the number of persons employed exceeds 50 but does not exceed 100 – 3; For every additional 100 – 3 c. If women are employed, separate latrines and urinals separated from

	those for men shall be provided on the same scale. d. Except in work site provided with water flushed latrines connected with a water bornesewage system all latrine shall be cleaned at least four times daily and at least twice during working hours and kept in a strict sanitary condition. The receipt scales shall betarred inside and outside at least once a year The excrete from the latrines shall be disposed of at the contractor's expenses in a way approved by the local public health authority. The contractor shall also employ adequate number of scavengers and conservancy shall keep the latrines and urinalsin a clean condition.
30.	**Shelters during Rest:** At the work site there shall be provided free of cost two suitable sheds, one for meals and other for rest for the use of workers.
31.	**Creches:** At every work site at which 50 or more women workers are ordinarily employed there shall be provided two rooms of suitable size for use of children under the age of 6 years. One room shall be used for infant's games and other as a bedroom. The rooms shall be secured and constructed following minimum standards. Planks spread over the mud floor and covered with matting. The use of rooms shall be restricted to children their attendants and mothers of the children.
32.	Land should be acquired temporarily for Storing Contractor's materials or for housing their staff. The contractor should make their own arrangements for temporary acquisition of land required for storing their materials and for the housing of their staff at their own expenses.
33.	**Ecological Balance:** The contractor shall maintain ecological balance by preventing de-forestation, water pollution and defacing of natural landscape. The contractor shall so conduct their construction operation as to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work. In respect of the ecological balance, Contractor shall observe the following instructions. • Where unnecessary destruction, scarring, damage or defacing may occur, as result of the operation, the same shall be repaired replanted or otherwise corrected at the contractor's expense. The contractor shall adopt precautions when using explosives, which will prevent scattering of rocks or other debris outside the work area. All work area including borrow areas shall be smoothened and graded in a manner to conform to the natural appearances of the landscape as directed by the Employer/ Employer's representative. • All trees and shrubbery which are not specifically required to be cleared or removed for construction purposes shall be preserved and shall be protected from any damage that may be caused by the contractor's construction operation and equipment. The removal of trees and shrubs will be permitted only after prior approval by the Employer/ Employer's representative. Special care shall be exercised where trees or shrubs are exposed to injuries by construction equipment, blasting, excavating, dumping, chemical damage or other operation and the contractor shall adequately protect such trees by use of protective barriers or other methods approval by the Engineer-in-Charge. Trees shall not be used for anchorages. The contractor shall be responsible for injuries to trees and shrubs caused by their operations. The term "injury" shall include, without limitation bruising, scarring, tearing and breaking of roots, trunks or branches. All injured trees and shrubs be restored as nearly as practicable without delay to their original condition at the contractor's expense.

	• The contractor's construction activities shall be performed by methods that will present entrance or accidental spillage of solid matter contaminants, debris and other objectionable pollutants and wastage into river. Such pollutant and waste include earth and earth products, garbage, cement concrete, sewage effluent, industrial wastes, radio-active substances, mercury, oil and other petroleum products, aggregate processing, mineral salts and thermal pollution. Pollutants and wastes shall be disposed off in a manner and at sites approved by the Engineer-in-Charge. • In conduct of construction activities and operation of equipments the contractor shall utilise such practicable methods and devices as are reasonably available to control, prevent and otherwise minimise the air pollution. The excessive omission of dust into the atmosphere will not be permitted during the manufacture, handling and storage of concrete aggregates and the contractor shall use such methods and equipment as a necessary for collection and disposal or prevention of dust during these operations. The contractor's methods of storing and handling cement shall also include means of eliminating atmospheric discharges of dust, equipment and vehicles that give objectionable omission of exhaust gases shall not be operated. Burning of materials resulting from clearing of trees, bushes, combustible construction materials and rubbish may be permitted only when atmospheric conditions for burning are considered favorable. Separate payment will not be made for complying with the provisions of this clause and all cost shall be deemed to have been included in the unit rates and prices included in the contract if any provision is not complied with within a reasonable time even after issue of a notice in this respect, the necessary operations would be carried out by the Employer/ Employer's representative at the cost of the Contractor, Orders of the Employer/ Employer's representative in this respect would be final and binding on the contractor.
34.	**Preservation of existing vegetation:** The contractor will preserve and protect all existing vegetation such as trees, on or adjacent to the site which do not unreasonably interfere with the construction as may be determined by the Employer/ Employer's representative. The contractor will be held responsible for all unauthorized cutting or damage of trees, including damage due to careless operation of equipment, stockpiling of materials or trecking of grass areas by equipment. Care shall be taken by the Contractor in felling tress authorised for removal to avoid any unnecessary damages to vegetation and tress that are to remain in place and to structures under construction or in existence and to workmen. All the produce from such cutting of trees by the contractor shall remain the property of Government and shall be properly stacked at site, approved by the Employer/ Employer's representative. No payment whatsoever shall be made for such cutting and its stacking by the Contractor. If any produce from such cutting is not handed over to the Government by the contractor, they shall be charged for the same at the rates to be decided by the Employer/ Employer's representative. The recovery of this amount shall be made in full from the intermediate bill that follows. The contractor shall also make arrangements of fuel deposits for supply of required fuel for the labourer to be employed for cooking purpose at their own cost in order to prevent destruction of vegetation growth in the surrounding area of the work site.
35.	**Access to the contractor's books:** Whenever it is considered necessary by the Engineer-in-Charge to ascertain the actual cost of execution of any particular extra item of work or supply of the plant or material

	on which advance is to be made or of extra items or claims, they shall direct the contractor to produce the relevant documents such as payrolls, records of personnel, invoices of materials and any or all data relevant to the item or necessary to determine its cost etc. and the contractor shall when so required furnish all information pertaining to the aforesaid items in the mode and manner that may be specified by the Engineer-in-Charge.
36.	**Drawing to be kept at site:** One copy of the drawings furnished to the contractor shall be kept by the contractor on the site and the same shall at all reasonable time be available for inspection and use by the Engineer-in-Charge and the Engineer-in-Charge's representative and by any other persons authorised by the Engineer-in-Charge in writing.
37.	**B.I.S. [I.S.I.] books and ANDHRA PRADESH STANDARD SPECIFICATIONS to be kept at site:** A complete set of Indian Standard specifications, CPHEEO manual and also conform to the standard specifications like APDSS/BIS Specifications/MoRTH/ NBC/NEC/GOI Manuals/GOI advisories etc., on sewerage and treatment and any other relevant literature referred to in "Technical Specifications" and A.P.S.S. shall be kept at site for reference.
38.	**Site Order Book:** An order book shall be kept at the site of the work. As far as possible, all orders regarding the work are to be entered in this book. All entries shall be signed and dated by the Project Manager of PMC, Department Officer in direct charge of the work and by the contractor or by their representative. In important cases, the Executive Engineer or the Superintending Engineer will countersign the entries, which have been made. The order book shall not be removed from the work, except with the written permission of the Executive Engineer.
39.	**Variations by way of modification, omissions or additions:** For all modifications, omissions from or additions to the drawings and specifications, the PMC on will issue revised plans, or written instructions, or both. No modification, omission or addition shall be made unless approved by the Department. The PMC shall have the privilege of ordering modifications, omission or additions at any time before the completion of the work and such orders shall not operate to annual those portions of the specifications with which said changes do not conflict. Employer/ Employer's representative Decision: It shall be accepted as in separable part of the contract that in matters regarding materials, workmanship, removal of improper work, interpretation of the contract drawings and contract specification, mode of the procedure and the carrying out o the work, the decision of the Employer/ Employer's representative, which shall be given in writing shall be binding on the contractor.
40.	**Care and diversion of river/stream:** The contractor shall submit details regarding the diversion and care of river or stream during construction of the work along with a separate print-out of the time table showing earliest and latest start and finish dates of various activities. They should submit a detailed layout plan with drawings for the diversion and care of river during construction of work. The above arrangements shall be at contractor's cost.
41.	**Supply of construction materials:** - The contractor has to make their own arrangements for procurements, supply and use of construction materials. - All materials so procured should confirm to the relevant specifications indicated in the bidding documents.

	- The contractor shall follow all regulations of the Department/Government of India in respect of import licenses etc., of the procurement of the materials is through imports and they shall be responsible for the payment of applicable duties and taxes, port clearances, inland transportation etc. - The contractor shall make their own arrangements for adequate storage of the materials. Usage of Ready mixed concrete manufactured by outside agencies shall not be allowed. The contractor shall invariably establish batch mix plant of required capacity and shall use same concrete for the work.
42.	Temporary office accommodation and transport facilities for the departmental engineers The Contractor shall provide and maintain separate temporary office accommodation for the exclusive use of the Departmental Engineers and delegated assistants of not less than 1800 sft. within site area compound with provision for work stations and Conference room, office desks, toilet facilities, RO drinking water arrangements, with complete air conditioning. The Contractor should also arrange for necessary inventory for Engineering department such projector, internet, printer, scanner & xerox facilities, washing, water, electrical & power, benches, tables, Chairs, storage racks, cabinets & other furniture as per requirement during execution period. All these facilities shall be completed within 2 months from the date of issue of work order.
43.	Drawings given, listed and indexed in bid documents are indicative. The above drawings show the system, as a whole. The contractor shall carry out investigation to prepare detailed layout, designs and drawings of balance required components of the work within the stipulated time period, to be approved by departmental authority. The contractor shall follow all relevant BIS codes / circulars issued by the department from time to time for various components of the works. In case of difference of opinion on technical matters between the contractor and the Engineer-in-charge, the decision of the appellate authority shall be final and binding on the contractor.
44.	**Setting Out** - The contractor shall establish, maintain and assume responsibility for grades, lines, levels and bench marks. They shall report any errors or inconsistencies regarding grades, lines, levels, dimensions to the Engineer-in-Charge before commencing work. Commencement of work shall be regarded as the contractor's acceptance of such grades, lines, levels and dimensions and no claim shall be entertained at a later date for any errors found. - In order to set the alignment of roads / foundations of structures and to mark the same on the ground, the agency is to adopt "total station" surveying method. The agency is to engage a well versed and well experienced surveyor in "total station" survey. Nothing extra for this total station survey is payable. - If at any time, any error in the respect of setting out appears during the progress of the work, the contractor shall, at their own expense rectify such error if so required, to the satisfaction of the Engineer-in-Charge. - Though the site levels are indicated in the drawings, the contractor shall ascertain himself and confirm the site levels with respect to GTS bench mark from the concerned authorities. The contractor shall protect and maintain temporary/ permanent benchmarks at the site of work throughout the execution of the work. These bench marks shall be got checked by the Engineer-in-Charge or their authorized representatives. - The work at different stages shall be checked with reference to bench marks maintained for the said purpose. Nothing extra shall be payable on this account. - The approval by the Engineer-in-Charge, of the setting out by the contractor, shall not relieve the contractor of any of their responsibilities and obligation to

	rectify the errors/defects, if any, which may be found at any stage during the progress of the work or after the completion of the work. - The contractor shall be entirely and exclusively responsible for the horizontal, vertical and other alignments, the level and correctness of every part of the work and shall rectify effectively any errors or imperfections therein. Such rectifications shall be carried out by the contractor at their own cost to the instructions and satisfaction of the Engineer-in-Charge. - The Contractor shall carry out survey of the work area, at their own cost, setting out the levels and bench marks in consultation with the Engineer-in-Charge & proceed further. Any discrepancy between the approved drawings and actual layout at site shall be brought to the notice of the Engineer-in-charge. It shall be responsibility of the Contractor to ensure correct setting out of alignment. Total station survey instruments only shall be used for layout, fixing boundaries, and center lines, etc., along with theodolites. Nothing extra shall be payable on this account. Contractor shall provide permanent bench marks, flag tops and other reference points for the proper execution of work and these shall be preserved till the end of work. All such reference points shall be in relation to the levels and locations, given in the approved design drawings.
45.	**General cleanliness of the site and Stacking & Storage of Materials:** - The site of work shall be always kept clean in general strictly adhering to approved job layout and green building parameters. The Contractor shall take all care to prevent any water- logging at site. The waste water shall not be allowed to be collected at site. It may be directly pumped into the public drainage system with prior approval of the concerned authorities. For discharge into public drainage system, necessary permission shall be obtained from concerned authorities after paying the necessary charges, if any, directly to the authorities. The work shall be carried out in such a way that the area is kept clean and tidy. All the fees/charges in this regard shall be borne by the Contractor. Nothing extra shall be payable on this account. - The contractor shall take instructions from the Engineer-in-Charge regarding collection and stacking of materials at any place. No excavated earth or rubbish shall be stacked on areas where other buildings, roads, compound wall, services etc. are to be constructed. - For construction works which are likely to generate malba / rubbish, contractor shall dispose of malba, rubbish & other unserviceable materials and wastes at their own cost to the notified/specified dumping ground and under no circumstances these shall be stacked / dumped even temporarily, outside the construction premises. The contractor shall construct suitable godowns, yard at the site of work for storing all other materials so as to be safe against damage by sun, rain, damages, fire, theft etc. at their own cost and also employ necessary watch and ward establishment for the purpose at their cost.
46.	**SECRECY** - The contractor shall take all steps necessary that all persons employed on any work in connection with the contract have noticed that the Indian Official Secrets Act 1923 applies to them & will continue so to apply even after the execution of such works under the contract. - The contract is confidential and must be strictly confined to the contractor's own use (except so far as confidential disclosure to sub-contractors or suppliers as necessary) and to the purpose of the contract. All documents, copies thereof & extracts there from furnished to the contractor shall

	be returned to the Engineer-in-Charge on the completion of the work / works or the earlier determination of the contract
47.	**LABOUR AND SECURITY** - In the event of the contractor(s) committing a default or breach of any of the provisions of the Contractor's Labor Regulations and Model Rules for the protection of health and sanitary arrangements for the workers as amended from time to time or furnishing any information or submitting or filing any statement under the provisions of the above Regulations and Rules which is materially incorrect, they shall, without prejudice to any other liability, pay to the Government a sum not exceeding Rs.500/- for every default, breach or furnishing, making, submitting, filing such materially incorrect statements and in the event of the contractor(s) defaulting continuously in this respect, the penalty may be enhanced to Rs.500/- per day for each day of default. The decision of the Engineer-in-Charge shall be final and binding on the parties. - No payment shall be made for construction of labor housing. - The Contractor shall display all permissions, licenses, registration certificates, other statements etc. under various labor laws and other regulations applicable to the works, at their site office. - Contractor should provide their plan for labor camps as per their requirement and get it approved from the Engineer-in-Charge. The contractor will be provided space for labor camps etc. inside the campus at a suitable place, but the space requirement and location, as assessed by Engineer-in-Charge shall be final and binding. - If as per the rules of the local authority, the camps for labor are not to be erected at the site of work by the contractors, the contractors are required to provide such accommodation as is acceptable to local bodies and nothing extra shall be paid on this account. - Contractor has to follow the security requirement of the campus and obtain necessary entry passes for the labor and vehicles and follow security checks at entry / exit gates, restriction on movement of vehicle, restricted timings of working etc. The Department however shall assist the contractor in obtaining such passes for movement of vehicles and labor. No claim whatsoever shall be entertained on account of delay in entry of vehicles and labor including restrictions in working hours, if there is any. - The contractor shall employ personnel after verifying their antecedents and loyalty. The contractor shall, on demand submit list of their agents, employees and work people concerned & shall satisfy as to the bonafides of such people. - The contractor & their work people shall observe all relevant rules regarding security promulgated in which work is to be carried out by the Controlling Administrative Authority of the campus/area (hereinafter referred to as "Administrator"). - The contractor, their representative, workman shall be allowed to enter through specified gates & timing as laid down by the controlling authority. They shall be issued an identity card or an individual pass in accordance with the standing rules & regulations & they should possess the same while working. The contractor shall be responsible for the conduct & actions of their workmen, agents/ representatives. - Normally contractor shall be allowed to carry out work between 7 AM to 6 PM. However, they may also be allowed to carry out the work beyond 6 PM & up to 7 AM if the site conditions / circumstances so demand with prior written permission from the "Administrator". However, if the work is carried out in more than one shift or at night, no claim on this account shall be entertained.

	- Normally contractor's material / vehicles etc. shall be allowed to move in / go-out between 7 AM to 7 PM only & no movement of material / vehicles out of site of work shall be allowed during night hours unless specific permission is obtained from the "Administrator". - In case if a separate entry has been allowed, the contractor has to make all arrangement for making a separate entry gate and barricading of the working area to segregate/separate the same from other areas. All these have to be done by the contractor at their own cost including safeguarding any untoward incident in the restricted area due to separate entry gate and barricading arranged by the contractor. No extra amount on this account shall be payable by the department. - In the event of any restrictions being imposed by the Security agency, movement of labor /material, the contractor shall strictly follow such restrictions and nothing extra shall be payable to the contractor on such accounts. The loss of time on these accounts, if any, shall have to be made up by augmenting additional resources whatever required. Nothing extra shall be payable on this account.
48.	**DOCUMENTATION** The Contractor shall render all help and assistance in documenting the total sequences of this project by way of photography, slides, audio / video recording & other records etc. The payments for all these jobs shall be borne by contractor. The original films shall be the property of the Department. No copy shall be prepared without the prior approval of the Engineer-in-Charge.
49.	**PROGRESS CHART: -** - The contractor shall submit a Time and Progress Chart for each mile stone. The Engineer-in-charge may within 15 days thereafter, if required modify, and communicate the program approved to the contractor failing which the program submitted by the contractor shall be deemed to be approved by the Engineer-in-charge. The work programme shall include all details of balance drawings and decisions required to complete the contract with specific dates by which these details are required by contractor without causing any delay in execution of the work. The chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the works. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work and may be amended as necessary by agreement between the Engineer-in-charge and the Contractor within the limitations of time imposed in the Contract documents, and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work, exceeds one month (save for special jobs for which a separate programme has been agreed upon) complete the work as per mile stones given elsewhere in this tender document. - In case of non-submission of construction programme by the contractor the program approved by the Engineer-in-charge shall be deemed to be final. - The approval by the Engineer-in-charge of such programme shall not relieve the contractor of any of the obligations under the contract. - The contractor shall submit the Time and Progress Chart and progress report using the mutually agreed software or in other format decided by Engineer-in-charge for the work done during previous month to the Engineer-in-charge on or before 5th day of each month failing which a recovery Rs. 5000/- shall be made per week or part basis in case of delay in submission of the monthly progress report.

	- The program chart should include the following: - ▪ Descriptive note explaining sequence of various activities. ▪ PERT or CPM of programming using MS Project or Primavera or in other format decided by Engineer-in-charge which will indicate resources in financial terms, manpower and specialized equipment's or every important stage. ▪ Program for procurement of materials by the contractor. The contractor shall first make note of pipes available at the site of work for use in the contract and then plan for procurement of balance pipes. ▪ Program for arranging and deployment of manpower both skilled and unskilled so as to achieve targeted progress. ▪ Program of procurement of machinery / equipment's having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor. In addition, to the above to achieve the progress of work as per programme, the contractor must bring at site adequate shuttering material required for cement concrete and RCC works etc. The contractor shall submit shuttering schedule adequate to complete the structure work within the laid down physical milestones. ▪ Programme for achieving milestones. The submission for approval by the Engineer-in-charge of such programme or such particulars shall not relieve the contractor of any of the duties or responsibilities under the contract. This is without prejudice to the right of Engineer-in-charge to act against the contractor as per terms and conditions of the agreement
50.	**PROGRESS AND MONITORING OF WORK:** - The progress report shall contain the following, apart from whatever else may be required as specified: - - Construction schedule of the various components of the work through an approved program chart for the next three months (or as may be specified), showing the micro milestones, targeted tasks and up to date progress. At least 10 digital photographs showing all the parts of construction site along with at least 5 minutes video of executions of different items in soft copy must be submitted in every monthly progress report. o Progress chart of the various components of the work that are planned and achieved, for the month as well as cumulative up to the month, with reason for deviations, if any in a tabular format. o Plant and machinery statement, indicating those deployed in the work. o Man-power statement, indicating individually the names of all the staff deployed on the work, along with their designations. Number of skilled workers and unskilled workers deployed on the work and their location of deployment. o Financial statement, indicating the broad details of all the running account payment received up to date, such as gross value of work done, advances taken, recoveries effected, amount withheld, net payments details of cheque payment received, extra /substituted /deviations items if any, etc. - The contractor shall conduct their work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer- in-Charge and shall as far as possible arrange their work and shall place and dispose of the materials being used or removed so as not to

	interfere with the operations of other contractor or they shall arrange their work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of Engineer-in-charge. - The Contractor shall do proper sequencing of the various activities by suitably staggering the activities within various pockets in the plot so as to achieve early completion. The agency may deploy adequate equipment, machinery and labor as required for the completion of the entire work within the stipulated period specified. Also ancillary facilities shall be provided commensurate with requirement to complete the entire work within the stipulated period. Nothing extra shall be payable on this account. Adequate number/sets of equipment in working condition, along with adequate stand-by arrangements, shall be deployed during entire construction period. It shall be ensured by the Contractor that all the equipment, Tools & Plants, machineries etc. provided by them are always maintained in proper working conditions during the progress of the work and till the completion of the work. Further, all the constructional tools, plants, equipment and machineries provided by the Contractor, on site of work or their workshop for this work, shall be exclusively intended for use in the construction of this work and they shall not be shifted / removed from site without the permission of the Engineer-in-Charge. All material shall only be brought at site as per program finalized with the Engineer-in- Charge. Any pre-delivery of the material not required for immediate consumption shall not be accepted and thus not paid for.
51.	**Rates and other conditions for payment:** The rates quoted by the Contractor are deemed to be inclusive of the following-- - Site clearance, setting out work, profile, establishment of reference benchmark(s), taking spot levels, construction of all safety and protection devices, barriers, barricading, signage, labor safety, welfare & training measures, preparatory works, working during monsoon, working at all depths, height, lead, lift and location etc. until - / Unless specified otherwise, and any other incidental works required to complete this work. Nothing extra shall be payable on this account. - For works below ground level the contractor shall keep that area free from water. If dewatering or bailing out of water is required, the contractor shall do it and nothing extra shall be paid except otherwise provided in the items of schedule of quantities. - Any legal or financial implications resulting out of disposal of earth shall be sole responsibility of the contractor. Nothing extra over the schedule shall be paid on this account. - All labor, material, tools and plants and other inputs involved in the execution of the item. - For completing the work in time, the Contractor might be required to work in two or more shifts (including night shifts). No claim whatsoever shall be entertained on this account, not with-standing the fact that the Contractor may have to pay extra amounts for any reason, to the laborers and other staff engaged directly or indirectly on the work according to the provisions of the labor and other statutory body regulations and the agreement entered upon by the Contractor with them. - The Contractor shall keep himself fully informed of all acts and laws of the Central & State Governments, all orders, decrees of statutory bodies, tribunals having any jurisdiction or authority, which in any manner may affect those engaged or employed and anything related to carrying out the work. All the

	rules & regulations and byelaws shall be adhered to, by the contractor, during the execution of work. The Contractor shall also adhere to all traffic restrictions notified by the local authorities. The Contractor shall arrange to give all notices as required by any statutory / regulatory authority and obtain all requisite licenses wherever required and shall pay to such authority all the fees that are required to be paid for the execution of work. They shall protect and indemnify the Department and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself or by their employees or their authorized representatives. Nothing extra shall be payable on these accounts. The fee payable to statutory authorities for obtaining the various permanent service connections and Occupancy Certificate for the building shall be borne by the Department. - The rates of the items indicated in the BoQ are exclusive of the Seigniorage Charges. Appropriate Seigniorage Charges for relevant materials will be calculated and paid by the PM to the concerned department of Government of AP at the time of payment of bills to the contractor. - All ancillary and incidental facilities required for execution of work like labor camp, stores, fabrication yard, offices for Contractor, watch and ward, temporary ramp required to be made for working at the basement level, temporary structure for plants and machineries, water storage tanks, installation and consumption charges of temporary electricity, telephone, water etc. required for execution of the work, liaison and pursuing for obtaining various No Objection Certificates, completion certificates from local bodies etc., protection works, barricading, testing facilities / laboratory at site of work, facilities for all field tests and for taking samples etc. during execution or any other activity which is necessary (for execution of work and as directed by Engineer-in-Charge), shall be deemed to be included in rates quoted by the Contractor, for various items in the schedule of quantities. Nothing extra shall be payable on these accounts. Before start of the work, the Contractor shall submit to the Engineer-in-Charge, a site / construction yard layout, specifying areas for construction, site office, positioning of machinery, material yard, cement and other storage, steel fabrication yard, site laboratory, water tank, etc. - The Contractor shall assume all liability, financial or otherwise in connection with this contract and shall protect and indemnify the Department from all damages and claims that may arise on any account. The Contractor shall indemnify the Department against all claims in respect of patent rights, royalties, design, trademarks of name or other protected rights, damages to adjacent buildings, roads or members of public, in course of execution of work or any other reasons whatsoever and shall himself defend all actions arising from such claims and shall indemnify the Department in all respect from such actions, costs and expenses. Nothing extra shall be payable on this account. - The Contractor shall make all necessary arrangements for protecting from rain or likewise extreme weather conditions, the work already executed and for carrying out the further work, during monsoon including providing and fixing temporary shelters, protections etc. Nothing extra shall be payable on this account. Also, no claims for hindrance shall be entertained on this account. - In case of flooding of site on account of rain or any other cause and any consequent damage, whatsoever, no claim financially or otherwise shall be entertained not withstanding any other provisions elsewhere in the contract agreement. Also, the Contractor shall make good, at their own cost, the damages caused, if any. Further, no claims for hindrance shall be entertained on this account.

	- No payment shall be made for any damage caused by fire, rain, snowfall, flood or any other natural calamity, whatsoever during the execution of the work. The contractor shall be fully responsible for any damage to the govt. property and the work for which payment has been advanced to them under the contract and they shall make good the same at their risk and cost. The contractor shall be fully responsible for safety and security of their material, T&P/Machinery brought to the site by them. The contractor shall maintain all the work in good condition at their own cost till the completion of the entire work. In case the same item appears more than once in the schedule of work under the same sub head or among the different sub heads of works, the lowest rate quoted for that item shall be taken for other items also and tender will be evaluated accordingly.
52.	The appellate authority is Superintending Engineer in respect of designs and drawings approved by Engineer-in-charge.
53.	The appellate authority is Chief Engineer – _____, APCRDA in respect of designs and drawings approved by Superintending Engineer.
54.	The appellate authority is the Committee constituted by the Competent Authority in respect of designs and drawings approved by Chief Engineer – _____, APCRDA.
55.	The designs are to be submitted by the executing agency which shall be approved by the competent authority. The contractor responsible for the technical features of designs. The competent authority approving the designs is accountable to the department.
56.	The Engineer-in-charge shall exercise check to see that the bill submitted by contractor is in accordance with agreement conditions and certified by the PMC, departmental Quality Control Authorities (or) 3rd Party Quality Control Agency (or) by both if both are deployed on the work. Payments shall be adjusted for recovery of advance payments, liquidated damages in terms of agreement conditions, security deposit for due fulfillment of the contract.
57.	**ROLES AND RESPONSIBILITIES OF DEPARTMENTAL STAFF, PMC, QUALITY CONTROL WING AND THIRD PARTY QUALITY CONTROL AGENCY IN EXECUTION OF PROJECT** FIELD STAFF i. The field staff (construction staff) has to associate with the contractor while conducting the tests. In case of necessity they may conduct tests independently whenever required. The field staff play a vital role in quality assurance of the works. ii. The field staff shall invariably check and produce all the following Records and OK cards maintained by contractor at the site to the Inspecting Officers. Registers (a) Site Order (b) Register of Bench Marks (c) Material OK Register (d) Register of Foundations (e) Register of placement for concrete, Embankment, reinforcement and other test reports. (f) Register of laying pipelines, testing. (g) Register of test reports of comprehensive strength of concrete specimens (h) Cement Day Book Department Quality Control Staff/ Third party Quality Control

	i. The filed quality control staff must check 25% of works such as pipes, laying, jointing, testing including pumping machinery and record independently. ii. Wherever the Third-Party Quality Control agency is not appointed, the department Quality Control staff have to issue the quality certificates for releasing payment to the contractor during construction and other completion. Third Party Quality Control Agency i. The Third-Party Quality Control agency or PMC should possess all the Testing facilities as per agreement and conduct independent testing to assure the quality of work. They should also witness 50% of the tests being done by the Contractor independently. ii. The third-party quality control agency must submit the reports and records to the Engineer-in-Charge vide appendix "E". Reporting procedure for adverse remarks of 3rd party Quality Control Agency and Departmental Quality Control Staff or PMC whichever is applicable. i. The third-party quality control agency shall submit reports in four sets for specific cases of deficiencies for corrective action to the Engineer-in-charge soon after verification. The sub-standard material shall be rejected and got them removed from the site. In case necessity, Engineer-in- Charge shall arrange to stop the work till the deficiencies are rectified to the satisfaction of the 3rd party Quality control Agency / departmental quality staff / PMC. ii. The Engineer-in-Charge shall communicate the above remarks of 3rd party quality control agency to the Contractor for compliance of corrective action. iii. The Contractor shall furnish compliance report to the Engineer-in-Charge, who in turn forward the same to the third-party quality control agency / department quality control for verification. iv. Soon after receipt of report on the compliance to the remarks of the third-party quality control agency by the Contractor, evidence of compliance of corrective action must be furnished to the Engineer-in-Charge to proceed with further work. v. In addition to the above, the observations made by the third-party quality control and the Department quality control staff must be invariably completed with before the next bill is present for payment and certificate to that effect has to be recorded in bills presented by the Contractor duly countersigned by their field construction staff before making payments. On completion of the works, the third-party control agency and Department Quality Control staff must certify that the work has been executed as per design and specifications satisfying intended scope of project as indicated in the agreement before making final payments to the Contractor.
58.	**Change in law** - If as a result of Change in Law, the Contractor suffers any additional costs in the execution of the Works or in relation to the performance of its other obligations under this Agreement, the Contractor shall, within 15 (fifteen) days from the date it becomes reasonably aware of such addition in cost, notify the Engineer-in-charge with a copy to the Authority's Engineer of such additional cost due to Change in Law. - If as a result of Change in Law, the Contractor benefits from any reduction in

	costs for the execution of this Agreement or in accordance with the provisions of this Agreement, either Party shall, within 15 (fifteen) days from the date it becomes reasonably aware of such reduction in cost, notify the other Party with a copy to the Authority's Engineer of such reduction in cost due to Change in Law. The Authority's Engineer shall, with in 15 (fifteen) days from the date of receipt of the notice from the Contractor or the Engineer-in-charge, determine any addition or reduction to the Contract Price due to the Change in Law.
59.	Data Protection and Confidentiality 1. Data Protection: o The Bidder must comply with applicable data protection and privacy laws, such as the Information Technology Act, 2000, to protect personal or sensitive data shared during the process. o No data or information should be shared or used without the Employer's approval. 2. Security Measures: o The Bidder must protect data using secure systems and restrict access to only authorized personnel. 3. Reporting Breaches: o Any unauthorized access or data breach must be reported to the Employer immediately, with details of what happened and how it is being resolved. 4. Ongoing Obligations: o These obligations continue even after the bidding process or the contract ends. 5. Penalties: o Non-compliance with these rules may lead to disqualification, cancellation of the contract, or legal action.

Part 3 – Conditions of Contract and Contract Forms

Section VII - General Conditions of Contract (GCC)

A. General

1. Definitions 1.1 Boldface type is used to identify defined terms.

(a) The '**Employer**' or '**Department**' is the party who employs the Contractor to carry out the Works, as **specified in the PCC**.

(b) The **Chief Engineer** shall mean the tender initiating authority as authorized by the employer, as **specified in the PCC**

(c) The '**Engineer in Charge'** is the person in charge of execution, as **specified in the PCC**

(d) **Days** are calendar days; months are calendar months.

(e) A **day** shall mean a day of 24 hours from midnight to midnight irrespective of hours worked in that day

(f) A **week** shall mean 7 consecutive days without regard to the number of hours worked in any day in that week

(g) The '**site**' shall mean the lands/or other places, on under in or through which the work is to be executed under the Contract including any other lands or places which may be allotted by the employer or used for the purpose of Contract.

(h) "**Urgent Works**" shall mean any measures which, in the opinion of 'Engineer in Charge' becomes necessary during the progress of the work to obviate any risk or accident or failure or which becomes necessary for security of the work or the persons working thereon.

(i) "**Change in Law**" means the means the occurrence of any of the following after the Base Date:

a) the enactment of any new Indian law.

b) the repeal, modification or re-enactment of any existing Indian law.

c) the commencement of any Indian law which has not entered into effect until the Base Date.

d) a change in the interpretation or application of any Indian law by a judgment of a court of record which has become final, conclusive and binding, as compared to such interpretation or application by a court of record prior to the Base Date.

(j) "**Commencement Date**" or "**Start Date**" shall means the date of signing of agreement.

(k) The **Intended Completion Date** is the date on which it is intended that the Contractor shall complete the Works. The Intended

Completion Date is **specified in the PCC**. The Intended Completion Date may be revised only by the Project Manager with prior approvals form the competent authority by issuing an extension of time or an acceleration order.

(l) "**Base Date**" means the last date of that calendar month, which date precedes the Bid Due Date by at least 28 (twenty-eight) days.

(m) The **Accepted Contract Amount** means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.

(n) **Compensation Events** are those defined in GCC Clause 43 hereunder.

(o) The **Completion Date** is the date of completion of the Works as certified by the Project Manager with prior approval from the Chief Engineer, in accordance with GCC Sub-Clause 54.1.

(p) The **Contract** is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in GCC Sub-Clause 2.3 below.

(q) The **Contractor**, also referred to as the Prime Contractor, is the party whose Bid to carry out the Works has been accepted by the Employer.

(r) The **Contractor's Bid** is the completed bidding document submitted by the Contractor to the Employer.

(s) The **Contract Price** is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract.

(t) A **Defect** is any part of the Works not completed in accordance with the Contract.

(u) The **Defects Liability Certificate** is the certificate issued by Project Manager with prior approval of Chief Engineer upon correction of defects by the Contractor.

(v) The **Defects Liability Period** is the period **named in the PCC** pursuant to Sub-Clause 35.3 and calculated from the Completion Date.

(w) **Drawings** means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Employer in accordance with the Contract, include calculations and other information provided or approved by the Project Manager for the execution of the Contract.

(x) **Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.

(y) "**In writing**" or "**written**" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

(z) The **Initial Contract Price** is the Contract Price listed in the Employer's Letter of Acceptance.

(aa) **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.

(bb) **Plant** is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.

(cc) The **Project Manager** is the person **named in the PCC** (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.

(dd) **PCC** means Particular Conditions of Contract.

(ee) **Site Investigation Reports** are those that were included in the bidding document and are factual and interpretative reports about the surface and subsurface conditions at the Site.

(ff) **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager with the prior approval of the Chief Engineer

(gg) A **Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.

(hh) **Temporary Works** are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.

(ii) A **Variation** is an instruction given by the Project Manager which varies the Works.

(jj) The **Works** are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as **defined in the PCC**.

(kk) The bidding firm should designate one of their regular officers on rolls as SEA/SH coordinator having domain expertise to deal with non-compliance verification

(ll) "Sexual Exploitation and Abuse" "(SEA)" means the following:

(mm) Sexual Exploitation is defined as any actual or attempted abuse of position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially, or politically from the sexual exploitation of another.

(nn) Sexual Abuse is defined as the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions; and

(oo) "Sexual Harassment" "(SH)" is defined as unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature by the Contractor's Personnel with other Contractor's or Employer's Personnel.

(pp) "GBV" means Gender Based Violence

(qq) All Standard Operating Procedures (SOPs) issued by APCRDA from time to time will be binding on all Consultants / Contractors for observing compliance

(rr) 'World Bank': means the International Bank for Reconstruction and Development (IBRD) or the International Development Association (IDA).

(ss) 'Anti-Corruption Guidelines' meansThe World Bank's Guidelines on Preventing and Combating Fraud and Corruption in Program for Results Financing dated February 1, 2012 and revised July 10, 2015 and the Asian Development Bank Guidelines to prevent or mitigate fraud, corruption, and other prohibited activities in Results-Based Lending for Programs.

(tt) "The ADB" means the Asian Development Bank.

(uu) "ESMU" is the Environmental and Social Management Unit team of the Employer.

2. Interpretation

2.1 In interpreting these GCC, words indicating one gender include all genders. Words indicating the singular also include the plural and words indicating the plural also include the singular. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.

2.2 If sectional completion is **specified in the PCC**, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

2.3 The documents forming the Contract shall be interpreted in the following order of priority:

(a) Agreement,

(b) Letter of Acceptance,

(c) Contractor's Bid & Bill of quantities (Price-bid)

(d) Particular Conditions of Contract,

(e) General Conditions of Contract, including Appendices,

(f) Specifications,

(g) Drawings,

(h) the completed Schedules and any other documents forming part of the contract, including, but not limited to:

a. the Contractor's Environmental and Social Management Plan (C-ESMP);

b. Code of Conduct for Contractor's Personnel (ES); and

c. Sexual Exploitation and Abuse (SEA), and/or Sexual Harassment (SH) Declaration

(i) Any other document **listed in the PCC** as forming part of the Contract.

3. Language and Law

3.1 The language of the Contract and the law governing the Contract are **stated in the PCC**.

3.2 Throughout the execution of the Contract, the Contractor shall comply with the import of goods and services prohibitions in India when

(a) as a matter of law or official regulations, the Borrower's country prohibits commercial relations with that country; or

(b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, India prohibits any import of goods from that country or any payments to any country, person, or entity in that country.

4. Project Manager's Decisions

4.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Employer and the Contractor in the role representing the Employer.

However, if the Project Manager is required, under the rules and regulations and orders of the Employer, to obtain approval of some other authorities for specific actions, the bidder will so obtain the approval. Provided further that any requisite approval shall be deemed to have been given by the Employer for any such authority exercised by the Project Manager.

5. Delegation

5.1 Unless otherwise specified in the PCC, the Project Manager may delegate any of their duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may revoke any delegation after notifying the Contractor.

6. Communications

6.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered. All oral instructions shall be confirmed in writing in seven working days.

7. Subcontracting

7.1 The Contractor may subcontract with the approval of the Project Manager upto a ceiling **specified in PCC**, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations.

7.2 The Project Manager should satisfy himself before recommending to the Employer whether:

a) the circumstances warrant such sub-contracting; and,

b) the sub-Contractor so proposed for the Work possesses the experience, qualifications and equipment necessary for the job proposed to be entrusted to them in proportion to the quantum of Works to be sub-contracted.

7.3 If payments are proposed to be made directly to that sub-contractor, this should be subject to specific authorization by the prime contractor so that their arrangement does not alter the contractor's liability or obligations under the contract.

7.4 The Contractor shall not be required to obtain any consent from the Employer for:

(a) the sub-contracting of any part of the Works for which the Sub-Contractor is already named in the contract.

(b) the provision for labour, or labour component, and,

(c) the purchase of materials which are in accordance with the standards specified in the contract.

8. Other Contractors

8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors, as **referred to in the PCC.** The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors and shall notify the Contractor of any such modification.

9. Personnel and Equipment

9.1 The Contractor shall employ the key personnel and use the equipment identified in its Bid, and **referred to in PCC**, to carry out the Works or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.

9.2 The Project Manager may require the Contractor to remove from the Site of Works, a member of the Contractor's staff or their work force, who:

a. persists in any misconduct or lack of care;

b. carries out duties incompetently or negligently;

c. fails to comply with any provision of the Contract;

d. persists in any conduct which is prejudicial to safety, health, or the protection of the environment;

e. based on reasonable evidence, is determined to have engaged in Fraud and Corruption during the execution of the Works;

f. has been recruited from the Employer's Personnel;

g. undertakes behavior which breaches the Code of Conduct for Contractor's Personnel (ES).

If the Employer, Project Manager or Contractor determines, that any employee of the Contractor be determined to have engaged in Fraud and Corruption during the execution of the Works, then that employee shall be removed in accordance with Clause 9.2 above.

In all the above cases, the contractor shall ensure that the person leaves the site within seven days and has no further connection with the work in the contract. The Contractor shall appoint a suitable replacement within 28 days or earlier as may be agreed to between the Project manager and the Contractor.

9.3 The Contractor shall take all necessary safety measures to avoid the occurrence of incidents and injuries to any third party associated with the use of, if any, Equipment on public roads or other public infrastructure. The Contractor shall monitor road safety incidents and accidents to identify negative safety issues and establish and implement necessary measures to resolve them.

9.4 Labor

9.4.1 *Engagement of Staff and Labor.* The Contractor shall provide and employ on the Site for the execution of the Works such skilled, semi-skilled and unskilled labor as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labor with appropriate qualifications and experience from sources within the Country.

Unless otherwise provided in the Contract, the Contractor shall be responsible for the recruitment, transportation, accommodation and welfare facilities in accordance with GCC Sub-Clause 9.4.6, of the Contractor's Personnel, and for all payments in connection therewith.

The Contractor shall provide the Contractor's Personnel information and documentation that are clear and understandable regarding their terms and conditions of employment. The information and documentation shall set out their rights under relevant labor laws applicable to the Contractor's Personnel (which will include any applicable collective agreements), including their rights related to hours of work, wages, overtime, compensation and benefits, as well as those arising from any requirements in the Specification. The Contractor's Personnel shall be informed when any material changes to their terms or conditions of employment occur.

9.4.2 *Conditions of Labor.* The Contractor shall inform the Contractor's Personnel about:

(a) any deduction to their payment and the conditions of such deductions in accordance with the applicable laws or as stated in the Specification; and

(b) their liability to pay personal income taxes in the Country in respect of such of their salaries, wages, allowances and any benefits as are subject to tax under the laws of the Country for the time being in force.

The Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such laws.

Where required by applicable laws or as stated in the Specification, the Contractor shall provide the Contractor's Personnel written notice of termination of employment and details of severance payments in a timely manner. The Contractor shall have paid the Contractor's Personnel (either directly or where appropriate for their benefit) all due wages and entitlements including, as applicable, social security benefits and pension contributions, on or before the end of their engagement/ employment.

9.4.3 The Contractor may bring into the Country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Employer will, if requested by the Contractor, use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national, or government permission required for bringing in the Contractor's personnel.

9.4.4 The Contractor shall at its own expense provide the means of repatriation to and the Contractor's Personnel employed on the Contract at the Site to their various home countries. It shall also provide suitable temporary maintenance of all such persons from the cessation of their employment on the Contract to the date programmed for their departure. In the event that the Contractor defaults in providing such means of transportation and temporary maintenance, the Employer may provide the same to such personnel and recover the cost of doing so from the Contractor.

9.4.5 *Disorderly conduct.* The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, riotous or disorderly conduct or behavior by or amongst the Contractor's Personnel.

9.4.6 *Facilities for Staff and Labor.* Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. If stated in the Specification, the Contractor shall give access to or provide services that accommodate the physical, social and cultural needs of the Contractor's Personnel. The Contractor shall also provide similar facilities for the Employer's Personnel if stated in the Specification.

9.4.7 The Contractor shall, in all dealings with the Contractor's Personnel, pay due regard to all recognized festivals, official holidays, religious or other customs and all local laws and regulations pertaining to the employment of labor. The Contractor shall provide the Contractor's Personnel annual holiday and sick, maternity and family leave, as required by applicable laws or as stated in the Specification.

9.4.8 *Supply of Foodstuff*s. The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.

9.4.9 *Supply of Water*. The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.

9.4.10 *Measures against Insect and Pest Nuisance.* The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce the danger to their health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

9.4.11 *Alcoholic Liquor or Drugs*. The Contractor shall not, otherwise than in accordance with the laws of the Country, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter or disposal thereto by Contractor's Personnel.

9.4.12 *Arms and Ammunition*. The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.

9.4.13 *Funeral Arrangements.* The Contractor shall be responsible, to the extent required by local regulations, for making any funeral arrangements for any of its local employees who may die while engaged upon the Works.

9.4.14 *Forced Labor.* The Contractor, including its Subcontractors, shall not employ or engage forced labor. Forced labor consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labor, such as indentured labor, bonded labor or similar labor-contracting arrangements.

No persons shall be employed or engaged who have been subject to trafficking. Trafficking in persons is defined as the recruitment, transportation, transfer, harboring or receipt of persons by means of the threat or use of force or other forms of coercion, abduction, fraud, deception, abuse of power, or of a position of vulnerability, or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purposes of exploitation.

9.4.15 *Child Labor*. The Contractor, including its Subcontractors, shall not employ or engage a child under the age of 14 unless the national law specifies a higher age (the minimum age).

The Contractor, including its Subcontractors, shall not employ or engage a child between the minimum age and the age of 18 in a manner that is likely to be hazardous, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.

The Contractor including its Subcontractors, shall only employ or engage children between the minimum age and the age of 18 after an appropriate risk assessment has been conducted by the Contractor with the Project Manager's approval. The Contractor shall be subject to regular monitoring by the Project Manager that includes monitoring of health, working conditions and hours of work.

Work considered hazardous for children is work that, by its nature or the circumstances in which it is carried out, is likely to jeopardize the health, safety, or morals of children. Such work activities prohibited for children include work:

(a) with exposure to physical, psychological or sexual abuse;

(b) underground, underwater, working at heights or in confined spaces;

(c) with dangerous machinery, equipment or tools, or involving handling or

(d) transport of heavy loads;

(e) in unhealthy environments exposing children to hazardous substances, agents, or processes, or to temperatures, noise or vibration damaging to health; or

(f) under difficult conditions such as work for long hours, during the night or in confinement on the premises of the employer.

9.4.16 *Employment Records of Workers.* The Contractor shall keep complete and accurate records of the employment of labor at the Site. The records shall include the names, ages, genders, hours worked, and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the project Manager.

9.4.17 *Non-Discrimination and Equal Opportunity.* The Contractor shall not make decisions relating to the employment or treatment of Contractor's Personnel on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment of Contractor's Personnel on the principle of equal opportunity and fair treatment and shall not discriminate with respect to any aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices.

Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination. The Contractor shall provide protection and assistance as necessary to ensure non-discrimination and equal opportunity, including for specific groups such as women, people with disabilities, migrant workers and children (of working age in accordance with GCC Sub-Clause 9.4.15).

9.4.18 *Contractor's Personnel Grievance Mechanism.* The Contractor shall have a grievance mechanism for Contractor's Personnel, and where relevant the workers' organizations stated in GCC Sub-Clause 9.4.17, to raise workplace concerns. The grievance mechanism shall be proportionate to the nature, scale, risks and impacts of the Contract. The mechanism shall address concerns promptly, using an understandable and transparent process that provides timely feedback to those concerned in a language they understand, without any retribution, and shall operate in an independent and objective manner.

The Contractor's Personnel shall be informed of the grievance mechanism at the time of engagement for the Contract, and the measures

put in place to protect them against any reprisal for its use. Measures will be put in place to make the grievance mechanism easily accessible to all Contractor's Personnel.

The grievance mechanism shall not impede access to other judicial or administrative remedies that might be available, or substitute for grievance mechanisms provided through collective agreements.

The grievance mechanism may utilize existing grievance mechanisms, providing that they are properly designed and implemented, address concerns promptly, and are readily accessible to Contractor's Personnel. Existing grievance mechanisms may be supplemented as needed with Contract-specific arrangements.

9.4.19 *Training of Contractor's Personnel.* The Contractor shall provide appropriate training to relevant Contractor's Personnel on ES aspects of the Contract, including appropriate sensitization on prohibition of SEA and SH, and health and safety training referred to in Works' .

As stated in the Specification or as instructed by the Project Manager, the Contractor shall also allow appropriate opportunities for the relevant Contractor's Personnel to be trained on ES aspects of the Contract by the Employer's Personnel.

The Contractor shall provide training on SEA and SH, including its prevention, to any of its personnel who has a role to supervise other Contractor's Personnel.

10. Compliance with Labour Regulations

10.1 During continuance of the Contract, the Contractor and their Sub-Contractors shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour laws (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law prevailing on the Base Date either by the State or the Central Government or the local authority. The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contraventions including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the Contractor, the Project Manager/ Employer shall have the right to deduct any money due to the Contractor including their amount of performance security. The Employer/ Project Manager shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

10.2 The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time.

10.3 The Contractor shall duly comply with the provisions of the Apprentices Act 1961 (III of 1961) and the rules made there under, and comply, failure or neglect to shall be subject to all liabilities and penalties provided in the said Act and Rules.

11. Employer's and Contractor's Risks

11.1 The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.

12. Employer's Risks

12.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Employer's risks:

(a) The risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to

(i) use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works or

(ii) negligence, breach of statutory duty, or interference with any legal right by the Employer or by any person employed by or contracted to him except the Contractor.

(b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Employer or in the Employer's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.

12.2 From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is an Employer's risk except loss or damage due to

(a) a Defect which existed on the Completion Date,

(b) an event occurring before the Completion Date, which was not itself an Employer's risk, or

(c) the activities of the Contractor on the Site after the Completion Date.

13. Contractor's Risks

13.1 All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract are the responsibility of the Contractor.

13.2 All risks and consequences arising from the inaccuracies or falseness of the documents and/or information submitted by the contractor shall be the responsibility of the Contractor alone, notwithstanding the fact that designs/drawings or other documents have been approved by the department.

14. Insurance

14.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles **stated in the PCC** for the following events which are due to the Contractor's risks:

(a) loss of or damage to the Works, Plant, and Materials [which are incorporated in works];

(b) loss of or damage to Construction Equipment.

(c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and

(d) personal injury or death.

14.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Employer's approval before the Start Date. All such insurance shall provide for compensation to be payable in Indian Rupees required to rectify the loss or damage incurred.

14.3 If the Contractor does not provide any of the policies and certificates required, the Employer may effect the insurance which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

14.4 Alterations to the terms of an insurance shall not be made without the approval of the Project Manager.

14.5 Both parties shall comply with any conditions of the insurance policies.

15. Site Data

15.1 The Contractor shall be deemed to have examined any Site Data **referred to in the PCC**, supplemented by any information available to the Contractor.

16. Contractor to Construct the Works including protection of environment and assurance of public health and safety, facilitate effective RAP

16.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings and as per instructions of Project Manager.

16.2.1 The Contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other cause arising because of their methods of operation.

16.2.2 During continuance of the contract, the contractor and their sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made thereunder, regulations, notifications and by-laws of the Sate or Central Government, or local authorities and other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local authority. Salient features of the major laws are given in Appendix 1 to the General Conditions of Contract.

17. The Works to Be Completed by the Intended Completion Date

17.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.

18. Approval by the

18.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, for their approval.

Project Manager

18.2 The Contractor shall be responsible for design of Temporary Works.

18.3 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

18.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.

18.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Project Manager before this use.

19. Safety

19.1 The Contractor shall be responsible for the safety of all activities on the Site.

20. Discoveries

20.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them. Any discoveries related to Archeological importance, will be informed to ASI.

21. Possession of the Site

21.1 The Employer shall give possession of part/ full Site to the Contractor. If possession of the balance part is not given by the date **stated in the PCC,** the Employer shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event.

22. Access to the Site

22.1 The Contractor shall allow the Project Manager and any person authorized by the Project Manager access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

23. Instructions, Inspections and Audits

23.1 The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.

23.2 The Contractor shall keep and shall make all reasonable efforts to cause its Subcontractors and sub-consultants to keep, accurate and systematic accounts and records in respect of the Works in such form and details as will clearly identify relevant time changes and costs.

24. Appointment of the Adjudicator

24.1 The Adjudicator shall be appointed jointly by the Employer and the Contractor, at the time of the Employer's issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority **designated in the PCC**, to appoint the Adjudicator within 14 days of receipt of such request.

24.2 Should the Adjudicator resign or die or should the Employer and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator shall be jointly appointed by the Employer and the Contractor. In case of disagreement between the Employer and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority **designated**

in the PCC at the request of either party, within 14 days of receipt of such request.

25. Procedure for Disputes

25.1 The procedure for disputes shall as **specified in the PCC.**

26. Fraud and Corruption

26.1 The Bank requires compliance with the Bank's Anti-Corruption Guidelines and its prevailing sanctions policies and procedures as set forth in the WBG's Sanctions Framework, as set forth in Appendix to the GCC.

26.2 The Employer requires the Contractor to disclose any commissions or fees that may have been paid or are to be paid to agents or any other party with respect to the bidding process or execution of the Contract. The information disclosed must include at least the name and address of the agent or other party, the amount and currency, and the purpose of the commission, gratuity or fee.

B. Time Control

27. Program

27.1 Within the time **stated in the PCC**, after the date of the Letter of Acceptance, the Contractor shall submit to the Project Manager for approval a revised Program (revising the program given along with the bid) including Environmental & Social Management Plan (to comply with the applicable Laws/ Rules/ Regulations for protection of environment, public health and safety, and the applicable parts of the Environment Management Plan of the project) showing the general methods, arrangements, order, and timing for all the activities in the Works along with monthly cash flow forecasts.

27.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.

27.3 The Contractor shall submit to the Project Manager for approval an updated Program at intervals no longer than the period stated in the PCC. If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount stated in the PCC from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted.

27.4 The Project Manager's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Project Manager again at any time. A revised Program shall show the effect of Variations and Compensation Events.

27.5 The Contractor shall furnish monthly progress reports as directed by the Project Manager by 7th of the succeeding month. The report shall include charts and detailed descriptions of the

progress of identified activities, photographs showing status of progress at site, records of Contractor's personnel and equipment, Quality Assurance documents, comparison of actual and planned progress as per program. This report will also include progress on the ESHS Management Strategies and Implementation Plans (ESHS-MSIP), and compliance to the applicable Laws/ Rules/ Regulations for protection of environment, public health and safety, and the applicable parts of the Environment Management Plan of the project.

28. Extension of the Intended Completion Date

28.1 The Project Manager shall extend the Intended Completion Date including milestones, if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date as per the agreed milestones without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.

28.2 The Project Manager shall decide whether and by how much to extend the Intended Completion Date/ milestones within 21 days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date/ milestone.

29. Acceleration

29.1 When the Employer wants the Contractor to finish before the Intended Completion Date, the Project Manager shall obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Employer accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Employer and the Contractor.

29.2 If the Contractor's priced proposals for an acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.

30. Delays Ordered by the Project Manager

30.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.

31. Management Meetings

31.1 Either the Project Manager or the Contractor may require the other to attend a management meeting (which will be held at the place **indicated in PCC**. The periodicity shall be fixed by Project Manager/ Contractor jointly). The business of a management meeting shall be to review the progress of construction with reference to the construction program given in accordance with GCC 26.1, the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.

31.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

32. Early Warning

32.1 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works. The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.

32.2 The Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Project Manager.

C. Quality Control

33. Quality Assurance

33.1 The Contractor shall institute Quality Assurance (QA) and Quality Control (QC) systems in accordance with Quality Assurance Plan to demonstrate compliance with the requirements of the Contract as approved by the Project Manager.

33.2 Compliance with the QA/QC systems shall not relieve the Contractor of any of their duties obligations or responsibilities under the Contract.

34. Tests

34.1 The Contractor shall provide all apparatus, assistance, documents and other information, electricity, equipment, fuel, consumables, instruments, labour, materials, and suitably qualified and experienced staff, as are necessary to carry out the specified tests efficiently.

34.2 If the Project Manager instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. .

35. Identifying Defects and Correction of Defects

35.1 The Project Manager shall check the Contractor's work and notify the Contractor of any Defects that are found specifying a time by which it should be corrected. Such checking shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.

35.2 The contractor shall permit the Employer's Technical auditor to check the contractor's work and notify the Project Manager and

Contractor of any defects that are found. Such a check shall not affect the Contractor's or the Project Manager's responsibility as defined in the Contract Agreement.

35.3 The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is **defined in the PCC.** The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

35.4 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager's notice.

36. Uncorrected Defects

36.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount. If the contractor fails to pay the amount, the same will be made good from their deposits with the department.

Note: 1. Where in certain cases, the technical specifications provide for acceptance of works within specified tolerance limits at reduced rates, Project Manager will certify payments to Contractor accordingly.

2. Where the failure to correct a particular defect within the specified time is considered as a fundamental breach of contract a notice should be given to the contractor as stated in GCC 58.2(e).

D. Cost Control

37. Contract Price

37.1 The Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.

38. Changes in the Contract Price

38.1 If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change.

(a) If the quantity of work executed exceeds the quantity of the item in BOQ beyond the higher specified limit the Project Manager shall fix the rate to be applied for the additional quantity of the work executed.

(b) If the quantity of work executed is less than the quantity of the item in BOQ and is lesser than the lower specified limit, the Project Manager shall fix the rate to be applied for whole of the quantity of the work so executed.

38.2 The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the prior approval of the Employer.

38.3 If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.

39. Variations

39.1 All Variations shall be included in updated Programs produced by the Contractor.

39.2 The Contractor shall provide the Project Manager with a quotation (with breakdown of unit rates) for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.

39.3 If the Contractor's quotation is unreasonable, [*or if contractor fails to provide the Project Manager with a quotation within a reasonable time specified by Project Manager in accordance with GCC38.2*] the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.

39.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.

39.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.

If the work in the Variation corresponds to an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in Sub-Clause 37.1 or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work.

39.6 Value Engineering: Unless otherwise **specified in the PCC,** the Contractor may prepare, at its own cost, a value engineering proposal at any time during the performance of the contract. The value engineering proposal shall, at a minimum, include the following;

(a) the proposed change(s), and a description of the difference to the existing contract requirements;

(b) a full cost/benefit analysis of the proposed change(s) including a description and estimate of costs (including life

cycle costs) the Employer may incur in implementing the value engineering proposal; and

(c) a description of any effect(s) of the change on performance/functionality.

The Employer may accept the value engineering proposal if the proposal demonstrates benefits that:

(a) accelerate the contract completion period; or

(b) reduce the Contract Price or the life cycle costs to the Employer; or

(c) improve the quality, efficiency, safety or sustainability of the Facilities; or

(d) yield any other benefits to the Employer,

without compromising the functionality of the Works.

If the value engineering proposal is approved by the Employer and results in:

(a) a reduction of the Contract Price; the amount to be paid to the Contractor shall be the **percentage specified in the PCC** of the reduction in the Contract Price; or

(b) an increase in the Contract Price; but results in a reduction in life cycle costs due to any benefit described in (a) to (d) above, the amount to be paid to the Contractor shall be the full increase in the Contract Price.

40. Cash Flow Forecasts

40.1 When the Program, is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast. The cash flow forecast shall be in Indian Rupees.

41. Payment Certificates

41.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously along with details of measurement of the quantity of works executed in a tabular form approved by the Project Manager.

41.2 The Project Manager shall check the Contractor's monthly statement and within 14 days certify the amount to be paid to the Contractor after considering any credit or debit for the month in question in respect of materials for the works in the relevant amount.

41.3 The value of work executed shall be determined by the Project Manage after due check measurement of the quantities claimed as executed by the contractor.

41.4 The value of work executed shall comprise the value of the quantities of work in the Bill of Quantities that have been completed.

41.5 The value of work executed shall include the valuation of Variations.

41.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

42. Payments

42.1 Payments shall be adjusted for deductions for advance payments, retention, other recoveries in terms of contract & taxes to be deducted at source [TDS] as per applicable law.

42.2 DELETED

42.3 DELETED

43. Compensation Events

DELETED

44. Tax

44.1 The rates quoted by the Contractor shall be deemed to be exclusive of the GST, Sales and other taxes that the Contractor will have to pay for the performance of this Contract. The Employer will perform such duties in regard to the deduction of such taxes at source [TDS] as per applicable law.

44.2 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the deadline for the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price.

45. Currencies

45.1 All payments shall be made in Indian Rupees.

46. Price Adjustment

46.1 Contract price shall be adjusted for increase or decrease in rates and price of labour, materials, fuels and lubricants and other inputs to the works in accordance with the principles and procedures outlined below. A table of adjustment data is **included in the PCC** which indicates the coefficients of various inputs and the sources of indices for various schedules of BOQ. If the PCC does not include a table of adjustment data this sub clause shall not apply and there shall be no price adjustment.

46.2 DELETED

47. Retention

47.1 The Employer shall retain from each payment due to the Contractor the proportion **stated in the PCC** until Completion of the whole of the Works.

47.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with GCC 53.1, half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Project Manager

has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected. On completion of the whole works the Contractor may substitute the balance retention money with an "on demand" Bank guarantee.

48. Liquidated Damages

48.1 The Contractor shall pay liquidated damages to the Employer at the rate per day **stated in the PCC** for each day that the Completion Date is later than the Intended Completion Date (for the whole of the works or the milestones as stated in the PCC). The total amount of liquidated damages shall not exceed the amount **defined in the PCC.** The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

Time is the essence of the contract and payment or deduction of liquidated damages shall not relieve the contractor from their obligation to complete the work as per agreed construction program and milestones, or from any of the Contractor's other obligations and liabilities under the contract.

48.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC Sub-Clause 42.1.

49. Bonus

49.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day stated in the PCC for each day (less any days for which the Contractor is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Project Manager shall certify that the Works are complete, although they may not be due to be complete.

50. Advance Payment

50.1 The Employer shall make advance payment to the Contractor of the amounts **stated in the PCC** by the date **stated in the PCC,** against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Employer in amounts in Indian Rupees equal to the advance payment. The Guarantee shall remain effective until the advance payment has been repaid, but the amount of the Guarantee shall be progressively (each instalment not less than Rs 500,000) reduced by the amounts repaid by the Contractor.

50.2 The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Project Manager.

50.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, or Liquidated Damages.

50.4 The Project Manager shall make advance payment in respect of materials intended for but not yet incorporated in the Works in accordance with conditions **stipulated in the PCC**.

51. Securities

51.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount **specified in the PCC,** by a Nationalized or Scheduled bank in India.

52. Day works

DELETED

53. Cost of Repairs

53.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Liability period shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions.

E. Finishing the Contract

54. Completion

54.1 The Contractor shall request the Chief Engineer to issue a Certificate of Completion of the Works, and the Chief Engineer shall do so upon deciding that the whole of the Works is completed.

55. Taking Over

55.1 The Employer shall take over the Site and the Works within seven days of the Engineer in Charge's issuing a certificate of Completion.

56. Final Account

56.1 The Contractor shall submit to the Project Manager with a detailed account of the total amount that the Contractor considers payable under the Contract at the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor **with the approval of Engineer-in-charge** within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary including corrections and additions to comply with the applicable Laws/ Rules/ Regulations for protection of environment, public health and safety, and the applicable parts of the Environment Management Plan of the project. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a

payment certificate within 56 days of receiving the contractor's revised account.

57. Operating and Maintenance Manuals

57.1 "As built" Drawings [including a compact disk containing digitized drawings] and/or operating and maintenance manuals shall be supplied by the Contractor by the dates **stated in the PCC.**

57.2 If the Contractor does not supply the Drawings [including a compact disk containing digitized drawings] and/or manuals by the dates **stated in the PCC** pursuant to GCC Sub-Clause 57.1**,** or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount **stated in the PCC** from payments due to the Contractor.

58. Termination

58.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract after giving fourteen (14) days written notice.

58.2 Fundamental breaches of Contract shall include, but shall not be limited to, the following:

(a) the Contractor stops work for 28 days when no stoppage of work is shown on the current Program, and the stoppage has not been authorized by the Project Manager;

(b) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 28 days.

(c) the Employer or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation.

(d) the Project Manager gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager.

(e) the Contractor does not maintain a Security, which is required.

(f) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as **defined in the PCC**; or

(g) if the Contractor, in the judgment of the Employer has engaged in Fraud and Corruption, as defined in paragraph 2.2 a of the Appendix to the GCC, in competing for or in executing the Contract, then the Employer may, after giving fourteen (14) days written notice to the Contractor, terminate the Contract and expel them from the Site.

(h) The contractor has contravened Clauses 7 and 9 of GCC.

(i) The contractor does not adhere to the agreed construction program and agreed Environmental & Social Management Plan and fails to take satisfactory remedial action as per

agreements reached in the management meetings [Clause 31 of GCC] for a period of 60 days.

(j) The contractor fails to carry out of the instructions of the Project Manager within a reasonable time determined by the Project Manager in accordance with GCC Clause 16.1 and 23.

(k) a payment certified by the Project Manager is not paid by the Employer to the Contractor within 84 days of the date of the Project Manager's certificate.

(l) The contractor (in case of Joint Venture) has modified the composition of the joint venture and/or the responsibility of each member of the joint venture from what is stated in joint venture agreement without the prior approval of the Employer.

58.3 Notwithstanding the above, the Employer may terminate the Contract for convenience.

58.4 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.

58.5 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under GCC Sub-Clause 58.2 above, the Project Manager shall decide whether the breach is fundamental or not.

59. Payment upon Termination

59.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate less other recoveries due in terms of contract, less taxes to be deducted at source [TDS] as per applicable law, and less the percentage to apply to the value of the work not completed, as **specified in the PCC.** Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer.

59.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate less other recoveries due in terms of contract, and less taxes to be deducted at source [TDS] as per applicable law.

60. Property

60.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Employer if the Contract is terminated because of the Contractor's default.

61. Release from Performance

61.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which a commitment was made.

62. Force Majeure

62.1 As used in this Agreement, the expression "Force Majeure" or "Force Majeure Event" shall mean occurrence in India of any or all of Non-Political Event, Indirect Political Event and Political Event, as defined in Clauses 62.2, 62.3 and 62.4 respectively, if it affects the performance by the Party claiming the benefit of Force Majeure (the "Affected Party") of its obligations under this Agreement and which act or event (i) is beyond the reasonable control of the Affected Party, and (ii) the Affected Party could not have prevented or overcome by exercise of due diligence and following Good Industry Practice, and (iii) has Material Adverse Effect on the Affected Party.

62.2 Non-Political Event

A Non-Political Event shall mean one or more of the following acts or events:

(a) act of God, epidemic, extremely adverse weather conditions, lightning, earthquake, landslide, cyclone, flood, volcanic eruption, chemical or radioactive contamination or ionizing radiation, fire or explosion (to the extent of contamination or radiation or fire or explosion originating from a source external to the Site);

(b) any failure or delay of a Sub-contractor but only to the extent caused by another Non-Political Event;

(c) any judgment or order of any court of competent jurisdiction or statutory authority made against the Contractor in any proceedings for reasons other than (i) failure of the Contractor to comply with any Applicable Law or Applicable Permit, or (ii) on account of breach of any Applicable Law or Applicable Permit or of any contract, or (iii) enforcement of this Agreement, or (iv) exercise of any of its rights under this Agreement by the Authority;

(d) the discovery of geological conditions, toxic contamination or archaeological remains on the Site that could not reasonably have been expected to be discovered

through a site inspection; or

(e) strikes or boycotts (other than those involving the Contractor, Sub- contractors or their respective employees/representatives, or attributable to any act or omission of any of them) interrupting supplies and services to theProject Works for a continuous period of 24 (twenty-four) hours and an aggregate period exceeding 10 (ten) days in an Accounting Year, and not being an Indirect Political Event set forth in Clause 62.3;

62.3 Indirect Political Event

An Indirect Political Event shall mean one or more of the following acts or events:

(a) an act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo, riot, insurrection, terrorist or military action, civil commotion or politically motivated sabotage;

(b) industry-wide or State-wide strikes or industrial action for a continuous period of 24 (twenty-four) hours and exceeding an aggregate period of 10 (ten) days in an Accounting Year;

(c) any civil commotion, boycott or political agitation which prevents construction of the Project Works by the Contractor for an aggregate period exceeding 10 (ten) days in an Accounting Year;

(d) any failure or delay of a Sub-contractor to the extent caused by any IndirectPolitical Event;

(e) any Indirect Political Event that causes a Non-Political Event;

62.4 Political Event

A Political Event shall mean one or more of the following acts or events by or on account of any Government Instrumentality:

(a) Change in Law, only if consequences thereof cannot be dealt with under and in accordance with the provisions of relevant PCC;

(b) compulsory acquisition in national interest or expropriation of any Project Assets or rights of the Contractor or of the Sub-Contractors;

(c) unlawful or unauthorized or without jurisdiction revocation of, or refusal to renew or grant without valid

cause, any clearance, license, permit, authorization, no objection certificate, consent, approval or exemption required by the Contractor or any of the Sub-contractors to perform their respective obligations under this Agreement; provided that such delay, modification, denial, refusal or revocation did not result from the Contractor's or any Sub-contractor's inability or failure to comply with any condition relating to grant, maintenance or renewal of such clearance, license, authorization, no objection certificate, exemption, consent, approvalor permit;

(d) any failure or delay of a Sub-contractor but only to the extent caused by another Political Event;

62.5 Duty to report Force Majeure Event

62.5.1 Upon occurrence of a Force Majeure Event, the Affected Party shall by notice report such occurrence to the other Party forthwith. Any notice pursuant hereto shall include full particulars of:

(a) the nature and extent of each Force Majeure Event which is the subject of any claim for relief under this Clause 62 with evidence in support thereof;

(b) the estimated duration and the effect or probable effect which such Force Majeure Event is having or will have on the Affected Party's performance ofits obligations under this Agreement;

(c) the measures which the Affected Party is taking or proposes to take for alleviating the impact of such Force Majeure Event; and

(d) any other information relevant to the Affected Party's claim.

62.5.2 The Affected Party shall not be entitled to any relief for or in respect of a Force Majeure Event unless it shall have notified the other Party of the occurrence of the Force Majeure Event as soon as reasonably practicable, and in any event no later than 10 (ten) days after the Affected Party knew, or ought reasonably to have known, of its occurrence, and shall have given particulars of the probable material effect that the Force Majeure Event is likely to have on the performance of its obligations under this Agreement.

62.5.3 For so long as the Affected Party continues to claim to be materially affected by such Force Majeure Event, it shall provide the other Party with regular (and not less than weekly) reports containing information as required by Clause 62.5.1, and such other information as the other Party may reasonably request the Affected Party to provide.

62.6 Effect of Force Majeure Event on the Agreement

62.6.1 Upon the occurrence of any Force Majeure after the Appointed Date, the costs incurred and attributable to such event and directly relating to this Agreement (the "Force Majeure costs") shall be allocated and paid as follows:

(a) upon occurrence of a Non-Political Event, the Parties shall bear their respective Force Majeure costs and neither Party shall be required to pay tothe other Party any costs thereof;

(b) upon occurrence of an Indirect Political Event, all Force Majeure costs attributable to such Indirect Political Event, and not exceeding the InsuranceCover for such Indirect Political Event, shall be borne by the Contractor, andto the extent Force Majeure costs exceed such Insurance Cover, one half of such excess amount shall be reimbursed by the Authority to the Contractor for the Force Majeure events; and

(c) upon occurrence of a Political Event, all Force Majeure costs attributable to such Political Event shall be reimbursed by the Authority to the Contractor.

For the avoidance of doubt, Force Majeure costs may include costs directly attributable to the Force Majeure Event, but shall not include debt repayment obligations, if any, of the Contractor.

62.6.2 Save and except as expressly provided in this Clause 62, neither Party shall be liable in any manner whatsoever to the other Party in respect of any loss, damage, cost, expense, claims, demands and proceedings relating to or arising out of occurrence or existence of any Force Majeure Event or exercise of any right pursuant hereto.

62.6.3 Upon the occurrence of any Force Majeure Event during the Construction Period, the Project Completion Schedule for and in respect of the affected Works shall be extended on a day for day basis for such period as performance of the Contractor's obligations is affected on account of the Force Majeure Event or its subsisting effects.

62.7 Termination Notice for Force Majeure Event

62.7.1 If a Force Majeure Event subsists for a period of 60 (sixty) days or more within a continuous period of 120 (one hundred and twenty) days, either Party may in its discretion terminate this Agreement by issuing a Termination Notice to the other Party without being liable in any manner whatsoever, save as provided in this clause 62, and upon issue of such Termination Notice, this Agreement shall, notwithstanding anything to the contrary contained herein, stand terminated forthwith; provided that before issuing such Termination Notice, the Party intending to

issue the Termination Notice shall inform the other Party of such intention and grant 15 (fifteen) days' time to make a representation, and may after the expiry of such 15 (fifteen) days period, whether or not it is in receipt of such representation, in its sole discretion issue the Termination Notice.

62.8 Termination Payment for Force Majeure Event

62.8.1 In the event of this Agreement being terminated on account of a Non-Political Event, the Termination Payment shall be an amount equal to the sum payable under Clause 59.

Provided that in the event Termination occurs during the Maintenance Period, the Authority's Representative shall only determine the value of Works associated with Maintenance.

(e) any event or circumstances of a nature analogous to any of the foregoing.

62.8.2 If Termination is on account of an Indirect Political Event, the Termination Payment shall include:

(a) any sums due and payable under Clause 59; and

(b) the reasonable cost, as determined by the Authority's Representative, of thePlant and Materials procured by the Contractor and transferred to theAuthority for use in Construction or Maintenance, only if such Plant and Materials are in conformity with the Specifications and Standards;

Provided that in the event Termination occurs during the Maintenance Period, the Authority's Representative shall only determine the value of Works associated with Maintenance.

62.8.3 If Termination is on account of a Political Event, the Authority shall make a Termination Payment to the Contractor in an amount that would be payable under Clause 59 as if it were an Authority Default.

62.9 Dispute resolution

In the event that the Parties are unable to agree in good faith about the occurrence or existence of a Force Majeure Event, such Dispute shall be finally settled in accordance with the Dispute Resolution Procedure; provided that the burden of proof as to the occurrence or existence of such Force Majeure Event shall be upon the Party claiming relief and/or excuse on account of such Force Majeure Event.

62.10 Excuse from performance of obligations

If the Affected Party is rendered wholly or partially unable to perform its obligations under this Agreement because of a Force Majeure Event, it shall be excused from performance of such of its obligations to the extent it is unable to perform on account of such Force Majeure Event; provided that:

(a) the suspension of performance shall be of no greater scope and of no longer duration than is reasonably required by the Force Majeure Event;

(b) the Affected Party shall make all reasonable efforts to mitigate or limit damage to the other Party arising out of or as a result of the existence or occurrence of such Force Majeure Event and to cure the same with due diligence; and

(c) when the Affected Party is able to resume performance of its obligations under this Agreement, it shall give to the other Party notice to that effect and shall promptly resume performance of its obligations hereunder.

63. Suspension of Bank Loan or Credit

63.1 In the event that the Bank suspends the Loan or Credit to the Employer, from which part of the payments to the Contractor are being made:

(a) The Employer is obligated to notify the Contractor of such suspension within 7 days of having received the Bank's suspension notice.

63.2 If the Contractor has not received sums due to it within the 28 days for payment provided for in Sub-Clause 40.1, the Contractor may immediately issue a 14-day termination notice.

64. Cyber Security

64.1 Pursuant to the PCC, the Contractor, including its Subcontractors/ suppliers/ manufacturers shall take all technical and organizational measures necessary to protect the information technology systems and data used in connection with the Contract. Without limiting the foregoing, the Contractor, including its Subcontractors/ suppliers/ manufacturers, shall use all reasonable efforts to establish, maintain, implement and comply with, reasonable information technology, information security, cyber security and data protection controls, policies and procedures, including oversight, access controls, encryption, technological and physical safeguards and business continuity/disaster recovery and security plans that are designed to protect against and prevent breach, destruction, loss, unauthorized distribution, use, access, disablement, misappropriation or modification, or other compromise or misuse of or relating to any information technology system or data used in connection with the Contract.

Appendix 1 of General Conditions of Contract

Salient features of major labour and other laws that are applicable to construction industry in India are given as

S. No	Name of Laws
1	Workman Compensation Act,1923
2	Payment of Gratuity Act,1972
3	Employees PF and Miscellaneous Provision Act,1952 (since amended)
4	Maternity Benefit Act,1961
5	Sexual Harassment of Woman at the work place(Prevention, Prohibition and Redressal) Act,2013
6	Contract Labour (Regulation and Abolition) Act,1970
7	Minimum Wage Act,1948
8	Payment of Wages Act,1936
9	Equal Remuneration Act,1976
10	Payment of Bonus Act,1965
11	Industrial Disputes Act,1947
12	Industrial Employment (Standing Order) Act,1946
13	Trade Union Act,1926
14	Child Labour(Provision and Regulation)Act,1986
15	Inter-state migrant workmen's (Regulation of employment & conditions of services) Act,1979
16	The Building and Other Construction works (Regulation of Employment and Conditions of service), Act,1996 and the cess Act of 1996
17	Factories Act,1948
18	Bonded Labour system (Abolition) Act,1976
19	Employer's Liability Act,1938
20	The Personal Injuries (Compensation Insurance) Act,1963

Section VIII - Particular Conditions of Contract (PCC)

These particular conditions of contract are to be read in conjunction with general conditions of contract. In case of any variation in particular conditions of contract than general conditions of contract, the provisions in particular conditions of contract shall take precedence

<table>
<tr><td colspan="2">A. General</td></tr>
<tr><td>GCC 1.1 (a)</td><td>a. The Employer is Andhra Pradesh Capital Region Development Authority (APCRDA)</td></tr>
<tr><td>GCC 1.1 (b)</td><td>The Chief Engineer shall mean Chief Engineer – _____ of APCRDA</td></tr>
<tr><td>GCC 1.1 (c)</td><td>The ‘Engineer in Charge’ shall mean the Executive Engineer –_____, APCRDA, who is designated as such for the time being, in whose jurisdiction the works lies</td></tr>
<tr><td>GCC 1.1 (j)</td><td>"Commencement Date” or "Start Date" shall be DD.MM.YYYY</td></tr>
<tr><td>GCC 1.1 (k)</td><td>The works shall be completed in all respects and handed over to APCRDA in ____ months from the Start Date.</td></tr>
<tr><td>GCC 1.1 (l)</td><td>“Base Date” shall be DD.MM.YYYY [Bid Publishing Date]</td></tr>
<tr><td>GCC 1.1 (cc)</td><td>The Project Manager is Project Management Consultant (PMC) appointed by APCRDA to act on behalf of APCRDA for the overall supervision, validation, quality / control, progress review and/or any other project related activity.</td></tr>
<tr><td>GCC 1.1 (gg)</td><td>The Site is located at Andhra Pradesh New Capital City, Amaravati and is defined in drawings annexed.</td></tr>
<tr><td>GCC 1.1 (jj)</td><td>The Works consist of:

WORLD BANK & ADB financed Amaravati Capital City Development Program related [INSERT PROJECT NAME] on Lump sum contract (Percentage Tender).</td></tr>
<tr><td>GCC 2.2</td><td>Sectional Completions are: Not Applicable</td></tr>
<tr><td>GCC 2.3 (l)</td><td>The following documents also form part of the Contract:
<table>
<tr><td>S. No.</td><td>Document</td><td>Description of the document</td></tr>
<tr><td>1.</td><td>Construction Methodology</td><td>Construction methodology given in bid amended as per comments of employer given in letter of acceptance.</td></tr>
<tr><td>2.</td><td>Quality control</td><td>Quality control procedures and assurance plans given in the bid and amended as per comments of</td></tr>
</table>
</td></tr>
</table>

			Employer given in letter of acceptance.
	3.	Contractor's Environmental and Social (ES) Management Plan (C-ESMP)	(i) ES Management Strategies and Implementation Plans; (ii) Labor Influx and Worker's Camp Management Plan including the process for mitigating construction related impacts on local community; and (iii) Code of Conduct that will apply to its employees and subcontractors, to ensure compliance with its Environmental, Social, Health and Safety (ESHS) obligations under the contract and (iv) Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH) Prevention and Response Obligations
	4	Code of Conduct for Contractor's Personnel (ES)	**Code of Conduct for Contractor's Personnel (ES)** The Contractor shall submit its Code of Conduct that will apply to Contractor's Personnel, to ensure compliance with the Contractor's Environmental and Social (ES) obligations under the Contract. No substantial modifications shall be made to this form, except that the contractor may introduce additional requirements, including as necessary to take into account specific Contract issues/risks. The code of conduct shall also state that the workers will comply with the following: (a) Wearing Personal and Protective Equipment (PPE) in the workplace at all times (b) Non-discrimination in dealing with the local community by race, ethnicity, gender, religion, disability, sexual orientation, gender identity, social or health status (c) Respectful attitude while interacting with the local community (d) Prohibit sexual harassment, particularly towards women and children (e) Prohibit violence, including sexual and/or gender based violence (f) Respecting reasonable work instructions (g) Protection and bidder use of the property Note: Consultants and all personnel including sub-consultants must sign a document outlining good practices and measures to address SEA/SH risks. Employers must follow minimum requirements and may add additional measures based on environmental and social assessments (see Appendix).

	5	Sexual Exploitation and Abuse (SEA), and/or Sexual Harassment (SH) documents	Sexual Exploitation and Abuse (SEA), and/or Sexual Harassment (SH) Declaration and progress reports: Progress reports should include: a) Gender: Number of female workers, percentage of workforce, and gender issues addressed. b) SEA/SH and Code of Conduct Training: • Number and dates of SEA and SH prevention training events. • Number of workers trained on the Code of Conduct. c) Grievances: Number of SEA and SH allegations received, unresolved grievances, complainant's age and sex, how received, referral details, resolution status, and any required follow-up. d) Compliance: Status of compliance with the SEA and SH prevention and response action plan
GCC 3.1	The language of the contract is ***English***. The law that applies to the Contract are the laws of Union of India. Salient features of major labour and other laws that are applicable to construction industry in India are given as Appendix 1 to General Conditions of Contract.		
GCC 4.1	The Project Management Consultant shall obtain the specific approval of the Employer for the following, but not limited to: - Approving subletting of the Work - Granting claims to the Contractor - Ordering suspension of the work - Determining an extension of time - Waiving off the penalty and arranging the repayment of compensation for delay - Issuing of Variation Order - Ordering any work/test beyond the scope of the Contract - Any amendment in the contract condition - Approval to designs and working drawings The project Manager shall take any decision with prior approval of the Chief Engineer. Any such decision taken without the notice of the Chief Engineer shall be invalid.		
GCC 5.1	The Project Manager **shall not** delegate any of their duties and responsibilities to other people without prior approval of the employer		
GCC 6.1	Communications between parties shall be effective only when in writing. A notice shall be effective only when it is delivered (as per the Indian Contract Law)		

GCC 7.1	- The total value of works to be awarded on sub-contracting shall not exceed _____% [*insert work-specific required percentage, not exceeding 50%]* of the contract value. - The Employer before awarding of works on sub-contracting shall verify the genuineness of the proposed Sub-Contractor`s qualification and other eligibility criteria. - The extent of sub-contract shall be added to the experience of the sub-contractor and to that extent deducted from that of the main contractor while issuing the experience certificate.
GCC 9.1	- The names of the Key Personnel agreed by the Employer shall be furnished by the contractor in a statement separately. The contractor shall also submit CVs of key personnel by proof of qualification and experience within 15 days of the issue of Letter of Acceptance (LoA). - The technical personnel shall be appointed on a full-time basis and shall be exclusively available at the project site for the works specified in the contract. They shall be present at the work site to supervise all materials, works, and quality control activities. The technical personnel shall be readily available to receive instructions from the Engineer-in-Charge whenever required. - If the Contractor is awarded multiple contracts simultaneously, and the same key personnel are proposed for all works in the bid document; the Contractor shall employ separate personnel for each project, of equivalent or more qualification and experience, subject to the approval of the Project Management Consultant (PMC) and the Engineer-in-Charge - If the Contractor fails to employ the required technical personnel, a penalty shall be imposed in accordance with applicable rules or as determined by the Engineer-in-Charge. The penalty shall be deducted from the Contractor's bills. - Should the Contractor fail to employ the required technical personnel, the Employer reserves the right to suspend the works or facilitate engagement of the necessary technical personnel. Any costs incurred by the Employer in facilitating the engagement of such personnel will be borne by the Contractor.
GCC 9.4.18	- The contractor shall designate Chief Project Manager of the Contractor’s Personnel as Grievance Redressal Officer.
GCC 12.1	DELETED
GCC 12.2	DELETED
GCC 13.1	Add the following in GCC 13.1 **“Monsoon Damages:** Damages due to rain or flood for excavation either in cutting or in banks etc shall have to be made good by the contractor till the work is handed over to the Department. The responsibility of de-silting and making good the damages due to rain or flood

	rests with the contractor. No extra payment is payable for such operations and the contractor shall therefore have to take all necessary precautions to protect the work done during the construction period.”
GCC 14.1	- The Contractor shall procure a comprehensive Contractor All Risk Insurance Policy with coverage equivalent to the contract value. The Engineer-in-Charge shall be named as the primary beneficiary, and the Contractor shall be the secondary beneficiary. A copy of the insurance policy must be submitted to the Engineer-in-Charge for review and approval. - The Contractor shall be solely responsible for and shall indemnify the Department against any and all liabilities arising from or related to the execution of the work. Furthermore, the Contractor shall obtain and submit to the Engineer-in-Charge a third-party insurance policy with a minimum coverage of Rs. 10 lakhs per accident. The Engineer-in-Charge shall be named as the primary beneficiary, and the Contractor shall be the secondary beneficiary. - The Contractor shall periodically provide documentary evidence to confirm the payment of premiums for all insurance policies, ensuring their validity until the completion of the work. Furthermore, the Contractor shall ensure that insurance policies are obtained for the workers of their Sub-Contractors and specialized agencies. - The Contractor, including sub-contractors, shall ensure that all workers and supervisory staff deployed on-site are covered by comprehensive group insurance. The specific details of the insurance coverage provided shall be submitted to PMC and the Engineer-in-Charge by the Contractor or associated agencies within twenty (20) days of the project's commencement date. - Without prejudice to any of its obligations and responsibilities specified above, the Contractor shall within 15 days from the date of letter of acceptance of the tender and thereafter at the end of each quarter submit a report to the Department giving details of the Insurance Policies along with Certificate of these insurance policies being valid, along with documentary evidences as required by the Engineer-in-Charge. No work shall be commenced by the Contractor unless the Contractor obtains the Insurance Policies as mentioned above. Also, no payment shall be made to the Contractor on expiry of insurance policies unless renewed by the Contractor. Nothing extra shall be payable on this account. - **Workmen’s Compensation Insurance**: Workmen’s compensation coverage shall be obtained by the Contractor to provide compensation to its personnel/employees engaged in the performance of this contract including personnel /employees of sub-contractors engaged by the contractor in respect of accidents and diseases of occupation and all actions, suits, claims, demands, costs, charges and expenses arising in connection with death or injury as a consequence of such accidents or diseases, whether or not such personnel lie within the scope of the Workmen’s Compensation Act, 1923, or other Applicable Laws. Such coverage shall be maintained in full force and effect during the whole

	time that any such personnel are engaged in the execution of the Work and shall provide a waiver of subrogation in favour of Employer and their directors, officers, employees, and agents, where allowed by law. - **Professional Indemnity Insurance:** If Contractor provides professional services and/or design/build Work, Contractor shall effect and maintain a Professional Indemnity Insurance coverage on a claims made basis, for a Policy Limit of design fee. Such policy shall be on a project specific basis, with limits dedicated to Contractor's Work and not shared with any other work performed by Contractor, have a retroactive date no later than commencement of Work, and remain in full force and effect until 12 months after Final Completion.
GCC 15.1	- The selected land by the employer for borrow area shall be made available to the Contractor by the Employer for extracting the required gravel for the work, at free of cost for selected earth.
GCC 16.1	The employer will provide different types and lengths of pipes (DI pipes/GWC pipes/HDPE pipes/HDPE silicore/HDPE 7 way multi duct) to the Contractor at the site free of cost. These pipes are to be transported by the contractor to various locations at their own cost for use. Such pipes should be tested by the Contractor and used for the intended purpose after the necessary technical tests are completed. The BOQs prescribed by the Employer are after accounting for such free pipes available at the site.
GCC 16.2.1	GCC 16.2.1 include " a) The contractor shall implement the mitigation and monitoring measures given in the ESMP to address E&S risks associated with the construction works. The Contractor shall refer to the Environmental and Social Impact Assessment (EIA) of the projects, which is available on the CRDA website at https://crda.ap.gov.in/ for further guidance. b) **Cost Allocation for E&S Provisions:** Any items, activities, or costs already accounted for in the Bill of Quantities (BOQ) or used in calculating the BOQ shall not be claimed from the Environmental & Social (E&S) provisions budget of 1%. The E&S provisions budget must exclusively cover new, additional costs directly related to environmental and social safeguards. c) Payments towards implementation and compliance of C-ESMP will be made as part of the works bill (i.e. equivalent to 1% of the works bill), after duly certified by the PMC and ESMU.
GCC 16.2.2	GCC 16.2.2 include " **Grievance Redressal:** The contractor shall designate Chief Project Manager as Grievance Redressal Expert. Grievances of frivolous nature and malafide intentions shall not be entertained and the Contractor/PMC/ESMU/officer of PIU/PgMC shall make separate note of such complaints and report to the Authority."
GCC 21.1	a) The Employer shall provide the Contractor with possession of the entire Site. b) Notwithstanding the foregoing, if unforeseen circumstances beyond the

	Employer's reasonable control, such as court orders or other legally binding directives, prevent the Employer from providing possession of the entire Site upon award of the Contract, the Employer may provide possession of a portion of the Site. c) The portion of the Site provided shall be suitable and sufficient to enable the Contractor to commence and perform the Work at the Site. d) The Contractor shall, as necessary, adjust the Work Program to accommodate the phased or partial Site possession. e) No claim of any kind shall be asserted by the Contractor against the Employer for any delay or disruption arising from the inability to provide possession of the entire Site upon award of the Contract or from the phased or partial provision of Site possession. The Clause 59 of P.S. to APDSS shall be applicable. f) The Contractor shall, to the extent practicable, specify the portions of the Site to be made available to them, the order in which such portions shall be provided, and the timing for such possession. g) Subject to any express provisions in the Contract regarding the sequence of work execution, the Employer or its duly authorized representative shall, upon issuing a written order to commence the Works, provide the Contractor with possession of such portions of the Site as are reasonably necessary to initiate and proceed with the Works in accordance with any approved Program or, in the absence of an approved Program, in accordance with a reasonable program submitted by the Contractor in writing to the Employer or its duly authorized representative. h) The Employer or its duly authorized representative shall, as the Works progress, continue to provide the Contractor with timely possession of subsequent portions of the Site as may be required to ensure the diligent and expeditious execution of the Works in accordance with the approved Program or the Contractor's reasonable program, as applicable. i) Should the Contractor experience delays or incur additional costs directly attributable to the Employer's or its duly authorized representative's failure to provide Site possession in accordance with the terms of this Clause, the Employer or its duly authorized representative shall grant a commensurate extension of time for the completion of the Works. j) The contractor shall take note of the Resettlement Action Plan (RAP) for this project (which will be provided to the contractor before the commencement of the project) and cooperate with the Employer for implementation of the same. It would, however, be the responsibility of the Employer to implement the said RAP. The contractor is required to ensure that no civil work is commenced or restriction (due to the works) caused to the owner/occupier or user of the land parcel unless compensation and other entitlements are fully paid/provided for the subject land parcel, as per the provisions of the resettlement framework and applicable resettlement plan. Necessary Extension of Time would be given as per APDSS Clause No.59 and the corresponding milestones would also be revised accordingly.

GCC 22.1	GCC 22.1 include "The Contractor shall be solely responsible for all costs and expenses associated with obtaining any necessary special or temporary way leases for access to the Site. Furthermore, the Contractor shall, at its own expense, secure and provide any additional on-site accommodation deemed necessary for the proper execution of the Work"
GCC 24.1	DELETED
GCC 24.2	DELETED
GCC 25.1	Modes of Settlement of claims/ disputes & place of exclusive jurisdiction: If any claim, dispute or disagreement of any kind whatsoever arises between the contractor and the employer, in connection with or arising out of or touching upon this Contract, including without prejudice to the generality of the foregoing, any question regarding its existence, validity, termination, or execution, whether before or after the termination, abandonment or breach of this Contract ("Dispute"), the Parties will seek to resolve the Dispute by mutual consultation within 15(fifteen) days from the occurrence of such Dispute and written representation given for it on behalf of the employer to the contractor or by the contractor to the employer, Lenin Centre, Governor pet, Vijayawada, AP. If the Parties fail to resolve the Dispute by mutual consultation within said 15 days' time, then, the provisions of Clause below will apply. SETTLEMENT OF CLAIMS: All disputes or difference arising of or relating to the Contract shall be referred for Evaluation and Negotiation as follows: a) Claims up to a value of Rupees 10,000/- by Superintending Engineer, APCRDA b) Claims above Rs. 10,000/- and up to Rupees 50,000/- by Chief Engineer, APCRDA c) Settlement of Claims above Rs. 50,000/- Appellate Authority. In the event of failure to resolve the dispute by the Superintending Engineer and / or Chief Engineer of APCRDA within the said 15 days of bringing it to their notice respectively, such disputes shall be referred to the Appellate Authority for resolution. The Appellate Authority for the purpose of this contract is the Secretary, MA&UD, Government of Andhra Pradesh may seek technical advice from the independent technical advisor. The Appellate Authority shall have exclusive jurisdiction to hear and resolve any disputes between the parties, and its decision shall be binding and final, subject to any legal rights of appeal. If any Dispute is not resolved by the Parties within 15(fifteen) days of the appeal to the Appellate Authority, the contractor has to approach a Civil Court

	of competent jurisdiction by way of Civil suit and not by arbitration.
GCC 26.1	The World Bank and ADB require compliance with their Anti-Corruption Guidelines and its prevailing sanctions policies and procedures as set forth in as set forth in Appendix 3 to the Agreement.
B. Time Control	
GCC 27.1	Within 14 days of signing the agreement, the Contractor shall submit to the Project Manager for approval, a revised Program (revising the program given along with the bid) including Environmental & Social Management Plan (to comply with the applicable Laws/ Rules/ Regulations for protection of environment, public health and safety, and the applicable parts of the Environment Management Plan of the project) showing the general methods, arrangements, order, and timing for all the activities in the Works along with monthly cash flow forecasts.
GCC 27.3	- Within fourteen (14) days of signing the Agreement, the Contractor shall submit a detailed Work Program outlining the proposed sequence of work execution, anticipated monthly progress, and a schedule for the procurement of materials, plant, and machinery. If the contractor does not submit the work plan within 14 days of signing the agreement, the work program submitted while bid submission will be considered as the baseline and first submission of the contractor. - This Work Program shall be presented in Critical Path Method (CPM) or Program Evaluation and Review Technique (PERT) format and shall demonstrate a realistic and achievable path to complete the entire Works within the Contract Time, while adhering to any Milestone Program specified in the Contract Documents. - The Contractor shall obtain the prior written approval of the Employer or its designated Project Manager for the initial Work Program. - The Contractor shall maintain and update the Work Program on an ongoing basis to reflect actual progress. - If the Contractor deems it necessary to revise the Work Program, they shall submit a revised program with sufficient advance notice to the Employer or Project Manager. - The revised program shall incorporate all necessary modifications and shall be subject to the prior written approval of the Employer or its Project Manager. - No revised Work Program shall be implemented without such prior written approval. - The Works shall be programmed to achieve the Milestones as defined in the "Rate of Progress" section of the Contract Documents. - The Contractor shall develop and submit a Milestone Program for approval by the Employer. - The Milestone Program shall outline the key stages of progress and shall include detailed scheduling for each sub-component or stage within each Milestone. - The Contractor shall utilize modern and state-of-the-art Project Monitoring and Scheduling software tools, such as Primavera P6 or other comparable software, to develop and maintain Micro-level planning and scheduling for all sub-components and stages of the Works.

<table>
<tr><td></td><td>The Contractor shall maintain a consistent and expeditious rate of progress throughout the duration of the Works. The date of commencement of the Works shall be the date of execution of the Contract Agreement. The Contractor may propose an accelerated work program for early completion of the entire Works. The Employer encourages the Contractor to strive for a rate of progress that exceeds the minimum requirements outlined below:

Work programme of achieving the milestones (Statement)

<table>
<tr><th>Mile stone No.</th><th>Period from the date of signing agreement</th><th>Percentage of Financial Progress to be achieved</th><th>Percentage of Financial Progress to be achieved (Cumulative)</th></tr>
<tr><td>Milestone-1</td><td>End of 6th Month</td><td></td><td></td></tr>
<tr><td>Milestone-2</td><td>End of 12th Month</td><td></td><td></td></tr>
<tr><td>Milestone-3</td><td></td><td></td><td></td></tr>
<tr><td>Milestone-N</td><td></td><td></td><td></td></tr>
</table>
Note: The percentage of work to be completed is based on the contract lump sum amount.</td></tr>
<tr><td>GCC 27.4</td><td>GCC 27.4 shall be read as

“The Project Manager’s approval of the Program shall not alter the Contractor’s obligations. The Contractor may revise the Program and submit it to the Employer/Project Manager again at any time for their approval.

The Employer/Project Manager can, without any way violating this contract, or forming grounds for any claim, alter the order of progress of the works or any part thereof and the contractor shall after receiving such directions proceed in the order directed. The contractor shall also report the progress to the Engineer-in-Charge within 7 days of directions to alter the order of progress of works.</td></tr>
<tr><td>GCC 27.5</td><td>GCC 27.5 also include “The Contractor shall prepare and submit to ESMU detailed progress reports on the project's Environmental, Health, and Safety (EHS) and Occupational Health and Safety (OHS) performance. These reports shall be submitted monthly and shall include, but not be limited to, the following:
- Environmental and Social (E&S) Performance: A detailed report on the project's compliance with applicable E&S standards, regulations, and the Project's Environmental Social Management Plan (ESMP) including:
o Progress on mitigation measures and monitoring activities
o Identification and management of potential E&S risks and impacts
o Stakeholder engagement and grievance redressal mechanisms
o Occupational Health and Safety (OHS) Performance: A detailed report on the project's OHS performance, including:</td></tr>
</table>

	o Accident and incident reporting and investigation o Implementation of OHS management systems and procedures o Training and awareness programs for workers o Emergency response plans and drills - Sexual Exploitation and Sexual Harassment (SEA&SH) Prevention and Response: A detailed report on the project's SEA&SH prevention and response efforts, including: o Implementation of SEA&SH policies and procedures o Training and awareness programs for all project personnel o Reporting and investigation of SEA&SH incidents o Grievance mechanisms and support services for victims. o Status of overall Compliance of SEA/SH Prevention and Response Action Plan.
GCC 28.1	GCC 28.1 includes" - If the Contractor encounters any of the following circumstances: o **Extra or Additional Work:** The need to perform extra or additional work of any kind, for any cause or reason. o **Delays:** Delays beyond the Contractor's reasonable control, such as: ▪ **Exceptional Adverse Climate Conditions:** Unforeseeable and exceptional adverse weather conditions. ▪ **Other Special Circumstances:** Other unforeseen circumstances beyond the Contractor's reasonable control and not attributable to the Contractor's negligence or breach of contract. which reasonably justify an extension of time for the completion of the Works, including the achievement of any Milestones as stipulated in Clause 27.6, the Contractor shall, within twenty-eight (28) days of the occurrence of such circumstance, or as soon thereafter as practicable, submit a written request for an extension of time to the Employer or its designated representative. This request shall include full and detailed particulars of the circumstances giving rise to the claim for an extension of time. The Employer or its designated representative shall review and approve or deny the requested extension of time. - Extensions of Time for reasons attributable to the Contractor shall be granted, if at all, as follows: o **Up to Six Months:** The Employer or its designated representative shall have the authority to grant extensions of time up to a maximum of six (6) months. o **Beyond Six Months:** For extensions of time exceeding six (6) months, the approval of the next higher authority within the Employer's organization shall be required. In all cases, the granting of an Extension of Time is subjected to the imposition of liquidated damages in accordance with the terms of this Contract.
GCC 29.1	DELETED
GCC 29.2	DELETED

GCC 30.1	a) The Employer or its duly authorized Representative may, in writing, instruct the Contractor to adjust the pace of work, including slowing down or temporarily halting any part or all of the Work, for any reason deemed necessary by the Employer. The Contractor shall promptly comply with such written instructions from the Employer or its Representative. Compliance with such instructions shall not entitle the Contractor to any claim for compensation for any resulting delays or costs. However, such delays ordered by the Employer or its Representative will be considered when evaluating requests for extensions of time submitted by the Contractor. i. As per Clause 59 of P.S. to APDSS, no additional compensation will be paid to the Contractor for delays ordered by the Employer or its Representative. ii. Delays ordered by the Employer or its Representative that exceed a cumulative total of thirty (30) days shall require the prior written approval of the Employer. b) If, at any time, the Employer or its duly authorized Representative determines that the Contractor is: i. Delaying Commencement of the Work: Failing to commence the Work within the agreed-upon timeframe. ii. Violating Contract Provisions: Failing to comply with any of the provisions of the Contract Agreement. iii. Neglecting or Delaying Progress of the Work: Failing to maintain the rate of progress as specified in the Contract Documents (including the "Rate of Progress" section). The Employer or its duly authorized Representative shall issue a written notice to the Contractor advising of the non-compliance and demanding immediate corrective action. If the Contractor fails to comply with the demands of the Employer within seven (7) days of receiving the written notice, the Employer may take appropriate action, including but not limited to: - **Forfeiture of Earnest Money:** Forfeiture of the entire amount of the Earnest Money Deposit. - **Withholding Payments:** Withholding payments for work completed but not yet paid for. - **Termination of Contract:** Termination of the Contract in accordance with the provisions of Clause 60A of PS to APDSS. The specific actions taken by the Employer will depend on the severity and nature of the Contractor's breach of contract. c) If, at any time, the Employer or its duly authorized Representative determines that the Contractor is:
GCC 31.1	- The Meeting place shall be **APCRDA office** - Monthly Review Meetings: Shall be attended by Project - in - charge and the Management Representative who can take independent decisions along with PMC and APCRDA.

	○ Agenda ○ Progress Status/Statistics. ○ Completion Outlook. ○ Major hold ups/slippages. ○ Assistance required. ○ Critical issues. ○ Any decision on queries raised either by Contractor/PMC. ○ Anticipated cash flow requirement for next two months.
C. QUALITY CONTROL	
GCC 33.1	**Quality Policy:** • **High-Quality Materials and Workmanship:** All materials, equipment, tools, and plant used in the Works shall be of the highest quality and shall conform to the specifications. • **Compliance with Standards:** The Contractor shall adhere to the requirements for materials and workmanship as outlined in the "Materials and Workmanship" section of the Andhra Pradesh Standard Specifications. All materials shall conform to the latest relevant Indian Standard (IS) Specifications and other approved codes and standards. **Quality Plan:** • **Development and Submission:** The Contractor shall develop a comprehensive Quality Plan based on the principles of ISO 9001:2015 (or the latest applicable version of the ISO 9001 standard). This Quality Plan shall be submitted to the Employer or its duly authorized Representative for approval prior to the commencement of the Works. • **Approved Materials List:** The Contractor shall utilize only those materials that are included in the approved list of materials, makes, and suppliers provided by the Employer. The Employer reserves the right to insist on the use of specific materials from this approved list. **Independent Laboratory Testing:** All tests required to be conducted in independent laboratories shall be performed at laboratories accredited by a recognized national accreditation body and equipped with instruments traceable to national standards. The laboratory reports shall clearly indicate the calibration status and traceability to national standards of all equipment used for testing. **Quality Control Inspections:** In addition to routine inspections conducted by the Engineer and the project staff responsible for construction oversight, the work shall be subject to independent inspections by: • The Executive Engineer • The designated Quality Control Circle • The State or District Level Vigilance Cell Unit

	• Any other authorized external agency as may be determined by the Employer. If any inspections reveal sub-standard work, instances of excess payments, or discrepancies in measurement books or other relevant project records, appropriate corrective actions shall be taken. These actions shall be implemented and overseen by the Engineer-in-Charge and Project Manager **Quality Audit:** i. The Department may engage external agencies for conducting quality audit in which case the following methodology would be adopted: ii. The external agencies shall conduct quality control tests as per the standard procedures in the presence of Construction and Quality Control Engineers and the Contractor. iii. The observations of the external agencies on the quality of work should be recorded then and there and signatures of all the concerned obtained as a token of acceptance of the observations. iv. If any sub-standard materials, work or workmanship is noticed, action will be taken based on their observations, and these will be affected by the Engineer- in-charge and Project Manager of the execution of the work. For all works costing more than Rs.2.00 Crores the Contractor shall submit Project quality plan and also show proof of owning quality lab.
GCC 34.1	The Contractor shall establish a field laboratory with a minimum area of 80 square meters for the purpose of conducting material testing. The Contractor shall equip the field laboratory with all necessary testing equipment as specified in Works requirements of the Contract Documents. If the Engineer-in-Charge determines that additional testing is required to verify the quality or integrity of any work, the Contractor shall conduct such testing. The Contractor shall be responsible for all costs associated with any additional testing requested by the Engineer-in-Charge. • **Material Testing:** o The Contractor shall be responsible for the testing of all materials procured for the Works, including raw materials and construction materials. o Testing shall be conducted as per the frequencies specified in the Andhra Pradesh Standard Specifications. o All testing costs shall be borne by the Contractor. o Materials shall only be used in the Works after the Employer or its duly authorized Representative has reviewed and approved the test results. o The Contractor shall maintain accurate and complete records of all test results and make them readily available for inspection by the Employer or its duly authorized Representative. • **Material Procurement and Testing:** The Contractor shall procure all necessary materials well in advance of their use. All materials shall undergo rigorous testing as per the approved Quality Plan. No

	material shall be used in the Works unless it has passed all required tests and inspections as per the established acceptance criteria.
GCC 35.3	The Defects Liability Period is: [_____] Months. Wherever applicable and upon instructions from the authority the Contractor shall furnish the manufacturers written warranty for the maximum available period in favour of the authority against respective trades for the defective materials and/or poor workmanship. The commencing date of the warranty shall be the date of the practical completion of the Works Contract.
GCC 36.1	**Defect Rectification:** If the Contractor fails to rectify a defect within the timeframe specified in the Employer's written notice, the Engineer-in-Charge shall assess the cost of rectifying the defect. The Contractor shall be liable to pay the Employer the assessed cost of rectifying the defect. Alternatively, the Employer may deduct the assessed cost of rectification from any outstanding payments to the Contractor, including but not limited to the Security Deposit. **Quality Control Checks and OK Cards:** The Employer or its duly authorized Representative shall implement a system of "OK Cards" for all major components of the Work. The format and procedures for the use of OK Cards shall be prescribed by the Employer. The Contractor or its authorized representative shall: • Initiate the OK Card process for each major component of the Work. • Complete the relevant sections of the OK Card. • Submit the completed OK Card to the construction supervision staff for initial inspection and approval. The construction supervision staff shall inspect the relevant work item and forward the OK Card to the Employer's Quality Control staff for final inspection and approval. Any defects identified during inspections by either the construction supervision staff or the Quality Control staff shall be promptly rectified by the Contractor. The Contractor shall document all corrective actions taken on the back of the corresponding OK Card. The Employer or its duly authorized Representative may implement a system of checklists for various aspects of the Work. These checklists shall be maintained in bound registers by the construction supervision staff. The Contractor shall be responsible for initial completion of these checklists, and subsequently, the Construction and Quality Control Engineers shall review and verify the information provided by the Contractor.

	If the rectification of any defects or damages impacts the overall performance of the Works, the Engineer-in-Charge may require the Contractor to repeat any of the tests specified in the Contract, including Tests on Completion and/or tests conducted after completion. The Engineer-in-Charge shall issue a written notice to the Contractor within twenty-eight (28) days of the rectification of the defect or damage, specifying the required re-tests. These re-tests shall be conducted in accordance with the same procedures and standards as the original tests, except that they shall be carried out at the sole cost and risk of the Contractor.
GCC 38.1	DELETED
GCC 38.2	DELETED
GCC 38.3	DELETED
D. COST CONTROL	
GCC 39	GCC 39 shall be read as " a) The contractor is bound to execute all supplemental works that are found essential, incidental and inevitable during execution of main work. b) The payment of rates for supplemental items of work will be regulated as under, Supplemental items directly deducible from similar items in the original agreement. i. The rates shall be derived by adding to or subtracting from the agreement rate of such similar item the cost of the difference in the quantity of materials labor between the new items and similar items in the agreement worked out with reference to the Standard Schedule of Rates adopted in the sanctioned estimate with which the tenders are accepted plus or minus over all tender percentage. ii. For Similar items but the rates of which cannot be directly deduced from the original agreement, the rates will be worked out from Standard Schedule of Rates adopted in the sanctioned estimate with which the tenders are acceptedplus or minus over all tender percentage. iii. If the rate for Variation item cannot be determined in the manner specified in (i) & (ii) above, the Contractor shall, within 14 days of the issue oforder of Variation work, inform the Employer/Employer's representative the rate which they propose to claim, supported by analysis of the rates. The Employer/Employer's representative shall assess the quotation and determine the rate based on prevailing market rates within one month of the submissionof the claim by the Contractor and approval from **Competent Authority/Technical Committee III** will be taken. As far as possible, the rate analysis shall be based on the standard data book and Standard Schedule of Rates adopted in the sanctioned estimate with which the tenders are accepted. The decision of the **Competent**

Authority/Technical Committee III on the rate so determined shall be final and binding on the Contractor.

Note: *It may be noted that the term Estimate Rate used above means the rate in the sanctioned estimate with which the tenders are accepted, or if no such rates is available in the estimate, the rate derived will be with reference to the Standard Schedule of Rates adopted in the sanctioned estimate with which tenders are accepted.*

c) Extra Items/additional item**:** Extra items of work shall not vitiate the contract. The contractor shall be bound to execute extra items of work as directed by the Employer/Employer's representative. The rates for extra items shall be worked out by Employer/Employer's representative as per the conditions of the Contract and the same are binding on the Contractor.

d) The contractor shall before the 15th day of each month, submit in writing to the **Employer/Employer's representative** a statement of extra quantities they have executed during the preceding month so as to seek approval of competent authority. Similarly, in case of new items, principle approval of **Competent Authority/Technical committee III** shall be taken before execution.

e) Should the Government, at any time during the execution of this contract, issue any order, directive, or enactment that subsumes the rates of items in the Bill of Quantities (BOQ) or modifies statutory provisions affecting the execution of the work, including but not limited to changes in taxes, duties, labour rates, material costs, or other legal requirements, the parties agree that the Contract Price may be subject to such adjustment to include equitable adjustment to the BOQ rates.

Entrustment of additional items:

i. Wherever additional items are to be entrusted to the original contractor, the Chief Engineer is empowered to entrust works initially to contractor without calling for tenders with the approval of **the higher authority.**

ii. Entrustment of the additional items will be authorized by the Chief Engineer up to the monetary limits up to which they themselves are competent to accept items in the original agreement so long as the total amounts upto which they are competent to accept in an original agreement rates for such items shall be worked out in accordance with the procedure (I) For all items of work in excess of the quantities shown in the Bill of Quantities of the Tenders, the rate payable for such items shall be estimate rates for the items (+) or (-) over all tender percentage accepted by the competent authority.

iii. Entrustment of either the additional or supplemental items shall be subject to the provisions of the agreement entered into by the employer after the tender is accepted. The Chief Engineer being the authority next higher to the Executive Engineer, who entered into the agreement approves the rate for the items / variation in quantity in the current agreement. The items shall not be ordered

	by an officer on their own responsibility if the revised estimate or deviation statement providing for the same requires the sanction of higher authority. ***Note:*** *It may be noted that the term Estimate Rate used above means the rate in the sanctioned estimate with which the tenders are accepted, or if no such rates is availablein the estimate, the rate derived will be with reference to the Standard Schedule*
GCC 41	**GCC 41 shall be read as "** **Payments and Certificates:** i. Payment will be made to the Contractor under the certificate to be issued at reasonably frequent intervals by the Engineer-in-Charge, and intermediate payment will be the sum equal to 92½% of the value of work done as so certified and balance of 7½% will be withheld and retained as security for the due fulfillment of the contractor under the certificate to be issued by the Engineer-in-Charge. On completion of the entire works the contractor will receive the final payment of all the moneys due or payable to them under or by virtue of the contract except earnest money deposit retained as security and a sum equal to 2½ percent of the total value of the work done. The amount withheld from the final bill will be retained under deposits and paid to the contractor after completion of defect liability period after making all defects made good according to the true intent and meaning thereof as per clause 68 of PS to APDSS. ii. Payments towards implementation and compliance of C-ESMP will be made as part of the works bill, proportionate to 1% of ESMP provision, after duly certified by the PMC and ESMU. iii. In case of over payments or wrong payments if any made to the contractor due to wrong interpretation of the provisions of the contract, Andhra Pradesh Standard Specifications or Contract conditions etc., such unauthorized payment will be deducted in the subsequent bills or final bill for the work or from the bills under any other contracts with the Government or at any time thereafter from the deposits available with the Government. iv. Any recovery or recoveries advised by the employer, due to non-fulfillment of any contract entered with them by the contractor shall be recovered from any bill or deposits of the contractor. v. No claim shall be entertained, if the same is not represented in writing to the Engineer- in-Charge within 15 days of its occurrence. vi. The contractor is not eligible for any compensation for inevitable delay in handing over the site or for any other reason. In such case, suitable extensions of time will be granted after considering the merits of the case. **Intermediate Payments**: i. Stage payments for supply items for pipes will be made @ 65% of BOQ rate. The stage payment for these pipes will be made based on the half-yearly work schedule proposed by contractor and approved by competent authority to the extent required for

	the work scheduled for the half-year. The stage payment for the subsequent half-year will be made subject to the condition that the pipes for which stage payment made in the preceding half-year are consumed or laid at least 50% of the pipes. ii. On completion of laying and jointing true to the alignment and gradient, 25% of the amount shall be released. iii. On completion of hydraulic field testing and refilling with excavated soils, the balance 10% will be released. iv. Recovery towards useful materials like earth, stone etc recovered from earthwork excavation: Recovery shall be made from the bills payable to the contractor towards the value of useful materials like sand, stone, clay, ballast, earth, trees and shrubs or other materials obtained in the excavation made or lying on the site of the work, either useful for reuse on the work or elsewhere. v. The fixed budget provision towards execution of E&S, SEA/SH requirements will be the same as the value estimated in the BoQs and will not be subject to any revisions. This amount will be paid proportional to work done along with each bill raised.
GCC 42.1	a) Payment for the work done by the contractor will be made for the finished work based on the measurements recorded in measurement books by any officer of the department not lower in rank than an Assistant Engineer and check measured by any officer not lower in rank than a Deputy Executive Engineer. The measurement shall be recorded at various stages of the work done and also after work is completed. The contractor shall be present at the time of recording of each set of measurement and their check measurement and accept them then and there so as to avoid disputes at alater stage. If the contractor is not available at the works pot at the time of recording measurements or check measurements the particulars of measurements shall be signed by the authorised agent of contractor based on which the contractor shall accept the set of measurements without any further dispute. If for any reason the contractor's authorised agent is also not available at site when the department decides to suspend the work recording of measurements in the absence of the contractor or their authorised representative the department shall not entertain any claim from the contractor for any loss incurred by them on this account. The Contractor shall however note that the Department cannot indefinitely wait for recording the measurement due to the absence of the Contractor and their authorized agent and check measure them even in the absence of the contractor. b) **Interest on Payment due to the Contractor:** No omission by the Executive Engineer or the sub-divisional officer to pay the amount due upon certificates shall vitiate or make void the contract, nor shall the contractor be entitled to interest upon any guarantee fund or payments in arrears, nor upon any balance which may, on the final settlement of their accounts, found to be due to them.
GCC 44.1	a) The percentage quoted by the contractor shall be deemed to be exclusive of all GST, NAC & Seigniorage charges for relevant

materials which will be calculated and paid by the Employer to the concerned department of Government of AP at the time of payment of bills to the contractor.

b) Composite supply of works contract GST as defined under GST Act, 2017 which is at present 18 %(GST) on value of work done will be paid to the contractor. If there is any variations the same shall be complied.

c) **Seigniorage Charges:** Seigniorage charges will be calculated as per rules based on the theoretical requirement of materials at the following present rates.

S. No.	Material	Seigniorage
1	Sand	-----
2	Metal, Stone Crusher Dust	Rs.90.00 / Cum
3	R.R.stone for masonry.	Rs.90.00 / Cum
4	Revetment stone	Rs.90.00 / Cum
5	C.R. stone.	Rs.90.00 / Cum
6	Gravel / Earth	Rs.45.00 / Cum

As per G.O Ms No. 37 dt. 15.03.2024 of INDUSTRIES & COMMERCE (M.III) DEPARTMENT,

The below shall be added to the bill value along with seigniorage charges:

- Extra @ 100% on Seigniorage Charges towards consideration amount
- Extra @ 2% on Seigniorage Charges towards MERIT
- Extra @ 30% on Seigniorage Charges towards DMF

The rates are liable to be revised and amended from time to time by the State Government, by notification in the 'Andhra Pradesh Gazettee'. Seigniorage charges will be calculated as per rates prevailing at the time of execution.

GCC 44.2

Income Tax:

- During the currency of the contract, deduction of Income Tax at source shall be made from the gross value of each bill of the contract, as per the directives of CBDT/Government of India.
- The contractors staff, personnel and labour will be liable to pay personnel income taxes in respect of their salaries and wages as are chargeable under the Laws and regulations for the time being in force and the contractor shall perform such duties in regard to such deductions there of as may be imposed on them by such laws and regulations.

Goods and Service Tax (GST) on works contract:

- The percentage quoted by the contractor is exclusive of Goods and Service Tax (GST) but inclusive of other taxes on all materials that the contractor will have to purchase for performance of this contract.
- GST component loaded in Part 'B' of the estimate will be reimbursed

	in each bill of the contractor. - The contractor should produce a valid GST Clearance Certificate before the payment of the final bill, otherwise payment to the contractor will be withheld. - Any revision in Tax rates will be implemented as per rules from time to time. TDS will be effected as per the norms. **Labour Cess:** As per the Building and other Construction Workers Welfare CESS Act, 1996, Section 3 of CESS Act, read with rule 4(3) of the cases rules and in accordance with S.O.No.2899, dt.28-03-1996 of Government of India, 1% CESS will be deducted from the bills payable to the contractor. **Institute of National Academy of Construction.** An amount of 0.10 % of the gross bills will be deducted from contractors as their contributions to the National Academy of construction, Hyderabad. (As per G.O.MS No 27 T R&B (Roads- III) Department Dated 29-6-2015
GCC 46.1	GCC 46.1 shall be read as " The Price Adjustment shall be applicable as under: i. Price adjustment shall apply only for work carried out within the stipulated time or extensions granted by the employer for the reasons attributable to the employer. It shall not apply to work carried out beyond the stipulated time with extension granted by the employer for reasons attributable to the Contractor. The price adjustment shall be determined during each quarter from the formulae as detailed herein after. The price adjustment shall be determined as per G.O. Ms. No. 62/ water resources (reforms) department dated: 30.11.2021. ii. price adjustment is applicable (both positive & negative) as per G.O Ms. No.62/water resources (reforms) department dated:30.11.2021 Price adjustment triggers only when the variation is beyond +/- 5% only. Price adjustment applicable for all the works of Rs. 40 lakhs and above and the original contract period is agreement 6 months or more. The Tender percentage (either + or –) shall not be applied to the price adjustment amount worked out. iii. In Respect of fuels, Average fortnightly wholesale price of High Speed Diesel at the existing consumer pumping stations located in the district headquarters nearest to worksite as on date of sanction of estimate will be adopted as base rates as per G.O. Ms. No.62/water resources (reforms) dated: 30.11.2021 iv. The price adjustment shall be applicable with in original contract period or extended on grounds of the departmental delays and with valid reasons and shall not be applicable to the extensions granted on account of the Contractor's faults. Price adjustment shall be applicable for components of works actually carried out during theperiod of the bill.

	v. The price adjustment shall not be allowed where liquidated damages are levied and extension of time granted for reasons attributable to the Contractor Price adjustment shall be made as per GO MS 62 dt 30.11.2021 of Water resources (Reforms) Department."
GCC 47.1	i. The department shall retain from each payment due to the contractor @ the rate of 7.5% of bill amount until completion of the whole of the Works.
GCC 47.2	The Clause shall be read as - i. On completion of the whole of the works out of total amount retained (i.e.,7.5%) 5% will be re-paid to the contractor and balance (i.e.,2.5%) when the Defects Liability Period has passed and the Engineer-in-Charge has certified that all the Defects notified by the Engineer-in-Charge to the Contractor before the end of this period have been corrected. ii. The retention amount in excess of 2.50% of value of work done shall be released against unconditional B.G/Insurance Surety Bond in multiples of Rs.25 Lakhs (in respect of contracts of Rs.100 Crores and below) / Rs.50 Lakhs (in respect of contracts of above Rs.100 Crores), if the rate of progress is maintained. The unconditional irrevocable B.G shall be for the period till the final bill is paid. In the final bill 2.50% of value of work done is to be retained and kept under deposits. The same shall be paid after defect liability period.
GCC 48.1	i. If for any reason, which does not entitle the contractor to an extension of item, the rate of progress of works, or any section is at any time, in the opinion of the PMC too slow to ensure completion by the prescribed time or extended time for completion **PMC** shall so notify the contractor in writing and the contractor shall there upon take such steps as are necessary and the **PMC** may approve to expedite progress so as to complete the works or such sectionby the prescribed time or extended time. The contractor shall not be entitled to any additional payment for taking such steps. If as a result of any notice given by the **PMC** under this clause the contractor shall seek the **PMC permission** to do any work at night or on Sundays, if locally recognized as days or rest,or their locally recognized equivalent, such permission shall not be unreasonably refused. ii. If the contractor fails to complete whole of the works or any part thereof or section ofthe works within the stipulated periods of individual mile stones (including any bonafide extensions allowed by the competent authority without levying liquidated damages), the **PMC** may without prejudice to any other method of recovery **will deduct Rs 50/- per lakh per day of unfinished value of work for period of delay respective milestone financial programme value per calendar day or part of the day for the period of delays subject to a maximum of 10%of the contract value** as damages due from the contractor from any monies in

their hands due or which may become due to the contractor. The payment or deductions of such damages shall not relieve the contractor from their obligation to complete the works, or from any other of their obligations and liabilities under the contract.

Also, the amounts withheld towards imposition of LDs against milestone(s) shall be released to the contractor upon achievement of cumulative progress in immediate next milestone, failing which, it would be recovered from the work bill.

iii. The liquidated damages for the whole of the work will be filled up at the time of concluding agreement.

Mile stone No.	Period from the date of signing the agreement	Minimum percentage of financial progress to be completed (Cumulative)	Liquidated damages amount in Rupees perday
For the Milestone-1	End of 3rd Month		Rs 50/- per lakh per day of unfinished value of work for period of delay which is short fall for that respective milestone financial programme value per calendar day orpart of the day for the period of delays subject to a maximum of 10% of the contract value
For the Milestone-2	End of 6th Month		
For the Milestone-3	End of 9th Month		
For the Milestone-4	End of 12th Month		
For the Milestone-5	End of 15th Month		
For the Milestone-6	End of 18th Month		

The maximum amount of liquidated damages for the whole of the works is **ten percent of final contract price.**

GCC 48.1

GCC 48.1 to also include the below, over and above the liquidated damages

Penalties for Non-Compliance of C – ESMP

Contractor's Responsibilities:

- Implement all assigned mitigation measures as per the ESMP and contract documents.
- Address grievances raised by the public during project implementation.
- Undertake regular reporting to the Employer.

Non Compliances in Contractor's Responsibilities:

	• Any Non compliances in implementing the above responsibilities will attract penalties as detailed in the clause. **Major Non Compliances:** • Failure to obtain clearances/permissions/NoC/Registrations/Consent under statutory environment and labour regulations. • Unaddressed public complaints within the Contractor's scope, formally registered and communicated, within the time period set by PMC/ESMU. • Inadequate safety arrangements or compromising occupational safety/serious hazards posing high risk levels to lives of personnel on site or conditions leading to possible suspension of work until safety is ensured, significant degradation of environment and continuous disturbances in settlements as determined by PMC/ESMU. • Reoccurrence of any minor non-compliances. All non-compliances, which are not major lapses, will be categorized as minor lapses. **Penalty for lapses:** An amount of minimum Rs.10000 and Rs.10 lakhs for each minor non-compliance with C-ESMP and minimum Rs. 10 lakhs and maximum Rs.50 lakhs for all major non-compliances with C-ESMP in the part bill shall be withheld. The amount shall be released only if the identified non compliances are rectified within the duration specified by the Employer. Duration specified shall consider the environmental damage/risks associated with non-compliances. Such specified duration shall not be more than 15 days. The penalty decided for non-compliances shall have a rationale and be judicious. Reoccurrence of the minor non-compliances shall be treated as major lapse. Reoccurrence of all major non compliances, a penalty of Rs. 50 lakhs shall be levied for each such non-compliance. **The total ceiling limit of the penalties under ESMP shall be limited to 25% of the ESMP provision of the contract.**
GCC 49.1	DELETED
GCC 50	GCC 50 shall be read as “ A) The contractors for works exceeding more than Rs.1.00 Crore of estimated cost are permitted to avail the facility of mobilization advance up to 10% in installments for the value of the contract against an unconditional and irrevocable bank guarantee of 110% in terms of G.O Ms. No. 94 dt.1.7.2003, G.O. Ms. No.267 MAUD dt.9.8.2018, G.O Rt No. 1474 MAUD dt.12.12.2007 and GO MS No. 57 Dt. 27-11-2024 of Water resources (Reforms) Department. Mobilization advance towards labour can be availed in 2 installments within a period of 25% of Agreement period or 6 months, whichever is earlier. Thereafter,the agency can not avail the facility.

	a) 1% after conclusion of agreement. b) The remaining 4% in after commencement of work. Mobilization advance towards new machinery and equipment/ material procured not exceeding 5% of the contract value can be availed within 50% of Agreement period (or) 1 year whichever is earlier. Thereafter, the agency cannot avail the facility. The mobilization advance is payable for the new machinery purchased after the date of conclusion of the agreement. Interest is to be levied till the entire mobilization advance is recovered even beyond Agreement period also B) The above advance shall bear an interest of one year MCLR of State Bank of India. The interest paid on the advance is chargeable from the date advance is paid. However, if completion is delayed by circumstances beyond control of the Contractor for which an extension of time has been granted the interest charges on such advances shall be waived for the period of Construction. C) The value of Advance Bank Guarantee given by the Contractor can be progressively reduced by the amount repaid by the Contractor. D) The recovery of advance from part bills shall commence in the next immediate payment following that in which the total of all such payments to the contractor have reached 10% of contract value as specified in the agreement. E) The first recovery of the Advance shall commence from such part bill (as stated in (a) above) @ 20% as specified in the agreement calculated on the value of work done and paid for (upto that part bill) along with interest payable upto that date, further recovery of Advance and interest (calculated on the balance as end of previous bill) in subsequent bills shall be made at the percentage prescribed. F) In any case, it should be seen that the entire advance is recovered before the expiry of the original time for completion of the work and by the end of 80% work done value whichever is earlier. G) While calculating the interest on the advance / balance of advance from time to time, the actual date of issue of cheque for advance / of payment of previous bill wherein part of advance plus interest was recovered shall be considered, and actual number of days for which the interest shall have to be worked out applying the rate of interest prescribed (and the number of days in a year shall be taken as 366 for a leap year and 365 days for a non-leap year). H) If the Advance Payment has not been fully repaid prior to Termination under Clause 59, as the case may be, the whole of the balance then outstanding shall immediately become due and payable by the Contractor to the Authority. In the event of Termination for Contractor Default, the Advance Payment shall be deemed to carry interest at the rate of 10% (ten per cent) per annum from the date of Advance Payment to the date of recovery by encashment of the Guarantee for the Advance Payment. For the avoidance of doubt, the aforesaid interest shall be payable on each installment

	of the Advance Payment, regardless of whether the installment or any part thereof has been repaid to the Authority prior to Termination.
GCC 51.1	- The contractor shall, for the performance of its obligations hereunder during the Construction Period, furnish the Performance Security for an amount equal to 2.5 per cent of the bid amount/contract value in the shape of unconditional and irrevocable Bank Guarantee/ Insurance Surety Bond valid until 60 days after the completion of DLP period. - The contractor shall also, for the performance of its E&S obligations hereunder during the Construction Period, furnish the Performance Security for an amount equal to 0.1 per cent of the bid amount/contract value in the shape of unconditional and irrevocable Bank Guarantee/ Insurance Surety Bond valid until 60 days after the completion of DLP period. This E&S Performance Security shall be over and above the Performance Security mentioned above .
	E. Finishing the Contract
GCC 54.1	Shall be read as "the Contractor shall request the Engineer-in-Charge to issue a Certificate of completion of the works and the Engineer-in-Charge shall do so upon deciding that the whole of the works is completed"
GCC 55.1	i. The works shall be taken over by the Employer when they have been completed in accordance with the Contract (except as described in sub-paragraph (a) below), have passed the Tests on Completion and a taking-Over Certificate for the works has been issued, or has deemed to have been issued in accordance with this Sub-Clause. ii. The Contractor may apply to the Employer for a taking-over certificate not earlier than 14 days before the works or section (as the case may be) will, in the contractor's opinion, be complete and ready for taking over. "The request for taking over shall be accompanied by as built drawings in Soft & Hard Copies (at least 6 sets)" The employer's representative shall, within 28 days after the receipt of the contractor's application: a. issue the taking-over certificate to the contractor, stating the date on which the works or section were completed in accordance with the contract (except for minor outstanding work that does not affect the use of the works or section for their intended purpose) including passing the tests on completion: or b. reject the application, giving their reasons and specifying the work required to be done by the contractor to enable the taking-over certificate to be issued: the contractor shall then complete such work before issuing a further notice under this sub-clause. If the Employer's representative fails to issue the taking over certificate or to reject the Contractors application within the period of 28 days, and if the works or section (as the case may be) are substantially completed in accordance with the contract, the taking-over certificate shall be deemed to have been issued on the last day of that period.

Use by the Employer

i. The Employee shall not use any part of the works unless the employer's representative has issued a taking-over certificate for such part. If a taking-over certificate has been issued for any part of the works (other than a section), the liquidated damages for delay in completion of the reminder of the works (and of the section of which it forms part) shall, for any period of delay after the date stated in such taking-over certificate, be reduced in the proportion which the value of the part so certified bears to the value of the works or section (as the case may be), such values shall be determined by the Employer's Representative. The provisions of this paragraph shall only apply to the rate of liquidated damages, and shall not affect the limit of such damages.

ii. If the Employer does use any part of the works before the taking-over certificate is issued:
    a. the part which is used shall be deemed to have been taken over at the date on which it is used,
    b. the Employer's Representative shall, when requested by the Contractor, issue a taking-over certificate accordingly, and
    c. the contractor shall cease to be liable for the care of such part from such date, when responsibility shall pass to the Employer.

After the Employer/Project Manager has issued a taking-over certificate for a part of the works, the contractor shall be given the earliest opportunity to take such steps as may be necessary to carry out any outstanding tests on completion, and the contractor shall carry out such tests on completion, and the contractor shall carry out such tests on completion as soon as practicable, before the expiry of the contract period.

Interference with Tests on Completion

If the contractor is prevented from carrying out the tests on completion by a cause for which the Employer (or another contractor employed by the Employer) is responsible, the employer shall be deemed to have taken over the works or section (as the case may be) on the date when the Tests on Completion would otherwise have been completed. The Project Manager shall then issue a taking-over certificate accordingly, and the contractor shall carry out the tests on completion as soon as practicable, before the expiry of the contract period. The Project Manager shall require the tests on completion to be carried out by 14 days' notice and in accordance with the relevant provisions of the Contract. If the contractor incurs additional cost as a result of this delay in carrying out the tests on completion, such cost plus reasonable profit shall be determined by the Project Manager and shall be added to the contract price.

Possession prior to completion:

The Employer/ Employer's representative shall have the right to take possession of or use any completed part of work or works or any part thereof under construction either temporarily or permanently. Such possession or use shall not be deemed as an acceptance of any work either completed or not completed in accordance with the contract with in the interest of Clause 28 of ANDHRA PRADESH STANDARD SPECIFICATIONS except where

	expressly otherwise specified by the Engineer-in-charge.
GCC 57.1	i. As-built drawings must be submitted within 28 days of completion. Final bill will be withheld for failing to produce as-built drawings. Six (6) sets of hard copies of as-built drawings along with soft copy have to be submitted. ii. Issuance of certificate of completion shall be provided upon the successful submission of the above
GCC 57.2	The final bill will be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required in GCC 57.1
GCC 58.2 (a)	The Contract may be terminated by the Employer in accordance with Clause 61 of PS to APDSS upon approval from the Department if the Contractor: • Suspends Work Without Authorization: Suspends work without the prior written consent of the Employer or its duly authorized Representative. • Sublets Work Without Authorization: Sublets any portion of the Work without the prior written consent of the Employer or its duly authorized Representative. • Neglects or Fails to Proceed with Due Diligence: Neglects or fails to proceed with the Work with due diligence as defined in the Contract Documents, including the Schedule and the specified "Rate of Progress." • Repeats Contractual Defaults: Repeatedly defaults on any of the obligations outlined in Clause 27 of APDSS.
GCC 58.2(f)	Furthermore, the Contract shall be deemed terminated under Clause 61 of PS to APDSS if: • **Unauthorized Work Stoppage:** The Contractor stops work for a continuous period of twenty-eight (28) days without prior written authorization from the Employer or its duly authorized Representative. **Delay in Completion of Works:** The Contractor fails to complete the Works within the Contract Time, despite the availability of any applicable extensions of time.
GCC 58.2 (k)	DELETED
GCC 58.2 (l)	DELETED
GCC 59.1 (b)	Also include: - In case of default for payment of such debt payable to the Employer, within 28 days from the date of issue of notice to the above effect, the contractor shall be liable to pay interest at 12% per annum for the period of delay.
GCC 64.1	GCC 64.1 also includes " - All documents, correspondences, decisions and orders, concerning the contract shall be considered as confidential and/or restricted in nature

	by the contractor and they shall not divulge or allow access to them by any unauthorized person.

Section IX - Contract Forms

S. No.	List for forms
1.	Letter of Acceptance
2.	Contract Agreement
3.	Performance Security forms – Options 1 & 2
4.	E&S Performance Security forms – Options 1 & 2
5.	Appendix 1: Code of Conduct for Consultant's Personnel (E&S) Form
6.	Appendix 2: Contractor's Environmental and Social Management Plan (C-ESMP)
7.	Appendix 3: Anti-Corruption Guidelines

Letter of Acceptance

[letterhead paper of the Employer]

[date]

To: *[name and address of the Contractor]*

This is to notify you that your Bid dated *[date]* for execution of the *[name of the Contract and identification number, as given in the Contract Data]* for the Accepted Contract Amount *[amount in numbers and words] [name of currency]*, as corrected and modified in accordance with the Instructions to Bidders, is hereby accepted by our Agency.

You are requested to furnish (i) the Performance Security (2.5% on Estimate Contract Value) and an Environmental and Social Performance Security of (0.1% on Estimate Contract Value) within 28 days in accordance with the Conditions of Contract, using, for that purpose, one of the Performance Security Forms and the ES Performance Security Form, and (ii) the additional information on beneficial ownership in accordance with BDS ITB ~~47.1~~, within eight (8) Business days using the Beneficial Ownership Disclosure Form, included in Section X, Contract Forms, of the bidding document.

Authorized Signature: _____

Name and Title of Signatory: _____

Name of Agency: _____

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made the _____ day of _____, _____, between _____of _____ (hereinafter "the Employer"), of the one part, and _____ of _____ (hereinafter "the Contractor"), of the other part:

WHEREAS the Employer desires that the Works known as _____ should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein,

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.

(a) the Letter of Acceptance;
(b) the Letter of Bid;
(c) the addenda Nos _____ (if any);
(d) the Particular Conditions;
(e) the General Conditions;
(f) the Specification;
(g) the Drawings*;* and
(h) the completed Schedules and any other documents forming part of the contract, including, but not limited to:
   i. the ES Management Strategies and Implementation Plans**;**
   ii. Code of Conduct for Contractor's Personnel (ES); and
   iii. Sexual Exploitation and Abuse (SEA), and/or Sexual Harassment (SH) Declaration

3. In consideration of the payments to be made by the Employer to the Contractor as specified in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of _____ on the day, month and year specified above.

Signed by _____ (for the Employer)

Signed by _____ (for the Contractor)

Performance Security

Option 1: Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: *[insert name and Address of* Employer*]*

Date: _____*[Insert date of issue]*

PERFORMANCE GUARANTEE No.: _____

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that _____ (hereinafter called "the Applicant") has entered into Contract No. _____ *dated* _____ with the Beneficiary, for the execution of _____ (hereinafter called "the Contract").

Further more, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (_____),[1] such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the …. Day of ……, 2…[2], and any demand for payment under it must be received by us at this office indicated above on or before that date.

_____
[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

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[1] *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency(cies) of the Contract or a freely convertible currency acceptable to the Beneficiary.*

[2] *Insert the date as prescribed in GC Clause 51.1. The Employer should note that in the event of an extension of this date for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."*

Option 2: FORM OF INSURANCE SURETY BOND FOR PERFORMANCE SECURITY

(To be executed on Non-Judicial Stamp Paper of Appropriate value)

(Insurance Surety Bond No……)

Date.....

(Name of the Contract)

To:
The Commissioner,
Andhra Pradesh Capital Region Development Authority,
Lenin Centre, Governorpet,
Vijayawada-520002 (India)

Dear Sir,

In consideration of the ....*[Employer's Name]* ..... (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) having awarded to M/s ..... *[Contractor's Name]* .... with its Registered/Head Office at ..... (hereinafter referred to as the 'Contractor', which expression shall unless repugnant to the context or meaning thereof, include its successors administrators, executors and assigns), a Contract by issue of Employer's Letter of Acceptance No. ..... dated ..... and the same having been acknowledged by the Contractor, for …… [Contract sum in figures and words] for ……... *[Name of the work]* and the Contractor having agreed to provide a Contract Performance Guarantee for the faithful performance of the entire Contract equivalent to ……..(*)…….. of the said value of the aforesaid work under the Contract to the Employer.

We .....*[Name & Address of the Insurance Company]* ..'..... having its Head Office at ..... (hereinafter referred to as the 'Surety', which expression shall, unless repugnant to the context of meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Employer, on demand any and all monies payable by the Contractor to the extent of ..... (*) ..... as aforesaid at any time upto ..... (@) ..... *[days/month/year]* without any demur, reservation, contest, recourse or protest and/or without any reference to the Contractor. Any such demand made by the Employer on the Insurance Company shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Surety undertakes not to revoke this guarantee during its currency without previous consent of the Employer and further agrees that the guarantees herein contained shall continue to be enforceable till the Employer discharges this guarantee or till ……..*[days/month/year]* whichever is earlier.

The Employer shall have the fullest liberty, without affecting in any way the liability of the Insurance company under this guarantee, from time to time to extend the time for performance of the Contract by the Contractor. The Employer shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers

vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Employer and the Contractor or any other course or remedy or security available to the Employer. The Insurance company shall not be released of its obligations under these presents by any exercise by the Employer of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts o omission or commission on the part of the Employer or any other indulgence shown by the Employer or by any other matter or thing whatsoever which under law would, but for this provision have the effect of relieving the Insurance Company.

The Surety declares that this Insurance Surety Bond is issued by the ……(name of Insurance Company) as per applicable rules and regulations of insurance regulatory development authority of India (IRDAI), and also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Insurance Company as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee the Employer may have in relation to the Contractor's liabilities.

i. Our liability under this Insurance Surety Bond shall not exceed ……(*)……
ii. This Insurance Surety Bond shall be valid up to …….(+)…….
iii. We are liable to pay the guaranteed amount or any part thereof under this Insurance Surety Bond only and only if Employer serve upon Insurance Company a written claim or demand on or before ……..@.....

Dated this .....day of ..... 20..... at.....

WITNESS

Signed for and on behalf of the Insurance Company

1. …….

(Signature)

…….

(Name)

……..

(Signature)

……..

(Name)

Notes:

1. (*) This sum shall be **Two and a half percent (2.5%)** of the Contract Price denominated in the types and proportions of currencies.
   (@) This date will be ninety (90) days beyond the issue of defect liability period as specified in the Contract.
   (+) This date will be the date of issue of defect liability Certificate.

2. Insurance Surety Bond should be executed on appropriate stamp paper of requisite value, such stamp paper should be purchased in the name of Issuing Insurance Company, not

more than six (6) months prior to execution / issuance of Insurance Surety Bond. The name of the purchaser should appear at the back side of stamp paper in the Vendors Stamp. Insurance Surety Bond should contain rubber stamp of the authorized signatory of the Insurance Company indicating the name, designation and signature/ power of attorney number as well as telephone numbers / e-Mail Id with full correspondence address of the Insurance Company.

In case the same is issued by an International Insurance Company (it should be registered under Insurance Act 1938 or as amended from time to time and approved by the Insurance Regulatory Development Authority of India (IRDAl)), the law prevalent in the country of execution shall prevail for the purpose of Stamp Duty on the Insurance Surety Bond. However, in such a case, the Insurance Surety Bond shall be got confirmed through any Indian Scheduled/Nationalized Insurance Company.

3. Insurance Surety Bond is required to be submitted directly to the Employer by the issuing Insurance Company (on behalf of Contractor) under registered post (A.D.). The Contractor can submit an advance copy of Insurance Surety Bond to the Engineer.
4. The issuing Insurance Company shall write the name of Insurance Company's controlling branch/ Head Office along with contact details like telephone no., e-Mail Id and full correspondence address in order to get the confirmation of Insurance Surety Bond from that branch/ Head office, if so required.

Environmental and Social (ES) Performance Security

Option 1 - ES Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: *[insert name and Address of* Employer*]*

Date: _ *[Insert date of issue]*

ES PERFORMANCE GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that _____ (hereinafter called "the Applicant") has entered into Contract No. _____ dated _____ with the Beneficiary, for the execution of _____ (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (_____),[1] such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its Environmental and/or Social (ES) obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the …. Day of ……, 2… [2], and any demand for payment under it must be received by us at this office indicated above on or before that date.

The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed one year, in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee

_____

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

---

[1] *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency (cies) of the Contract or a freely convertible currency acceptable to the Beneficiary.*

[2] *Insert the date ninety days after the Defect Liability Period. The Employer should note that in the event of an extension of this date for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.*

Option 2: FORM OF INSURANCE SURETY BOND

(To be executed on Non-Judicial Stamp Paper of Appropriate value)

(Insurance Surety Bond No……)

Date.....

(Name of the Contract)

To:
The Commissioner,
Andhra Pradesh Capital Region Development Authority,
Lenin Centre, Governorpet,
Vijayawada-520002 (India)

Dear Sir,

In consideration of the ....*[Employer's Name]* ..... (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) having awarded to M/s ..... *[Contractor's Name]* .... with its Registered/Head Office at ..... (hereinafter referred to as the 'Contractor', which expression shall unless repugnant to the context or meaning thereof, include its successors administrators, executors and assigns), a Contract by issue of Employer's Letter of Acceptance No. ..... dated ..... and the same having been acknowledged by the Contractor, for …… [Contract sum in figures and words] for ……... *[Name of the work]* and the Contractor having agreed to provide a Contract Performance Guarantee for the faithful performance of the Environmental and/or Social (ES) obligation(s) under the Contract, equivalent to ……..(*)……... of the said value of the aforesaid work under the Contract to the Employer.

We .....*[Name & Address of the Insurance Company]* ..'..... having its Head Office at ..... (hereinafter referred to as the 'Surety', which expression shall, unless repugnant to the context of meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Employer, on demand any and all monies payable by the Contractor to the extent of ..... (*) ..... as aforesaid at any time upto ..... (@) ..... *[days/month/year]* without any demur, reservation, contest, recourse or protest and/or without any reference to the Contractor. Any such demand made by the Employer on the Insurance Company shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Surety undertakes not to revoke this guarantee during its currency without previous consent of the Employer and further agrees that the guarantees herein contained shall continue to be enforceable till the Employer discharges this guarantee or till ……..*[days/month/year]* whichever is earlier.

The Employer shall have the fullest liberty, without affecting in any way the liability of the Insurance company under this guarantee, from time to time to extend the time for performance of the Contract by the Contractor. The Employer shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise

the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Employer and the Contractor or any other course or remedy or security available to the Employer. The Insurance company shall not be released of its obligations under these presents by any exercise by the Employer of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Employer or any other indulgence shown by the Employer or by any other matter or thing whatsoever which under law would, but for this provision have the effect of relieving the Insurance Company.

The Surety declares that this Insurance Surety Bond is issued by the ……(name of Insurance Company) as per applicable rules and regulations of insurance regulatory development authority of India (IRDAI), and also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Insurance Company as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee the Employer may have in relation to the Contractor's liabilities.

iv. Our liability under this Insurance Surety Bond shall not exceed ……(*)……

v. This Insurance Surety Bond shall be valid up to …….(+)…….

vi. We are liable to pay the guaranteed amount or any part thereof under this Insurance Surety Bond only and only if Employer serve upon Insurance Company a written claim or demand on or before ……..@.....

Dated this .....day of ..... 20..... at.....

WITNESS

Signed for and on behalf of the Insurance Company

1. …….

(Signature)

…….

(Name)

……..

(Signature)

……..

(Name)

Notes:

5. (*) This sum shall be **zero point one per cent (0.1%)** of the Contract Price denominated in the types and proportions of currencies.
   (@) This date will be ninety (90) days beyond the issue of defect liability period as specified in the Contract.
   (+) This date will be the date of issue of defect liability Certificate.

6. Insurance Surety Bond should be executed on appropriate stamp paper of requisite value, such stamp paper should be purchased in the name of Issuing Insurance Company, not more than six (6) months prior to execution / issuance of Insurance Surety Bond. The name

of the purchaser should appear at the back side of stamp paper in the Vendors Stamp. Insurance Surety Bond should contain rubber stamp of the authorized signatory of the Insurance Company indicating the name, designation and signature/ power of attorney number as well as telephone numbers / e-Mail Id with full correspondence address of the Insurance Company.

In case the same is issued by an International Insurance Company (it should be registered under Insurance Act 1938 or as amended from time to time and approved by the Insurance Regulatory Development Authority of India (IRDAl)), the law prevalent in the country of execution shall prevail for the purpose of Stamp Duty on the Insurance Surety Bond. However, in such a case, the Insurance Surety Bond shall be got confirmed through any Indian Scheduled/Nationalized Insurance Company.

7. Insurance Surety Bond is required to be submitted directly to the Employer by the issuing Insurance Company (on behalf of Contractor) under registered post (A.D.). The Contractor can submit an advance copy of Insurance Surety Bond to the Engineer.
8. The issuing Insurance Company shall write the name of Insurance Company's controlling branch/ Head Office along with contact details like telephone no., e-Mail Id and full correspondence address in order to get the confirmation of Insurance Surety Bond from that branch/ Head office, if so required.

Appendix 1

Code of Conduct for Contractor's Personnel (E&S) Form

CODE OF CONDUCT FOR CONTRACTOR'S PERSONNEL[12]

We are the Contractor, [*enter name of Contractor*]. We have signed a contract with [*enter name of Employer*] for [*enter description of the Works*]. These Works will be carried out at [*enter the Site and other locations where the Works will be carried out*]. Our contract requires us to implement measures to address environmental and social risks related to the Works, including the risks of sexual exploitation, sexual abuse and sexual harassment.

This Code of Conduct is part of our measures to deal with environmental and social risks related to the Works. It applies to all our staff, labourers and other employees at the Works Site or other places where the Works are being carried out. It also applies to the personnel of each subcontractor and any other personnel assisting us in the execution of the Works. All such persons are referred to as "**Contractor's Personnel"** and are subject to this Code of Conduct.

This Code of Conduct identifies the behavior that we require from all Contractor's Personnel.

Our workplace is an environment where unsafe, offensive, abusive or violent behavior will not be tolerated and where all persons should feel comfortable raising issues or concerns without fear of retaliation.

REQUIRED CONDUCT

Contractor's Personnel shall:

1. carry out his/her duties competently and diligently.
2. comply with this Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Personnel and any other person.
3. maintain a safe working environment including by:
    a. ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health.
    b. wearing required personal protective equipment.
    c. using appropriate measures relating to chemical, physical and biological substances and agents; and
    d. following applicable emergency operating procedures.
4. report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health.
5. treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children.
6. not engage in Sexual Harassment, which means unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature with another Contractor's or Employer's Personnel;
7. not engage in Sexual Exploitation, which means any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another.

[12] This form to be signed by contractor's personnel after contract is awarded.

8. not engage in Sexual Abuse, which means the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.
9. not engage in chasing or hunting or capture of wildlife including birds and fishing and, refrain from acquiring wildlife meat, skins, feathers, or any similar products derived from wildlife.
10. Not engage in encroaching upon or degrading of forests as well as the collection and harvesting of forest resources such as firewood, herbs, timber and non-timber forest products among others.
11. Not engage in any form of sexual activity with individuals under the age of 18, except in case of pre-existing marriage- including contact through digital media. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not a defense or excuse.
12. In responding to any reporting of SEA/SH/VAC, everyone should follow the project SEA/SH GRM procedure and process. Individuals/employees experiencing any forms of GBV, including SEA/SH is supported by facilitating access to specialist services in accordance with the SEA/SH GRM procedure and records will be kept in confidentiality. The Contractor must immediately inform the gender/GBV focal point of any SEA/SH allegations or incidents, ensuring confidentiality. The report should include the type of allegation (sexual exploitation, abuse, or harassment), and the gender and age of the affected person. The Contractor must also notify the focal person of any such incidents occurring on Subcontractors' or suppliers' premises related to the Works. Subcontractors and suppliers are required to promptly inform the Contractor of any SEA/SH incidents.
13. complete relevant training courses that will be provided related to the environmental and social aspects of the Contract, including on health and safety matters, Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH);
14. report violations of this Code of Conduct; and
15. not retaliate against any person who reports violations of this Code of Conduct, whether to us or the Employer, or who makes use of the grievance mechanism for Contractor's Personnel or the project's Grievance Redress Mechanism.

RAISING CONCERNS

If any person observes behavior that he/she believes may represent a violation of this Code of Conduct, or that otherwise concerns him/her, he/she should raise the issue promptly. This can be done in either of the following ways:

1. Contact [*enter name of the Contractor's Social Expert with relevant experience in handling sexual exploitation, sexual abuse and sexual harassment cases, or if such person is not required under the Contract, another individual designated by the Contractor to handle these matters*] in writing at this address [ ] or by telephone at [ ] or in person at [ ]; or
2. Call [ ] to reach the Contractor's hotline *(if any)* and leave a message.

The person's identity will be kept confidential, unless reporting of allegations is mandated by the country law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. We take seriously all reports of possible misconduct and will investigate and take appropriate action. We will provide warm referrals to service providers that may help support the person who experienced the alleged incident, as appropriate.

There will be no retaliation against any person who raises a concern in good faith about any behavior prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

CONSEQUENCES OF VIOLATING THE CODE OF CONDUCT

Any violation of this Code of Conduct by Contractor's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.

FOR CONTRACTOR'S PERSONNEL:

I have received a copy of this Code of Conduct written in a language that I comprehend. I understand that if I have any questions about this Code of Conduct, I can contact [*enter name of Contractor's contact person(s) with relevant experience*] requesting an explanation.

Name of Contractor's Personnel: [insert name]
Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: (day month year): _____

ATTACHMENT 1: Behaviors constituting Sexual Exploitation and Abuse (SEA) and behaviors constituting Sexual Harassment (SH).

The following non-exhaustive list is intended to illustrate types of prohibited behaviors.

(1) **Examples of sexual exploitation and abuse** include, but are not limited to:

- A Contractor's Personnel tells a member of the community that he/she can get them jobs related to the work site (e.g. cooking and cleaning) in exchange for sex.
- A Contractor's Personnel that is connecting electricity input to households says that he can connect women headed households to the grid in exchange for sex.
- A Contractor's Personnel rapes, or otherwise sexually assaults a member of the community.
- A Contractor's Personnel denies a person access to the Site unless he/she performs a sexual favor.
- A Contractor's Personnel tells a person applying for employment under the Contract that he/she will only hire him/her if he/she has sex with him/her.
- A Contractor's Personnel dates or has a romantic relationship with a child under 18 years old, keeps secrets with children, or displays favoritism.
- A Contractor's Personnel has inappropriate physical contact with children under 18 years old, including kisses and showing affection of any kind in an isolated area.
- A Contractor's Personnel holds private electronic communication with children under 18 years old, including via social media, as well as transportation of children unless for authorized purposes.
- A Contractor requests sexual favors in return for protection, food, shelter, payment of medical or school fees, or any other form of assistance or promise of assistance.

(2) **Examples of sexual harassment in a work context**

- Contractor's Personnel comment on the appearance of another Contractor's Personnel (either positive or negative) and sexual desirability.
- When a Contractor's Personnel complains about comments made by another Contractor's Personnel on his/her appearance, the other Contractor's Personnel comment that he/she is "asking for it" because of how he/she dresses.

- Unwelcome touching of a Contractor's or Employer's Personnel by another Contractor's Personnel.
- A Contractor's Personnel tells another Contractor's Personnel that he/she will get him/her a salary raise, or promotion if he/she sends him/her naked photographs of himself/herself.
- A Contractor's Personnel makes jokes that are uncomfortable, frightening, or hurtful, or name calls with sexual epithets.

Appendix 2

CONTRACTOR'S ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (C-ESMP)

[Add the approved C-ESMP]

Appendix 3

ANTI-CORRUPTION GUIDELINES

[insert World Bank and Asian Development Bank prescribed ACG]

2380968/2019/ADM2-DEVC-APCRDA

O/C

File No.CRDA-12029(50)/7/2017-ASST PLNG OFF-DEVC-APCRDA

Andhra Pradesh Capital Region Development Authority Vijayawada

BUILDING PERMIT ORDER No. 112 /2018/ZONE-IX

To

Smt. Puvvadda Lavanya W/o P.Rambabu, **Sri Puvvadda Rambabu S/o P.Subbarao &** **Sri Jammula Sambasiva S/o J. Lakshmaiah**	**Rc.No.CRDA-12029(50)/7/2017**
3-13, Library Centre, Thulluru Panchayat (Vi)	**DATE: 11/03/2019**
Thulluru Mandal Guntur District	

Sir ,

Sub: **APCRDA**-Building Permission-Proposal for construction of Cellar, Ground floor for parking & three upper floors **Kalyanmandapam** -Banquet Hall (Commercial Building) in an extent of 3160.33 Sqm in D.No.54/2, 55 & 69/1A of Thulluru Village, Thulluru Mandal, Guntur District-Permission Sanctioned- Regarding.

Ref:

1. Application dt. 31/10/2017 of **Puvvada Lavanya & others**
2. Minutes of the open forum meeting dated 10/11/2017
3. This office letter dt.26/11/2017
4. Your letter for Revised drawings dt.23/01/2018
5. Minutes of the open forum meeting dated 30/01/2018
6. Note orders of Commissioner dated 01/03/2018
7. This office letter dt.07/03/2018
8. Your letter for Revised drawings dt.15/03/2018
9. This office letter dt.13/04/2018 for payment of fees
10. Your letter dt.20/06/2018 for payment of fees
11. This office letter dt.16/07/2018 for Fire NOC
12. Your letter dt.05/11/2018 with provisional Fire NOC
13. Your letter dt.07/01/2019 with revised drawing as per provisional Fire NOC
14. Amaravati Capital city ZR-2016

****

DESPATCHED
Dt:12/3/19

The Application submitted in the reference has been examined with reference to the rules and regulations of Amaravati Capital City Master plan & Zoning regulations-2016 and permission is hereby sanctioned conditionally as detailed below:

A	**APPLICANT AND LICENSED PERSONNEL DETAILS:**

Revised copy.
11/3/2019

2380968/2019/ADM2-DEVC-APCRDA

File No.CRDA-12029(50)/7/2017-ASST PLNG OFF-DEVC-APCRDA

	Applicant	**Smt. Puvvadda Lavanya W/o P.Rambabu, Sri Puvvadda Rambabu S/o P.Subbarao & Sri Jammula Sambasiva S/o J. Lakshmaiah**		
	Developer / Builder	P.Sankararao	Lic No.	12012(59)/42/17
	Licensed Technical Person	Lakshmanrao M.	Lic No.	222/2014
	Structural Engineer	Sri Srimannarayana	Lic No.	License No:12021/(57)37/16
	Others	---		---

B	**SITE DETAILS**			
	D No.	D.No. 54/2, 55 & 69/1A	Premises No	
	Plot No	---	Layout/RLP/ULP	---
	Street	---	Locality	---
	Name of Village	Thulluru	Mandal	Thulluru
	District	Guntur	State	Andhra Pradesh

C	**Details Of Permission Sanctioned As For Zr Of Amaravati Capital City Master Plan**			
1	**Site area (Sqm) (as per documents)**			3255.07
2	**Site area proposed for construction of Kalyanmandapam with Cellar, Ground floor for parking & Three upper floors (Cellar +G+3) (as on ground)**			3223.58
3	**Road Affected Portion (Sqm)**			63.25
4	**Net Site Area (Sqm)**			3160.33
5	**Floors**		**Parking floors**	
	Built up area (m2)	**Area (Sqm)**	**Level**	**No**
	Cellar(Parking)	860.94	On site	36stalls
	Ground floor(Parking)	855.94	Cellar	17 stalls
	First floor	874.68	Ground floor	17 stalls
	Second floor	874.68	Total	70 stalls
	Third floor	484.26		
	Total Built Area (Sqm)	**3950.50 Sqm**	**Net built up area excluding parking floors = 2233.62 Sqm**	
6	**Usage**	**Commercial – Kalyanmandapam (Banquet Hall)**		
7	**Cellar Height(m)**	3.54m	**8 Building Height(m)**	16.00m

9	**(i) Set-backs**			**Front (m) North**	**Rear (m) South**	**Side–1(m) East**	**Side–2 (m) West**
		Provided		12.69	6.67	6.35	12.60
	(ii) Coverage:	**As per rules**	60%	**As per plans**		27.68%	
	(iii) F.S.I	**As per rules**	1.4	**As per plans**		0.71	

File No.CRDA-12029(50)/7/2017-ASST PLNG OFF-DEVC-APCRDA

10	**No. of Units**	-	11	**Recreational open space (m2) (%)**	5 %
12	**Green coverage (%)**	15.04%	13	**Water tank**	---

D	**DETAILS OF FEES PAID**			
1	Building application fee		Rs. 20,160/-	Paid
2	Development charges		Rs. 1,77,889/-	Paid
3	Open space cost		Rs. 5,29,166/-	Paid
4	Road formation cost		Rs. 54,720/-	Paid
5	Building Permit fee		Rs. 1,61,283/-	Paid
6	Labour welfare cess		Rs. 3,78,811/-	Paid
7	Green Fee		Rs. 1,30,204/-	Paid
8	Compounding fee		Rs. 4,75,937/-	Paid
E	**OTHER DETAILS:**			
1	Contractor's All risk Policy No:		Dt:	Valid up to:
2	Reg. Mortgage Deed No/Dated: 3350/2018, Dt: 19/06/2018 at SRO, Thulluru	Local body: APCRDA	Floor handed over : First Floor	Area (m2): 236.90
			10% Site area	Area (m2): 316.033
F	**FIRE NOC DETAILS**			
1	Provisional Fire NOC for File No.4975/GNT/MSB/2018 dt 02/11/2018			
F	**Construction to be Commenced Before : /02/2020**			
G	**Construction to be Completed Before : /01/2022**			

The Building permission is sanctioned subject to following conditions:

1. The permission accorded does not confer any ownership rights. As per Sec 113 of APCRDA Act, the Commissioner or the Authority or the Government, may revoke any development permission issued under this Act, whenever it is found that there has been any false statement or wrong permission is issued or any misinterpretation of any material fact or rule on which the permission was granted.
2. Limitations of Building Sanction:

Sanction of building permission by this Authority shall not mean responsibility or clearance of the following aspects:

- Title or ownership of the site or building.
- Easement Rights.
- Variation in area from recorded area of a plot / site or building.
- Structural Reports, Structural Drawings and structural stability.
- Workmanship, soundness of structure and materials used.
- Quality of building services and amenities in the construction of building.
- The site/ area liable to flooding as a result of not taking proper drainage arrangement as

File No.CRDA-12029(50)/7/2017-ASST PLNG OFF-DEVC-APCRDA

per the natural lay of the land, etc.

- Other requirements or licenses or clearances required for the site /premises or activity under various other laws.

3. If any dispute litigation arises in future, regarding the ownership of a land the applicant shall be responsible for the settlement of the same, APCRDA or its employees shall not be a part to any such dispute / litigation.
4. This permission does not bar any public agency including APCRDA to acquire the lands for public purpose as per law
5. As per the undertaking executed:

- The construction shall be done by the owner, only in accordance with sanctioned Plan under the strict supervision of the Architect, Structural Engineer and site engineer failing which the violations are liable for demolition besides legal action.
- The owner, builder, Architect, Structural Engineer and site engineer are jointly & severally responsible to carry out and complete the construction strictly in accordance with sanctioned plan.
- The Owner, Builder, Architect, Structural Engineer and Site Engineer are jointly and severally are held responsible for the Structural Stability during the building construction and should strictly adhere to all the conditions mentioned in the rules.
- The Owner / Builder should not deliver the possession of any part of mortgaged built up area of the building unless and until Occupancy Certificate is obtained from Andhra Pradesh Capital Region Development Authority after providing all the regular service connections to each portion of the building and duly submitting the required documents.

6. Structural Safety and Fire Safety Requirements shall be the responsibility of the Owner, Builder/Developer, Architect and Structural Engineer and shall provide all necessary Fire Fighting installations as stipulated in National Building Code of India – 2016.
7. Construction shall be covered under the contractors all risk Insurance till the issue of occupancy certificate and Proper care to avoid risk and injury to persons working on site and passers-by shall be taken by owner / applicant. The owner / builder shall be responsible for safety of construction workers.
8. Architect / Structural Engineer if changed, the consent of the previous Architect / Structural Engineer is required and to be intimated to the APCRDA.
9. The Services like Sanitation, Plumbing, Fire Safety requirements, lifts, electrical installations etc., shall be executed under the supervision of Qualified Technical Personnel.
10. The permit Order remains valid for three years during which time the development works or layout works or construction and civil works shall be completed, and if not completed, such permission shall be got revalidated for another two years only on submitting an application and on payment of the additional fees and charges as may be prescribed.
11. If the works are not commenced within one year from the date of issue of Permit Order, the Development Permission stands lapsed: Provided that such lapse shall not bar any subsequent application for fresh Development Permission under the Act, however, such application shall be subject to the rules / regulations and payment of fees and charges which are in force as on that date of fresh application.
12. Neither the granting of the development permission or the approval of the drawings and specifications, nor the inspections made by the Sanctioning Authority during development shall, in any way, relieve the licensed professional or developer from full responsibility for carrying out the development in accordance with these Regulations.

File No.CRDA-12029(50)/7/2017-ASST PLNG OFF-DEVC-APCRDA

13. If during the execution any deviation is made from the Sanctioned Permit Order and if the same are in accordance with the provisions of the Act or Plans or Schemes or any rules or regulations made under the Act, the revised Development Permit shall be obtained without fail.
14. Sanctioned Plan copy as attested by the APCRDA shall be displayed at the construction site for public view and Results of tests of materials, records of the test data shall be kept available for inspection during the construction of the building and for such a period thereafter as required by the Sanctioning Authority.
15. Commencement Notice shall be submitted by the applicant before commencement of the building.
16. Basement and designated areas approved for parking in the plan should be used exclusively for parking of vehicles without partition walls & rolling shutters and the same should not be converted or misused for any other purpose at any time in future and parking stalls shall be striped.
17. No. of flats as sanctioned shall not be increased without prior approval of APCRDA at any time in future.
18. All greenery and live landscaping as shown in the approved plan shall be completed before occupancy of building and shall be properly maintained. All dead or dying landscaping shall be replaced immediately and all sodden areas mowed, fertilized and irrigated on a regular basis.
19. Stocking of Building Materials on footpath and road margin causing obstruction to free Movement of public & vehicles shall not be done, failing which permission is liable to be suspended.
20. A safe distance of minimum 3.0mts Vertical and Horizontal Distance between the Building & High Tension Electrical Lines and 1.5mts for Low Tension electrical line shall be maintained.
21. Green building norms, energy efficiency guidelines (ECBC) and Environmentally sustainable development shall be followed
22. Rain Water Harvesting Structure (percolation pit) and plantation of trees shall be taken up as per stipulations in Water, Land and Trees Act.2002.
23. Buildings shall be designed for compliance with earth quake resistance and resisting other natural hazards.
24. Owner / Builder shall install roof top solar plants in the 1/3 of the roof top areas of all buildings to meet 10% of the total energy demand of the buildings.
25. Builder / owner shall ensure to meet 15% of the external lighting load and 5% of the lighting load through renewable energy and this is in addition to 20% of the hot water energy needs from renewable energies.
26. Owner / Builder shall ensure to establish site level waste management facility with adequate space accommodating space for sorting, storage in segregated forms, processing and composting.
27. Owner / Builder shall ensure to establish multiple bin system in all the activity areas for segregation at source level.
28. Owner / Builder shall ensure to establish composting facility for the processing of the biodegradable waste within the site.
29. Owner / Builder shall ensure to handing over the recyclable, biomedical and hazardous wastes to the authorize recyclers and Reuse / Handing over of the composted manures of greenery development and the wastes for filling operations in the Capital City development project works.
30. The functional/line agencies dealing with electric power, water supply, drainage and sewerage shall not give regular connections to the building unless such Occupancy Certificate is produced, or alternatively may charge the tariff as prescribed till such

File No.CRDA-12029(50)/7/2017-ASST PLNG OFF-DEVC-APCRDA

time Occupancy Certificate is produced.

31. The Registration Authority shall register only the permitted built up area as per the sanctioned building plan and only upon producing and filing a copy of such sanctioned building plan. On the Registration Document it should be clearly mentioned that the registration is in accordance with the sanctioned building plan in respect of setbacks and number of floors.
32. The Financial Agencies and Institutions shall extend loans facilities only to the permitted built up area as per sanctioned plan.
33. Owner/builder shall ensure the Requirements for accessibility in built environment for elders and disabled persons as per norms in NBC 2016.
34. Owner / Developer shall not change or convert the building usage/ part of the building usage without prior approvals by this Authority.
35. **Owner /Builder/ Developer shall comply with all the conditions as specified in the Provisional Fire NOC issued by Ap state Disaster Response and Fire Services Department vide File n. 4975/GNT/MSB/2018 Dt. 02.11.2018.**
36. **Owner /Builder/ Developer shall comply with conditions in NGT Orders in Original Application No. 171 of 2015 Dt. 17th November, 2017, the conditions in SEIAA/AP/GTN -151/2015 - Environmental Clearance dt. 09.10.2015, conditions in enclosed Annexure without fail/deviation.**
37. Occupancy Certificate shall be mandatory for all buildings. No person shall occupy or allow any other person to occupy any building or part of a building for any purpose unless such building has been granted an Occupancy Certificate by the Sanctioning Authority.
38. The owner through the licensed professional who has supervised the construction shall give notice to the Commissioner regarding completion of work described in the development permission. The completion certificate shall be submitted in the prescribed form and shall be accompanied by six sets of completion plan.
39. Issue of completion certificate misrepresenting the facts shall be an offence punishable under section 114 under the Act and such licensed professional shall be black listed permanently.
40. Occupancy Certificate will be issued only on submission of Fire Occupancy from Fire Department and Mortgage shall be released only upon issue of Occupancy Certificate by the Commissioner, APCRDA.
41. **Owner/Builder/ Developer shall comply with all the guidelines as specified in Amravati Capital city Zoning Regulations.**
42. The applicant shall pay the short fall of payment if any, noticed by the Authority at any time.
43. **The conditions mentioned in Annexure (NGT order) shall be complied during execution of work without fail.**

Enclosure: Annexure

By order

DIRECTOR
For COMMISSIONER
APCRDA

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Copy to:

The Panchayat Secretary,

Thullur Gram Panchayat,

Thullur Mandal,

1. Guntur District

Signature valid

Digitally signed by Nagia Sundari K
Date: 2019.03.11 1[illegible]:47:57 IST
Reason: Approved

Climate Change Action Plan for the Capital City of Amaravati

Volume I: Urban Profile, Climate Risk and Vulnerability Assessment, and GHG Emissions Inventory

AMARAVATI
THE PEOPLE'S CAPITAL

ICLEI
Local Governments for Sustainability
SOUTH ASIA

October 2025

Acknowledgement

Developing the Amaravati City Climate Change Action Plan (CCAP) for Andhra Pradesh Capital Region Development Authority (APCRDA) marks a significant step towards developing a climate-resilient and net-zero capital city over the coming decades. This plan represents a united effort to address the impacts of climate change and enhance Amaravati's resilience. APCRDA has engaged ICLEI - Local Governments for Sustainability, South Asia, for the preparation of a comprehensive city-level CCAP for Amaravati city. This collaborative effort has been instrumental in shaping the CCAP, bringing in internationally accepted climate action planning approaches that enhance its scope and feasibility, helping lay out ambitious yet attainable targets. Heartfelt gratitude is extended to all the departments and staff within APCRDA, as well as to all the stakeholders who contributed towards developing this plan. APCRDA is committed to leading by example, implementing the strategies outlined in this plan, and continuing the collaborative efforts to build a climate-resilient, net-zero and inclusive Amaravati for present and future generations.

Contributing team from ICLEI South Asia: Anuradha Adhikari, Avantika Arjuna, Bedoshruti Sadhukhan, Emani Kumar, Goru Satyasai Sivakumar, Maaz Ali, Dr. Monalisa Sen, Nikhil Kolsepatil, Prateek Mishra, Soumya Chaturvedula, Vasavi Yarram, Vijay Saini.

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Disclaimer:
This report is based on information extracted from the Master Plan, Zoning Plan, Infrastructure Plans, Detailed Project Reports (DPRs), and other related documents and datasets shared by APCRDA, some of which are currently under revision or being updated. Accordingly, the analyses, inferences, findings, and interpretations presented herein are subject to change in line with future updates to these source documents and the receipt of additional data during the project period. The contents of this report may be revised based on further data sharing and continued consultation with APCRDA and Amaravati Development Corporation Limited (ADCL). No conclusions should be regarded as final until all relevant information has been comprehensively updated, reviewed, and validated.

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Contents

List of Tables iv
List of Figures vi
List of Abbreviations ix
1 Introduction 15
1.1 Background 15
1.1.1 Climate Change – A Global Challenge that requires ambitious action 15
1.1.2 Imperative: City Climate Action 15
1.1.3 Climate Action at the State level in Andhra Pradesh 17
1.2 Amaravati's Sustainability Vision 17
2 City profile 19
2.1 About the city 19
2.2 Location 19
2.3 Connectivity 21
2.4 Demography 23
2.5 City Administration 23
2.6 Planned Economic Development 23
2.7 Physiography 24
2.7.1 Topography 24
2.7.2 Existing Environmental Features 25
2.7.3 Soil 25
2.7.4 Ground Water Table 26
2.8 Land Use Planning 26
2.8.1 Planning Strategies and Approach for Land Use 26
2.8.2 Spatial Structure 27
2.8.3 Zoning Approach 28
2.8.4 Heritage and Tourism 30
2.8.5 Environmental Integration 30
2.8.6 Climate Resilience and Sustainable Development Strategies 31
2.9 Disaster Management 32
3 Urban System Gap Analysis 33
3.1 Water Supply 33

3.1.1 Water Sources 34
3.1.2 Water Treatment 34
3.1.3 Transmission and Distribution Network 35
3.2 Wastewater Management 36
3.2.1 Wastewater Generation 37
3.2.2 Wastewater Network Infrastructure 37
3.2.3 Treatment Plants and Technology Options 38
3.2.4 Treated Wastewater Reuse and Disposal Plan 39
3.2.5 Supervisory Control and Data Acquisition (SCADA) Integration 40
3.3 Stormwater Management 40
3.3.1 Proposed City-level Stormwater Drainage System 41
3.3.2 Stormwater Drainage for LPS zones 43
3.4 Solid Waste Management 44
3.4.1 Waste Collection and Transport 45
3.4.2 Treatment, Processing and Disposal 47
3.5 Transport 48
3.5.1 Modal Share Strategy and Mode-Wise Distribution Targets 49
3.5.2 Road Network 50
3.5.3 Public Transit 51
3.5.4 City Bus, Feeder, and Intermediate Public Transport (IPT) Services 52
3.5.5 Electric Mobility and Charging Infrastructure 53
3.5.6 Non-Motorized Transport (NMT) Infrastructure 53
3.5.7 Street Design Guidelines 53
3.5.8 Parking Policy 53
3.5.9 Intelligent Transport Systems (ITS) and Traffic Management Systems 54
3.6 Built Environment and Energy 55
3.6.1 Power Demand Forecast and Sector-Wise Load Distribution 56
3.6.2 Power Source 56
3.6.3 Renewable Energy & Rooftop Solar 57
3.6.4 Transmission and Distribution Infrastructure 57
3.6.5 ECBC and Energy-Efficient Building Compliance 58
3.6.6 Street-Lighting 58

3.6.7 Smart Grid, SCADA, and Distribution Architecture 58
3.6.8 District Cooling System (DCS) 59
3.7 Health 59
3.7.1 Proposed Health Infrastructure and Service Delivery 59
3.7.2 Medical Devices Manufacturing: An Emerging Hub 60
3.8 Urban Greening and Biodiversity 60
3.8.1 Urban Greening and Biodiversity Initiatives 61
4 Climate Risk and Vulnerability Assessment 63
4.1 Introduction and Methodology 63
4.1.1 Step-by-step approach based on ICLEI's ClimateResilientCITIES methodology 63
4.2 Climate Profile 64
4.2.1 Climate Trend Analysis 64
4.2.2 Analysis of Historical Climate Events 72
4.2.3 Air Quality 75
4.3 Climate Projections and Scenario Statements 79
4.4 Climate Risk and Vulnerability Mapping 82
4.4.1 Assessment of Heat Hotspots 82
4.4.2 Assessment of Flood 89
4.4.3 Existing villages' vulnerability to climate risks 98
4.5 Consequences of Projected Climate Change on urban services infrastructure 99
4.5.1 Projected Climate Change 99
4.5.2 Interventions for immediate term 105
4.6 Adaptive capacity analysis of vulnerable groups and stakeholders 106
5 Greenhouse Gas Emissions Inventory 109
5.1 Introduction 109
5.2 Methodology for GHG Emissions Inventory 109
5.2.1 GPC Framework 109
5.3 GHG Emissions for Amaravati 112
5.3.1 Scoping of Amaravati's GHG Emission Estimates 112
5.3.2 GHG Emission for Base Year 2024 116
5.3.3 Insights on Sectoral GHG Emissions for 2024 117
6 Scenario Planning for Future Emissions Reduction in Amaravati 122

6.1 Scenarios Identified for GHG Emissions Reduction 122
6.2 Key Assumptions for Scenario Planning 123
6.3 Climate Action Scenario 127
6.3.1 Insights on Sectoral GHG Emissions for 2028 to 2058 – Climate Action Scenario 131
6.4 Business-as-Usual (BAU) Scenario 140
6.5 Comparison between Climate Action Scenario and BAU Scenario 142
7 Way Forward 145
Annexure A. Analysis of Adaptive Capacities of Identified Actors 148
Annexure B. Key assumptions in GHG emission estimation 152
Annexure C. Power Demand of Amaravati in 2058 152
Annexure D. Renewable Energy (Solar PV) Integration Target for Amaravati in the Planning Period 153
Annexure E. Electric Cooking Target for Amaravati 153
Annexure F. Estimated Modal Share of Transportation in Amaravati 154
Annexure G. Estimated Trip Generation Rates for Amaravati 154
Annexure H. Estimated Fuel-Mix of the Vehicles/Transport Modes in Amaravati – Climate Action Scenario 154
Annexure I. Estimated Fuel-Mix of the Vehicles/Transport Modes in Amaravati – BAU Scenario 155
Annexure J. Renewable Energy (Solar PV) Integration Target for Transportation in Amaravati (2028-2058) 155
Annexure K. Solid Waste Processing in Amaravati (2028-2058) in the Planning Period 155
Annexure L. Emission Factors 156
Annexure M. Minutes of Focus Group Discussions 157

List of Tables

Table 2-1 Land use allocation as per Master Plan 2050 29
Table 3-1 Projected Water Demand in Amaravati over the Time Horizon 2028-2058 33
Table 3-2 Water Source Capacities Phase-wise 34
Table 3-3 Water Treatment Plant Capacities 35
Table 3-4 Transmission & Distribution Components 35
Table 3-5 Projected Wastewater Generation in Amaravati, 2028-2058 37
Table 3-6 Design Considerations of Sewerage Infrastructure in Amaravati 37
Table 3-7 Zone-wise STP and CETP Treatment Capacities in Amaravati (Phase I and II) 39
Table 3-8 Projected Waste Generation in Amaravati, 2028-2058 45
Table 3-9 Projected Waste Generation by Waste Type, 2058 48
Table 3-10 Modal Share Targets for Internal Trips in Amaravati 50
Table 3-11 Planned Road Hierarchy in Amaravati 50
Table 3-12 Electricity Consumption for Amaravati city by Sector in 2024-25 55
Table 3-13 Estimated Power Demand for Amaravati City 56
Table 3-14 Rooftop Solar Power Potential for Amaravati 57
Table 3-15 Proposed Healthcare Infrastructure Benchmarks for Amaravati 60
Table 4-1: Mandal-wise Hazard Risk Mapping 72
Table 4-2 Month-wise no. of days recorded AQIs from 2020 to 2024 79
Table 4-3: Temperature and Precipitation projections for RCP 2.6,4.5,6 and 8.5 scenarios 79
Table 4-4 Climate scenarios 80
Table 4-5 Indicators and Methodology Used for Heat Hotspots Assessment 82
Table 4-6 Comparison of areas under baseline and 2058 projected LST ranges 88
Table 4-7 Existing villages' vulnerability to climate risks 98
Table 4-8 Analysis of Adaptive capacity of identified actors 106
Table 5-1 Global Warming Potential (GWP) values for GHGs 113
Table 5-2 Sectors and GHG Emission Sources included in Amaravati's Baseline Emission 113
Table 5-3 Sources of Activity Data for GHG Emission Estimations 115
Table 5-4 Sector-wise GHG emissions for Amaravati, 2024 116
Table 5-5 Break-up of Amaravati's sectoral GHG emissions for 2024 116
Table 6-1 Sector-wise GHG emission estimates under the Climate Action Scenario, 2028 - 2058 128
Table 6-2 Amaravati's Per Capita GHG Emissions Compared to Indian and Global Cities 129
Table 6-3 Amaravati's sectoral GHG emissions under the Climate Action Scenario, 2028 - 2058 129
Table 6-4 Projected GHG emissions from the transport sub-sector under the Climate Action Scenario, 2028 - 2058 136
Table 6-5 Projected GHG emissions from the Waste sub-sectors under the Climate Action Scenario, 2028 - 2058 137

Table 6-6 Projected GHG Emissions from domestic wastewater in Amaravati in the Climate Action Scenario, 2028 to 2058 139
Table 6-7 Sector-wise projected GHG Emissions in the BAU Scenario in Amaravati, 2028-2058 140
Table A-1 Actors' Capacities Rating and Scoring 148
Table A-2 Levels of Adaptive Capacity of Urban Actors 148
Table A-3 Scoring of Actors 149

List of Figures

Figure 2-1 Snapshot of Capital city Amaravati 19
Figure 2-2 Location map of Capital city Amaravati 20
Figure 2-3 Existing settlements in Amaravati 20
Figure 2-4 Regional Connectivity 22
Figure 2-5 Population projected for Amaravati 23
Figure 2-6 Topography of Amaravati 25
Figure 2-7 Capital City Amaravati Township Model 28
Figure 2-8 Capital City Amaravati Master Plan 2050 29
Figure 2-9 Organizational Structure for Disaster Management 32
Figure 3-1 Water distribution from source to consumer in Amaravati 34
Figure 3-2 Proposed Water Supply infrastructure for Amaravati, 2058 36
Figure 3-3 Proposed Sewerage infrastructure for Amaravati, 2058 38
Figure 3-4 Kondaveeti Vagu catchment and natural drainage features 41
Figure 3-5 Proposed Reservoirs and Pumping Stations of Storm water infrastructure 42
Figure 3-6 SWD zones 44
Figure 3-7 Expected waste composition in Amaravati 45
Figure 3-8 Proposed Solid Waste Management Infrastructure in Amaravati 46
Figure 3-9 Proposed MSW Collection and Processing by 2058 47
Figure 3-10 Hierarchical Road Network for Amaravati City 51
Figure 3-11 Proposed Public Transport Infrastructure in Amaravati 52
Figure 3-12 Green areas in Amaravati 62
Figure 4-1 Comparison of Monthly Max. and Min. Temperatures in 2024 with 30-Year Monthly Average 64
Figure 4-2 Comparison of monthly rainfall received in 2024 with 30 year monthly averages 65
Figure 4-3 Month wise Temperature Variation with respect to Annual Mean Temperature for Amaravati 66
Figure 4-4 Annual Mean temperature trend for Amaravati 66
Figure 4-5 Anomalies in Annual Mean Temperature (1991 to 2021) 67
Figure 4-6 30-year Monthly Average Relative Humidity compared with Annual mean humidity for Amaravati 68
Figure 4-7 Annual rainfall trend for Amaravati for past 30 years (1994-2024) 69
Figure 4-8 30 Year monthly average rainfall recorded 69
Figure 4-9 Seasonal rainfall trend of Amaravati for 30 years (1994-2024) 70
Figure 4-10 Anomalies in annual rainfall and number of rainy days (1994 to 2024) 71
Figure 4-11 Number of days taken to receive half of total annual avg. rainfall (530.6 mm), 1994-2024 71
Figure 4-12 Number of Heavy rainfall days (1994-2024) 72

Figure 4-13: Flood and Waterlogged zones in Guntur District 73
Figure 4-14: Heatwave zones in Guntur District 74
Figure 4-15 Trend of concentration of Air Pollutants (2018 to 2024) 75
Figure 4-16 PM 2.5 Concentration in Amaravati for March 2024 76
Figure 4-17 PM 2.5 Concentration in Amaravati for January 2025 77
Figure 4-18 PM 10 Concentration in Amaravati for March 2024 78
Figure 4-19 PM 10 Concentration in Amaravati for January 2025 78
Figure 4-20 Land Surface Temperature Baseline 84
Figure 4-21 Land Surface Temperature projected for 2058 85
Figure 4-22: Illustration of expected reduction in LST from planned greening measures 86
Figure 4-23 Hotspots in the baseline LST 87
Figure 4-24 Estimated LST hotspots for 2058 88
Figure 4-25 Waterlogging in September 2024 91
Figure 4-26 Recurrence of Waterlogging (1984-2021) 92
Figure 4-27 Weeds obstruct the natural flow of water in Kondaveeti Vagu during heavy rainfall events, as dated 02nd June 2025 93
Figure 4-28 Weeds obstruct the natural flow of water in Pala Vagu during heavy rainfall events, as dated 02nd June 2025 93
Figure 4-29 Flood analysis of Kondaveeti vagu catchment for baseline scenario 2024 for a 100-year return period rainfall 95
Figure 4-30 Flood analysis of Amaravati for baseline scenario 2024 for a 100-year return period rainfall 96
Figure 4-31 Flood analysis of Kondaveeti vagu catchment for near future scenario for a 100-year return period rainfall 97
Figure 4-32 Flood analysis of Amaravati for near future scenario for a 100-year return period rainfall 98
Figure 4-33 Water supply and wastewater infrastructure in the near future flood vulnerable areas. 100
Figure 4-34 Transport and Solid waste management infrastructure in the vicinity of estimated LST hotspots for 2058 101
Figure 4-35 Transport and Solid waste management infrastructure in the near future flood vulnerable areas. 102
Figure 4-36 Social infrastructure (Health and Educational facilities) in the vicinity of estimated LST hotspots for 2058 104
Figure 4-37 Social infrastructure (Health and Educational facilities) in the near future flood vulnerable areas. 105
Figure 5-1 Scope-wise sources and boundaries of GHG emissions in GPC inventories 110
Figure 5-2 GPC reporting level - BASIC sources 111
Figure 5-3 Formula for estimating GHG emissions 112
Figure 5-4 Sectoral share of GHG emissions 2024 117
Figure 5-5 Stationary energy emissions by sub-sector 2024 118

Figure 5-6 Stationary energy emissions energy source 2024 118
Figure 5-7 Sector wise share of electricity consumption and emissions, 2024 119
Figure 5-8 Transportation emissions by fuel type, 2024 120
Figure 5-9 Waste emissions by sub-sector, 2024 121
Figure 6-1 Illustrative Depiction of Climate Action Scenario compared to BAU Scenario 123
Figure 6-2 Projected trend of GHG emissions under the Climate Action Scenario, 2028- 2058 128
Figure 6-3 Sectoral share of GHG emissions in Amaravati under the Climate Action Scenario, 2058 130
Figure 6-4 Projected trend of GHG emissions in the stationary energy sector under the Climate Action Scenario, 2028 - 2058 132
Figure 6-5 Stationary energy emissions by sub-sector under the Climate Action Scenario, 2058 132
Figure 6-6 Sector-wise electricity consumption and GHG emissions in the stationary energy sector under the Climate Action Scenario, 2058 133
Figure 6-7 GHG emissions from PNG consumption in the stationary energy sector under the Climate Action Scenario, 2058 134
Figure 6-8 Projected trend of GHG emissions in the transport sector under the Climate Action Scenario, 2028–2058 135
Figure 6-9 Share of on-road and metro/rail modes in transportation emissions under the Climate Action Scenario, 2058 136
Figure 6-10 Projected trend of GHG emissions in the waste sector under the Climate Action Scenario, 2028–2058 137
Figure 6-11 Trend of solid waste generation and processing under the Climate Action Scenario, 2028–2058 138
Figure 6-12 Distribution of solid waste by treatment type under the Climate Action Scenario, 2058 138
Figure 6-13 Trend of GHG emissions from domestic wastewater under the Climate Action Scenario, 2028–2058 139
Figure 6-14 Projected Trend of GHG emissions for Amaravati under the BAU Scenario, 2028–2058 141
Figure 6-15 GHG Emissions reduction potential of actions in the Climate Action Scenario compared to the BAU Scenario, 2028 - 2058 143
Figure 6-16 Sector contribution to GHG emissions reduction from the BAU levels, 2058 144

List of Abbreviations

A2O	Anaerobic–Anoxic–Oxic
AAGR	Annual Average Growth Rate
AAQMS	Ambient Air Quality Monitoring Systems
ADCL	Amaravati Development Corporation Ltd
AFOLU	Agriculture, Forestry, and Other Land Use
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
APADCL	Andhra Pradesh Airports Development Corporation Ltd.,
APCRDA	Andhra Pradesh Capital Region Development Authority
APEPDCL	Andhra Pradesh Eastern Power Distribution Company Limited
APGENCO	Andhra Pradesh Power Generation Corporation Limited
APIIC	Andhra Pradesh Industrial Infrastructure Corporation
APSPCL	Andhra Pradesh Solar Power Corporation Private Limited
APSPDCL	Andhra Pradesh Southern Power Distribution Company Limited
APSRTC	Andhra Pradesh Road Transport Corporation
APTRANSCO	Transmission Corporation of Andhra Pradesh
AR4	IPCC Fourth Assessment Report
ATC	Area Traffic Control
AVL	Automated Vehicle Location
AYUSH	Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy
BESS	Battery Energy Storage System
BRT	Bus Rapid Transit
BUR	Biennial Update Report submitted to the UNFCCC
C&D	Construction and Demolition
CBD	Central Business District
CCAP	Climate Change Action Plan
CCUS	Carbon Capture, Utilization, and Storage
CEA	Central Electricity Authority

CETP	Common Effluent Treatment Plant
CH_4	Methane
CNG	Compressed Natural Gas
CO_2	Carbon-dioxide
COP	Conference of the Parties
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health & Environmental Engineering Organisation
CRC	Climate Resilient CITIES
CSMC	Central SCADA Monitoring Centre
DAS	Distribution Automation Systems
DBR	Design Basis Report
DCS	District Cooling Systems
DPR	Detailed Project Report
DSM	Demand Side Management
ECBC	Energy Conservation and Building Code
E-E	External-External
E-I	External-Internal
EIA	Environment Impact Assessment
EV	Electric Vehicles
FAR	Floor Area Ratio
FGDs	Focused Group Discussions
GHG	Greenhouse Gas
GIS	Gas Insulated Substations
GPC	Global Protocol for Community-Scale Greenhouse Gas Emission Inventories
GPRS	General Packet Radio Service
GWP	Global Warming Potential
GRIHA	Green Rating for Integrated Habitat Assessment
GWT	Ground Water Table

HDPE	High-Density Polyethylene
HPCL	Hindustan Petroleum Corporation Limited (HPCL)
ICMR	Indian Council of Medical Research
IDF	Intensity-Duration-Frequency
I-E	Internal - External
IGBC	Indian Green Building Council
I-I	Internal - Internal
IIT	Indian Institute of Technology
IMD	Indian Meteorological Department
IOCL	Indian Oil Corporation Limited
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
IPT	Intermediate Public Transport
ISLS	Intermediate Sewage Lifting Stations
ITS	Intelligent Transport Systems
kW	Kilo Watt
kWh	kilo watt Hour
kV	Kilo Volt
LCC	Life Cycle Cost
LEED	Leadership in Energy and Environmental Design
LPCD	Litres per capita per day
LPG	Liquefied Petroleum Gas
LPS	Land Pooling Schemes
LST	Land Surface Temperature
LTO	Landing and Take-Off
MBBR	Moving Bed Biofilm Reactor
MCF	Methane Correction Factor
MCS	Main Control Station

MGS	Micro Grid Stations
MLD	Million Litres Per Day
MPS	Main Pumping Station
MRF	Material Recovery Facilities
MRT	Mass Rapid Transit
MSL	Mean Sea Level
MTMC	Mangalgiri-Tadepalli Municipal Corporation
MUZ	Multi-Utility Zones
MW	Mega Watt
N_2O	Nitrous Oxide
NAAQMS	National Ambient Air Quality Standards
NAPCC	National Action Plan on Climate Change
NATCOM	National Communication submitted to the UNFCCC
NDWI	Normalized Difference Water Index
NGO	Non-Government Organization
NMT	Non-Motorised Transport
NSSO	National Sample Survey Office
OFC	Optical Fiber Cable
O&M	Operations and Maintenance
PHC	Primary Health Centre
PIS	Passenger Information Systems
PLC	Programmable Logic Controllers
PM	Particulate Matter
PNG	Piped Natural Gas
RCP	Representative Concentration Pathways
RDF	Refuse Derived Fuel
RE	Renewable Energy
RTO	Road Transport Officer

SAPCC	State Action Plan on Climate Change
SBR	Sequence Batch Reactor
SCADA	Supervisory Control And Data Acquisition
SCS	Secondary Control Stations
SHG	Self-Help Group
Solar PV	Solar Photovoltaic
STP	Sewage Treatment Plant
SWM	Solid Waste Management
tCO_2e	Tonnes of Carbon Dioxide Equivalent
STP	Sewage Treatment Plant
T&D	Transmission and Distribution
TMC	Thousand Million Cubic Feet
TOD	Transit-Oriented Development
TPD	Tonnes Per Day
TR	Tons of Refrigeration
UNFCCC	United Nations Framework Convention on Climate Change
UPS	Uninterruptible Power Supply
VMS	Variable Message Signs
VTPP	Vijayawada Thermal Power Plant
WTE	Waste to Energy
WTP	Water Treatment Plants
ZLD	Zero Liquid Discharge

1 Introduction

1.1 Background

1.1.1 Climate Change – A Global Challenge that requires ambitious action

Climate change is the most formidable challenge faced by humanity today. The rate of climate change is accelerating, and its impacts are felt across societies, ecosystems and the environment. Addressing these impacts requires a comprehensive understanding of historic trends and potential future scenarios, leading to ambitious strategies and actions for climate resilience.

Global average temperature has increased by approximately 1.2° Celsius[1] since the late 19th century, exacerbating weather extremes and impacting ecosystems worldwide. Concurrently, sea levels have increased by about 20 centimetres since 1900, due to melting caused by warmer seawater, threatening coastal communities and habitats.[2] IPCC projects that global warming could reach or exceed 2.0°C within the 21st century, if emissions continue unchecked, posing catastrophic risks to food systems, water availability, and global supply chains[3]. The compounded damage to infrastructure and livelihoods will disproportionately affect low-income regions, especially in the Global South. A comprehensive general description of these phenomena reveals an urgent need to adopt not only immediate measures to mitigate greenhouse gas (GHG) emissions, but also to design innovative strategies that promote resilience against climate-related threats.

The effects of climate change are not distributed evenly; rather, they disproportionately affect vulnerable populations, amplifying existing inequalities and compounding socioeconomic vulnerabilities. The World Bank has estimated that climate change could push 100 million additional people to extreme poverty by 2030, underlining the urgency of addressing climatic change impacts. Communities that depend on natural resources for their livelihoods are exceptionally vulnerability to climate change impacts.

1.1.2 Imperative: City Climate Action

The IPCC's Special Report on Global Warming of 1.5°C[4] highlights the essential role of cities and urban centres in advancing climate action. As hubs of population, economic activity, and infrastructure, urban areas are uniquely positioned to scale up mitigation and adaptation measures that can collectively shape the global trajectory toward limiting warming to 1.5°C. With over two-thirds of the world's population expected to live in urban settings by 2050[5], the urgency of embedding climate resilience into urban planning frameworks has

[1] NASA: 2020 Tied for Warmest Year on Record, NASA Analysis Shows. Available at: 2020-tied-for-warmest-year-on-record-nasa-analysis-shows.

[2] Intergovernmental Panel on Climate Change (IPCC). (2023). Ocean, Cryosphere and Sea Level Change. In Climate Change 2021 – The Physical Science Basis: Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (pp. 1211–1362). chapter, Cambridge: Cambridge University Press.

[3] IPCC: Climate change widespread, rapid, and intensifying. Intergovernmental Panel on Climate Change (IPCC). (2023). Climate Change 2022 – Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press.

[4] IPCC Special Report - Global Warming of 1.5 °C. Available at: https://www.ipcc.ch/sr15/ (accessed: 15th May 2025)

[5] United Nations Department of Economic and Social Affairs, "68% of the world population projected to live in urban areas by 2050, says UN", 16 May 2018, Available at: https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html (accessed: 15th May 2025)

never been more evident. In recognition of the global imperative for accelerated action, India announced its target to achieve net-zero emissions by 2070 at the 26th Conference of the Parties (COP26) in Glasgow. This long-term commitment is aligned with broader sustainable development objectives and places increased emphasis on integrating low-carbon strategies into urban development pathways. Local governments, therefore, emerge not only as implementers but as critical enablers of national and global climate ambition.

India is urbanizing at an unprecedented pace. By 2036, it is expected that more than 40% of country's population will be living in urban areas, which offers both advantages and disadvantages in the context of climate change[6]. Projections also suggest that by 2050, the urban population will have doubled compared to 2018 levels, adding more than 400 million people to the cities[7]. This increased urbanization is expected to lead to an increase in energy demand, transportation requirements as well as infrastructure development demands, which will result in increased GHG emissions. Additionally, urbanization will also bring along the encroachment on natural ecosystems which will likely have huge impact on the local biodiversity and their capacity to act as carbon sinks, thus adding to the climate change impacts.

Against this backdrop, it is clear that Indian cities must take centre stage in the national climate strategy. Through comprehensive planning, improved infrastructure, and integrated development models, cities can lead India's push toward a low-carbon and resilient future and inspire other nations in the Global South.

Urban development and climate actions should no longer be treated as separate goals. Many national programmes are now moving in this direction. Initiatives such as the Smart Cities Mission, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Swachh Bharat Missions and the National Clean Air Program demonstrate the government's commitment to promoting sustainable urban development and addressing environmental challenges. At a more strategic level, the National Action Plan on Climate Change (NAPCC) offers thematic missions that cities can align with. The National Mission on Sustainable Habitat 2.0, for instance, encourages cities to reduce their carbon footprint through smarter building codes, improved public transport, and better waste management systems. Other NAPCC missions like the National Solar Mission, Green India Mission, and Electric Mobility Mission provide the national-level push that cities can connect with through local projects.

Cities can significantly contribute to India's climate ambitions by embedding climate considerations in infrastructure design, integrating green and blue spaces in land use planning, scaling clean energy and mobility, and prioritising inclusive governance. A collaborative, multiple stakeholder engagement approach that includes government agencies, the private sector, civil society organizations and local communities becomes essential.

[6] Financing India's urban infrastructure needs: Constraints to commercial financing and prospects for policy action, World Bank Group. Available at: http://documents.worldbank.org/curated/en/099615110042225105/pdf/P17130200d91fc0da0ac610a1e3e1a664d4.pdf (accessed: 15th May 2025)

[7] World Urbanization Prospects, 2018, United Nations Department of Economic and Social Affairs. Available at: https://population.un.org/wup/assets/WUP2018-Report.pdf?utm_source=chatgpt.com (accessed: 15th May 2025)

1.1.3 Climate Action at the State level in Andhra Pradesh

With an extensive coastline, rapidly growing urban centres and presence of varied ecosystems, Andhra Pradesh is highly vulnerable to climate change. The state's agriculture, water availability, and coastal livelihoods are already experiencing the impacts of rising temperatures, erratic rainfall, rising sea level, and increasing cyclones. Recognising these risks, the Government of Andhra Pradesh is revising the State Action Plan on Climate Change (SAPCC), which aligns with India's NAPCC. The SAPCC presents sector-specific interventions for energy, transport, urban development, water resources and biodiversity. The plan stresses on the need to integrate climate resilience into policy development and implementation.

Andhra Pradesh's SAPCC postulates stronger inter-departmental coordination and has opened pathways for mobilizing technical and financial support from national and international agencies. The state has piloted district-level vulnerability assessments and initiated urban climate planning in key cities. The SAPCC has laid the groundwork for a climate-resilient Andhra Pradesh by integrating climate action within the state's broader vision of sustainable development.

Andhra Pradesh has developed the Swarna Andhra 2047 vision,[8] envisioning water security, equal access to water, sanitation, and hygiene (WASH) facilities, creating clean living environments across the state, and moving towards net-zero emissions by 2047. This will be achieved by leading in green hydrogen production and decarbonizing sectors that emit high levels of GHGs, thereby promoting sustainable development. Key innovations such as carbon capture, utilization, and storage (CCUS), solar energy storage, and green ethanol, are central to this plan. The state intends to establish a Central Climate Knowledge Centre and partner with universities and research institutions to disseminate knowledge and advance technology. Additionally, Andhra Pradesh aims to achieve local energy self-sufficiency through the implementation of smart grids, extensive rooftop solar deployment, and energy democratization, ensuring affordable, sustainable, and reliable energy for households and industries. To support these efforts, the state has also introduced the Andhra Pradesh Integrated Clean Energy Policy 2024[9] to implement measures to realise these goals and has established a Climate Change Cell within the state's Environment department.

1.2 Amaravati's Sustainability Vision

Amaravati, the capital city of Andhra Pradesh, is being developed with a strong focus on environmental sustainability and planned urban growth. The city's broader vision is to grow not just a world-class capital city for the State, but as a symbol of planned, future-ready urban centre in India. The city envisions to synthesize best features of urban planning, sustainability, and effective governance to create an inclusive, highly liveable, and world-class urban ecosystem.

To meet the city's overall vision, it is envisaged that Amaravati's physical infrastructure will meet global standards, with efficient utilities that are environmentally friendly, and technologically driven. The city's current development plans include dedicated zones for open green spaces, preservation of water bodies, and mixed-use development designed to minimise travel demand and energy consumption. Additionally, there is a push for non-motorised and public transport, energy-efficient infrastructure, and the use of clean

[8] Swarna-Andhra 2047
[9] Andhra Pradesh Integrated Clean Energy Policy 2024

and renewable energy where possible. Environmental considerations such as flood protection, wastewater reuse, and urban cooling have also been built into the land use strategy to ensure long-term resilience.

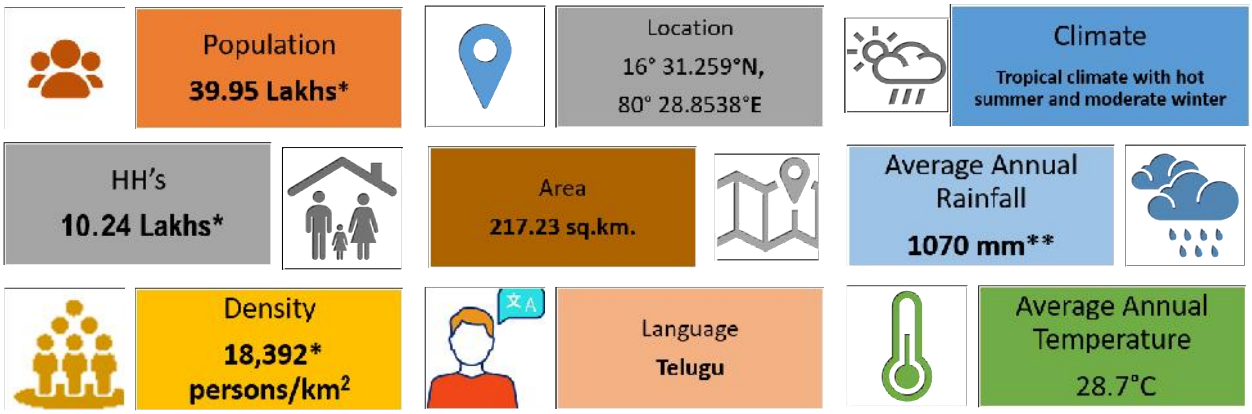
The above initiatives are part of a larger strategy to enable Amaravati support Andhra Pradesh's climate objectives while addressing the state's urbanisation demand. As the development of city progresses, the vision remains on creating a sustainable, functional and inclusive capital city that support's Andhra Pradesh's journey toward climate-resilient sustainable development.

2 City profile

2.1 About the city

Amaravati, the capital city of newly bifurcated Andhra Pradesh state (2014)[10], is being developed by the government of Andhra Pradesh as a Smart City that meets global standards of urban living. This capital city is designed to serve as an economic hub, generating diverse job opportunities for local residents and focusing on enhancing skills to meet the demands of various industries. It aims to attract high-tech and knowledge-based industries, ensuring that job offerings are competitive on a global scale.

Sustainability and efficient resource management are priorities in Amaravati's development strategy. These principles have been integrated into the city's master plan, helping to preserve its clean and green environment while fostering a vibrant community that honours the region's rich cultural heritage. Central to Amaravati's planning is the provision of affordable and high-quality housing for its residents, ensuring that the city meets the diverse needs of its population.



* Projected values for 2058
** Source: Storm Water Management Final DPR, Volume I Main Report, February 2025.

Figure 2-1 Snapshot of Capital city Amaravati

2.2 Location

Amaravati is situated on the banks of the Krishna River, near Vijayawada and 20 km from Guntur. The capital city area includes 29 existing villages, with a total population of 106,000 persons according to the 2011 Census. It spans an area of 217.23 square kilometres and encompasses parts of Thullur, Mangalagiri, and Tadepalli mandals in Guntur District.

[10] As per Andhra Pradesh Reorganisation Act of 2014, state of Andhra Pradesh is bifurcated into Telangana state and the residuary Andhra Pradesh state

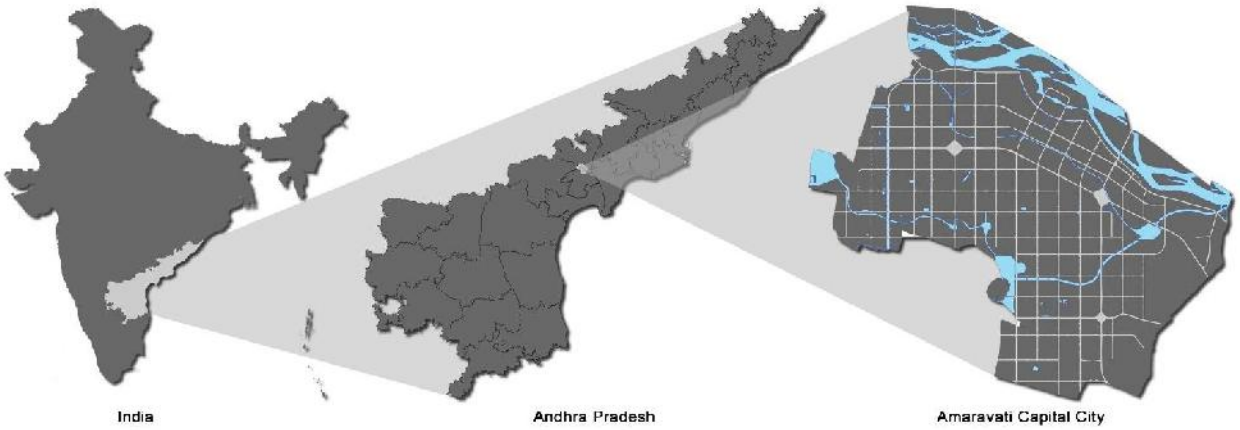


Figure 2-2 Location map of Capital city Amaravati

Under the unique Land Pooling Scheme (LPS), 17,000 acres of land owned by farmers and others have been incorporated into the capital city for development.

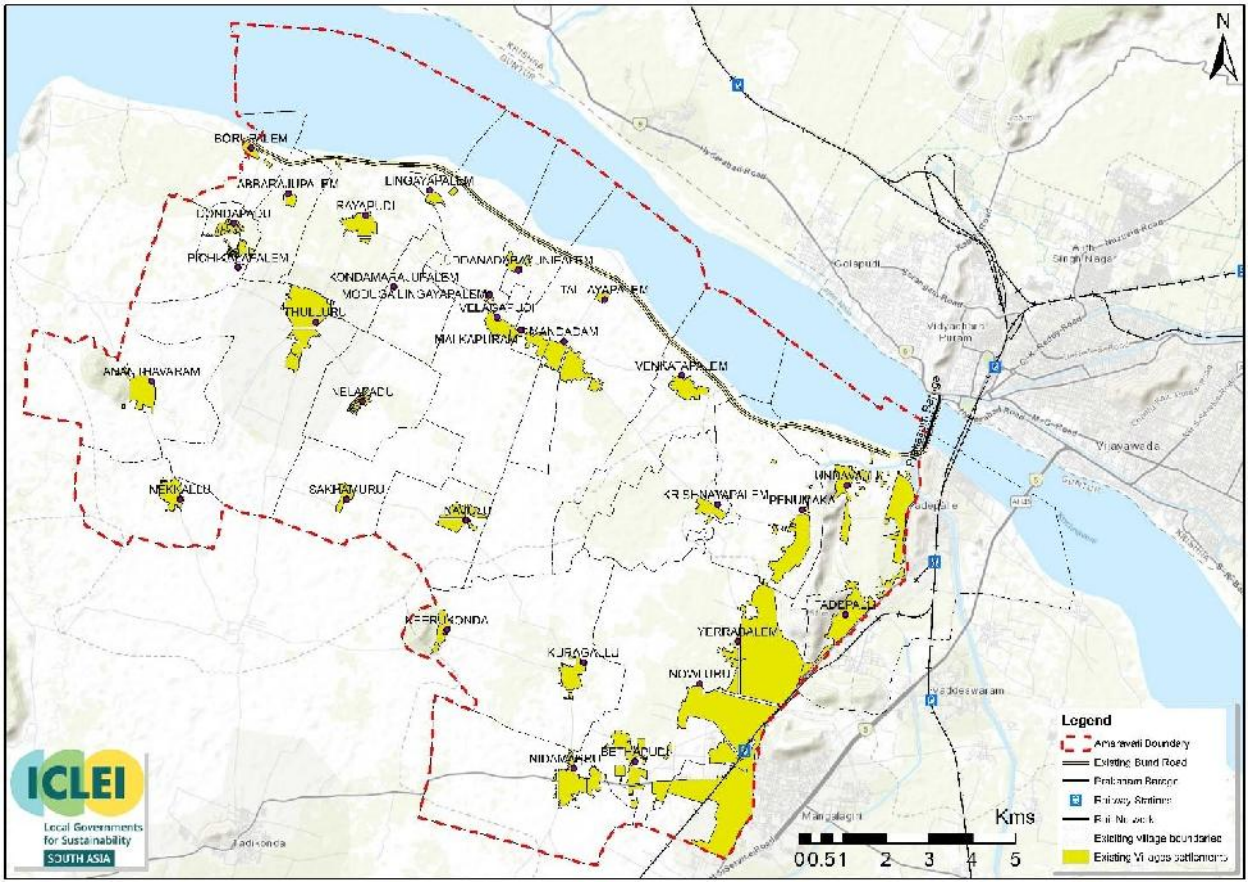


Figure 2-3 Existing settlements in Amaravati
Source: Prepared by ICLEI South Asia based on data received from APCRDA

2.3 Connectivity

The new greenfield city is adjacent to the city of Vijayawada and in close proximity to Guntur. Major cities within a 380 km radius include Chennai, Bengaluru, Hyderabad, Visakhapatnam, and Tirupati. The city is well connected via air, road, rail and waterways.

Road:
National Highway (NH) 16 (previously known as NH 5) is an important national highway that connects Amaravati with Chennai, Visakhapatnam, Bhubaneswar, and Kolkata. NH 9 connects Amaravati to Hyderabad and Pune in north-west and Machilipatnam towards south. Additionally, the Andhra Pradesh Capital Region Development Authority (APCRDA) has proposed an Inner Ring Road within its jurisdiction, along the perimeter of Amaravati. This ring road will serve as a bypass for regional traffic and enhance accessibility to the new capital and the surrounding villages and towns[11].

Rail:
Mangalagiri railway station is located within the jurisdiction of the capital city. Vijayawada is a prominent railway junction located 3 km away from Amaravati. Other prominent railway stations nearby include Krishna Canal (at a distance of 1 km), Guntur (at a distance of 30 km), Tenali (at a distance of 30 km), and Gudivada (at a distance of 45 km). A DPR for a new railway line of 56 kilometres, connecting Errupalem and Namburu via Amaravati, has been submitted to the Railway Board, and its execution is expected to begin soon[12].

Air:
Amaravati is accessible via the Vijayawada International Airport, which is located 35 kilometres away. The Andhra Pradesh Airport Development Corporation Ltd. (APADCL) has proposed a greenfield international airport for Amaravati and has begun the process of preparing a prefeasibility study and a techno-economic feasibility report[13].

Sea:
Andhra Pradesh, being a coastal state in India, boasts multiple ports that facilitate global trade and commerce. The upcoming Machilipatnam Port, expected to be completed by December 2026, is the nearest port to Amaravati, located about 100 km away. Other port in proximity includes Kakinada Port (253 km), Krishnapatnam port (321 km), Visakhapatnam (363 km) and Chennai (455 km). Furthermore, additional ports

[11] Inner Ring Road & Extensin of Capital city roads to IRR Master Plan, APCRDA Available at: https://crda.ap.gov.in/APCRDAdocs/Downloads/MasterPlans/Report%20-%20English.pdf (accessed: 15th May 2025)
[12] The Times of India, "New rly line proposed to improve connectivity", 4 October 2024, Available at: https://timesofindia.indiatimes.com/city/vijayawada/amaravati-to-get-new-56-km-railway-line-for-enhanced-connectivity/articleshow/113947775.cms#:~:text=A%20new%2056-kilometre%20railway%20line%20proposed%20between%20Errupalem,and%20improve%20connectivity%20in%20Andhra%20Pradesh%27s%20capital%20region. (accessed: 15th May 2025)
[13] RFP: Selection of Consultant for conducting Prefeasibility Study & Preparation of Techno-Economic Feasibility Report (TEFR) for Development of Greenfield International Airport in Amaravati in the state of Andhra Pradesh for Amaravati international Airport, APADCL, March 2025. Available at: https://www.apadcl.com/tender_docs/1741266343Airports-Adv-01.pdf (accessed: 15th May 2025)

have been proposed across the state[14], which will further enhance opportunities for intra and cross-boundary trade.

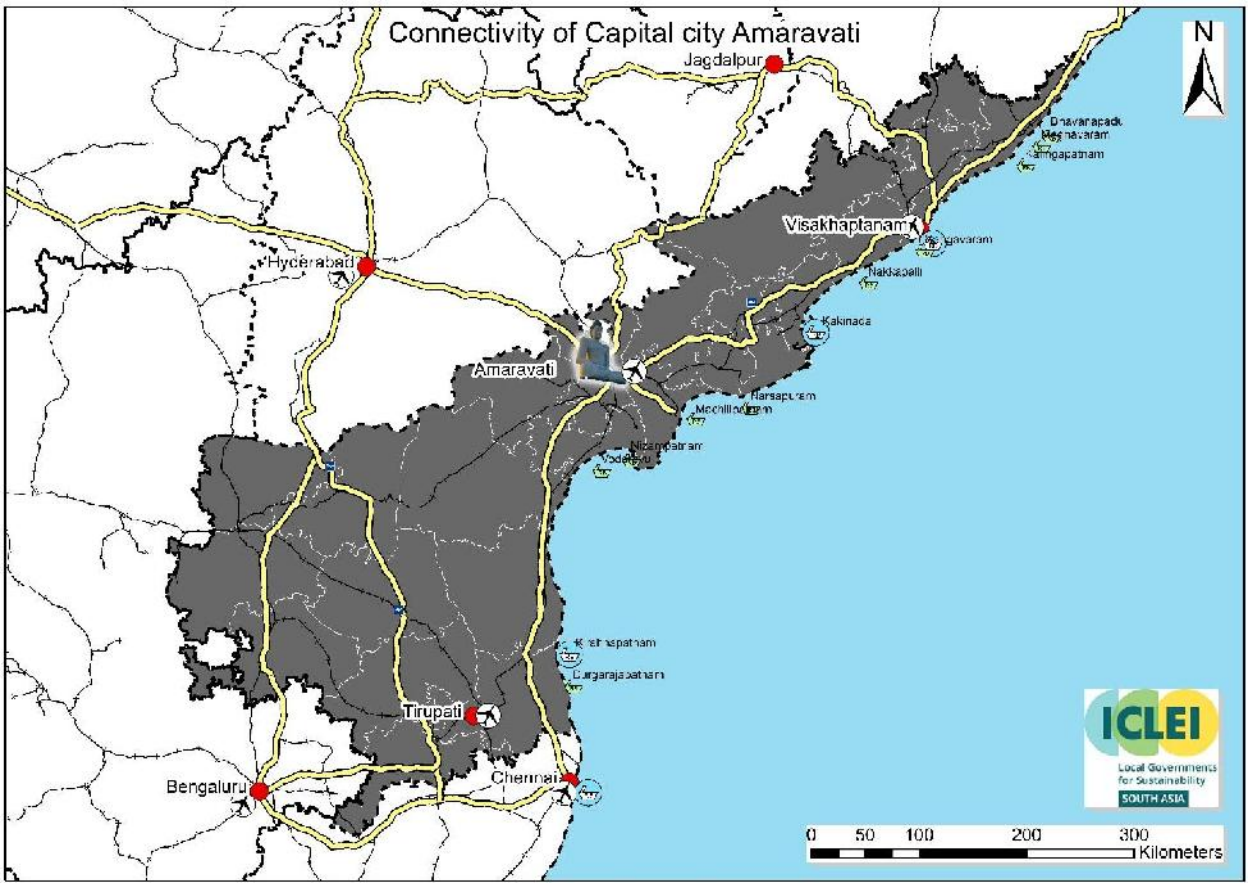


Figure 2-4 Regional Connectivity

[14] The New Indian Express, "Andhra Pradesh govt eyes global tie-ups to develop ports", 13 November 2024. Available at: https://www.newindianexpress.com/states/andhra-pradesh/2024/Nov/13/andhra-pradesh-govt-eyes-global-tie-ups-to-develop-ports (Accessed: 15th May 2025)

2.4 Demography

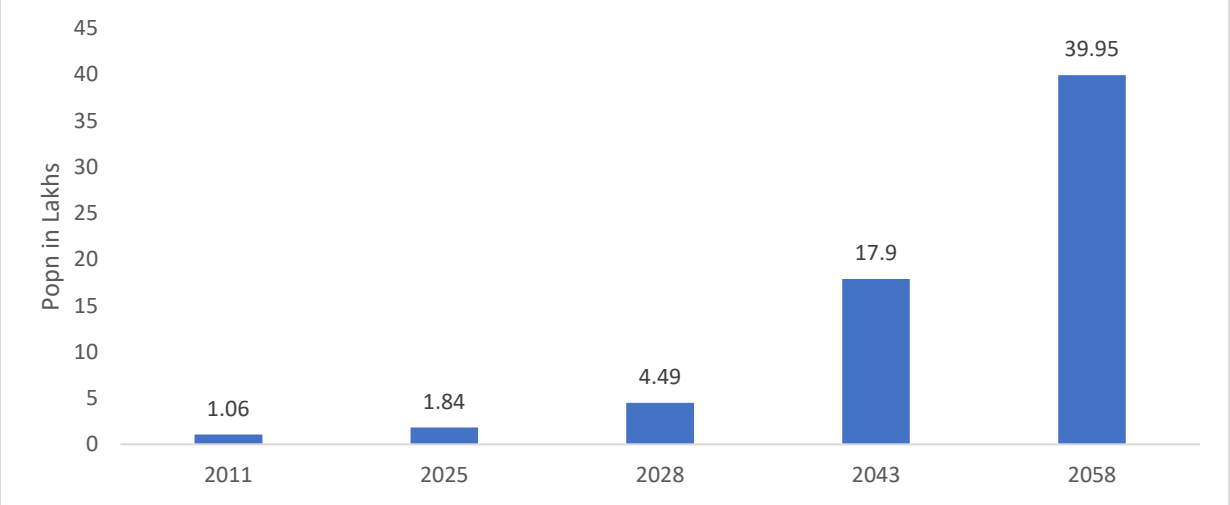


Figure 2-5 Population projected for Amaravati
Source: Prepared by ICLEI South Asia based on data received from APCRDA

According to the 2011 Census, 1.06 lakh persons reside in Amaravati, spread across 29 village settlements. By 2058, the fully developed city is projected to accommodate a population of 39.95 lakhs[15], with a gross density of 18,392 people per square kilometre. It is estimated that there will be approximately 10.24 lakh households living in Amaravati by 2058[16].

2.5 City Administration

Government of Andhra Pradesh, through an Official Act (No. 11 of 2014) constituted the Amaravati Development Corporation Limited (ADCL) & Andhra Pradesh Capital Region Development Authority (APCRDA) for creating the new capital; they are responsible for planning, coordination, execution, supervision, and management of the capital region development area.

The World Bank and the Asian Development Bank are supporting the first phase of Amaravati's development to create a transparent and effective city management framework that fosters citizen involvement in urban planning and development. The construction of the trunk infrastructure is currently underway, encompassing road networks, public transportation systems, measures for flood prevention and wastewater management. These developments are being implemented by integrating innovative, environmentally friendly technologies and design practices.

2.6 Planned Economic Development

Amaravati city is envisaged to be a hub for economic development and job-creation, with non-polluting, high-value manufacturing and service industries, creating 20 lakh jobs over 25 years with a GDP contribution

[15] Projected population as informed by APCRDA, 2025.
[16] Household size of 4 is considered based on Vijayawada 2011 Census.

of INR 1.5-2 lakh crores.[17] The city is planned to house industries such as electronics, food processing, fashion and apparel, tourism, higher education, and healthcare. It is anticipated that economic development within Amaravati will also boost the regional economy, livelihoods and quality of life.

Economic Activities and Sectoral Growth

Amaravati's economic strategy revolves around a chosen set of high-value sectors. The city is planned to become India's leading hub for food services and organic food manufacturing; and a centre for innovative agro-tech research and development. Electronics manufacturing will initially focus on assembly, evolving over time to include electronics design and fabrication. The apparel and fashion sector, which will benefit from the robust regional textile industry, is also being encouraged. Integrated industrial parks are planned that will bring together upstream (e.g. spinning, dyeing, weaving) and downstream (e.g. textile manufacturing and dyeing processes) manufacturing units. The city will also house institutions of higher education, tourism and health services. Planned economic activity will be supported by world-class infrastructure and serviced by integrated logistic networks that include more than 115 km of public transport corridors, well connected regional road and rail networks, quick access to the airport and well-developed ports in proximity.

2.7 Physiography

2.7.1 Topography

The general topography of the city slopes from south-west to north-east, towards Kondaveeti Vagu (stream), which finally flows into the River Krishna, upstream of Prakasam Barrage. Toward the West, Ananthavaram village is at an elevation of 55 m above Mean Sea Level (MSL) and Venkatapalem village toward the East is at an elevation of 19 m. Nekkallu village in the South is at an elevation of 38 m and Kara Katta to the North has an elevation of 20 m.

The topography is predominantly flat in the central portion of the city, with a slight slope to the south-east. Western part of the capital city slopes towards the central portion. Central portion of the capital city shows mild slope towards north-east and exhibits an undulating terrain.

All the streams in the capital city area originate from South, South-west draining toward the North-East and discharge finally into the Krishna River. The northern side of Pala Vagu slopes towards the vagu/stream in some locations. The southern side of Kondaveeti Vagu slopes towards the vagu at different locations.

[17] Amaravati Project Edition : 04, APCRDA, February 2019. Available at: https://crda.ap.gov.in/APCRDADOCS/DataModuleFIles/Reports/01~Amaravati%20Project%20Report%20Edition%20No4%20Status%20Feb%202019.pdf (accessed: 15th May 2025)

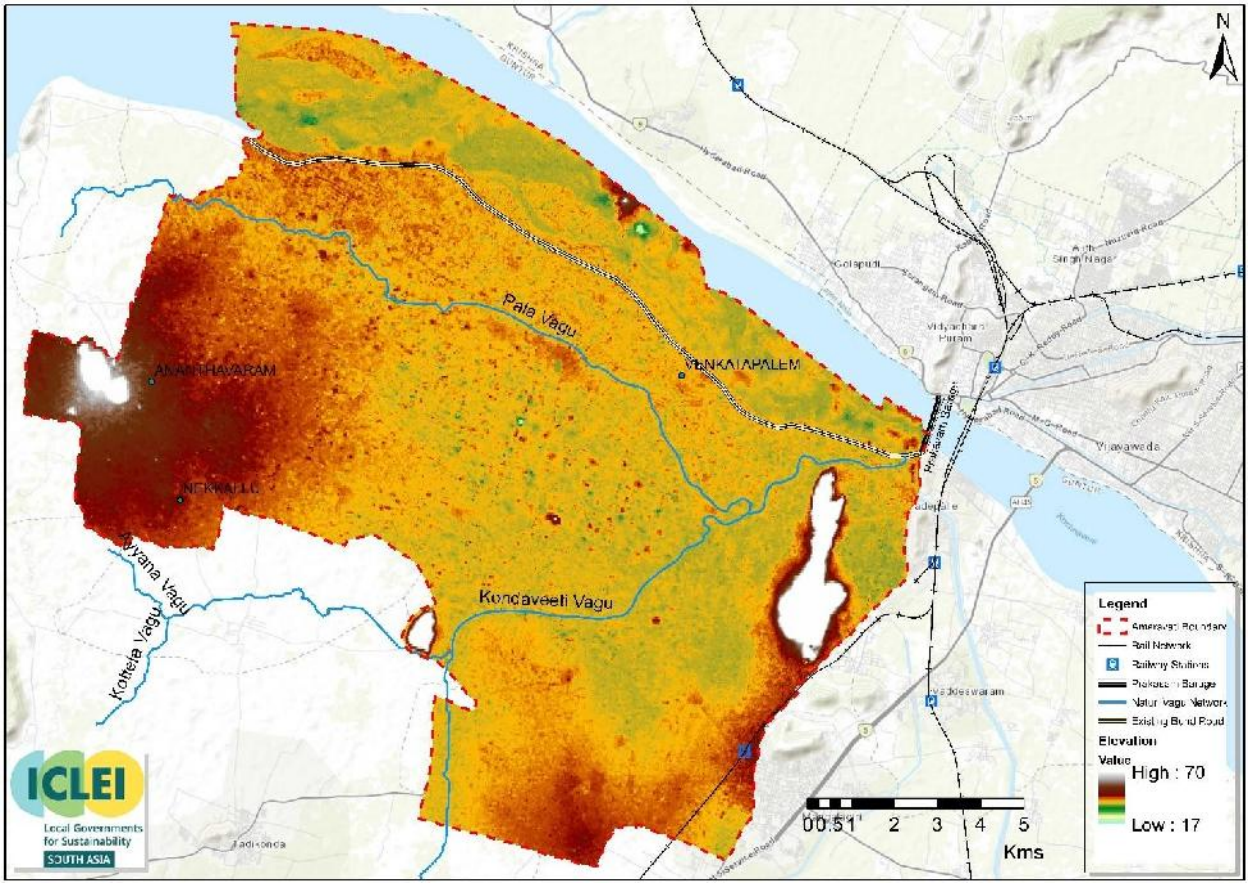


Figure 2-6 Topography of Amaravati

2.7.2 Existing Environmental Features

- **Green Cover and Forests:** Amaravati comprises a total forest area of 3,165 hectares, including, water bodies Kondapalli, Mangalagiri, and Tadepalli reserve forests. Agricultural fields, forests, and groves present in the region provide ecological services. Preservation of these green areas and environmental features is key to preventing heat island effect and retaining biodiversity.
- **Hilly terrain:** Hills such as Kondaveedu, Mangalagiri, and Undavalli are present, acting as ecological and visual landmarks; it is envisaged that the city will integrate and will be built around these hills.
- **Water Bodies:** Amaravati is endowed with the Krishna River and several other water bodies spread across 2,160 hectares, with a long riverfront of over 22 km. The Krishna River, along with a network of canals and tanks, forms the region's primary blue infrastructure. These water bodies are critical for irrigation, drinking water, flood control, and recreation.
- **Flood Zones:** Certain areas along the Krishna River and its tributaries are flood-prone.

2.7.3 Soil

Black Cotton, Alluvial and Clayey-loam soils are predominantly found along the Krishna Riverbank. Within the capital city area, black cotton soil is the most widespread. The capital city area has layers of stacked up

clayey and silty soil underlaid by medium sand and clay.[18] Silty-clayey soils, loamy soils and sandy clayey/gravelly clayey soils are also observed.

Soil characteristics influence the thermal profile of the city, that is, its warming and heat retention. Black cotton, which is predominant in the city, soil has high thermal conductivity[19] and diffusivity. Due to this thermal characteristic of soil, barren land absorbs heat faster than other surfaces during daytime and releases heat faster and cools down during night-time. Soil conditions are largely suitable for urban construction but require proper stormwater drainage planning.

2.7.4 Ground Water Table

The depth of ground water table is observed to be between 2 to 5 m in the northern part of the capital city (near River Krishna). In comparison, ground water levels are in the range of 5 to 10m in western and southern parts of the city. To preserve the existing aquifer conditions, it is envisaged that ground water extraction in Amaravati will be subject to government regulations.

2.8 Land Use Planning

Amaravati is envisioned as Andhra Pradesh's "People's Capital" – a world-class, smart city with the state-of-the-art infrastructure and global standards followed by developed cities and countries. It aims to be an economic hub generating high-value jobs (knowledge/tech, finance, education) while capitalizing on the region's heritage and culture and offering affordable, high-quality housing and a green, livable environment.

2.8.1 Planning Strategies and Approach for Land Use

The Master plan aims to address 6 key goals through an Urban Sustainability Framework namely:

1. Creating Jobs
2. Attracting Investments
3. Provision of good quality housing
4. Nature and Environment
5. Flood Management
6. Heritage and Culture

Several goals and strategies are framed based on these 6 goals,

- **State of the art Infrastructure:** Transit-oriented development (TOD) and high-density mixed use along transit axes, 225 km of public transport corridors by 2050, prioritizing high public transport mode share, and strategic first and last mile connectivity integration with approximately 593 km of major roads by 2050.
- **Jobs & Homes for all:** Generate more than 20 lakhs jobs to sustain population of 39.95 lakhs by 2058 and create quality and affordable housing catering to the needful low and medium-income groups

[18] Water supply revised DPR 2025, ADCL
[19] Thermal conductivity of black soil 2 Days after Saturation (DAS) is 8.61 W m−1K−1 (1.4 Mgm-3 Compaction level) and 14.02 W m−1K−1 (1.2 Mgm-3 Compaction level) and 6 DAS is 3.88 (1.2 Mgm-3 Compaction level) and 5.73 (1.4 Mgm-3 Compaction level) (Pramanik & Aggarwal, 2013).

- **Green and Clean:** Mandate retaining the green network (forests, hills) as well as waterfront, and utilize these natural features to create a regional green network and make it accessible to the inhabitants.
- **Quality Living:** Create universal and accessible amenities and infrastructure including transit, healthcare facilities, education, public spaces, among others.
- **Efficient Resource Management:** Adopt nature-based solutions and develop sustainable flood management system, adopt 3R principles of Reduce, Recycle and Reuse and maximize use of renewable energy, develop smart energy grid, and attain global certification on climate responsive green buildings and infrastructure.
- **Identity and Heritage:** Preserve all historic and culturally important sites and create conservation awareness, promote cultural activities at strategic locations, and integrate existing villages to reflect and promote region's culture.

The Capital City's development and land use plan has been designed considering the traditional Indian approach of 'Vastu Shastra' which ensures climate responsive urban planning while conserving existing flora and fauna and maintaining health and wellbeing of inhabitants throughout the year.

The plan proposes 3 important axes which serve as potential corridors within the city, namely: civic axis for administrative functions, recreation axis housing a number of parks and open spaces, and waterfront axis along the river front lying between the civic and recreational axis. This axis shall house the city's downtown area with a vibrant waterfront commercial district that will create a distinctive skyline for the Amaravati city; with 'Brahmastan' (Silent Centre) at its centre.

The plan defines goals and strategies prioritizing Transit-oriented development (TOD), high-density mixed use with slum-free housing; cutting-edge public transport [Bus Rapid Transit (BRT)/Mass Rapid Transit (MRT)] and connectivity (including a high-speed rail link); strict sustainability principles following "reduce-recycle-reuse" approach for waste management, maximizing the use renewable energy, and a green, "walkable" urban form with parks and amenities within every neighbourhood integrating region's identity of heritage and culture. The master plan envisages nine thematic sub-cities including the Government city, Justice city, Finance city, Education & knowledge city, Health city, Sports city, Cultural city, Electronics city and Tourism city, that have been strategically planned across Amaravati.

2.8.2 Spatial Structure

The city is organized around multiple urban centres linked by high-capacity transit. A waterfront Central Business District (CBD) along the Krishna River is envisioned as the commercial/cultural heart, featuring mixed-use towers, cultural institutions and high-end housing. Two other transit nodes – the Eastern Gateway (airport corridor) and the Government Core (assembly, secretariat, judiciary) – anchor mixed-use developments and high-density jobs.

A Township model, as shown in Figure 2-7~~Figure 2-7~~ has been adopted for the proposed capital region using the strategy of hierarchical distribution of population, land uses, open spaces, and infrastructure, while also integrating and upgrading existing village neighbourhoods through the provision of essential civic amenities, aligning with future urban settlements.

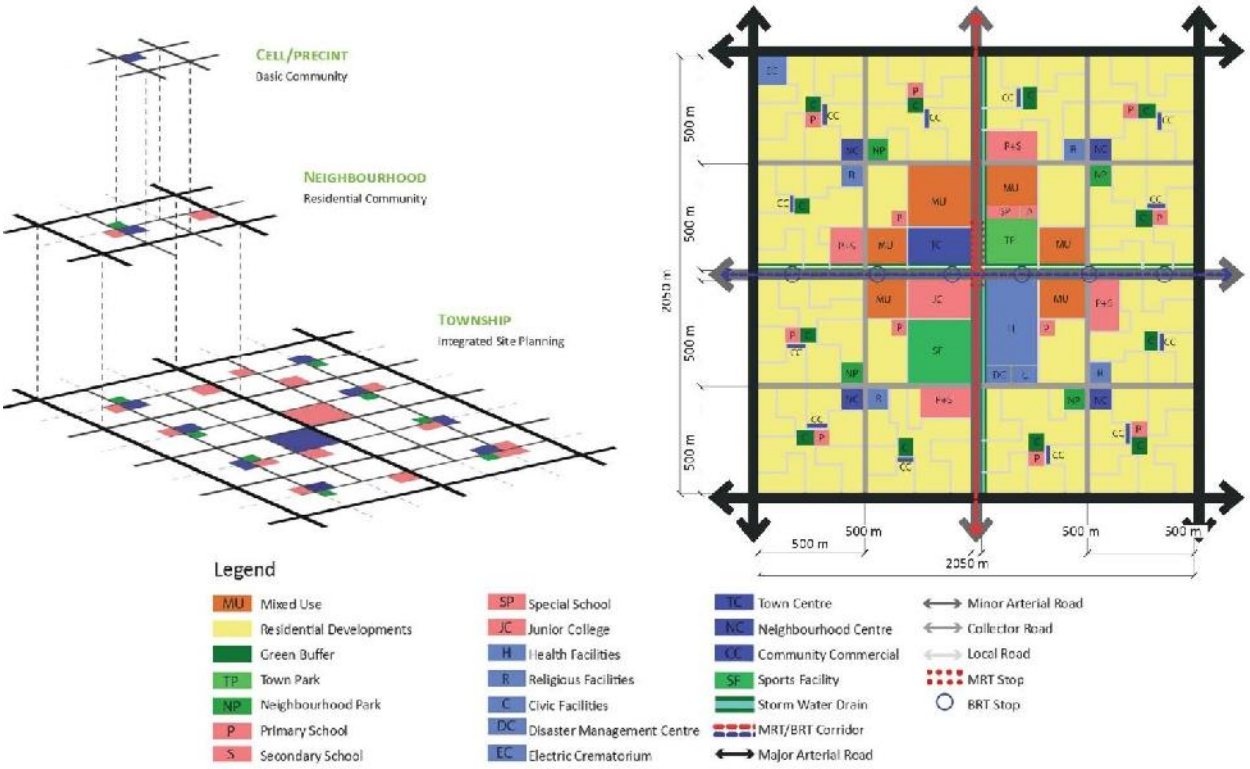


Figure 2-7 Capital City Amaravati Township Model
Source: Amaravati Capital City Master Plan Report

Each township is planned in "Cells" of 500x500 meters each, with a potential for up to 4,550 dwelling units. Each "cell" represents a small community with greenery, playground and no-vehicle zones. The proposed township model also integrates a number of employment nodes such as commercial offices, light industries and business parks in close proximity to residential developments, connected by public transport.

2.8.3 Zoning Approach

As shown in Figure 2-8~~Figure 2-8~~, land parcels are designated by intended land use.

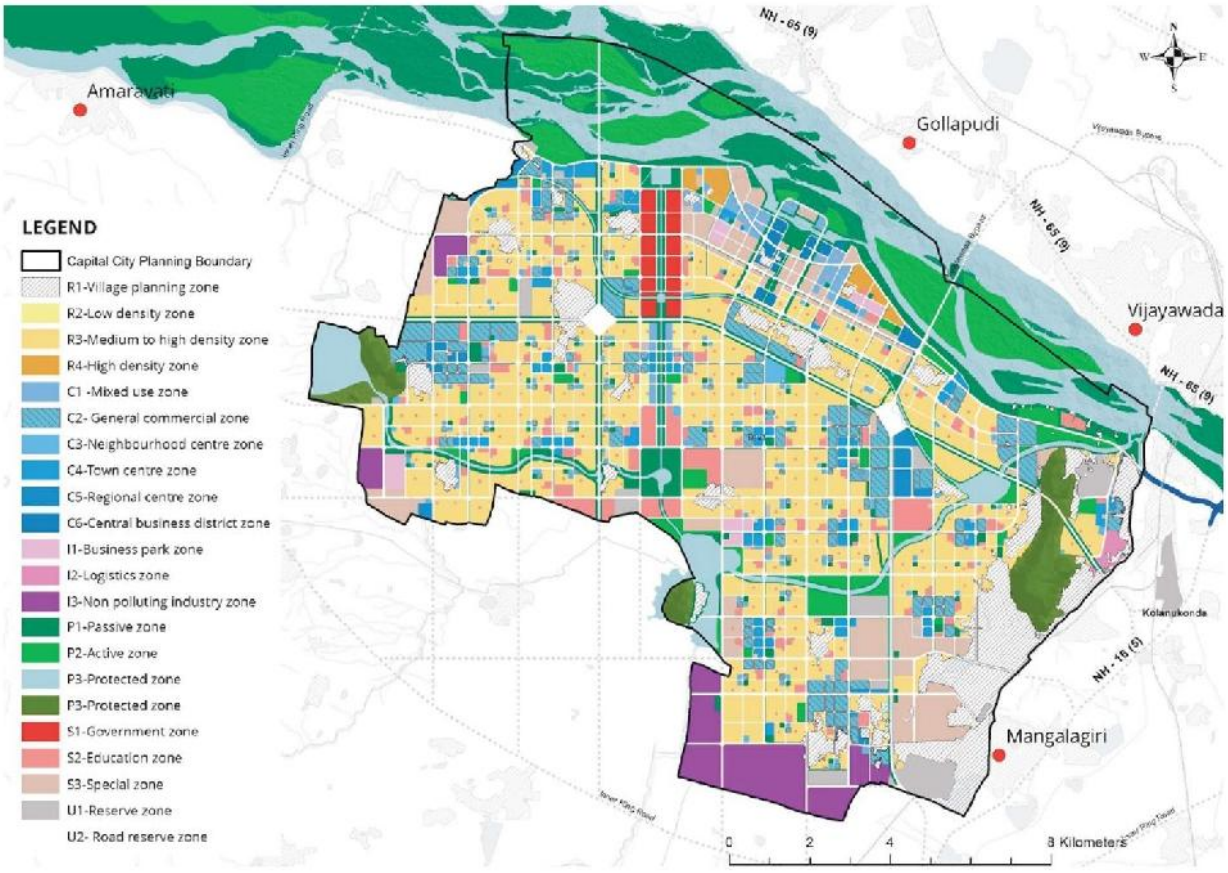


Figure 2-8 Capital City Amaravati Master Plan 2050
Source: Amaravati Capital City Master Plan Report

Table 2-1 Land use allocation as per Master Plan 2050

Land Use	Percentage of Area	Area in Hectares
Residential	32%	6,951
Commercial	11%	2,389
Industrial	4%	869
Parks and Open spaces	29.5%	6,397
Institutional	10.5%	2,280
Infrastructure	13%	2,823

Source: Capital City Master Plan Report

- **Residential (R) zone:** The residential zone comprises four subzones R1 to R4 that include existing settlement zones (integrating existing villages), low-rise, low-density developments, medium to high density (single to multifamily dwelling units), and high-density apartment zones, planned along the riverfront within the central business district.

- **Commercial (C) zone:** Multiple commercial zones, C1 to C6, allocate space for town centres, neighbourhood shops and business parks. Special mixed-use "C2- community commercial zones" permit small-scale retail and offices within residential areas. The Central business district zone, C6, represents a high-rise commercial zone in the downtown area to create an iconic city centre. About 7.84% of commercial land has been allocated for mixed use development.

- **Institutional (I) zone:** Comprises land parcels for strategic government institutional projects like the Legislative Assembly, Secretariat, State Departments and other government offices.
- **Infrastructure Reserve:** To enable the government in securing land for strategic infrastructure and transportation projects. It includes large scale transport utilities like bus terminal, metro depot as well as large scale infrastructure utilities like water treatment plants (WTPs), sewage treatment plants (STPs), and electrical substations.
- **Industrial zone:** It is proposed to house clean and non-polluting industries along with IT/ITeS corridors, financial and R&D clusters within Amaravati. A mega food processing park and electronic manufacturing cluster are also envisaged. The Industrial zone is further categorized into 3 zones: 1) Business Park Zone 2) Industrial Zone 3) Logistics Zone

2.8.4 Heritage and Tourism

Cultural heritage forms an integral part of the master plan. Existing religious and historical assets are planned to be protected and showcased.

- **Tourism Circuit:** A religious and heritage circuit is planned linking temple sites within Amaravati, the planned Buddha Statue, Undavalli Caves, Vasudhara Falls and other attractions. Interpretation facilities and museums will highlight the region's 2,200-year Buddhist heritage.
- **Temple Hub:** Amaravati is planned as a "Temple Tourism" hub, leveraging and connecting existing village temples. A heritage zone with village walkways that integrate living temples and community sites is planned.
- **Eco-tourism:** Natural features (river islands, Kondapalli/Undavalli hills) are to be developed as eco-cultural nodes. Flood zones have been identified and designated for non-intensive land uses such as parks and open space.
- **Identity:** Iconic architecture (e.g. legislative complex, convention centre) and public art will reflect local history and create a memorable skyline. The plan enforces conservation of historic village cores even as they gain infrastructure, ensuring development "respects and supports the rich cultural and religious heritage".

2.8.5 Environmental Integration

The framework for Amaravati's sustainable development focuses on integration of existing natural systems—land, water, vegetation, and air—into the urban fabric, ensuring ecological balance, resilience to climate change, and quality of life for residents. The master plan has set a goal to "create a clean, healthy vibrant city with well protected environment which supports a sustainable society and economy"

The primary objectives are:

- Preserving the region's natural assets valuable to the public
- Minimize environmental degradation during urbanization based on scientific well-informed decisions and be the authoritative advocate for the environment

- Promote climate-sensitive infrastructure and design including the climate responsive buildings adhering to the global standards such as GRIHA and LEED, at least 10% of urban farming, decentralized wastewater management, solid waste management, constructed wetlands

The APCRDA has defined various strategies and measures to conserve the diverse environmental features of the region. The key strategies include:

- **Green-Blue Network:** A comprehensive system of parks, green corridors, and water bodies is planned to promote ecological continuity and improve stormwater management. A large open green space is planned at the city centre housing a large water reservoir, will collect the rainwater from the various city canals, and channelize the water to other water bodies.
    - Primary green spaces spanning about 3,165 hectares (Ha) are planned along the existing canals and water bodies to serve as city's main ecological corridors
    - 505 Ha of secondary green spaces are planned through the townships connecting the various town and neighbourhood parks mostly aligned to the arterial roads. These are passive recreational spaces, jogging trails and non-motorized transport corridors across the city.
- **Infrastructure and land use regulation:** Environmentally sensitive zones—including wetlands, riverbanks, and forests are protected through land use restrictions and designated conservation zones. Recreational facilities of about 560 Ha such as stadiums, multi-purpose halls, sports hubs, theme parks, golf courses are proposed close to the green-blue network.
- **Krishna River Protection:** Strategies are proposed to conserve the river and its catchment area. Projects that leverage the river's ecosystem services are planned. A network of water taxis is also proposed to connect eco-tourism attractions on the cluster of islands on river Krishna. Strict land use and zoning regulations are in place to protect the river.
- **Pollution Management**: Guidelines are in place to manage air, water, and noise pollution. These include buffer zones near industrial areas, sewage treatment systems, and clean energy promotion.

2.8.6 Climate Resilience and Sustainable Development Strategies

The Master Plan also defines sustainable development strategies that are to be adopted across Amaravati.

- **Promotion of Green buildings and infrastructure:** All public and private developments are encouraged or mandated to meet green building certifications. Renewable energy-based solutions such as solar, wind, and biomass energy will be adopted and promoted to reduce lifecycle emissions from built-up infrastructure.

  Mandatory provisions such as rainwater harvesting systems, decentralized wastewater treatment and reuse will be integrated in the building regulations.
- **Stormwater and Flood Management:** To manage flood in flood prone areas various strategies are designed including infrastructure such as retention ponds, recharge wells, and improved drainage systems to manage monsoon run-off.
- **Urban Forest and Tree Cover:** Large-scale tree plantation and preservation of existing vegetation will be prioritized to mitigate urban heat and maintain air quality.

2.9 Disaster Management

Abutting the Krishna River and its flood plain, Amaravati is susceptible to riverine flooding during the rainy season. A robust disaster and vulnerability assessment was conducted and preventive and mitigative measures are suggested in the Environment Management Plan prepared as part of the Environment Impact Assessment (EIA) conducted in 2015.

A Disaster Management Plan was also proposed as part of the EIA, including guidance on the formation of 'Disaster Management Committee', to monitor, steer and mitigate potential disasters.

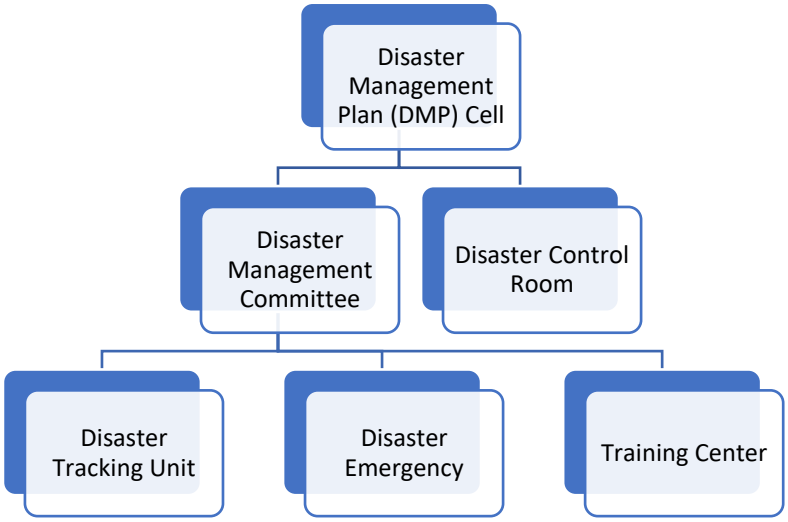


Figure 2-9 Organizational Structure for Disaster Management
Source: EIA & EMP of Amaravati Capital City, APCRDA, September 2015.

The proposed organizational structure for disaster management is shown in Figure 2-9~~Figure 2-9~~.

Flood Management Plan: A detailed flood management plan was also prepared by the APCRDA based on the recommendations and assessments provided by National Green Tribunal (NGT) and EIA conducted thereafter. The plan provides details on past flooding occurrences and provides current situation as well as future projections. Flood mitigation measures including infrastructure planning, stormwater drains networks, canal networks, reservoirs, flood water pumping stations, among others, have been detailed out along with cost estimates. Refer section 3.3 for further details.

3 Urban System Gap Analysis

3.1 Water Supply

Existing Situation

The primary source of surface water in the capital city area is the Krishna River. The Rural Water Supply and Sanitation (RWSS) department is the nodal agency in the state for providing drinking water and sanitation facilities in rural areas. As of 2024, the RWSS department sources water from the Krishna River and treats it to provide 13 million liters per day (MLD)[20] of water supply to 25 villages and the Mangalagiri-Tadepalli Municipal Corporation (MTMC) areas falling within the Amaravati jurisdiction. The quality of piped water supplied meets the standards. . Village settlements also depend on groundwater extracted through borewells to meet their water requirements. For drinking water, some of the settlements in Harishchandrapuram and Venkatapalem buy RO water from NTR Sujala plants.

Proposed Water Supply

The water supply system for Amaravati is planned to meet the projected water demand of 925 MLD in 2058. The city's projected water demand has been estimated based on assessment of anticipated demographic growth and development and using Central Public Health & Environmental Engineering Organization (CPHEEO) norms. Residential water demand has been estimated using the projected population for 2058 and applying a standard water demand rate of 150 litres per capita per day (lpcd). Commercial and institutional demand is estimated based on the anticipated workforce population, with an estimated demand rate of 45 lpcd. For industrial areas, water requirements have been estimated at 35,000 litres per hectare per day. Floating population demand has been included at 5% of the total population, with 2.5% assumed to need 45 lpcd and the remaining 2.5% around 15 lpcd. In addition, system losses are factored in at 15%, which includes 10% for unaccounted-for water, 2% for transmission losses, and 3% loss at the water treatment plants (WTPs). Additionally, the water requirement from the three Startup Area zones has also been incorporated to project the water demand.

Table 3-1 Projected Water Demand in Amaravati over the Time Horizon 2028-2058

Year	Projected Water Demand (MLD)
2028	141
2043	412
2058	925

Source: ICLEI South Asia estimates based on Final DPR water supply, ADCL, 2025

A two phased approach is adopted to meet the city's water demand; phase I will cater to the demand until 2043 (2028-2043) and phase II will meet the demand until 2058 (i.e. from 2043-2058). Figure 3-1~~Figure 3-1~~ provides an overview of the plan for Amaravati's water supply system from source to consumer.

[20] Estimated based on an average per capita water supply of 70 litres per capita per day (lpcd) by the Rural Water Supply and Sanitation Department, excluding groundwater sources

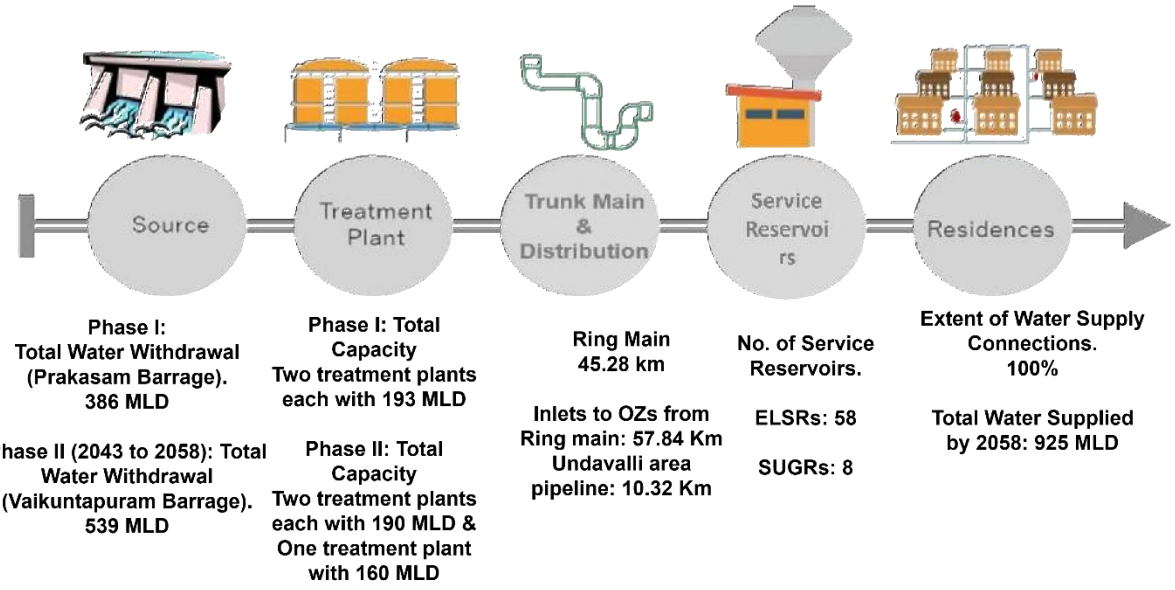


Figure 3-1 Water distribution from source to consumer in Amaravati
Source: Prepared by ICLEI South Asia based on data received from APCRDA.

3.1.1 Water Sources

The Krishna River is the primary water source for the city. Two intake wells have been proposed for water withdrawal. In Phase I, it is proposed to lift 386 MLD from Prakasam Barrage intake well to meet the city's water demand until 2043. In Phase II, the proposed Vykuntapuram Barrage, designed for a storage capacity of up to 10 thousand million cubic feet (TMC), will cater the additional projected water demand of 539 MLD by 2058.

For the initial 15 years from 2028 to 2043, water will be drawn from the backwater storage of Prakasam Barrage to cater to the demand of the city. In the second phase, from 2043 to 2058, the plan is to supply water from both the proposed Vykuntapuram Barrage and the Prakasam Barrage.

In addition, considering the long-term sustainability of water supply, diversion of water from the River Godavari on completion of the Polavaram project is also planned, which will help balancing water demand during peak season or during other conditions of exigency.

Table 3-2 Water Source Capacities Phase-wise

Phase	Source Location	Supply Capacity (MLD)	Key Infrastructure
Phase I (2028-2043)	Prakasam Barrage	386	Intake wells, pump house, raw water transmission mains
Phase II (2043-2058)	Vykuntapuram Barrage	539	Proposed barrage with storage facilities

Source: Final DPR water supply, ADCL, 2025

3.1.2 Water Treatment

The water treatment design for Amaravati adopts a modular and technologically advanced approach to ensure water quality meets the World Health Organization (WHO) standards. For Phase I, the WTP is

planned at Venkatapalem, with a total designed capacity of 386 MLD, comprising two modules of 193 MLD each. The first phase treatment incorporates sophisticated technology for rapid and efficient clarification using plate settlers, complemented by rapid sand gravity filtration and efficient disinfection. This modular approach allows the future expansion or upgradation of water treatment capacity as the city grows.

In Phase II, treatment facility at Borupalem will be added, to handle the additional demand. This facility will comprise three modular units: two units with a capacity of 190 MLD each and a third unit of 160 MLD, designed to scale with the city's expanding demand. This phase will integrate innovative features such as zero liquid discharge (ZLD) for water reuse and enhanced automation through Supervisory Control and Data Acquisition (SCADA) systems. These integrations will help automate operational processes while also facilitating continuous monitoring and real-time adjustment of treatment parameters to maintain high water quality.

Table 3-3 Water Treatment Plant Capacities

Phase	WTP Location	Capacity (MLD)	Treatment Technology
Phase I (2028-2043)	Venkatapalem	386 (2 modules of 193)	Plate Settlers, Rapid Sand Gravity Filters, Disinfection
Phase II (2043-2058)	Borupalem	539 (2 modules of 190 and 1 module of 160)	Zero Liquid Discharge (ZLD), Advanced SCADA-based control

Source: Final DPR water supply, ADCL, 2025

3.1.3 Transmission and Distribution Network

Treated water will be supplied through a direct-pumping transmission and distribution network that guarantees round the clock supply, i.e. 24x7 supply. The system is engineered to minimize energy losses and maintain a consistent residual pressure at consumer endpoints. In Phase I, raw water will be conveyed via ductile iron and mild steel pumping mains with diameters in the range of 2000 to 2500 mm. The clear water will then be transmitted from the treatment plants via dedicated clear water mains—approximately 1.2 km in length in Phase I—to a ring main that extends across 45.28 km, thereby providing a central backbone for distribution.

The ring main will be a critical element of the network as it not only ensures rapid and equitable distribution of water to the various parts of the city but also provides multiple tapping points and connection zones. There will be 24 tapping points that serve as nodes that feed into 66 operational zones (OZs), which will further be supported by 58 elevated service reservoirs (ELSRs) and 8 semi-underground reservoirs (SUGRs) for flexible demand management. In Phase II, additional pipeline extensions and pumping mains are planned to reinforce the network's resilience, while the basic design of the ring main remains similar to that of Phase I.

Table 3-4 Transmission & Distribution Components

Component	Phase I	Phase II
Raw Water Pumping Main	Approximately 2.66 km	Approximately 7.50 km
Clear Water Transmission Main	Approximately 1.2 km	Approximately 3.29 km

Component	Phase I	Phase II
Ring Main	45.28 km	Same as Phase I (expanded as required)
Operational Zones (OZs)	66 zones	Expanded based on demand
Storage Tanks (ELSRs & SUGRs)	58 ELSRs + 8 SUGRs	Additional units as per demand

Source: Final DPR water supply, ADCL, 2025

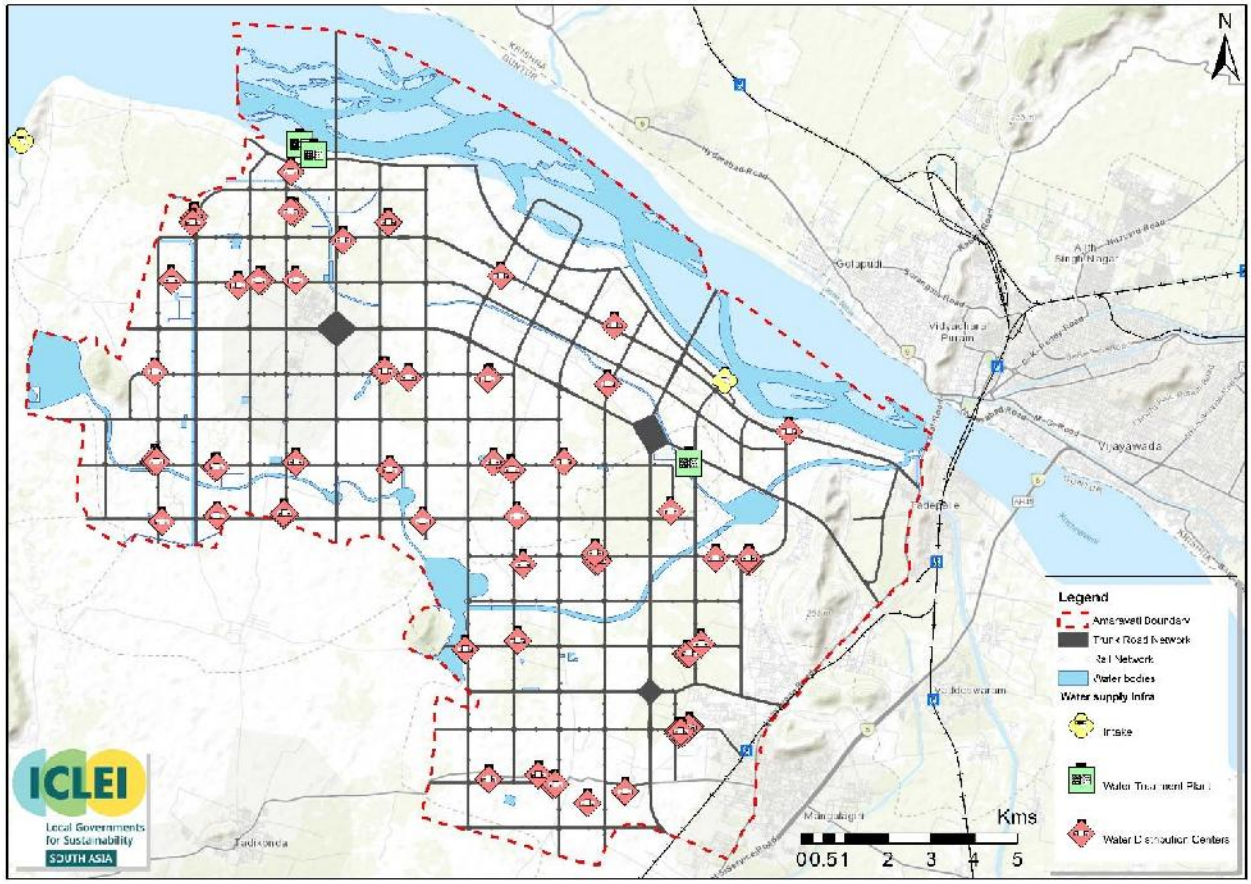


Figure 3-2 Proposed Water Supply infrastructure for Amaravati, 2058

Source: Prepared by ICLEI South Asia based on data received from APCRDA.

3.2 Wastewater Management

Existing Situation

Existing settlements, including around 46,224 households,[21] generate about 10.3 MLD[22] of wastewater in 2024. All the households are currently dependent on individual septic tanks . Desludging of the septic tanks is carried out by private operators . Instances of emptying collected fecal sludge into open fields and

[21] Estimated based on the average household size of 4

[22] Wastewater generation has been estimated based on the assumption that 80% of the total water supply (13 MLD), after accounting for losses, is discharged as wastewater

vagus/natural drains is in practice by a few desludging operators. During the active period of agriculture, some of the farmers were using this fecal waste as manure in the fields.

Proposed Wastewater Management

The wastewater management system in Amaravati is designed as a fully decentralized, zoned network aimed at providing comprehensive wastewater collection, treatment, and reuse or safe disposal. The city is divided into 13 sewerage catchments, including 12 for domestic wastewater and one dedicated zone for industrial effluents. Each zone is planned with its own Sewage Treatment Plant (STP) or Common Effluent Treatment Plant (CETP) to decentralize treatment operations and reduce the need for long-distance conveyance systems.

The system has been designed in alignment with CPHEEO 2013 guidelines on the Manual on Sewerage and Sewage Treatment Systems and incorporates gravity-based flow principles wherever possible. Amaravati's wastewater management system will be entirely separate from its stormwater network and will be implemented in two major phases to synchronize with urban development timelines.

3.2.1 Wastewater Generation

By the planning horizon year of 2058, Amaravati's projected water demand is estimated to be 925 MLD, based on anticipated residential, commercial, institutional, and industrial development. Correspondingly, the total wastewater generation is expected to reach 723 MLD[23]. These estimates are based on land use zoning, population density norms, and projected occupancy across the city area, as outlined in the master plan, and includes domestic, non-domestic and infiltrations from all planned activity zones.

Table 3-5 Projected Wastewater Generation in Amaravati, 2028-2058

Year	Projected Wastewater Generation (MLD)
2028	113
2043	319
2058	723

Source: ICLEI South Asia Analysis based on Final DPRs for Water and Wastewater, ADCL, 2025

3.2.2 Wastewater Network Infrastructure

The total length of the trunk sewer network is planned to be 1,035 km, covering the entire jurisdiction of Amaravati city. The network will comprise the following key components:

- 58 intermediate sewage lifting stations (ISLS)
- 1 main pumping station per zone
- Pipe diameters ranging from 200 mm to 1800 mm
- Design period: up to 2058, with an interim milestone in 2043

Table 3-6 Design Considerations of Sewerage Infrastructure in Amaravati

Parameter	Value
Total Area Covered	217.23 sq. km

[23] Wastewater generation for Amaravati has been calculated by assuming that 80% of the water supplied, after accounting for losses, is discharged as wastewater. To meet CPHEEO norms, an additional 10% of the estimated wastewater has been added to account for possible groundwater infiltration, resulting in the final wastewater generation figure.

Total Sewerage Zones	13 (12 STPs + 1 CETP)
Total Sewer Length	1,035 km
Number of Intermediate Lifting Stations (ISLS)	58
Design Period	30 years (up to 2058)
Diameter of Sewer Lines	200 mm to 1800 mm

Source: Final DPR Wastewater, ADCL, 2025

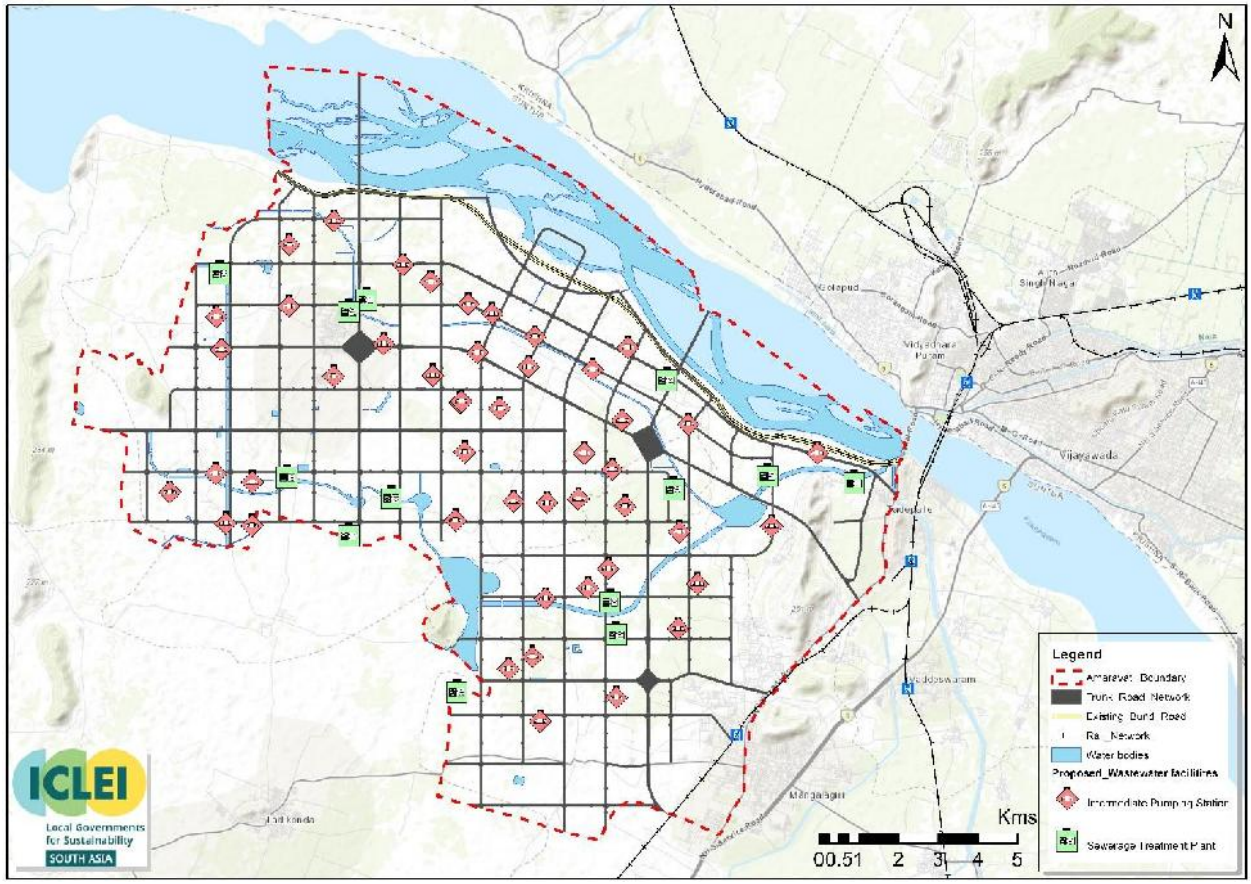


Figure 3-3 Proposed Sewerage infrastructure for Amaravati, 2058

Source: Prepared by ICLEI South Asia based on data received from APCRDA.

3.2.3 Treatment Plants and Technology Options

A total of 12 STPs and 1 CETP are proposed for treatment of Amaravati's anticipated domestic and industrial wastewater generation. The CETP is designated to be located in zone 12A, which houses industries. The STPs are proposed to be modular and designed for scalability. Deployment of the wastewater management infrastructure is structured into two phases:

- **Phase I (up to 2043)** will include the complete sewerage network, all intermediate sewage lifting stations, main pumping stations, and the initial modular capacities of all STPs (a total of 284 MLD) and CETP (35 MLD).
- **Phase II (2043–2058)** will focus on expanding the treatment capacities at each STP (to a total of 586 MLD) and CETP (53 MLD) to cater to projected wastewater generation.

Table 3-7 Zone-wise STP and CETP Treatment Capacities in Amaravati (Phase I and II)

Zone	STP/CETP	Phase I Capacity (MLD) (2043)	Phase II Capacity (MLD) (2058)
Zone 1	STP	16.8	33.6
Zone 2	STP	12.3	24.6
Zone 3	STP	37.2	74.4
Zone 4	STP	6.59	13.18
Zone 5	STP	37.14	74.28
Zone 6	STP	8.16	16.32
Zone 7	STP	18.02	36.04
Zone 8	STP	9.08	18.16
Zone 9	STP	46.54	93.08
Zone 10	STP	31.23	62.46
Zone 11	STP	8.32	16.64
Zone 12	STP	52.68	71.12
Total STP		**284.06**	**586.56**
Zone 12A	**CETP**	**35.56**	**52.69**

Source: Final DPR Wastewater, ADCL, 2025

The wastewater treatment capacity presented in Table 3-7~~Table 3-7~~ reflects estimates from an earlier planning scenario. The city envisions a modular approach to infrastructure development to meet future increases in demand, aiming to achieve 100% wastewater network coverage and treatment. Accordingly, the capacities presented are indicative and subject to change.

Amaravati's wastewater management strategy is organized across four key components: collection, treatment, treated effluent disposal, and sludge management. Based on a life cycle cost (LCC) analysis, three technologies have been recommended for the proposed STPs, including: sequencing batch reactor (SBR) technology, anaerobic-anoxic-oxic process (A2O), and moving bed biofilm reactor (MBBR). Final technology selection will depend on the intended end use of the treated wastewater and compliance with discharge norms.

3.2.4 Treated Wastewater Reuse and Disposal Plan

By 2058, total wastewater generation is projected to reach 723 MLD. 100% of the wastewater is expected to be treated through decentralised STPs installed on a modular basis to cater to the wastewater generation. Treated wastewater is intended for reuse in applications such as urban irrigation, landscaping, and district cooling, with an estimated requirement of 193 MLD[24]. The remaining treated wastewater of 386 MLD[25] will be discharged into the Palavagu and Kondaveeti Vagu navigational canals. Prior to both reuse and discharge, disinfection will be carried out using chlorine to ensure effluent safety, as the water discharged into vagus

[24] Wastewater DPR report for Amaravati city 2025

[25] 80% of the wastewater is the expected volume of wastewater after the treatment from STPs, which is 579 MLD. The remaining wastewater is the subtraction of the volume of wastewater from STPs (579 MLD) and treated wastewater for reuse (193 MLD)

will eventually reach the Prakasam barrage, which is the surface water source for Vijayawada, Guntur, and Amaravati.

3.2.5 Supervisory Control and Data Acquisition (SCADA) Integration

Amaravati's wastewater network will be fully SCADA-enabled, supporting 24/7 centralized monitoring through the Central SCADA Monitoring Centre (CSMC) located at Zone-1 STP. Equipment at each lifting station and STP will include:

- Programmable logic controllers (PLCs)
- Manual override systems
- Online monitoring of power consumption, flow, and energy recovery
- Redundant remote interfaces and UPS systems
- Data transmission via optical fiber cable (OFC) and GPRS

The system enables real-time monitoring, error logging and energy management through the Central Command and Control Centre which serves as the digital foundation of Amaravati's sewerage system.

3.3 Stormwater Management

Amaravati city falls within the catchment area of Kondaveeti Vagu and Pala Vagu (421 sq. km), the two major water streams flowing through the city. Located along the banks of the River Krishna, the capital city area is susceptible to riverine flooding.

The natural discharge flow of Kondaveeti Vagu and Pala Vagu into the River Krishna is obstructed by the existing bund, its regulating mechanism, and the operations of the Prakasam Barrage. The area surrounding the Kondaveeti Vagu is especially susceptible to pluvial flooding. In the prevailing conditions, the catchment area is susceptible to severe flooding and frequent inundations every year during the monsoon season, primarily due to the overflow of the Kondaveeti Vagu and its local streams, Kottela Vagu and Pala Vagu, which join the Kondaveeti Vagu at various points.

Existing Situation

The Amaravati city area currently lacks a dedicated stormwater drainage system. In villages with a surface wastewater network, the runoff flows through the surface wastewater network that connects with either Kondaveeti Vagu or Pala Vagu. In villages with no surface drainage network, runoff follows natural drainage network .

Annually, both Kondaveeti Vagu and Pala Vagu overflow during the monsoon season for about 4 to 5 days, disrupting connectivity between villages. The construction of a pumping station at Undavalli to lift runoff into the barrage during periods of higher water levels in the Prakasam barrage has significantly reduced flooding in the Kondaveeti Vagu catchment, which previously experienced backwater flooding. Instances of flooding have increased due to the failure in the timely execution of maintenance of vagus, such as desilting and hyacinth removal.[26]

[26] Information shared in focus group discussions were conducted by ICLEI South Asia in six villages of Rayapudi, Borupalem, Neerukonda, Velagapudi, Krishnayapalem, Penumaka and in the Babunaiahnagar colony of MTMC

Proposed Stormwater Drainage

The transition of land use from agriculture to an urban environment that will happen over the course of Amaravati's development can potentially increase peak runoff, early peak flow rate and higher runoff volumes downstream. The design and planning of the capital city area's stormwater drainage and flood mitigation infrastructure has been based on the future scenario in which the city is fully developed.

3.3.1 Proposed City-level Stormwater Drainage System

The city's proposed stormwater drainage system is being designed and built to withstand rainfall events with a return period of up to 1 in 100 years, minimizing the potential impact of flooding.

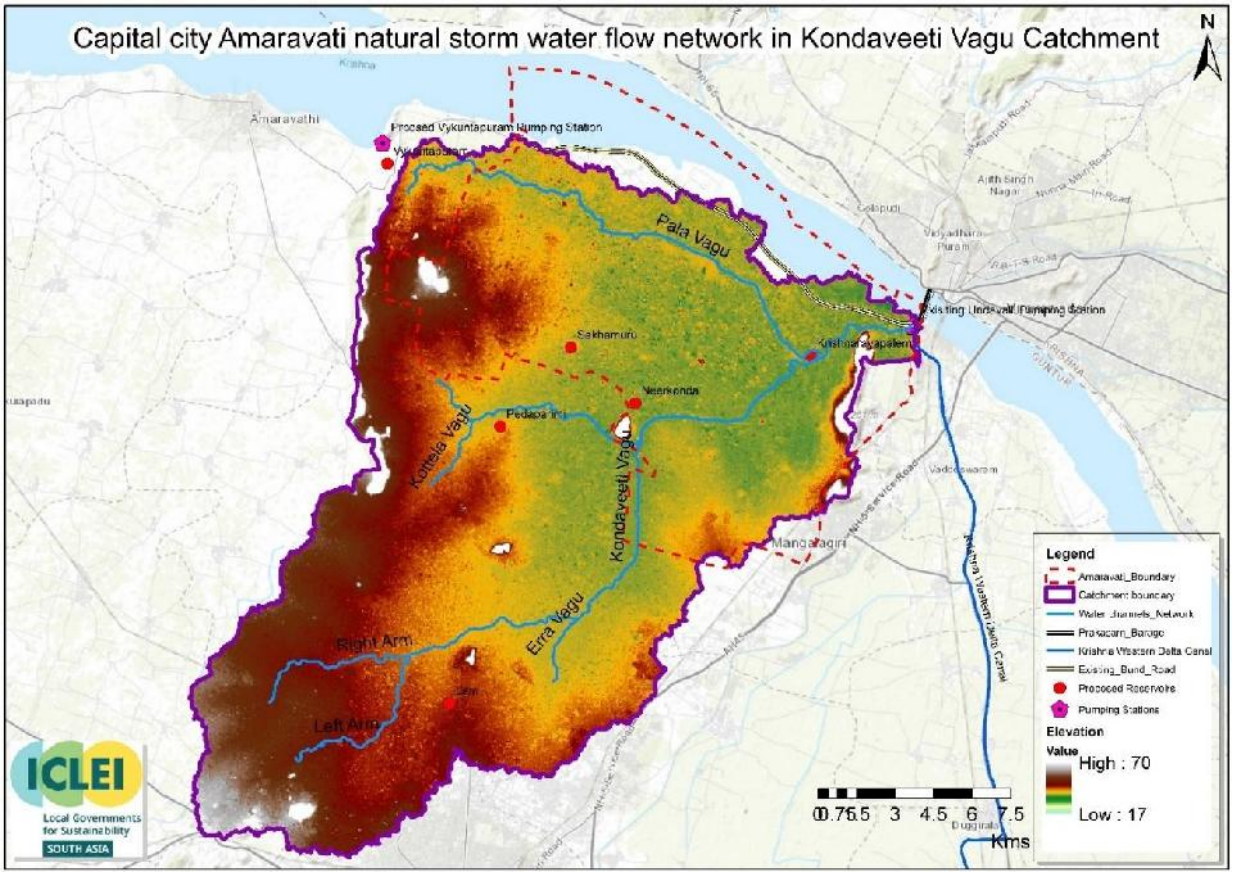


Figure 3-4 Kondaveeti Vagu catchment and natural drainage features
Source: Prepared by ICLEI South Asia based on data received from APCRDA.

Using IMD's historical rainfall data recorded at 15-minute intervals, intensity-duration-frequency (IDF)[27] curves have been developed for a 1-in-200-year return period rainfall event. This serves as the basis for designing the stormwater network in the city.

The underlying concept for planning the city-level storm water network is to align with the natural drain network following the Kondaveeti Vagu and Pala Vagu. Measures are in place to widen and deepen

[27] IDF curve is a tool in hydrology and urban drainage design that represents the relationship between Rainfall intensity, Rainfall duration and Rainfall frequency of such an event. These IDF curves are used to design stormwater infrastructure like culverts, drains, and detention basins.

Kondaveeti Vagu and its tributary drains to manage the stormwater runoff generated on completion of Amaravati's development. Additionally, the construction of five reservoirs is planned, three outside the capital city—Lam, Pedaparimi, and Vykuntapuram—and two within the capital city—Neerukonda and Krishnayapalem[28].

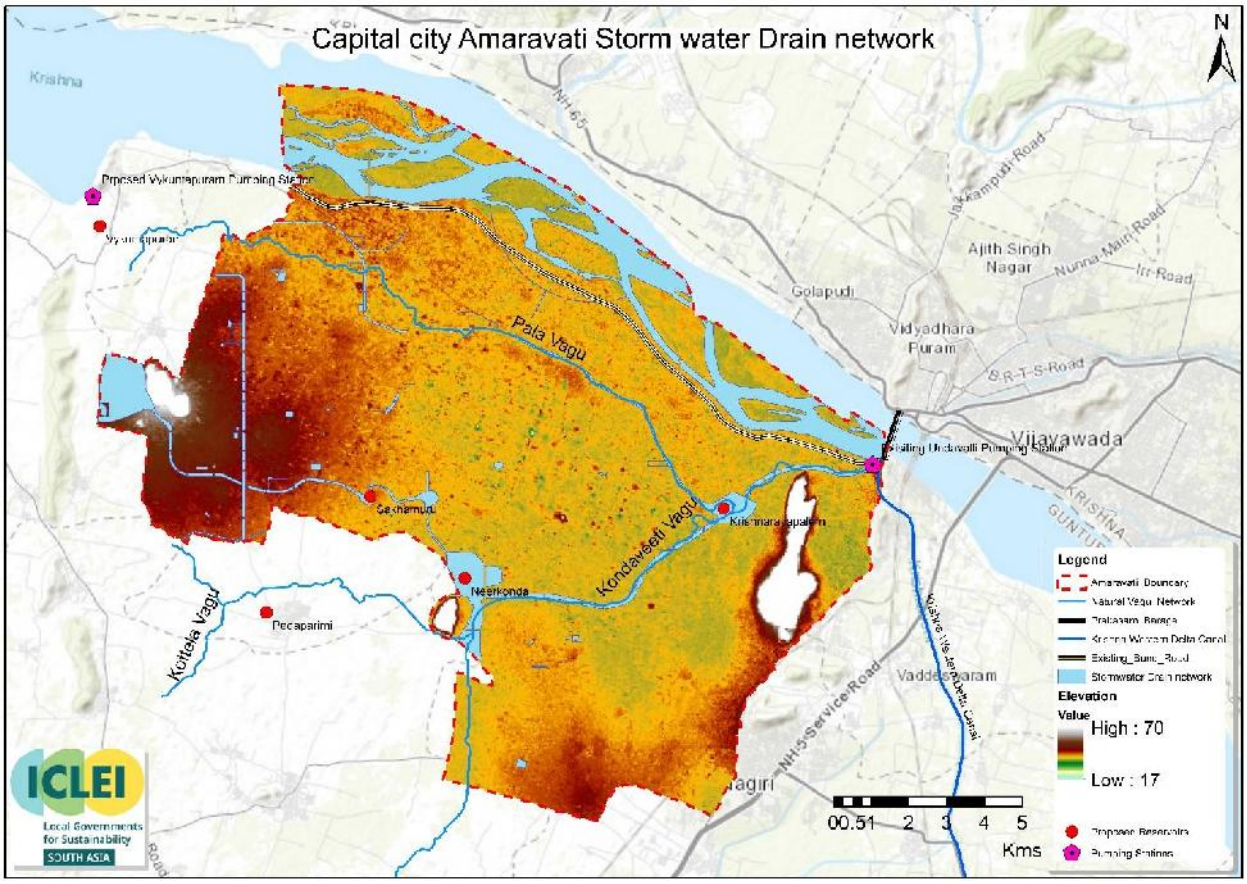


Figure 3-5 Proposed Reservoirs and Pumping Stations of Storm water infrastructure
Source: Prepared by ICLEI South Asia based on data received from APCRDA.

The city's stormwater management system is designed to align with the natural drainage patterns of Kondaveeti Vagu and Pala Vagu. Runoff from the upstream area of the Kondaveeti Vagu catchment (190 sq. km), reaching the Lam Reservoir, along with the runoff from the western catchment area of Kondaveeti Vagu will be channelled to the proposed reservoirs at Pedaparimi and Vykuntapuram via a gravity-based canal system, ultimately discharge 5,650 cusecs of runoff into the Krishna River, facilitated by pumping stations planned at Vykuntapuram.

The flood discharge from the downstream area of the Kondaveeti Vagu catchment, after the Lam Reservoir, follows the natural flow network of the Kondaveeti Vagu and reaches the outfall at the Undavalli sluice. A total of 4,000 cusecs of runoff from the Kondaveeti Vagu will be diverted through the existing escape

[28] DPR for Flood Management for Capital city Amaravati, June 2017.

regulator at the Undavalli Sluice to the Krishna Western Delta Canal. By enhancing the pumping infrastructure at the Undavalli, the remaining runoff will be discharged into the Prakasam Barrage.

3.3.2 Stormwater Drainage for LPS zones

The stormwater drainage network at the LPS level is designed for a rainfall with a return period of once in five years, which corresponds to a rainfall intensity of 46.75 mm/hr, in accordance with the standards set by the CPHEEO. The entire city is divided into six stormwater drainage basins, following the alignment of existing water bodies, natural drainage pathways, and proposed waterways, as illustrated in Figure 3-6~~Figure 3-6~~. The stormwater runoff collected through the LPS infrastructure is directed into natural drainage areas and reservoirs at various locations, utilizing gravity flow[29].

Stormwater from the roofs and open areas of residential, commercial, and industrial developments is planned to be managed on-site, through downspouts and harvesting structures, reducing the volume of stormwater that enters the drainage system. Runoff from the roads enters the drainage network through horizontal grates located at specified intervals along the curbs. These grates will connect to drains below, which will allow fine silt and debris to settle in designated silt pits. This process will enable stormwater to flow freely through the system. Amaravati's stormwater drains will operate on gravity flow, from tertiary to secondary drains, with no requirement for any mechanical equipment.

The storm drains shall be located beneath the roads within a block, running along the carriageway to collect stormwater. Runoff collected flows into tertiary collector drains situated along all major arterial and sub-arterial roads, ultimately discharging into the vagu, either directly or through a secondary network of box drains. Stormwater drains will also be positioned beneath the cycle track along all trunk roads. The stormwater drainage network along the trunk roads measures 599 km, while that in the LPS zones and the Amaravati Government Complex measures 2,369 km.[30]

[29] Storm Water Management Final DPR for Phase I Infrastructure projects at Amaravati, February 2025
[30] Excluding LPS zone 8 and Zone 11

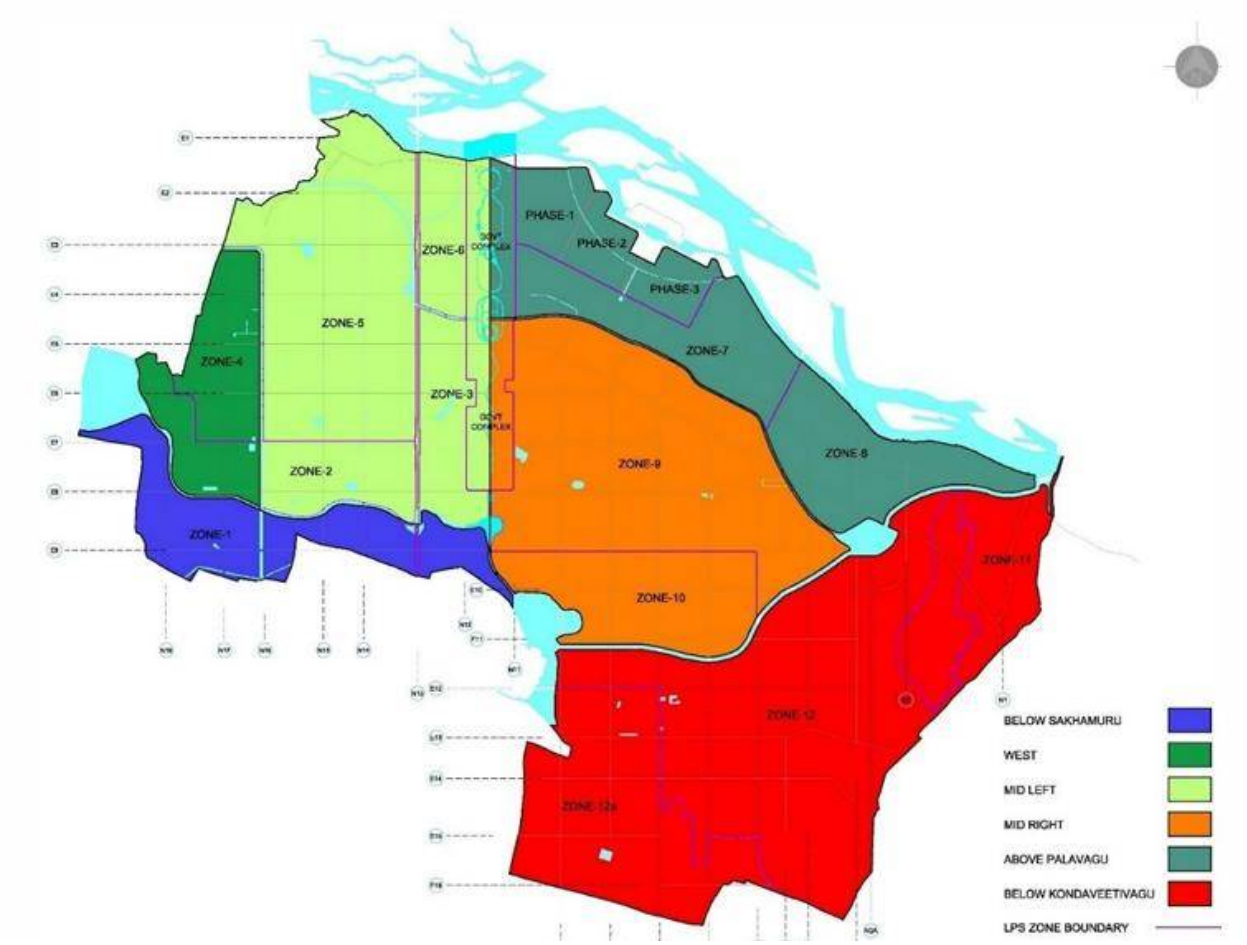


Figure 3-6 SWD zones
Source: Stormwater Management Final Detailed Project Report, ADCL, February 2025

3.4 Solid Waste Management

Existing Situation

Existing settlements in the capital city area are estimated to generate about 70 tonnes per day (TPD)[31] of solid waste as of 2024. 100% of the generated municipal solid waste in villages is collected and transported by APCRDA[32] to the waste-to-energy (WtE) plant for treatment located at Guntur. Solid waste generated within the MTMC area is also transported every day to the Guntur WtE plant for treatment by MTMC itself. At present, the capital city area does not have any waste treatment facilities . Before the establishment of WtE facility, MTMC and nearby settlements disposed of solid waste at the Kolanukonda disposal site, leading to accumulation of approximately 2.25 lakh metric tonnes of legacy waste. As of early 2024, 100% of the legacy waste has been remediated.

Proposed Solid Waste Management

[31] Per capita waste generation is estimated at approximately 0.38 kg per person per day based on the total waste generation and population figures sourced from APCRDA and MTMC. The per-capita figure is applied to existing population of 1,84,898 to estimate the total MSW generation of approximately 70 TPD

[32] APCRDA has engaged a contractor on buy/hire, own & operate (BOO) basis to collect mixed waste and transport it to Jindal waste-to-energy plant

Amaravati is estimated to generate 3,956 tonnes per day (TPD) of municipal solid waste (MSW) by 2058[33]. This includes about 2,028 tonnes will be wet waste (51%) and another 1,927 tonnes (49%) of dry waste including recyclables, combustibles and inert waste[34], basis waste composition for Hyderabad as Amaravati is planned to be a smart and capital city.

Table 3-8 Projected Waste Generation in Amaravati, 2028-2058

Year	Projected Waste Generation (TPD)
2028	527
2043	1,678
2058	3,956

Source: ICLEI South Asia Analysis

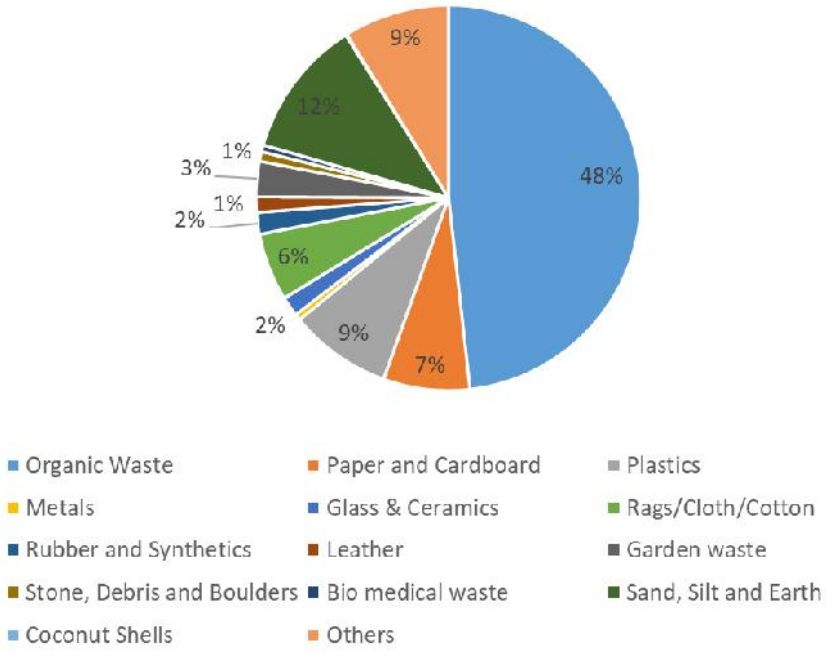


Figure 3-7 Expected waste composition in Amaravati

Source: Prepared by ICLEI South Asia based on data sourced from Solid Waste Master Plan, 2016

3.4.1 Waste Collection and Transport

Amaravati's integrated solid waste management is planned as a two-tier system for effectively collecting and transporting waste from every household in the city. The system is designed for its estimated population size until 2058, while reducing the impact on the environment. It proposes source segregation of waste, utilizing standardized, color-coded HDPE bins in accordance with EN 840 specifications. Residential areas will utilize a three-bin system—one for biodegradable (wet) waste, one for non-biodegradable (dry) waste, and one for domestic hazardous waste—while commercial, institutional, and passive areas (such as parks, gardens, and green spaces) are planned with a two-bin system. The segregated waste will be collected through a door-to-door collection service as well as automated systems for high-priority zones such as

[33] Total waste generation in the city for 2058 is estimated based on population projections for 2058 and per capita waste generation considered in the SWM Master Plan, 2016.
[34] Amaravati Solid Waste Master Plan, 2016

government complexes and the seed capital area. Primary collection vehicles—refuse compactors that have hydraulic bin lifts—are to be deployed along pre-determined routes.

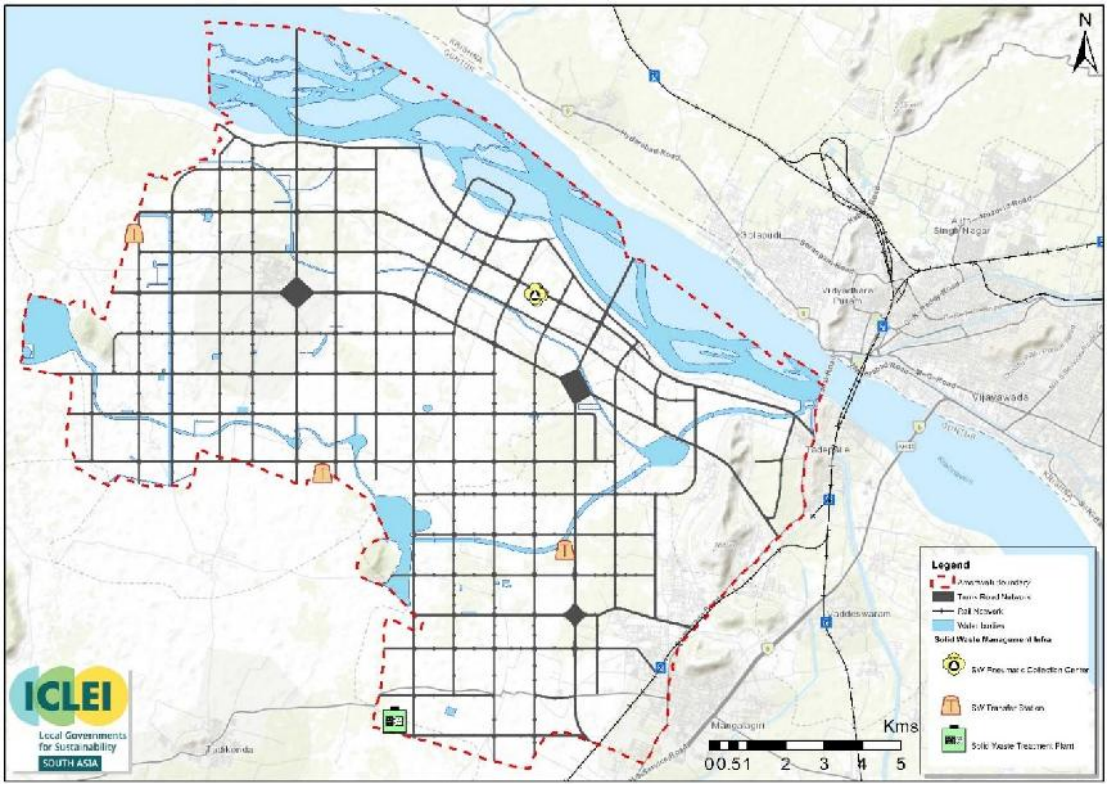


Figure 3-8 Proposed Solid Waste Management Infrastructure in Amaravati
Source: Prepared by ICLEI South Asia based on data received from APCRDA.

Waste transfer stations will act as intermediate nodes/secondary collection points. Waste collected through compactors will be mechanically compressed (i.e. compacted) and transferred to roll-on/roll-off containers for secondary collection at the transfer stations. Segregated waste will be compacted using stationary compactors with a processing capacity of 50 tonnes per hour. In addition, mechanical road sweepers will be deployed to clean the streets every day.

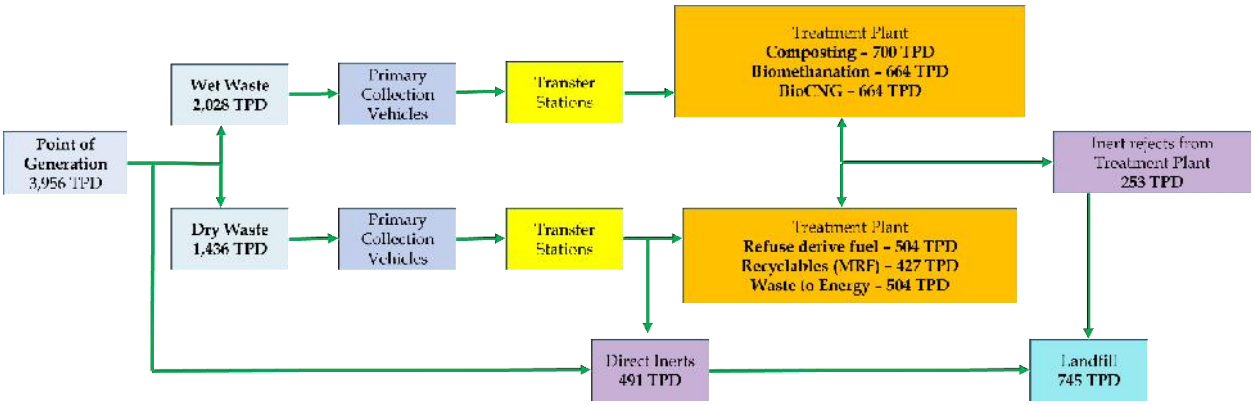


Figure 3-9 Proposed MSW Collection and Processing by 2058

Source: Chart prepared by ICLEI South Asia, data estimated by ICLEI South Asia in consultation with APCRDA[35]

3.4.2 Treatment, Processing and Disposal

When waste arrives at the transfer stations, it will be processed and treated before disposal, thus ensuring maximum recovery and reuse.

3.4.2.1 Wet Waste

Wet waste in Amaravati will be treated through a combination of biomethanation, composting, and waste-to-energy (WTE) technologies. Organic waste with high moisture content will be directed to bio-methanation plants, where it will undergo anaerobic digestion to produce biogas, which can subsequently be used for electricity generation. Yard waste or wet wood, unsuitable for bio-methanation facilities, will be diverted to windrow composting facilities, while the remaining wet waste will be sent to mass incineration type WTE plants.

As per the estimates by ICLEI South Asia, the treatment capacities include 1,328 TPD of bio-methanation and bio-CNG technology and 700 TPD will be treated through composting processes.

3.4.2.2 Dry Waste

Dry waste will be recycled at material recovery facilities (MRFs) located at bulk transfer stations, where recyclables such as plastics, metals, paper, and glass will be sorted and recovered. The recyclables will then be baled and stored after being recovered, before being transported to an authorised recycling facility. Non-recyclable dry waste will be compacted and transported to refuse derived fuel (RDF) plants. The RDF plants will take advantage of the remaining waste with high calorific values to produce alternative fuel which can be supplied to local industrial units such as cement manufacturing plants.

Of the total dry waste, 504 TPD[36] is planned to be converted into RDF, which then will be supplied further as an alternative fuel to industries. Additionally, 427 TPD of recyclables, including plastics, metals, paper, and glass are planned to be recovered through the MRF facility. Any excess dry waste that cannot be processed through RDF or recovered as recyclables is proposed to be diverted to the WTE plants.

[35] ICLEI SA estimated treatment facilities quantities based on the values from Solid waste Master Plan, 2016 in consultation with APCRDA.

[36] Estimated by ICLEI South Asia based on the assumption that 50% of the non-recyclable RDF fluff is sent to WtE and 50% to cement kilns

3.4.2.3 Inert Waste and Rejects from Treatment Facilities

The residual inert and reject material from treatment plants will be disposed of at a sanitary landfill. The sanitary landfill will employ a composite liner system (clay liners and dense polyethylene geomembrane), leachate collection and drainage systems, as well as gas collection systems, which when used appropriately, can ensure safe disposal and minimal environmental impact.

Table 3-9 Projected Waste Generation by Waste Type, 2058[37]

S.No	Type of Waste	Generation Rate	Quantity for 2058
1.	Solid Waste (Municipal)		
a.	Residential	0.8kg/capita/day	3,196 TPD
b.	Commercial/Institutional	0.3kg/capita/day	481 TPD
c.	Passive areas	0.03kg/sq. m	278 TPD
2.	C&D waste (all through the construction phase)	50kg/sq. m	105.7 lakh tonnes
3.	Biomedical Waste	2kg/bed/day	5.33 TPD
4.	Hazardous Waste (Domestic)	1.2% of total residential waste	38 TPD
5.	Electronic waste	5% of total MSW	198 TPD

Source: Solid Waste Master Plan, 2016

3.4.2.4 Construction and Demolition (C&D) Waste

C&D waste is generated at every stage of a construction project including raw material extraction, building the structure, and finally, demolition or renovation. Based on a typical waste generation rate of 50 kg generated for every square meter of built-up area, Amaravati city is expected to generate roughly 105.7 lakh tonnes of C&D waste by 2058. Given the scale, recycling and reuse strategies for C&D waste will be essential to minimise environmental impacts.

3.4.2.5 Hazardous Waste

Hazardous wastes are toxic, reactive, flammable, or corrosive, and pose substantial risks to human health and the environment. Amaravati is projected to generate 38 TPD of hazardous waste by 2058, highlighting need for robust handling and disposal strategies.

3.4.2.6 Electronic Waste (E-Waste)

E-waste is one of the fastest growing waste streams and typically includes discarded electrical and electronic equipment that has become obsolete. In India, e-waste consists generally of iron and steel - 51% of the mass, non-ferrous metals - 13%, plastics - 21%, and miscellaneous materials. Amaravati is projected to generate around 198 tonnes of E-waste per day by the year 2058, which demonstrates the need for effective recycling and environmentally sound methods of disposal to meet the city's sustainable urban development goals.

3.5 Transport

Existing Situation

[37] Calculated based on the population projections and generation rate standards mentioned in the solid waste management master plan 2016

Amaravati city is located centrally in the APCRDA region, characterized by well-connected major railway stations in Vijayawada and Guntur, by two main national highways, and nearby international airport in Vijayawada city. Currently, private vehicles and intermediate public transport serve as the primary modes of transportation both within and beyond the Amaravati city, with public transport absent.

Residents primarily depend on two-wheelers and autos for travelling within and outside the area to neighbouring cities such as Vijayawada and Guntur especially for work and education trips.[38] During the COVID-19, the public transport services operated by Andhra Pradesh State Road Transport Corporation (APSRTC) were stopped. As of 2024, APSRTC has not resumed the bus services in some of the villages.

Proposed Transport System

The 2016 Draft Master Plan for Traffic and Transportation lays out a comprehensive mobility framework for Amaravati. The Transport Master Plan is in sync with city's Master Plan and aims to support the development of integrated multi-modal transport infrastructure for alternative travel options as well as smart and accessible transport infrastructure for non-motorized transport (NMT) modes. The master plan also focuses on real-time intelligent system integration.

The plan's fundamental targets include:

- Modal share of more than 70% for public transport and NMT in internal trips within the city
- Full integration across MRT, BRT, local bus services, intermediate public transport (IPT), and feeder modes
- Mass transit systems to contribute to 70% of modal share of public transport by 2050, with the same being 80% within the Central Business District (CBD)
- Intelligent transport systems (ITS) and SCADA for dynamic traffic management and system-level integration

The phased development plan for Amaravati aims to ensure that infrastructure development aligns with projected population growth and future travel demand.

3.5.1 Modal Share Strategy and Mode-Wise Distribution Targets

Amaravati's transportation strategy is focused on shifting commuter behaviour towards using public and NMT modes of mobility. The modal split targets are to be achieved through a combination of actions including deployment of mass transit system, NMT infrastructure, and regulating high private vehicle dependency (refer Table 3-10~~Table 3-10~~).

As per modelled projections for internal trips:

- By 2035, public and semi-public transport will account for 38% of internal trips, while non-motorized modes (walking and slow modes such as bicycling) are expected to account for 42% (30% walk + 12% slow modes) of internal trips. Private vehicle share is projected to be 20% of the internal trips.
- By 2050, public and semi-public transport will account for 35%, non-motorized around 40% (25% walk + 15% slow modes), and private vehicles account for about 25% of the internal trips.

[38] This information is captured during the FGD discussions held with village settlements on June 2nd and 3rd 2025.

Table 3-10 Modal Share Targets for Internal Trips in Amaravati

Mode Type	2035	2050
Public + Semi-Public Transport	38%	35%
Private Vehicles (2-wheelers + Cars)	20%	25%
Slow Modes (Cycle, Rickshaw)	12%	15%
Walking	30%	25%

Source: Draft Master Plan for Traffic & Transportation

Amaravati's transportation strategy seeks to reinforce sustainable commuting behaviour by prioritizing public transit infrastructure and last-mile connectivity.

3.5.2 Road Network

The proposed transport system for Amaravati is based on a fully planned road network designed to support the future mobility requirements, including public transport and freight movement, and remain adaptable as the city grows. The city master plan includes 1,693 km of road network with 593 km dedicated to major roads and 1,100 km for internal roads. The road design for Amaravati includes dedicated areas for public transport, walking and cycling pathways, utility and drainage systems, and public facilities that will be integrated into the right of way.

Table 3-11 Planned Road Hierarchy in Amaravati

Road Type	ROW (m)	Total Length (km)	Primary Function
Major Arterial Road	60	52	Linking capital city with the inter-city and sub regional roads of the surrounding network. 8 lane configurations.
Seed Access Road	60	19	4 lane configurations and 18m Mass transport corridor in median
Arterial Road	50	94	Serve both the inter-city and intra city traffic in equal measure
Sub-Arterial	50	151	Distributors connecting sectors and major destinations
Collector Roads	25	277	Local bus access and neighbourhood connectivity
Local Roads	–	1,100	Plot-level access, NMT corridors, pedestrian-priority segments
Total	–	1,693	

Source: Draft Master Plan for Traffic & Transportation

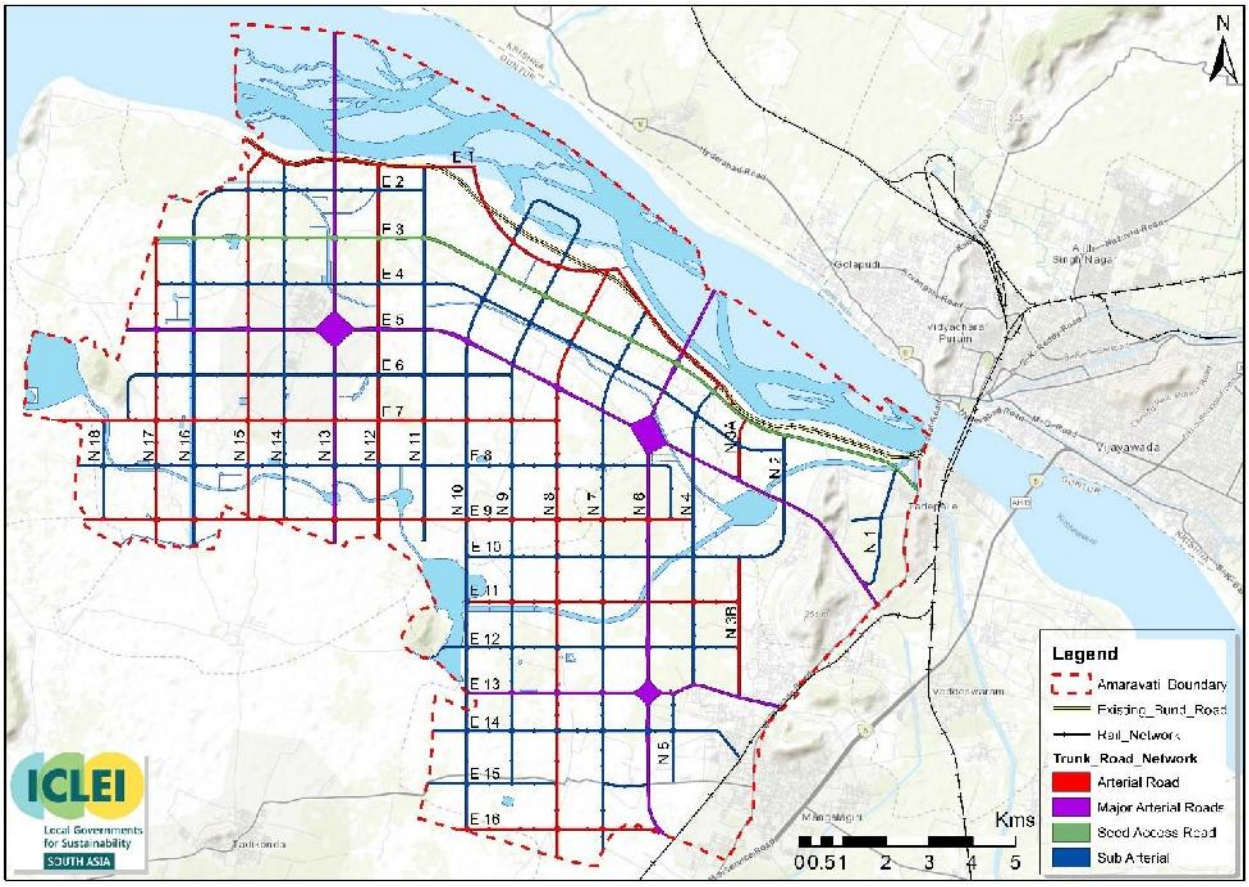


Figure 3-10 Hierarchical Road Network for Amaravati City
Source: Prepared by ICLEI South Asia based on data received from APCRDA.

Design priorities in Amaravati's road hierarchy include:

- Separation of local and through-traffic
- Bus lanes and MRT corridors within medians
- TOD-supportive alignment with mixed-use zoning and high FAR sectors
- Provision for cycle tracks, pedestrian walkways, and utility corridors

3.5.3 Public Transit

Amaravati's public transport system is centred around a high-capacity transit network combining BRT and MRT corridors. The BRT is proposed as the core transit system, with a subsequent upgradation to MRT depending on the growth in travel demand levels. By 2050, the total length of proposed mass transit corridors within the city is approximately 168 km, with an additional 57 km connecting Amaravati to Vijayawada and Guntur[39]. The corridors have been aligned with land use and projected demand.

The proposed corridors include:

- North–South Spine (Seed zone to Guntur)
- East–West Transit Spine (Government Core to Vijayawada edge)

[39] Draft Master Plan for Traffic & Transportation

- CBD Circular Loop
- Peripheral BRT Loops along Inner and Outer Ring Roads

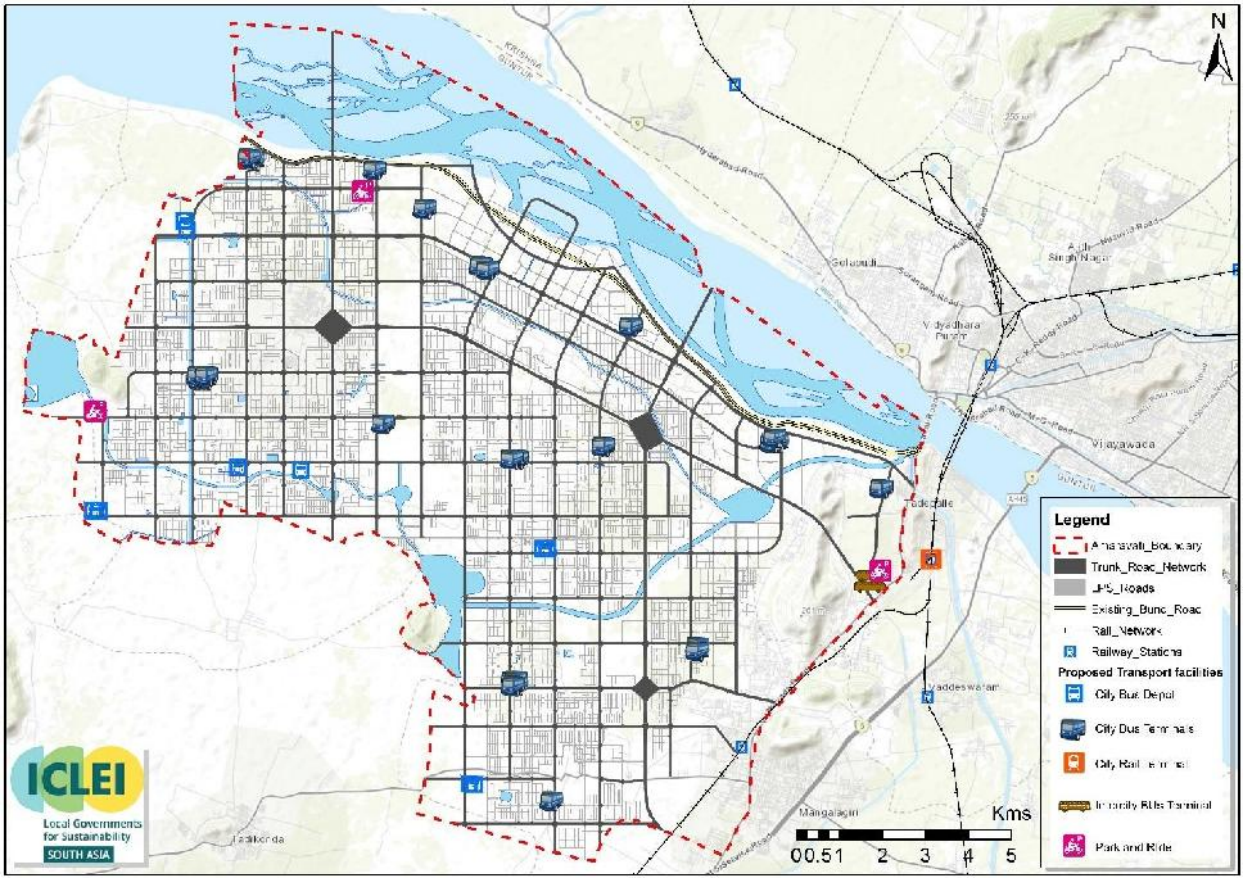


Figure 3-11 Proposed Public Transport Infrastructure in Amaravati
Source: Prepared by ICLEI South Asia based on data received from APCRDA

The plan also includes feeder bus networks, multimodal terminals, and dedicated interchange facilities to support system integration.

3.5.4 City Bus, Feeder, and Intermediate Public Transport (IPT) Services

The public transport system of Amaravati will also include a bus network which would function as a feeder system to high-capacity MRT and BRT corridors. The Master Plan establishes a grid-based city bus network with 22 intra-city terminals and 15 depots[40] to achieve extensive coverage and direct access to mass transit corridors. The feeder routes will operate at short intervals to provide dependable first and last-mile connectivity across the city's residential and institutional areas.

The IPT modes will serve to bridge accessibility gaps in lower-density and transition-phase areas. The plan establishes IPT terminals at multimodal hubs and MRT/BRT stations and major city nodes to enhance

[40] Section 9.1.4.5 City Bus Terminals and Depots, Draft Master Plan for Traffic & Transportation

transfer efficiency and minimize road congestion. The integration of IPT with cycling and pedestrian infrastructure and electric mobility corridors works to create uninterrupted multimodal travel options.

3.5.5 Electric Mobility and Charging Infrastructure

The Draft Master Plan for Traffic and Transportation for Amaravati presents a strategic vision which integrates electric mobility solutions into the city's overall transport framework. The plan establishes a goal to achieve 80% passenger trips through non-motorized, mass transport and electrically powered vehicles by 2050. The plan also recommends using battery-operated IPT modes including electric rickshaws and vans which will have designated parking areas throughout the Multi-Utility Zones (MUZ) of the city. The planning documents of Amaravati demonstrate its commitment to electric mobility, EV-ready building regulations or phased implementation plans. Additional detailing and implementation frameworks for EV infrastructure are essential to realize the city's clean mobility objectives.

3.5.6 Non-Motorized Transport (NMT) Infrastructure

NMT has high significance in the mobility framework of Amaravati. The transport plan establishes a policy structure to integrate NMT into street design and infrastructure. The NMT policy framework includes four main features which are:

- Dedicated pedestrian and cycling space across the entire road network
- Design guidance aligned with safety, universal accessibility, and climate resilience
- Promotion of walkable zones in public institutional areas and multimodal hubs
- Integration of green buffers and stormwater-friendly materials in street corridors

3.5.7 Street Design Guidelines

Amaravati's street network is envisioned not only as a transport corridor but as a shared public space that supports everyday life, social interaction, and neighbourhood vitality. Streets are meant to serve pedestrians, cyclists, public transport users, and vehicles, but also act as spaces for commerce, recreation, and environmental function. The street design guidelines aim to ensure that roads support the surrounding land uses, provide universal accessibility and prioritize safety for all users, especially pedestrians and non-motorized transport.

These guidelines define street hierarchy, cross-sectional standards, and usage functions, incorporating architectural, landscape, traffic engineering, and urban design elements. Pedestrian-first design has been incorporated to guide all typologies, followed by public and shared transport, and then private vehicles. Universal design for children, elderly, and differently abled users will be mandatory across all street elements.

3.5.8 Parking Policy

The parking policy for Amaravati is structured to support a compact, transit-oriented city. The policy discourages long-term on-street parking in high-mobility corridors and promotes the development of multi-level or underground parking in commercial zones. The residential areas are required to include shared and EV-ready parking spaces and building bylaws specify the minimum number of EV slots. The high-demand

areas will use dynamic pricing and digital reservation systems to control parking space and decrease roadside congestion.

The integrated parking management system will support public transport access through facilities near transit hubs and discourage private vehicle use in dense walkable districts. The development control regulations will define parking requirements based on land use intensity and public transport accessibility and location-specific demand assessments.

3.5.9 Intelligent Transport Systems (ITS) and Traffic Management Systems

Amaravati envisions ITS as its core component to establish safe and efficient transportation. The master plan establishes ITS as an essential base that connects infrastructure development with operational management of every transport system. The ITS system functions as an essential element that supports Amaravati's mission to create a world-class sustainable capital with enhanced citizen benefits.

The ITS planning system of Amaravati exists through separate components for each transportation mode and functional application:

3.5.9.1 ITS for Non-Motorized Transport (NMT)

- Deployment of surveillance and safety systems to protect pedestrians and cyclists at both crossing points and intersections along with mid-block areas
- Cycle tracking systems for bike-sharing schemes, designed based on estimated demand
- The design of crossing types along with safety features depends on both pedestrian demand and network configuration
- The deployment of ITS components will match NMT corridor implementation phases to determine bike station positions while determining the timing for safety infrastructure construction.

3.5.9.2 ITS for Public Transport (PT)

- Installation of priority signals for transit vehicles at essential intersections according to demand patterns and public transport routes
- On-board ITS systems such as Automated Vehicle Location (AVL), Passenger Information Systems (PIS), and surveillance systems
- Installation of passenger Information Displays and journey planning systems for passenger use at bus stops and terminals
- ITS design for multi-modal hubs includes device counts, station-level equipment, and coordination points based on transfer volumes

3.5.9.3 ITS for Road Networks and Private Vehicle Users

- SCADA-based traffic signal control at all arterial and sub-arterial junctions
- Variable Message Signs (VMS) and Public Address systems to disseminate real-time traffic and emergency information
- Integration of Area Traffic Control (ATC) systems at high-demand intersections
- Enforcement systems for traffic rule compliance, including access-controlled expressways and key commercial routes

- Parking management systems for proposed lots, with dynamic parking guidance in high-density areas like the CBD
- ITS deployment around logistics hubs to optimize freight movement and enforcement

All ITS systems will be developed according to the infrastructure expansion schedule and projected land use development and transportation demand forecasts.

3.6 Built Environment and Energy

Existing Situation

A population of about 1.84 lakh is estimated to reside in the capital city area as of 2025, which encompasses 25 villages, two hamlets and portions of the Mangalagiri-Tadepalli municipal corporation area. The existing buildings primarily include low-rise residential houses, village panchayat buildings, institutional buildings of the Mangalagiri-Tadepalli corporation, small commercial shops, and community facilities such as schools and health centres. The area currently reflects emerging urban and rural development patterns, with limited infrastructure.

The power supply to the Amaravati city is generated from the Vijayawada Thermal Power Plant (VTPP) and distributed by Andhra Pradesh Central Power Distribution Corporation Limited (APCPDCL). Power lines presently link the VTPP to a primary electrical substation which distributes power to the existing village settlements within the city. The total electricity consumption of the capital city area in the year 2024-25 was 220.5 million kWh[41], with the Residential sector having the highest share of electricity consumption (~48%) followed by the Commercial and institutional consumers (~45%). (see Table 3-12)

Table 3-12 Electricity Consumption for Amaravati city by Sector in 2024-25

Sector/Consumer type	Total Annual Electricity Consumption in 2024-25 (million kWh)	Percentage share of electricity consumption
Residential	104.85	47.5%
Commercial and Institutional	99.81	45.2%
Industrial	12.04	5.5%
Agriculture	3.78	1.8%
Total	220.48	100%

Source: APCPDCL, 2025

Proposed Energy Systems and Built Environment

The urban development strategy of Amaravati emphasizes the integration of energy-efficient buildings and decentralized renewable energy sources. The 2015 Capital City Master Plan includes zoning codes, prescribes plot-level Energy Conservation Building Code (ECBC) norms compliance and promotes green buildings to reduce energy consumption in Amaravati.

[41] The electricity consumption dataset received from the APCPDCL covers both the MTMC area and the villages under the Amaravati city area. However, since only one-third of the current MTMC population falls within the Amaravati city boundary, the dataset has been scaled down and apportioned using per capita consumption to estimate electricity use specific to Amaravati city.

The Draft Power Master Plan supports this goal by establishing an electricity distribution system, smart metering provisions and rooftop solar integration potential. The city plans to provide uninterrupted round the clock power supply through a smart distribution network which combines Gas Insulated Substations (GIS) with SCADA systems and underground cabling. Solar photovoltaic (PV) system has been identified as the major contributor to the city's energy mix, accounting for at least 60% of total power demand.

The Amaravati building energy performance standards demands that all buildings fulfil the requirements of the ECBC specifications. The implemented measures work to reduce grid dependence while improving operational performance and supporting the city's clean energy transition goals.

3.6.1 Power Demand Forecast and Sector-Wise Load Distribution

Amaravati's power demand has been estimated based on detailed assessments of built-up areas, population growth, and sectoral energy intensities.

Table 3-13 Estimated Power Demand for Amaravati City

Classification	Estimated Power Demand (MW)
Residential	1,076.59
Commercial	521.43
Institutions	21.25
Industrial	498.85
AGC (Excluding DC)	169.25
Startup Area	202.35
Residential area in commercial & Industrial Zones	36.49
Utilities (Including District Cooling Systems)	123.21
Line losses (@2.84%)	77.47
Total Demand	**2,726.89**

Source: Design Basis Report, Zone 7, Power & ICT

By 2050, the city's total power demand is projected to reach 2,726.89 MW, with a power density of 12.56 MW per sq. km, comparable to global cities like New York or Tokyo. The sector-wise power demand forecast is summarized in Table 3-13~~Table 3-13~~ above.

3.6.2 Power Source

As per the power policy of Andhra Pradesh, Andhra Pradesh Power Generation Corporation Limited (APGENCO) is responsible for power generation, Transmission Corporation of Andhra Pradesh (APTRANSCO) for power transmission and Andhra Pradesh Southern Power Distribution Company Limited (APSPDCL) for power distribution. The power supply for Amaravati will depend on APGENCO's thermal and hydel stations which have a total installed capacity of 6,080 MW and will be transmitted through EHV lines, managed by APTRASNCO, through the capital area. The power transmission lines operate within the Andhra Pradesh and Southern Regional Grid network with reliable power feed points located within 5 km of the capital area that originate from the Vijayawada Thermal Power Station (VTPS). APTRANSCO has approved two substations, a 220/33KV substation (380 MVA) at Lingayapalem and a 400/220KV substation (1,500 MVA) at Tallayapalem and has proposed two more 400/220KV substations at Borupalem and Nidamarru, along with 400KV double circuit transmission lines, to cater to Amaravati's growing energy demand.

3.6.3 Renewable Energy & Rooftop Solar

The renewable energy strategy of Amaravati promotes decentralized power generation through rooftop solar PV systems. The technical evaluation shows that 18.16 million square meters of rooftop area is suitable for rooftop solar PV systems. The available rooftop space amounts to approximately 1,816 MW of solar energy potential based on estimated solar density of 1 kW per 10 sq. meters (refer Table 3-14~~Table 3-14~~). The planning guidelines of Amaravati specify mono-crystalline PV panels with 20% minimum efficiency while requiring suppliers to demonstrate R&D capabilities and achieve global reliability ratings.

Table 3-14 Rooftop Solar Power Potential for Amaravati

Category	Rooftop Area for PV (acres)	Estimated Potential (MW)
Residential	1,19,17,992	~1,190 MW
Commercial	39,78,060	~397 MW
Industrial	13,15,228	~131 MW
Government	3,60,170	~36 MW
Education	5,90,841	~59 MW
Total	**1,81,62,292**	**~1,816 MW**

Source: Draft Power Master Plan, 2017

The state net metering policy will enable rooftop solar installations to connect with Amaravati's grid as part of its distributed generation strategy. The policy mandates the use of bi-directional meters for all grid-connected rooftop photovoltaic systems. Consumers will be billed based on net energy usage, with provisions to carry forward surplus energy units for up to two billing cycles. Additionally, any remaining net exports are settled bi-annually by the DISCOMs at the pooled cost of power purchase.

Amaravati's strategy also includes exploration of floating solar installations, solar farms, and canal-top PV systems to fully utilize the city's renewable potential.

3.6.4 Transmission and Distribution Infrastructure

The transmission system of Amaravati follows a three-tier grid structure:

- 400KV/220KV GIS substations (city grid interface)
- 220KV/33KV GIS substations at regional load centres
- 33KV/415V Compact Substations for local distribution

The entire transmission system will use GIS at all voltage levels to achieve space efficiency and better reliability. The planned substation locations follow planned development phases with compact station installations in high density areas. The underground cabling system will minimize conflicts with rights-of-way while creating smart infrastructure corridors. The planning of substations includes power requirements from common utility infrastructure including WTPs, STPs and DCS.

Amaravati will also include an underground cabling network throughout the city which will link GIS-enabled substations with compact substation nodes and distribution automation systems (DAS) to enable integration of renewable energy into the grid. The 33 kV distribution centre level microgrid structure will integrate rooftop solar power through decentralized microgrids to enable real-time demand-response controls and bi-directional energy flow.

3.6.5 ECBC and Energy-Efficient Building Compliance

All major buildings in Amaravati must comply with the ECBC and green building certification systems such as GRIHA, IGBC, or LEED. Specific targets and design mandates are listed below[42]:

- U-value limits:
    - Roof: Max 0.261 W/m²K (24-hour use); 0.409 W/m²K (day use)
    - Wall: Max 0.44 W/m²K
    - Windows: Max 3.30 W/m²K
- Energy Performance Index: Less than 150 kWh/m²/year for major complexes
- Solar water heating for buildings with more than 500 m² plots
- All commercial buildings with more than 100 kW connected load to comply with ECBC
- 15% of external lighting in residential complexes and 5% in commercial/institutional buildings must come from renewable sources

These requirements are to be incorporated into the city's building byelaws and monitored through planning permissions.

3.6.6 Street-Lighting

The street lighting network of Amaravati follows a strategic design to maintain uniform and dependable illumination throughout all road types. LED lamps will be used across all street-lights. The streetlight specifications follow a wattage range from 45W to 337W based on road width and usage between narrow 9-meter lanes and major 60-meter arterial corridors. Pole spacing and mounting arrangements have been tailored for each road type to ensure proper visibility and uniform lighting, while avoiding glare and excessive energy use. The system uses standardized pole types and layouts, including double-arm poles for wider medians and staggered placements for narrower roads, ensuring that the lighting design matches both safety requirements and urban form.

The lighting infrastructure will be supported with smart controls to support efficient operations and minimize long -term costs. The system will enable dimming functions based on traffic density, time of day and weather conditions, while also providing remote monitoring for fault detection and maintenance scheduling. Streetlights will be managed through a network of wirelessly connected Light Nodes, which communicate with Road-Side Units and a central control centre. This enables automated alerts when faults occur and supports real-time energy tracking. In areas where underground cabling is difficult, solar-powered LED streetlights with battery backup will be used to extend coverage.

3.6.7 Smart Grid, SCADA, and Distribution Architecture

Amaravati's power infrastructure is designed as a Smart Grid ecosystem integrated with SCADA, GIS substations, and smart meters. The Main Control Station (MCS) and Secondary Control Stations (SCS) and Micro Grid Stations (MGS) operate as a hierarchical system to monitor and control power flow and outages and maintain load balance.

Highlights include:

[42] EC Order, State Level Environment Impact Assessment Authority (SEIAA), Order No. SEIAA/AP/GTN-151/2015

- SCADA Integration: Real-time monitoring of power supply and distribution faults
- Smart Meters: Real-time energy consumption feedback
- Compact Substations: Load centres located strategically to minimize transmission losses
- Distributed Energy Systems: Rooftop solar and localized battery systems integrated into the grid

3.6.8 District Cooling System (DCS)

DCS in Amaravati has been planned as a centralized energy network for space cooling across buildings. Designed to improve energy efficiency and reduce greenhouse gas emissions, the system replaces individual cooling units with a shared infrastructure, significantly lowering power consumption and improving air quality.

For Amaravati's 900-acre Government Complex (S1 Zone), two DCS plant with a total estimated cooling capacity of 50,000 TR has been proposed. The system will be powered by a hybrid model, combining grid electricity with renewable solar thermal energy. The system has been designed to prioritize the use of clean, renewable energy to meet the city's cooling needs, and will only switch to grid-based electricity during shortfalls. Additionally, recycled wastewater from the STP (21 MLD) is planned to be used as the plant's water source.

3.7 Health

Existing Situation

There are only primary health centers in Amaravati, and residents need to travel to nearby hospitals in Mangalagiri, Guntur, and Vijayawada for any other medical needs. During the monsoon season cases of vector-borne and waterborne diseases are monitored by the district health department through fever surveys and the provision of required healthcare services.

Proposed Healthcare System

Amaravati is planned as a "people's city," promoting economic growth and liveability, with a strong emphasis on quality health care. The health sector plan for Amaravati incorporates modern clinical facilities, innovative technology platforms (telemedicine), and a combination of conventional care and traditional care such as Ayurveda, Yoga, and Naturopathy, Unani, Siddha, and Homeopathy (AYUSH) to meet the needs of both the local population and regional clientele. This broad plan will be supported by quantitative benchmarks for social infrastructure and aims to position Amaravati as a national centre for quality health care delivery and medical manufacturing.[43]

3.7.1 Proposed Health Infrastructure and Service Delivery

The health sector plan anticipates innovative health services as part of wider smart city initiatives, including new facilities. Amaravati's vision outlines the provision of more than 40 hospital beds per 10,000 population and an emergency care response time of 5-10 minutes in line with benchmarks proposed in the draft concept note on Smart City Scheme, Government of India[44]. Planned health-related development mandates a minimum of 300 acres of land earmarked for public health facilities, which will serve as critical nodes into

[43] Socio-economic Master Plan 2018
[44] Draft concepts note on Smart City Scheme, 3 December 2014 Available at: https://praja.in/files/Note_on_Smart_City_10914.pdf (accessed 15th May 2025)

primary and secondary care networks. A health centre with emergency services will be included in every township and 3 new multi-speciality hospitals are planned to assist with tertiary services.

The plan also identifies the importance of deploying digital technologies. The health plan outlines a health integrated command and control centre for 24x7 surveillance. The plan identifies the deployment of telemedicine as an integral tool to narrow the geographic gap to remote and regional populations. The city's plans to establish partnerships with leading service providers for conventional medical facilities, as well as traditional AYUSH services is an important way to develop a holistic, inclusive health care ecosystem.

Table 3-15 Proposed Healthcare Infrastructure Benchmarks for Amaravati

Component	Proposed Specification	Remarks
Hospital Beds	>40 beds per 10,000 population	Supported by three multi-specialty hospitals in first 10 years
Emergency Response	5–10 minutes response time	Health centres in every township ensure timely care
Public Health Facilities	300 acres reserved	Designed to support regional primary and secondary care
Telemedicine Services	Integrated network with 24×7 command centre and high-speed Wi-Fi	To extend care to remote areas and optimize resource use

Source: Socio-economic Master Plan 2018

3.7.2 Medical Devices Manufacturing: An Emerging Hub

Amaravati seek to establish itself as a national centre for medical devices manufacturing, which is an extremely significant component of modern health care delivery. The medical device industry made about INR 15 lakh crore globally in 2015. According to the latest figures (2014), domestic revenues in India have already crossed INR 33 thousand crore, with a projected growth rate of approximately 13% every year, resulting in a domestic market of more than INR 42,500 crore by 2018. This industry is comprised of four major segments: small and medium devices, large devices, consumables, and implants. Amaravati will focus on small and medium devices since these devices can utilize local raw materials and present skilled (semi-skilled) labour and are at a much better cost position.[45]

3.8 Urban Greening and Biodiversity

Existing Situation

The capital city area is characterised by riverine ecosystems, agricultural landscapes and vegetation. Its environmental features include forests, agricultural fields, hills of Kondaveedu, Mangalagiri, and Undavalli, and the Krishna River and other water bodies. The area supports biodiversity including native trees, wetlands and aquatic and semi-aquatic fauna, especially given the riverbanks and water bodies. It is a habitat for resident and includes ecologically sensitive zones near the floodplains of Krishna River.

Proposed Measures

[45] Socio-economic Master Plan 2018

The urban greening initiatives in Amaravati are interrelated actions structured to combine environmental sustainability with urban enhancement. Preserving and maintaining the area's critical habitats, biodiversity and ecological balance is important as it transforms is high on the agenda.

3.8.1 Urban Greening and Biodiversity Initiatives

APCRDA and ADCL have mandated that no trees are to be cut down in the city during the development of the capital. Instead, existing trees are being carefully relocated using modern techniques. ADCL maintains a comprehensive inventory of existing trees, cataloguing their species, age, and trunk diameter. The APCRDA has also prepared a list of native species that are well-suited to the local environment, ensuring that the majority of new plantings throughout the city will be indigenous.

The development of green areas in the first phase includes the enhancement of 35 priority roads, canal fronts, parks, and the restoration and development of water bodies, along with improved riverfront areas along the Krishna River. These activities will feature avenue and median plantations throughout the road network, as well as buffer zone development along watercourses. A buffer zone of 30 meters is planned along the Kondaveeti Vagu and a 20-meter buffer along the Pala Vagu to protect water bodies through the establishment of green areas.

One unique aspect of the implementation is the reuse of topsoil excavated during construction activities. This topsoil is mixed with organic manure obtained from local farming associations and then used in median plantations to promote plant growth. Plantation activities are supported by the Venkatapalem nursery, located within Amaravati, which supplies most of the landscaping plants. By utilizing native species for these plantings, we are also helping to conserve the natural ecology.

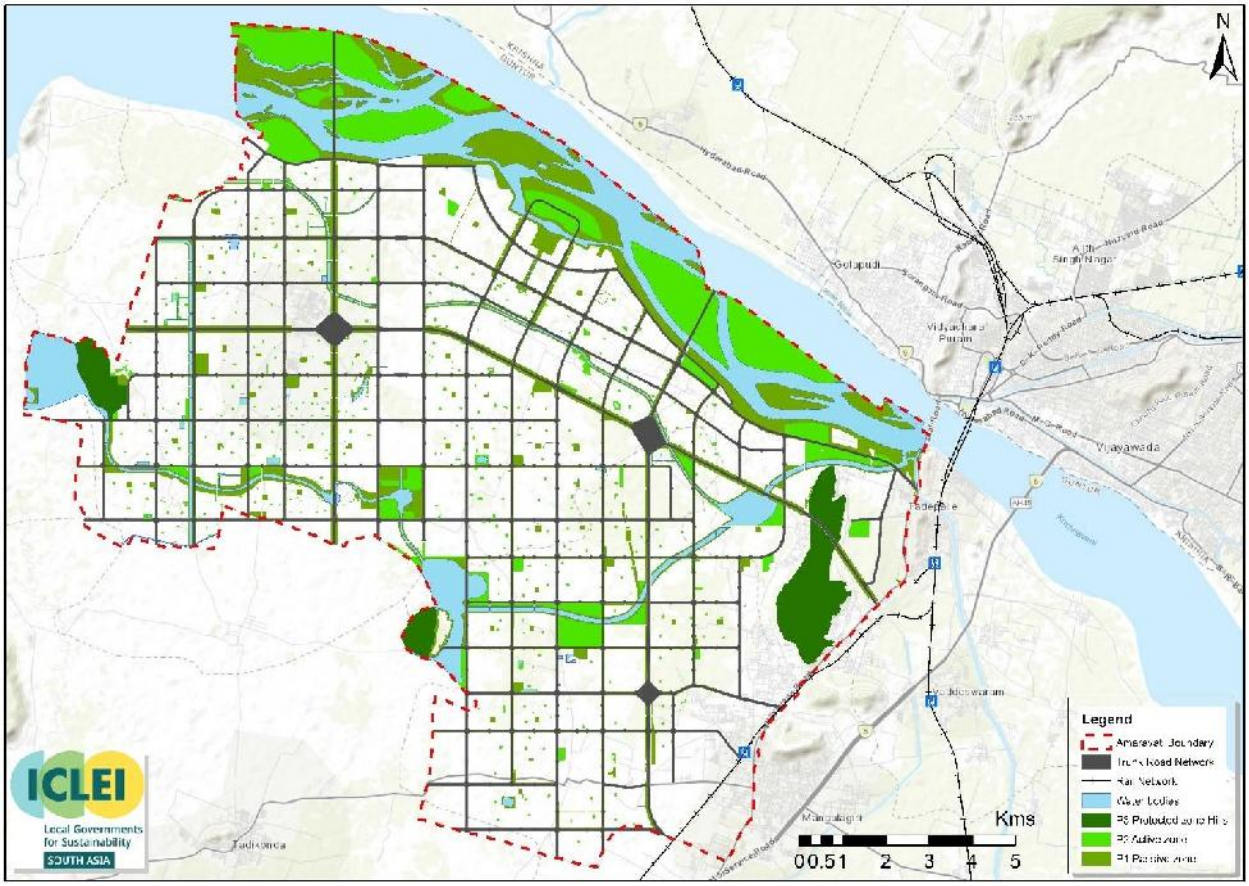


Figure 3-12 Green areas in Amaravati
Source: Prepared by ICLEI South Asia based on data received from APCRDA

Development initiatives involve the creation of approximately 500 parks in different areas throughout the city, which will feature amenities for both commercial and recreational use while enhancing the city's natural landscape. The green cover of Amaravati is expected to be between 15% and 17% of the total land area. The initiatives also include the adoption of Miyawaki plantations and nutrition gardens to enhance carbon sequestration rates, thereby accelerating the capture of carbon from the atmosphere while improving urban food security. According to the National Green Tribunal (NGT), the expected carbon sequestration target is 5 tonnes per hectare of land. These initiatives are designed to support achieving these targets.

The urban greening initiatives are primarily being carried out by the ADCL, with overarching guidance from the APCRDA. A Greening Policy is currently being developed, which will provide detailed guidelines, including technical specifications on the appropriate times for planting, maintenance, and monitoring. The approach focuses on sustainability in several key areas: (a) planting deep-rooted native species for resilience, (b) conserving and enhancing the existing natural vegetation and grass cover, and (c) employing advanced techniques for tree transplantation to reduce shock and increase survival rates.

4 Climate Risk and Vulnerability Assessment

4.1 Introduction and Methodology

This chapter presents the analysis of climate risks and vulnerability for Amaravati due to climate change induced hazards (urban flooding, heat stress). This assessment will help the city adopt climate sensitive urban planning, effectively manage climate change induced risks, and efficiently implement climate resilient policies and interventions. The assessment is carried out using the Net-zero ClimateResilientCities Methodology of ICLEI South Asia.[46]

4.1.1 Step-by-step approach based on ICLEI's ClimateResilientCITIES methodology

Step-1: Climate Trends Analysis

Historic climate and weather data from 1994 to 2024 was analysed to identify trends and patterns in temperature and rainfall. The analysis covers both annual and seasonal variations for 2024. In addition to trends, the study also analyses the increase in number of relatively hotter days and the frequency of high intensity rainfall events over the 30 year period.

Step-2: Analysis of Historical Extreme Events

Information on the past extreme weather events such as heatwaves, floods, droughts, cyclones was analysed from the Guntur District Disaster Management Plan and desktop research. This analysis helped to identify the types of extreme events that have occurred and their impacts on local settlements.

Step-3: Climate Projections

Further, climate projections for different scenarios were derived from the Bias-corrected climate projections for South Asia from Coupled Model Intercomparison Project-6 and State Action Plan on Climate Change for Andhra Pradesh, 2012. Based on the climate trend analysis and future projections, climate scenario statements were developed.

Step 4: Climate Risk and Vulnerability Assessment

Based on the assessments from the previous sections, this step involved identifying and assessing the risk posed by climate hazards such as urban floods, extreme heat and air quality to both people and infrastructure. The assessment considered three key components – hazard exposure, vulnerability to future climate projections and adaptive capacity. GIS tools were used to map high risk zone such as heat hotspots, flood prone areas and regions with poor air quality. Existing and planned critical infrastructure in these zones were analyzed.

To understand the vulnerability, focused group discussions (FGDs) were conducted in 7 settlements – six rural - Rayapudi, Borupalem, Neerukonda, Velagapudi, Krishnayapalem, Penumaka, and one urban - Tadepalli. The FGDs engaged with the community and local stakeholders to gather community-specific insights, identify existing challenges and explore feasible adaptation measures. More than 200 participants took part in the discussions, including farmers, daily wage labours, women, elderly, youth and

[46] CRC methodology is an action planning process tailor-made for local governments, providing step-by-step guidance for the development of a CRCAP that addresses both climate change adaptation and climate change mitigation

representatives from local institutions. These qualitative insights were a critical component of the risk and vulnerability assessment, ensuring that the Climate Change Action Plan reflects ground realities.

The adaptive capacity of the communities and stakeholders was analyzed based on their capacity to organise and respond to climate threats, access to technical and financial resources to respond to such threats, and ability to access information regarding such threats for timely response.

4.2 Climate Profile

Amaravati has a tropical climate characterised by hot summers and moderate winters. The climatic cycle is divided into four seasons: the cooler months of January and February, the hot months from March to May, the Southwest Monsoon from June to September, and the Northeast Monsoon from October to December.

The Gannavaram IMD station, located close to the jurisdiction of Amaravati, has historical weather records that are used for analyzing temperature and rainfall in the region. This analysis includes annual and seasonal data for the most recent year, 2024, as well as a historical trend analysis of both temperature and rainfall from 1994 to 2024. Analysis also includes the change in relatively hotter days and high-intensity rainfall events annually.

4.2.1 Climate Trend Analysis

The weather records for 2024 indicate that the maximum recorded temperature was 42.4°C in May, and the minimum recorded temperature was 18°C in December. The monthly average maximum temperature in 2024 ranges from 39.53°C in April to 29.99°C in December, while the 30-year trend shows maximum monthly averages are recorded high in May and low in December (Section 4.2.1.1). The monthly averages of minimum temperatures in 2024 range from 21.04°C in December to 28.13°C in May, recording higher averages than the 30-year trend.

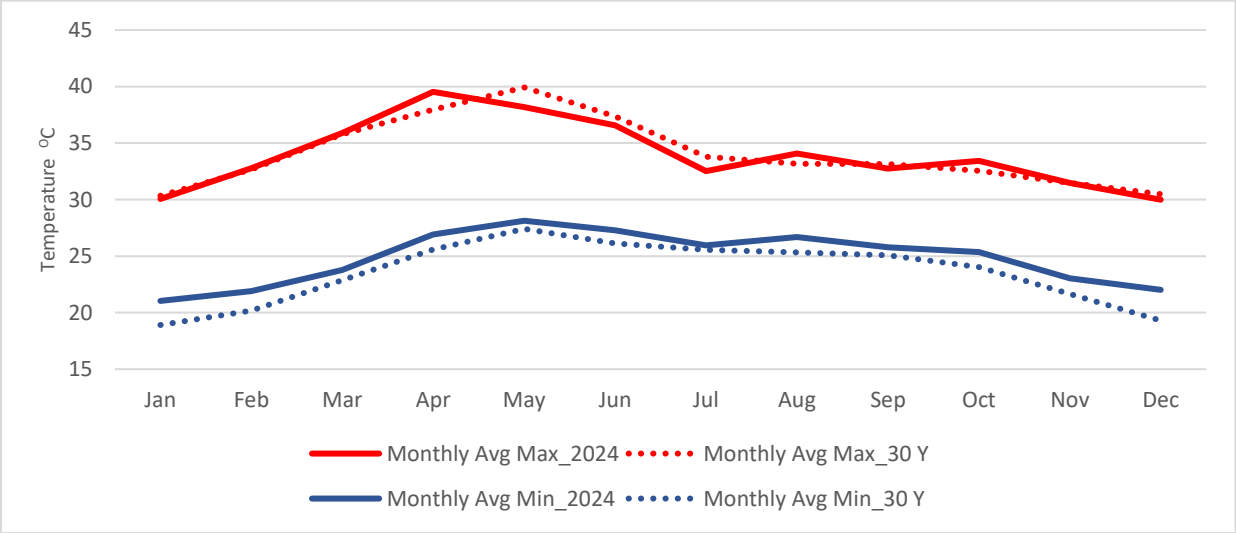


Figure 4-1 Comparison of Monthly Max. and Min. Temperatures in 2024 with 30-Year Monthly Average
Source: Chart prepared by ICLEI South Asia, based on data sourced from IMD

Rainfall records for 2024 indicate that the city received an annual rainfall of 1160 mm, which is 64 mm higher than the annual average. The city recorded 937 mm of rainfall, exceeding the southwest monsoon average by 200 mm, and during the northeast monsoon, it received twice the 30-year average. The winter months (January and February), which typically receive an average rainfall of 25.47 mm over a 30-year trend, remained completely dry.

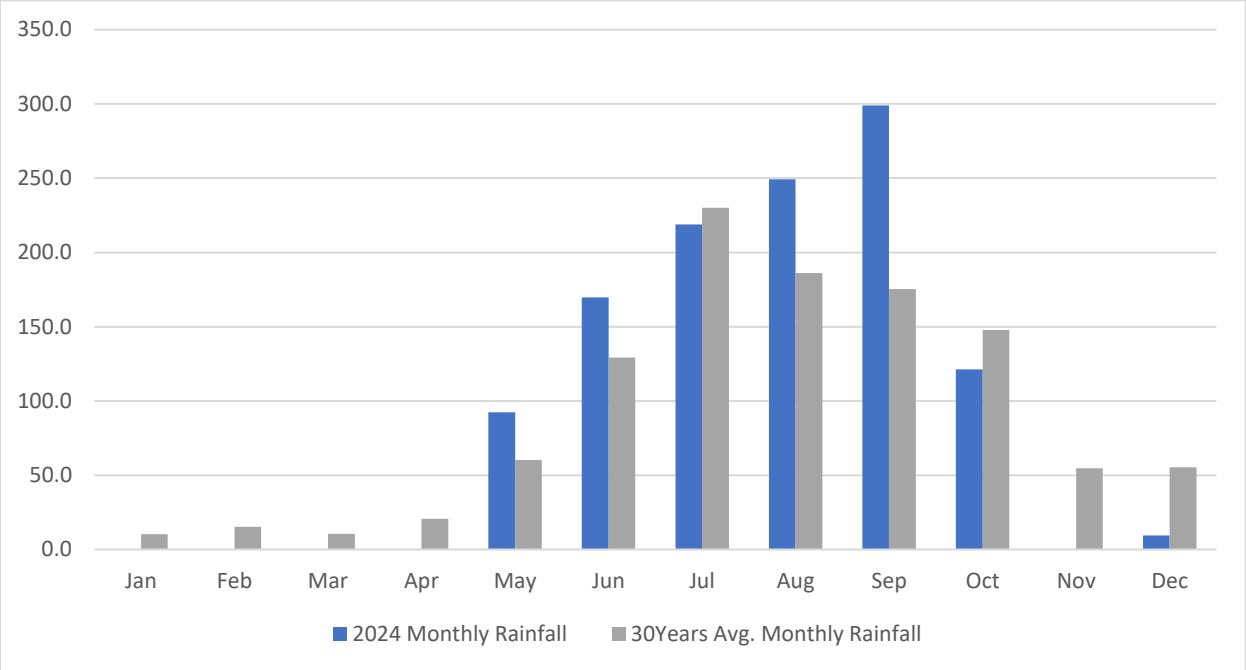


Figure 4-2 Comparison of monthly rainfall received in 2024 with 30 year monthly averages
Source: Chart prepared by ICLEI South Asia, based on data sourced from IMD

4.2.1.1 Air Temperature Trend Analysis

From 1994 to 2024, IMD's air temperature records indicate that maximum daily temperature ranges from 16°C to 48.8°C, and minimum daily temperature ranges from 12.4°C to 33.9°C. May is the hottest month, and January is the coldest month of the year. Monthly averages of maximum temperature recorded vary from 30.34°C to 39.92°C, and the monthly averages of minimum temperatures vary from 18.91°C to 27.41°C.

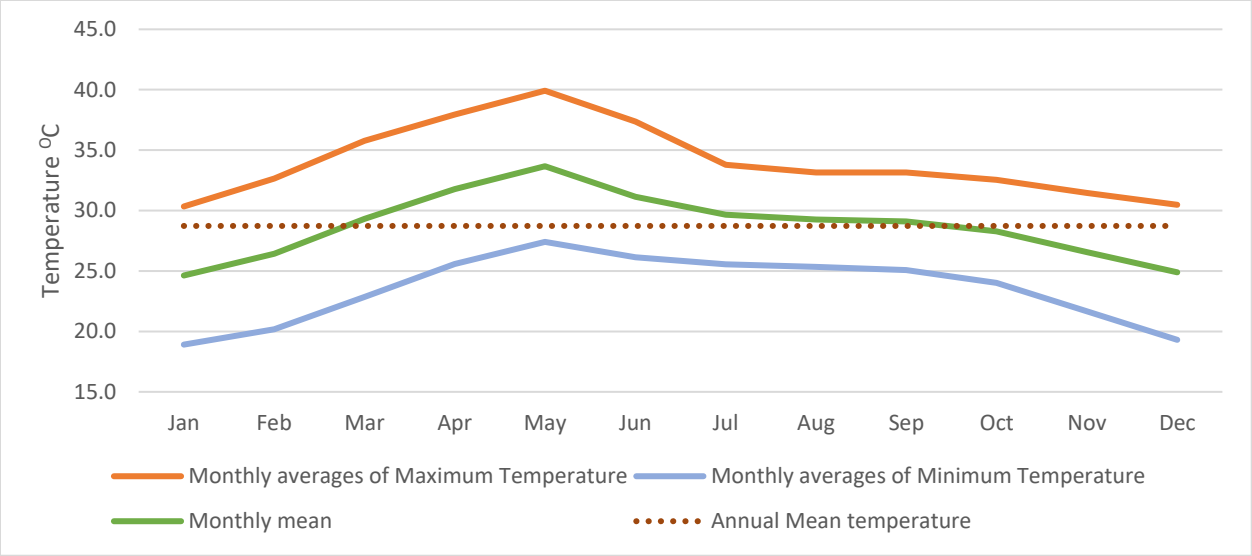


Figure 4-3 Month wise Temperature Variation with respect to Annual Mean Temperature for Amaravati
Source: Chart prepared by ICLEI South Asia, based on data sourced from IMD

Analysing the annual mean temperatures from 1994 to 2024 indicates a decadal increase of 0.36°C. The maximum temperatures are increasing at a rate of 0.2°C per decade, while the minimum temperatures are increasing at a rate of 0.32°C per decade, indicating a reduction in the difference between maximum and minimum temperatures over the years and an overall warming of the city.

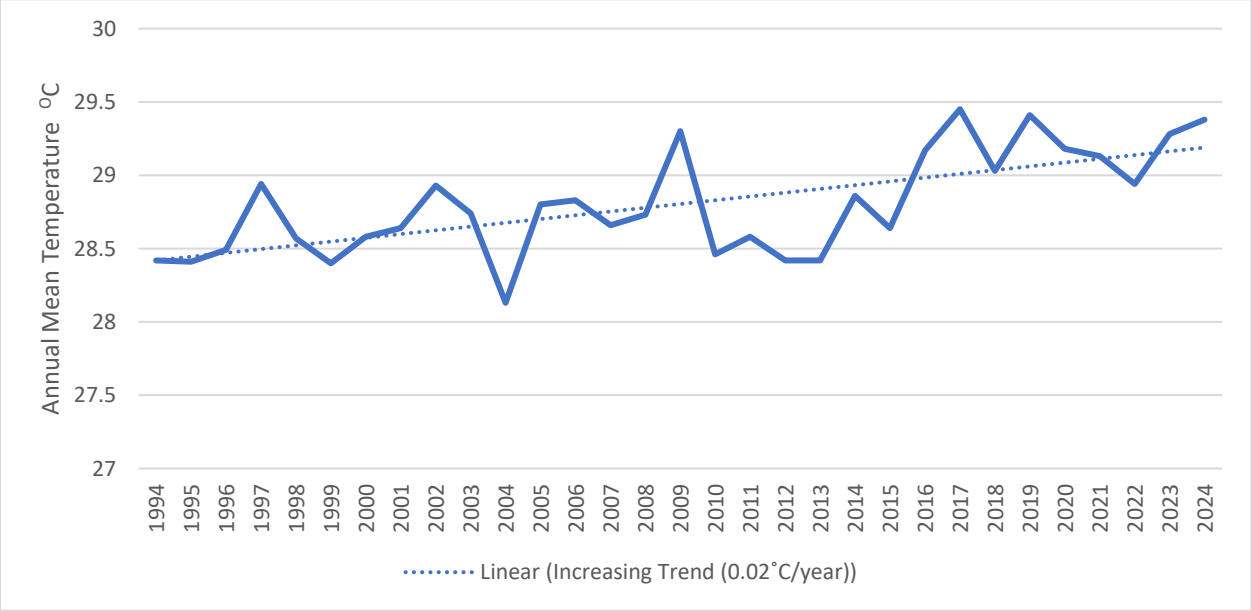


Figure 4-4 Annual Mean temperature trend for Amaravati
Source: Chart prepared by ICLEI South Asia, based on data sourced from IMD

A significant increase in the hotter years[47] was observed from 1994 to 2024. Between 1994 and 2000, there was only one hotter year. The hotter years from 2001 to 2010 and 2011 to 2020 were 3 and 6, respectively. From 2021 to 2024, all of them are hotter years. In total, there are 14 years where the annual mean temperatures crossed the mean average temperatures from 1994 to 2024. Over the last ten years, 9 years recorded higher temperatures, exceeding the annual mean temperatures by 0.14°C to 0.61°C.

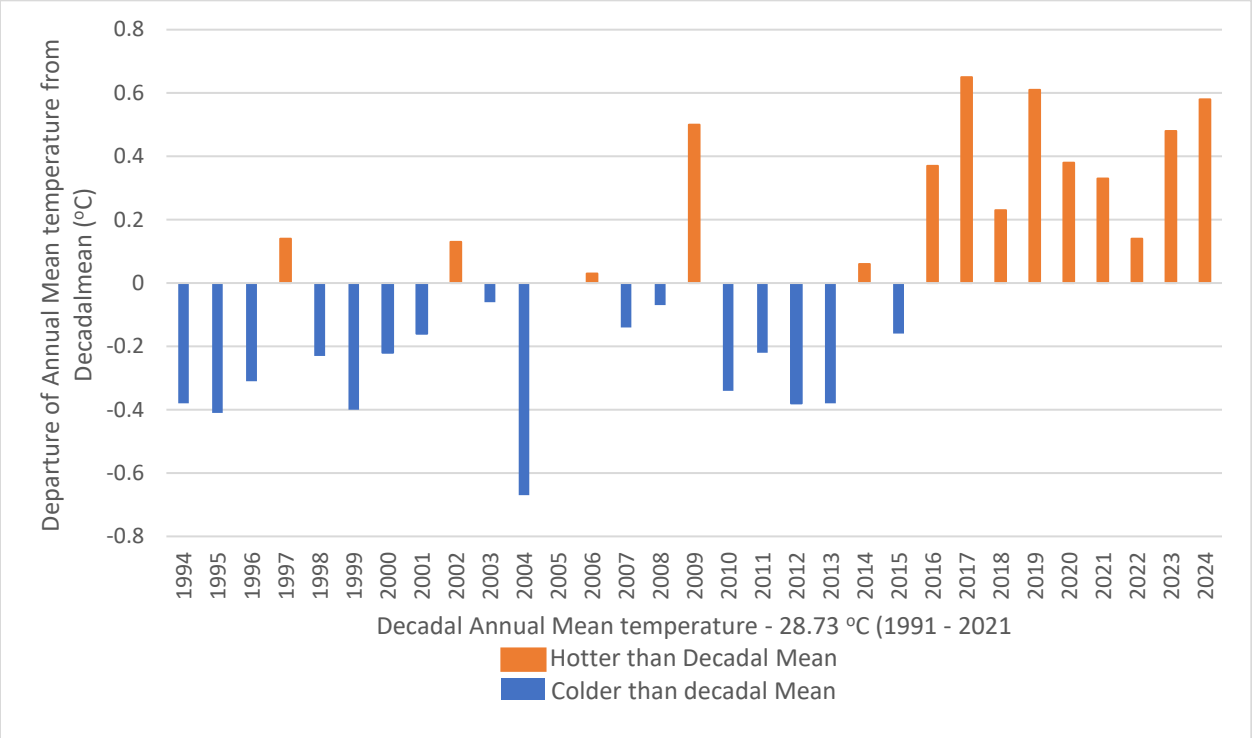


Figure 4-5 Anomalies in Annual Mean Temperature (1991 to 2021)
Source: Chart prepared by ICLEI South Asia, based on data sourced from IMD

4.2.1.2 Relative Humidity Trend Analysis

The annual average relative humidity in Amaravati is 70.41%. Humidity levels exceed this annual average in January and from July to November, while the summer months experience relatively lower humidity.

[47] A hot year is defined as a year in which the annual average temperature exceeds the mean annual temperature over the studied time frame, which is 30 years in this case

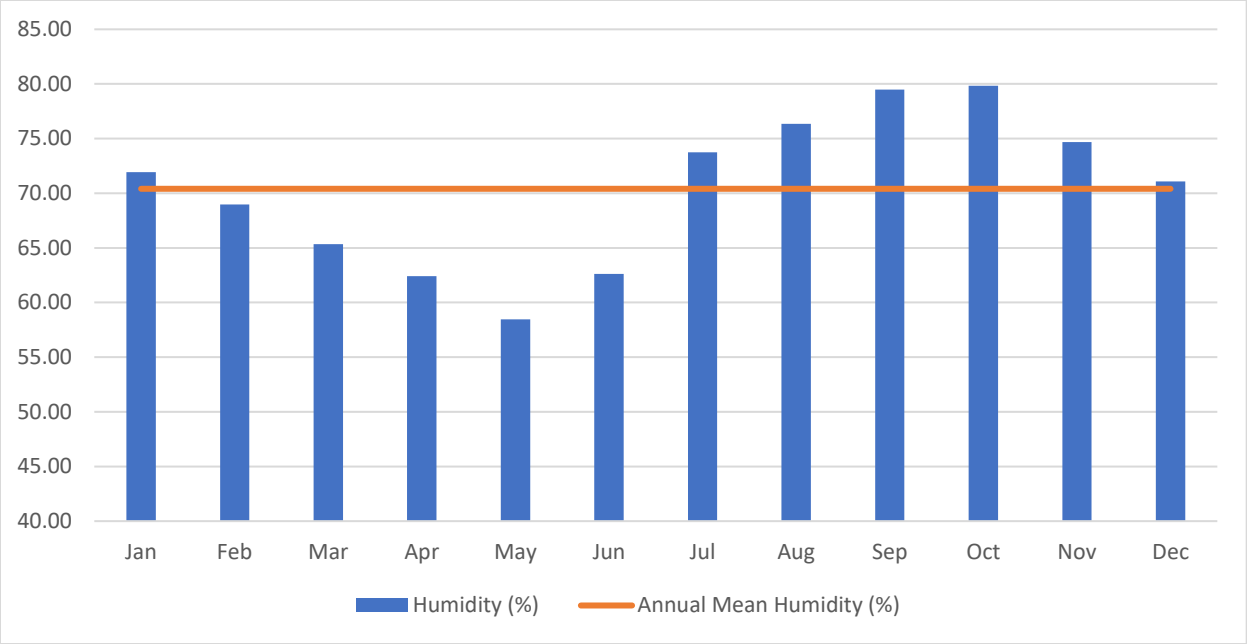


Figure 4-6 30-year Monthly Average Relative Humidity compared with Annual mean humidity for Amaravati

Source: Chart prepared by ICLEI South Asia, based on data sourced from IMD

4.2.1.3 Rainfall Trend Analysis

Amaravati receives rainfall primarily during the South-West and North-East monsoons. The annual average rainfall recorded in Amaravati from 1994 to 2024 is 1061 mm. Analysing the historical rainfall data indicates an increase in rainfall at a rate of 45 mm per decade.

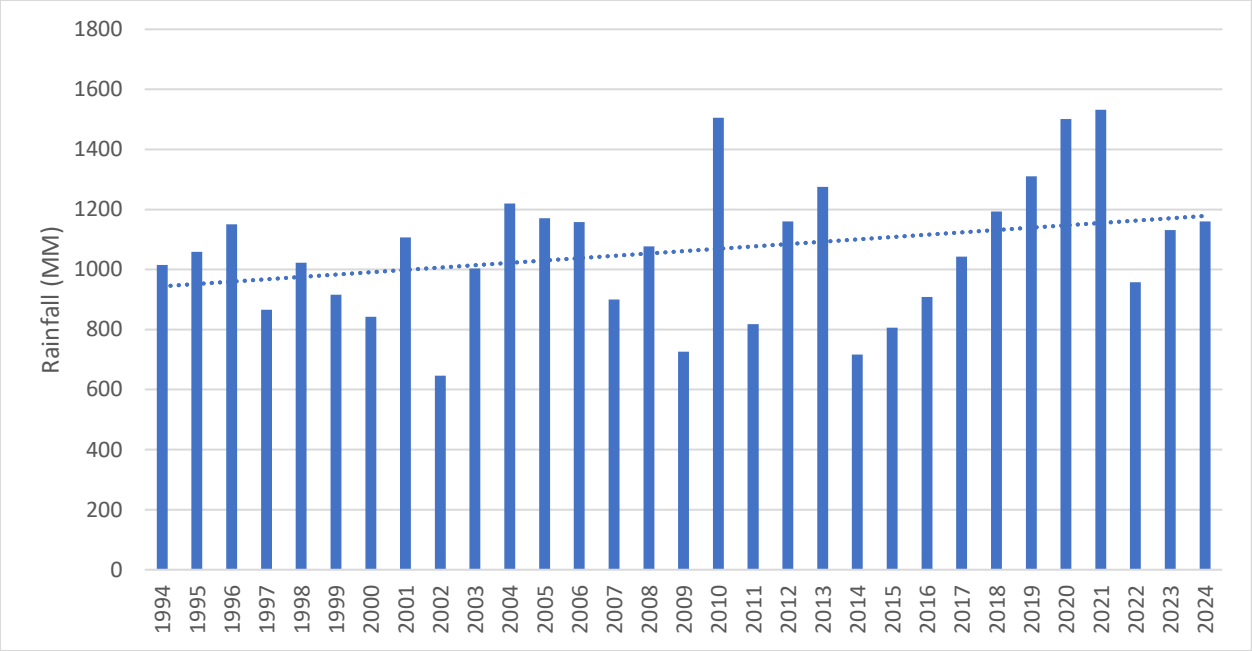


Figure 4-7 Annual rainfall trend for Amaravati for past 30 years (1994-2024)
Source: Chart prepared by ICLEI South Asia, based on data sourced from IMD

The wettest month is July, which has an average rainfall of 230 mm, while the driest month is January, with an average of only 10.24 mm.

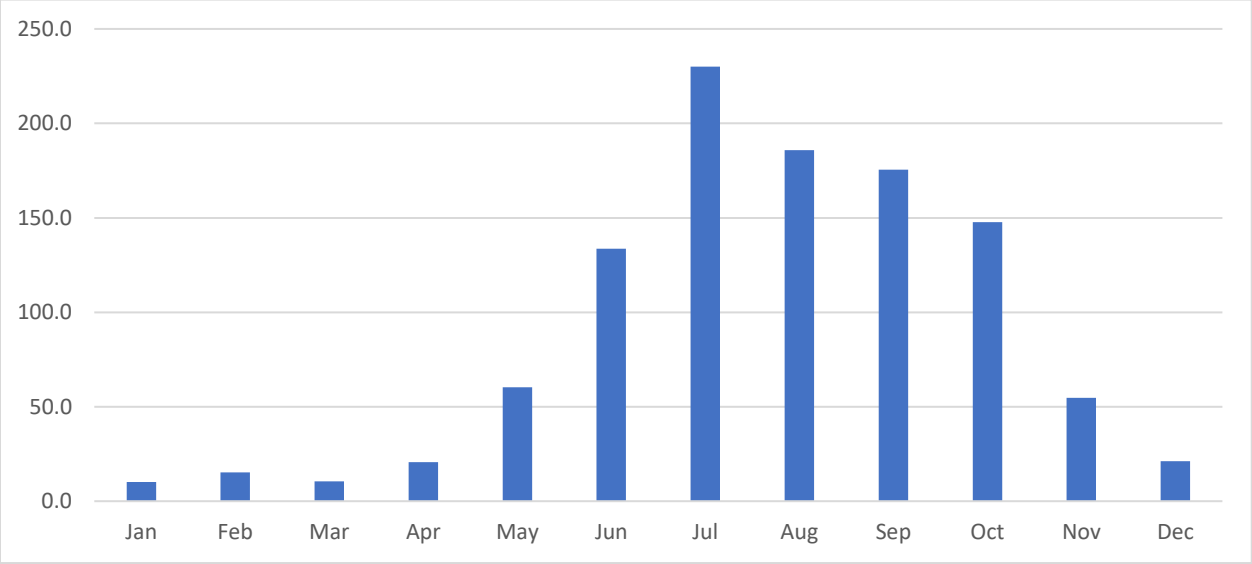


Figure 4-8 30 Year monthly average rainfall recorded
Source: Chart prepared by ICLEI South Asia, based on data sourced from IMD

As discussed earlier, it is clear that Amaravati receives the majority of its rainfall during the monsoon season, which lasts from July to December. Additionally, there is an increasing annual trend in rainfall, primarily evident during the Southwest monsoon, with a minor increase during the hot and cooler months. This

growing trend in rainfall during the southwest monsoon underscores the need for planning infrastructure to manage higher volumes of runoff and enhance the holding capacity of retention ponds.

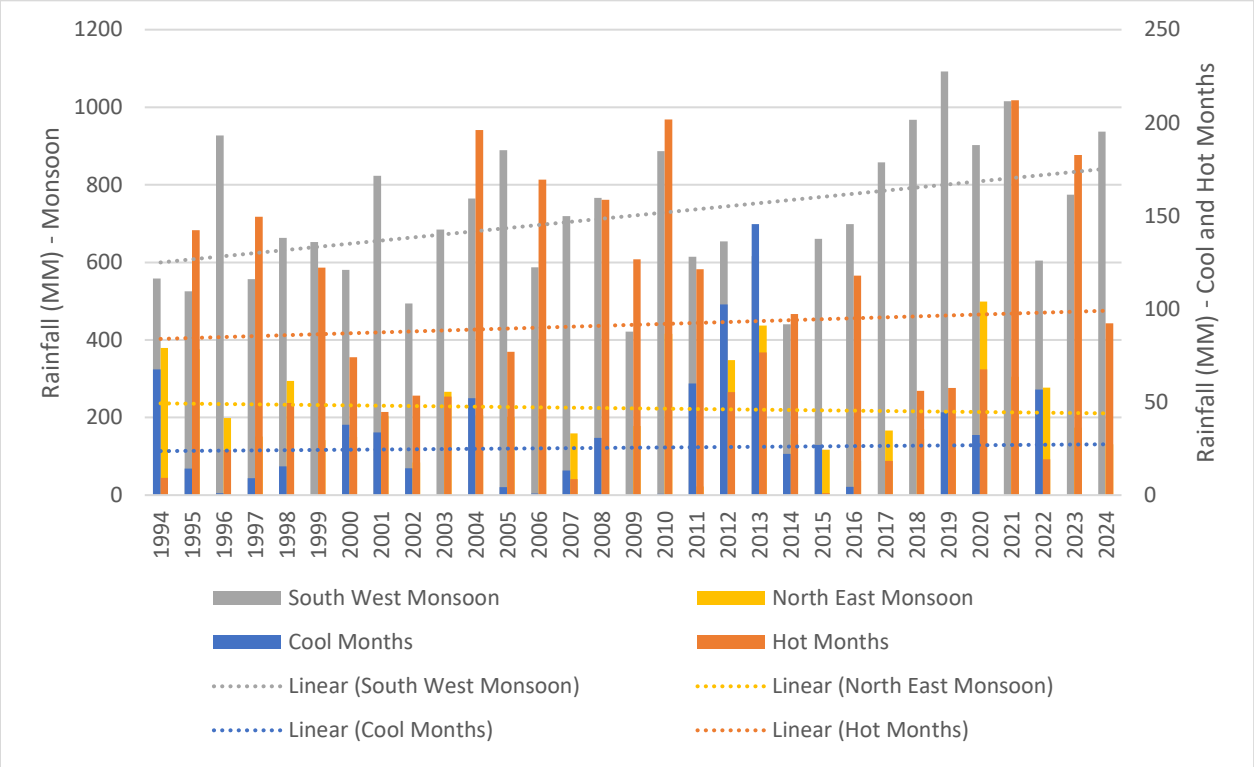


Figure 4-9 Seasonal rainfall trend of Amaravati for 30 years (1994-2024)
Source: Chart prepared by ICLEI South Asia, based on data sourced from IMD

The number of years recording higher rainfall than the annual mean has increased over the decades. From 1994 to 2000, only one year had rainfall higher than the annual average, while from 2001 to 2010, there were six years, and from 2011 to 2020, there were five years. From 2021 to 2024, three years have already recorded rainfall higher than the annual mean rainfall. At the same time, a decreasing trend in the number of rainy days at a rate of 2.6 days per decade is observed. Even though there is a positive record of more rainy days than the 30-year average of 54 rainy days from 2019, except in 2023, the number of rainy days meeting half of the annual average rainfall is decreasing, which is further exacerbated by the increase in the number of heavy rainfall days[48]. All of these trends indicate the rising frequency of high intensity rainfall events, which could lead to flooding events when the infrastructure gets surcharged due to the discrepancy between designed rainfall and actual rainfall.

[48] Heavy rainfall days are days which receive rainfall in the range of 64.5-115.5 mm/24 hour

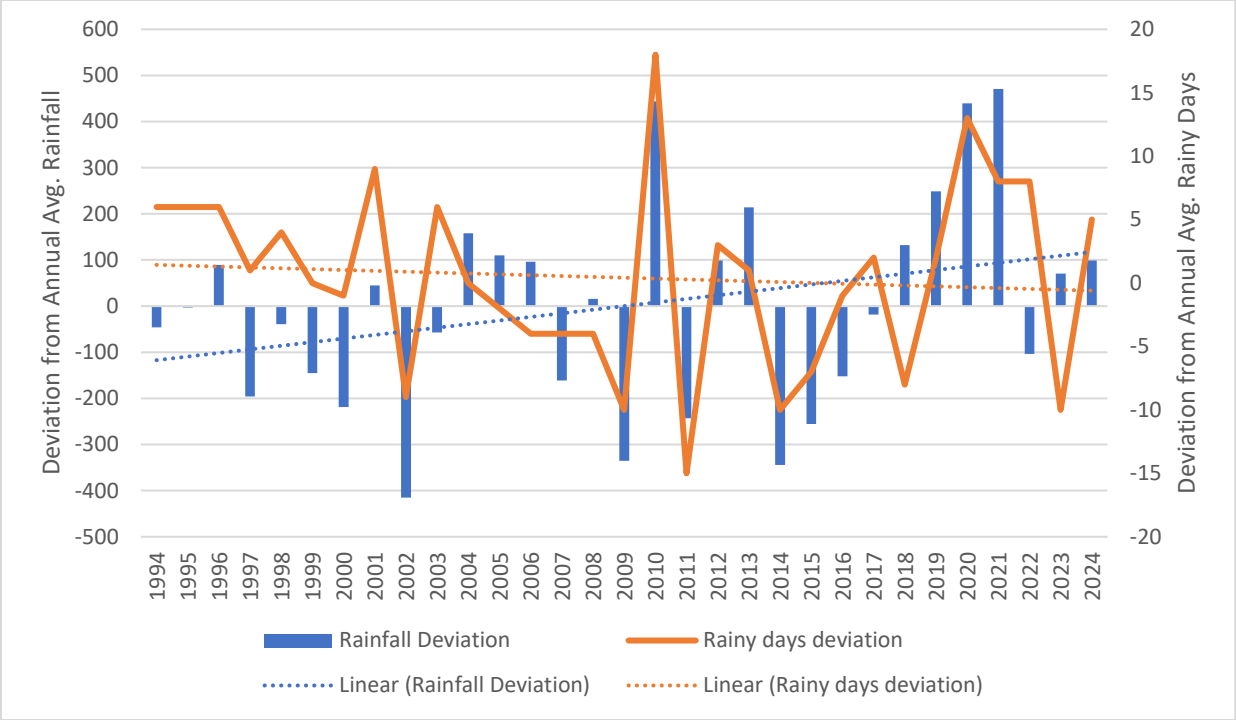


Figure 4-10 Anomalies in annual rainfall and number of rainy days (1994 to 2024)
Source: Chart prepared by ICLEI South Asia, based on data sourced from IMD

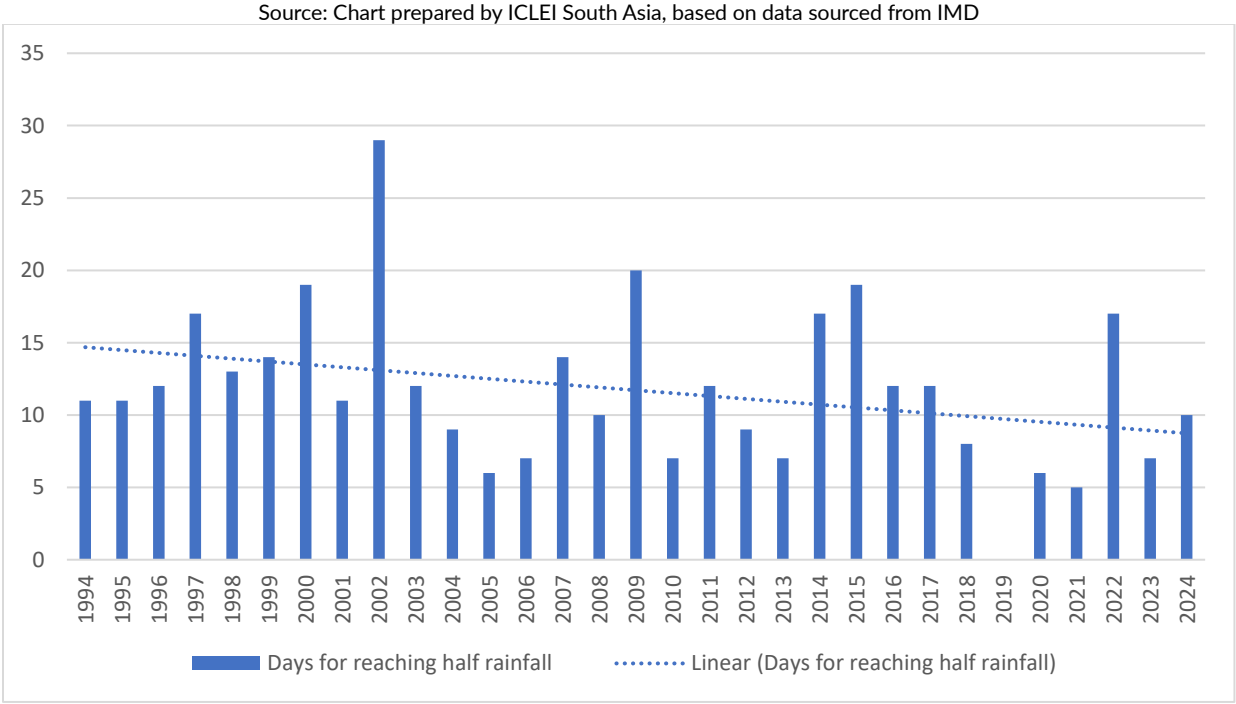


Figure 4-11 Number of days taken to receive half of total annual avg. rainfall (530.6 mm), 1994-2024
Source: Chart prepared by ICLEI South Asia, based on data sourced from IMD

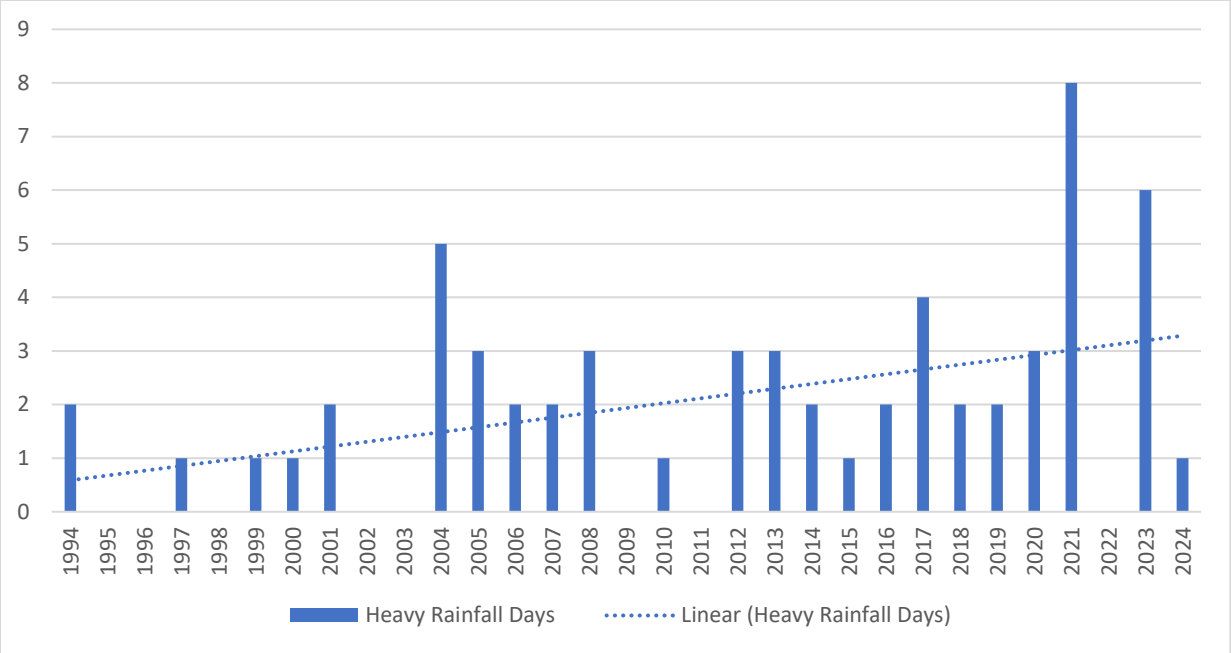


Figure 4-12 Number of Heavy rainfall days (1994-2024)
Source: Chart prepared by ICLEI South Asia, based on data sourced from IMD

4.2.2 Analysis of Historical Climate Events

Amaravati is experiencing the impacts of climate change, marked by noticeable shifts in temperature and rainfall patterns. The rising average temperatures and increasing erratic rainfall are the primary observed climate risks, contributing to growing instances of heat stress and urban flooding. Data sourced from Guntur District Disaster Management Plan (DDMP) and other secondary sources indicate that the city is vulnerable to climate induced hazards, including urban flooding caused by riverine flooding and intense rainfall, heat stress, cyclones and droughts. Since disaggregated data specific to Amaravati is limited, mandal level information has been used where necessary. The available data is sufficient to understand the climate risks and their impacts on existing settlements within the city jurisdiction.

Table 4-1: Mandal-wise Hazard Risk Mapping

Mandal[49]	Urban Flooding	Cyclone	Drought	Heatwave
Mangalagiri	High	Medium	Low	Medium
Tadepalli	High	Medium	Low	Medium
Thulluru	High	Medium	Low	Medium

Source: Guntur DDMP, Volume-1

4.2.2.1 Urban Flooding

Flooding is a major concern in Amaravati due to runoff from the up streams of Kondaveeti vagu catchment and flat terrain, proximity to the Krishna River. The Kondaveeti *vagu* (water channel) often overflows during

[49] Amaravati city spans across Managalagiri, Tadepalli and Thulluru mandals, due to lack of city level data availability, mandal level information is considered to understand the hazards risk. The Hazard risk mapping has been carried based on Hazard exposure, frequency and intensity, coping capacity as outlined in the Guntur DDMP, volume-1.

heavy monsoon rains causing localized flooding, and flood risk is exacerbated when the Krishna River is at high flood levels, restricting the outflows from Kondaveeti *vagu*.

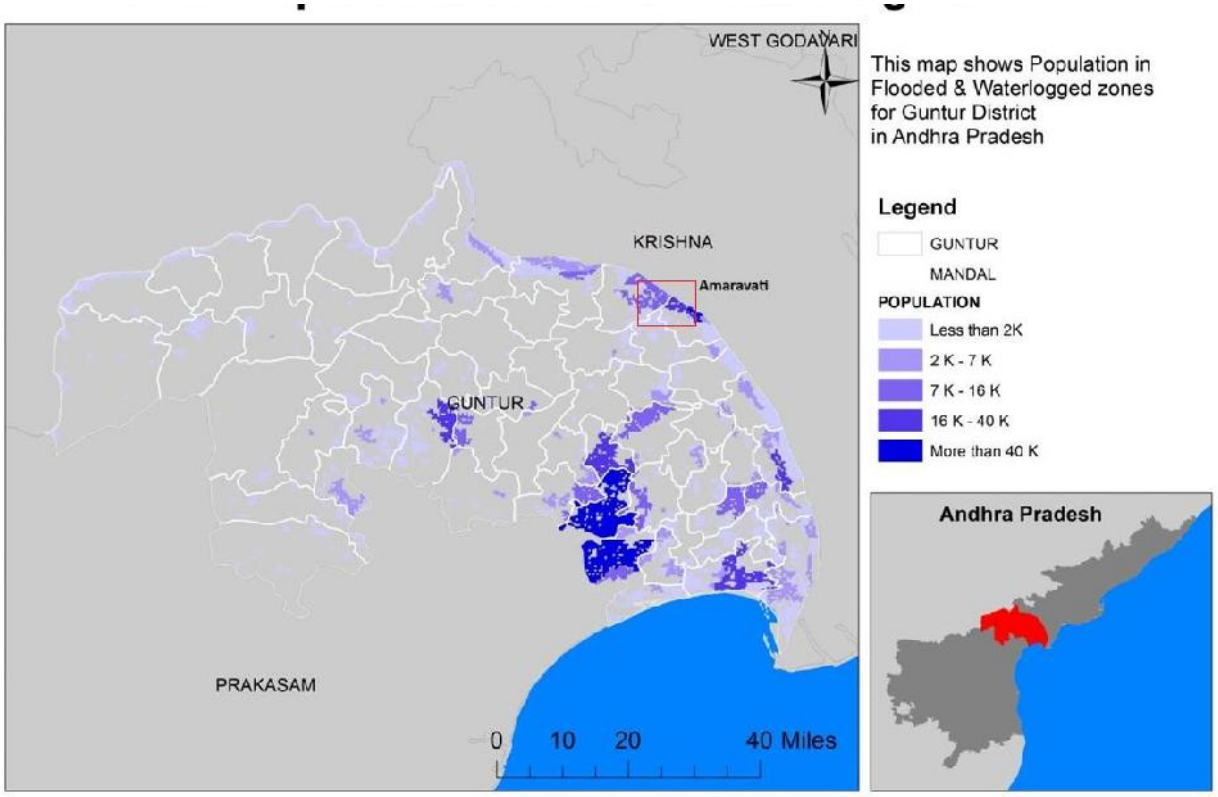


Figure 4-13: Flood and Waterlogged zones in Guntur District
Source: Guntur DDMP, Volume-1

The flooding of Krishna River and excessive rainfall in the Kondaveeti vagu catchment has very rare occurrence at same time. A notable exception occurred on 20th September 2005, a major flood event was recorded with the Krishna River reaching a peak discharge of 20,545 m^3/sec, accompanied by an average of 162 mm rainfall in the Tadikonda and Thulluru areas. [50]

On 31st August 2024, Amaravati experienced about 280 mm of rainfall in one day and 150 mm of rainfall in 3 hours.[51] While there was no reported loss of human life, the flooding caused widespread disruption to connectivity and livelihoods. Several villages were affected, including Penumaka, Undavalli, Nowluru, Nidamarru, Kuragallu, Krishnayapalem, Velagapudi, Venkatapalem, Borupalem, Abbarajupalem, Dondapadu and Sakamuru, with roads submerged, and access to livelihood and public services impacted. The inundation areas and impacts are detailed in section 4.4.2.1.

4.2.2.2 Cyclone

As per the Wind and Cyclone Hazard Map of India, Amaravti city falls within a moderate risk zone for cyclones, with a wind speed of 44m/sec. Although Amaravati has not experienced direct landfall of major

[50] Source: DPR for flood management for Amaravti capital city, Volume-1, June 2017.
[51] Hindustan times new article published on September 10, 2024.

cyclones in recent decades, it has been affected by the peripheral impacts of cyclonic storms such as Cyclone Phethai (2018), Cyclone Gulab(2021), etc., which brought heavy rainfall and waterlogging in low-lying areas.

4.2.2.3 Heatwave

According to Guntur DDMP, Amaravati has witnessed more frequent heat conditions over the past years and the whole city falls in extreme heatwave conditions with a temperature range of 43-49˚C.

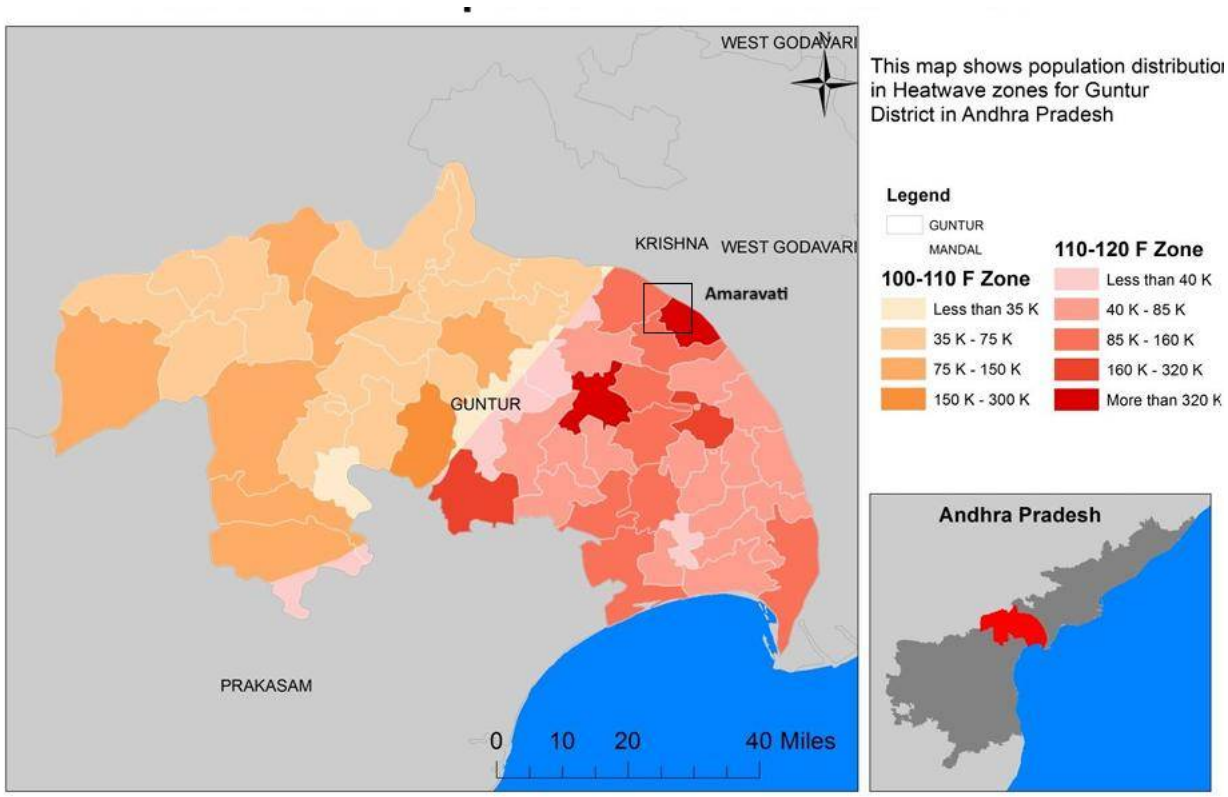


Figure 4-14: Heatwave zones in Guntur District
Source: Guntur DDMP, Volume-1

As per the Andhra Pradesh State Heatwave Action Plan, the Thulluru, Tadepalli and Mangalagiri mandals are vulnerable to rising temperature and heat stress. The maximum temperature of 48°C was recorded in this region on 11th May 2002 and 31st May 2003.

Although the region is heat-prone, the local community is habituated to it and does not consider it as a major concern. However, physical vulnerability remains high due to outdoor occupations, elderly populations and a lack of cooling infrastructure particularly in rural settlements.

4.2.2.4 Drought

As per the Memorandum on Drought in Andhra Pradesh 2014, all three mandals that comprises the Amaravati region – Thulluru, Tadepalli and Mangalagiri were classified under the moderate drought category. However, the overall drought risk for the region is considered low as per the DDMP.

4.2.3 Air Quality

The Amaravati capital region is experiencing increased construction activities aimed at urban infrastructure development, resulting in a higher concentration of particulate matter leading to deteriorated air quality. The CPCB has been monitoring air quality through the installed AAQMS at the secretariat building in Amaravati since 2018. Analysing the information from 2018 to 2024 for this AAQMS indicates that the annual average concentrations of NO2 and SO2 have not surpassed the National Ambient Air Quality Standards (NAAQS), with only the concentration of NO2 exceeded the NAAQS of 80 µg/m^3 in 2018 and 2019 for 13 and 14 days, respectively. The annual average concentration of PM 2.5 remained at 32.15µg/m^3, below the NAAQS of 40 µg/m^3 from 2018 to 2024. In contrast, the annual average concentration of PM10 exceeded the NAAQS of 60µg/m^3 in 2018, 2019, and 2023, with an annual average of 65.22 µg/m^3. Analysing the daily records of particulate matter concentrations indicates that the concentration of PM2.5 is higher during the months of January, February, November, and December and the concentration of PM10 is higher in January, February, and from October to December.

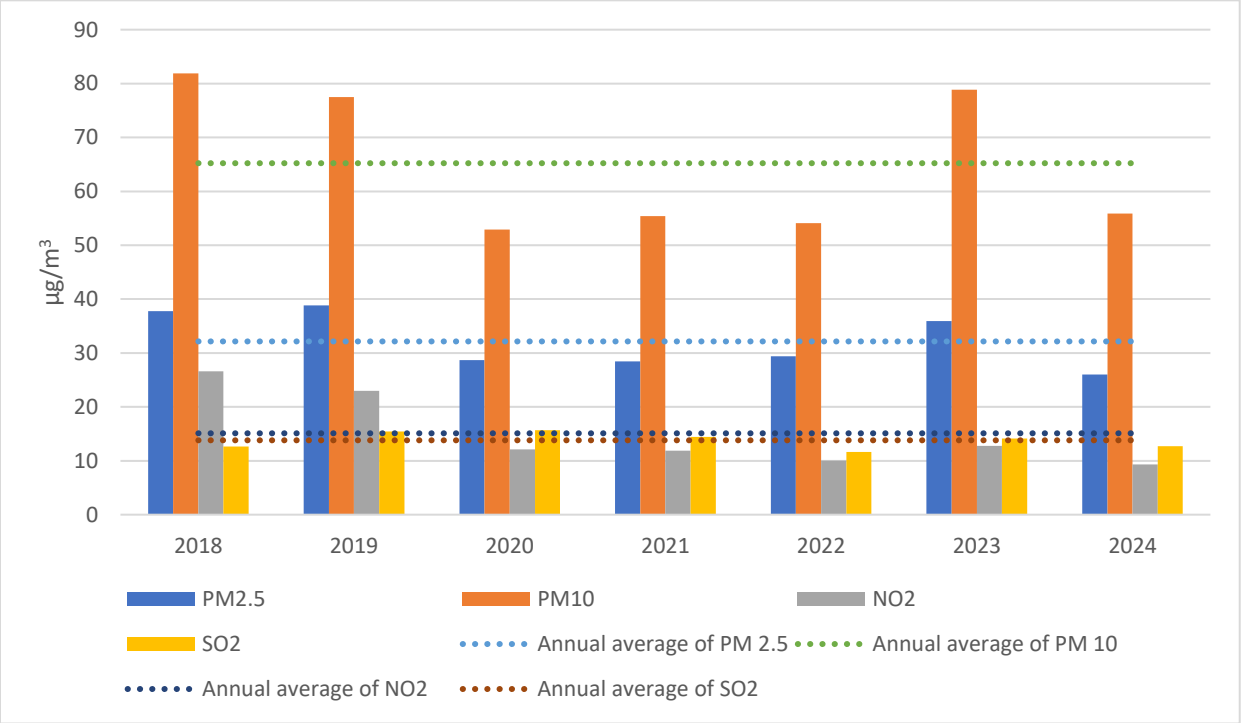


Figure 4-15 Trend of concentration of Air Pollutants (2018 to 2024)
Source: Chart prepared by ICLEI South Asia, based on data sourced from CPCB

4.2.3.1 Spatial analysis

Spatial analysis is performed to identify areas with high concentrations of PM2.5 and PM10 using MODIS AOD spatial data in Google Earth Engine. The study was conducted using the data captured in March 2024 and January 2025, with a primary focus on comparing the period of a few construction activities to the period with higher construction activities.

PM2.5 concentrations in March 2024 range from 23 µg/m^3 to 24 µg/m^3, which is higher than the WHO permissible limits, although it is within the Indian NAAQS standards. By January 2025, the concentration

has risen to between 29.8 µg/m^3 to 49.4 µg/m^3. The PM2.5 levels are higher in existing villages, namely Nidamarru, Kuragallu, Nowluru, Ainavolu, Rayapudi and Borupalem.

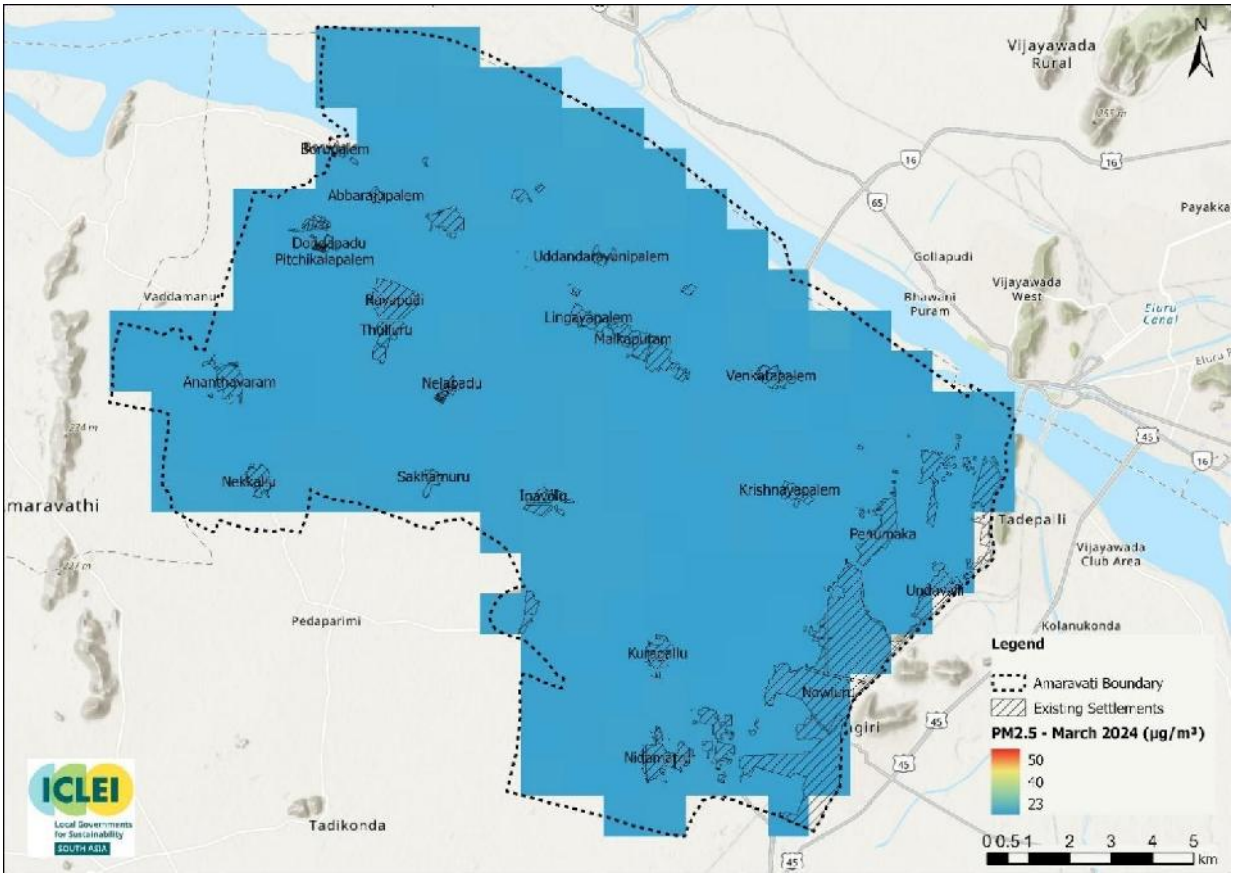


Figure 4-16 PM 2.5 Concentration in Amaravati for March 2024
Source: Map prepared by ICLEI South Asia, based on MODIS satellite imagery

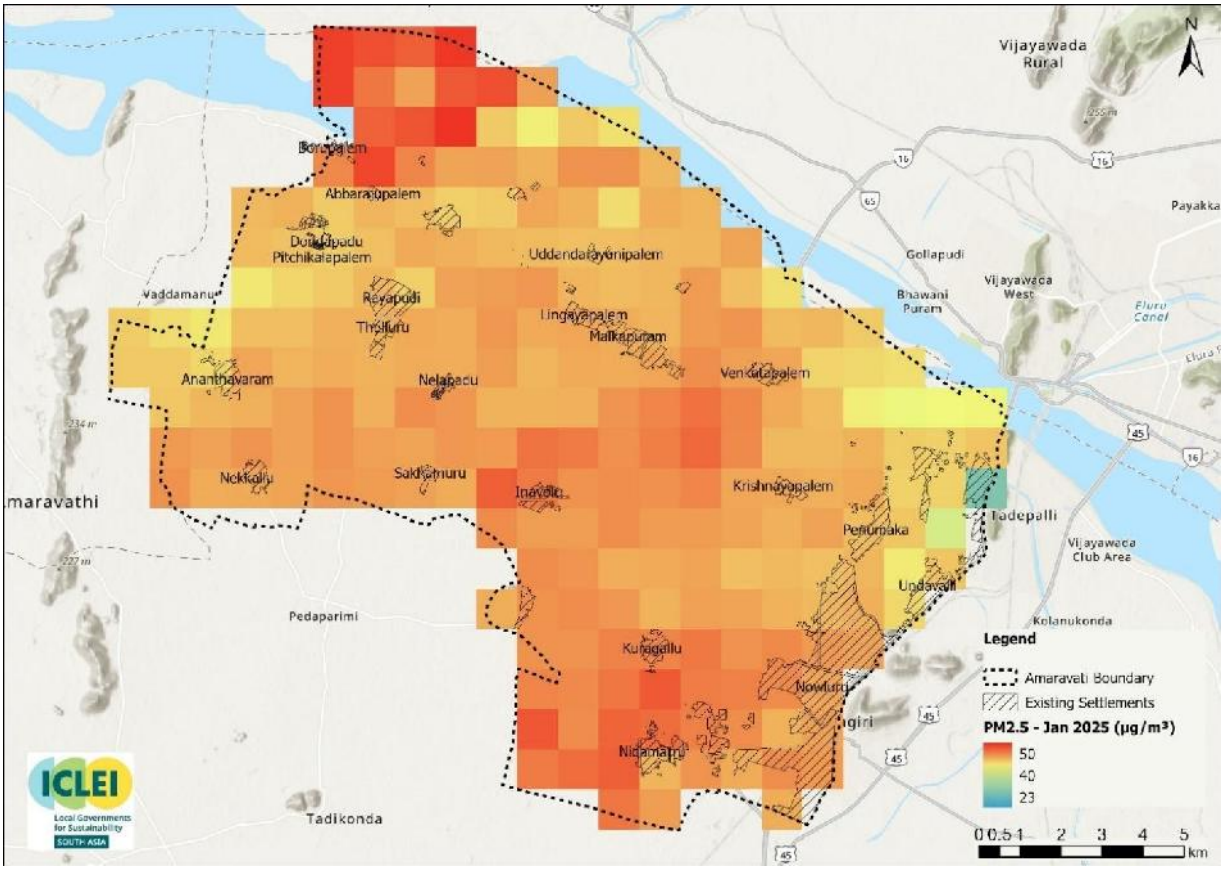


Figure 4-17 PM 2.5 Concentration in Amaravati for January 2025
Source: Map prepared by ICLEI South Asia, based on MODIS satellite imagery

Although the PM10 concentration was within permissible limits, ranging from 52.5 µg/m^3 to 55 µg/m^3 in March 2024, the concentrations increased significantly in January 2025, exceeding the permissible limit of 60 µg/m^3 throughout the city and reaching as high as 105.5 µg/m^3. Areas such as Nidamarru, Kuragallu, Ainavolu, Nelapadu, Mandadam, and Borupalem exhibited very high concentrations of PM10.

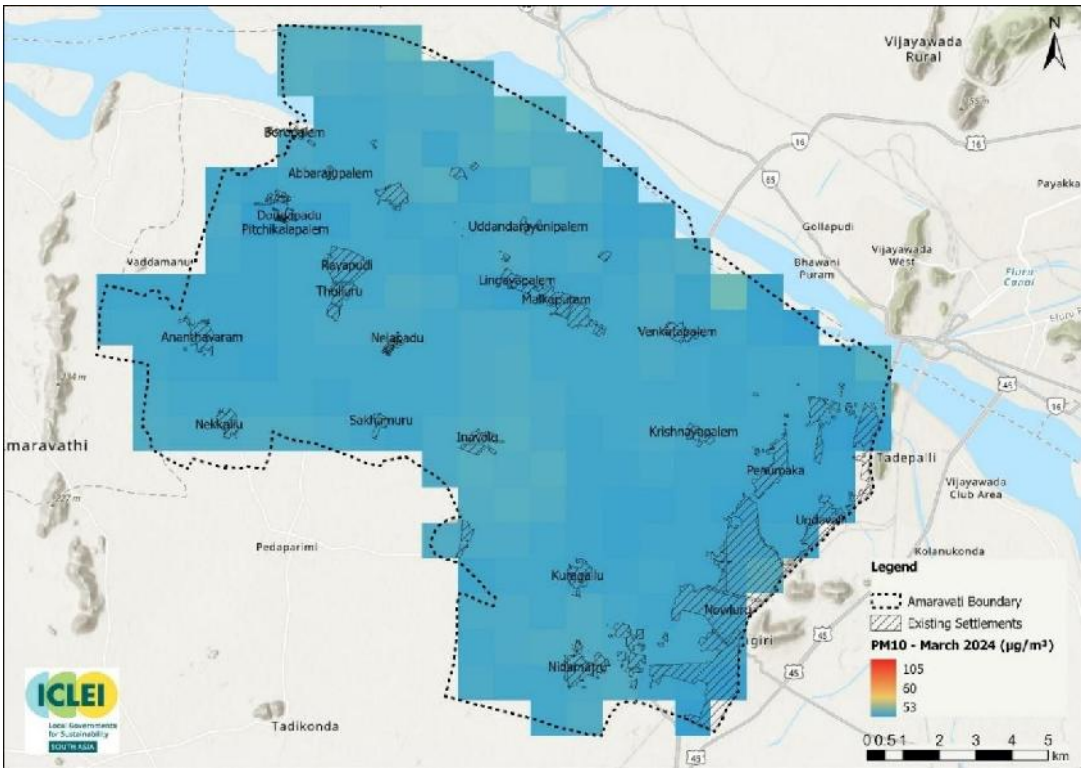


Figure 4-18 PM 10 Concentration in Amaravati for March 2024
Source: Map prepared by ICLEI South Asia, based on MODIS satellite imagery

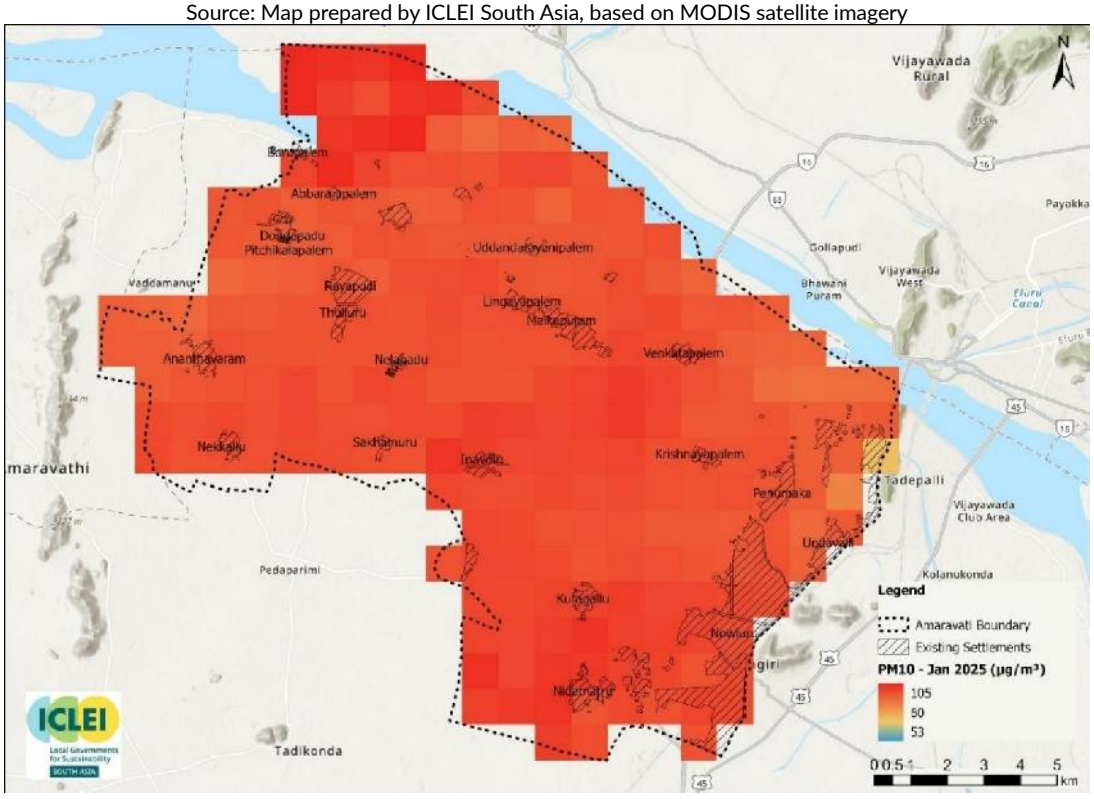


Figure 4-19 PM 10 Concentration in Amaravati for January 2025
Source: Map prepared by ICLEI South Asia, based on MODIS satellite imagery

4.2.3.2 Air Quality Index

Data from the CPCB monitoring centre shows that the AQI in Amaravati was mostly satisfactory and good for about 82% of the days from 2020 to 2024. Approximately 14% of days had moderate AQI levels, and 3% experienced poor air quality. There was only one instance in 2020 when the AQI was categorized as very poor. AQI tends to decline to poor levels in January and December, while it remains moderate or better in the other months. Days with poor air quality have been recorded across all five years.[52]

Table 4-2 Month-wise no. of days recorded AQIs from 2020 to 2024

AQI	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Good	10	25	54	73	56	101	140	125	114	51	34	16
Satisfactory	66	93	89	68	88	36	3	22	18	66	48	49
Moderate	52	21	10	5	8	7	0	2	1	35	58	52
Poor	16	0	0	0	0	0	0	0	0	0	4	28
Very poor	0	0	0	0	0	0	0	0	0	0	0	1
Severe	0	0	0	0	0	0	0	0	0	0	0	0

Source: AQI Data repository, NAQI, CPCB

4.3 Climate Projections and Scenario Statements

To assess Amaravati's future vulnerabilities, it is necessary to understand the projected climate trends in its region. Since city-level projections are not available, regional-level projections have been considered from two key sources. The first is the "Hydrological and Climate Modelling of Solapur and Vijayawada cities" by IIT Madras, wherein the Vijayawada projections have been considered due to its proximity and comparable climatic conditions with Amaravati. The second reference is the "Draft Andhra Pradesh State Action Plan on Climate Change (SAPCC)", which provides climate projections for Guntur district, where Amaravati is located. These references provide a relevant contextual basis for deriving precipitation and temperature projections for Amaravati.

The climate scenarios are based on Representative Concentration Pathways (RCPs)[53] – RCP 2.6, 4.5, 6.0 and 8.5,[54] representing varying levels of GHG emissions and mitigation efforts. These scenarios help understand potential climate futures under different socio-economic and policy trajectories. The precipitation and temperature projections for Vijayawada and Guntur district, have been used to derive the climate scenarios for Amaravati.

Table 4-3: Temperature and Precipitation projections for RCP 2.6,4.5,6 and 8.5 scenarios

Parameter	RCP 2.6		RCP 4.5		RCP 6.0		RCP 8.5	
	2020-2048	2050-2078	2020-2048	2049-2078	2020-2048	2049-2078	2020-2048	2049-2078

[52] Ranges of AQI categories are Good 0 to 50, Satisfactory 51 to 100, Moderate 101 to 200, Poor 201 to 300, Very poor 301 to 400, Severe 401 to 500 as per the National Air Quality Index.
[53] Representative Concentration Pathway (RCP) scenario describes different trajectories for greenhouse gas concentrations and the resulting radiative forcing (energy added to the climate system) by 2100
[54] RCP 2.6 scenario, GHG emissions and air pollutants are reduced substantially over time.
RCP 4.5 is a stabilization scenario in which a range of technologies and strategies are employed to reduce emissions before 2100.
RCP 6 is a stabilization scenario in which stabilization is achieved after 2100 using a range of technologies and scenarios.
RCP 8.5 is a high-emission scenario leading to high greenhouse gas concentrations

Average maximum temperature	Increase by 1.1°C	Increase by 1.2°C	Increase by 1°C	Increase by 1.5°C	Increase by 1°C	Increase by 1.5 - 1.7 °C	Increase by 1.2-1.3°C	Increase by 2.2-2.4°C
Average minimum temperature	Increase by 1.1°C	Increase by 1.2°C	Increase by 1°C	Increase by 1.5°C	Increase by 1°C	Increase by 1.5 - 1.6°C	Increase by 1-1.2°C	Increase by 2-2.3°C
Average precipitation	Decrease in monsoon rainfall, increase in non-monsoon		Decrease by 50mm from historic mean		No change in mean annual rainfall		Decrease by 70mm from historic mean	
Extreme precipitation/ wet events	Overall decline in annual rainfall, with peak years up to 1650mm and dry years less than 550mm. Non-monsoon rainfall increases by 10%		8-10 years of high rainfall expected with annual rainfall >1500mm		7-8 extremely wet years expected with annual rainfall >1700mm		Peak rainfall during wet years reach 1500mm	
Drought occurrence	25-30 moderate to severe drought years		20-25 moderate to severe drought years with annual rainfall below 450mm		10-15 severe droughts		25-30 moderate to severe drought years	

Source: Hydrological and Climate Modelling of Solapur and Vijayawada cities by IIT Madras,2019

According to Hydrological and Climate Modelling of Solapur and Vijayawada cities study by IIT Madras (2019), Amaravati is projected to increase in both mean annual minimum and maximum temperatures across all future scenarios. The mean annual maximum temperature is expected to rise by 1- 1.3°C in the near term (2020-2048) and by 1.2-2.4°C during the mid to late century period (2049-2078). Under RCP 8.5 scenario, the increase could reach 2.2- 2.4°C by 2049-2078 period. Similarly, the mean annual minimum temperature is projected to rise by 2 to 2.3°C under the RCP 8.5, while other scenarios indicate a rise of atleast 1 to 1.5°C in the far period.

The study indicates a shift in rainfall patterns with an increase in the frequency of floods and droughts in the region. The mean annual rainfall is projected to decrease by 40mm under RCP 2.6 and by up to 70mm under RCP 8.5. However, all the scenarios project extreme rainfall events are expected to increase, indicating the heightened potential for flooding. The combination of reduced total rainfall and more intense rainfall events heightens the risk of both urban flooding and drought conditions.

According to the draft SAPCC, similar patterns are projected for the Guntur district, where Amaravati is located. The SAPCC highlights a temperature rise of around 0.9°C across Andhra Pradesh. The maximum temperatures are projected to increase by 1.35 to 1.8°C across the scenarios, leading to a notable increase in the occurrence of extreme heat events. The annual average number of rainy days in Guntur district is projected to be 91-100 days under RCP4.5 and 81-90 days under RCP 8.5 scenario until year 2100, indicating the rainfall variability and concentration over shorter duration.

Table 4-4 Climate scenarios

Climate parameter	Climate Scenario Statement

Change in Rainfall	• Annual average rainfall is expected to decrease by 40-70mm, depending on the scenario • Rainfall variability is projected to increase, ranging as high as 1650mm during peak rainfall years to less than 450mm in dry years. • Frequency and intensity of extreme rainfall events are likely to rise, leading to an increased risk of urban flooding. • Monsoon rainfall is projected to decline by up to 10%, while an increase in non-monsoon rainfall is anticipated • Annual average number of rainy days in Guntur district is projected to be 91-100 days under RCP4.5 and 81-90 days under RCP 8.5 scenario (until year 2100).
Change in temperature	• Rising trends in both mean maximum and minimum temperatures, ranging from 1 to 2.4°C • Increase in heatwave frequency and intensity
Drought events	• At least 10-15 Moderate to severe drought events are projected across all scenarios. • Up to 25-30 droughts are expected under high-emission scenarios.

4.4 Climate Risk and Vulnerability Mapping

4.4.1 Assessment of Heat Hotspots

The objective of this analysis is to identify potential heat stress zones based on the surface temperature trends, land use transformation, and the role of natural and built environment features. The result is critical to inform planning interventions such as green infrastructure, heat resilient design and zoning regulations. Temperature in a region is influenced by various parameters, including natural features such as soil cover and solar radiation, as well as manmade interventions that alter surface albedo. Identifying heat hotspots in Amaravati, which spans 217 sq. km, is essential for understanding how the upcoming development might result in temperature changes compared to baseline year temperatures and relatively hotter areas once the city is fully developed according to the Master Plan. The conventional heat mapping techniques that rely on historical surface temperature data from built-up areas is not relevant in this case. A forward-looking approach has been adopted to assess the potential future heat risks in line with the city's projected land use as per the Amaravati Master Plan. Indicators and methodology used for assessment are described in Table 4-5.

Table 4-5 Indicators and Methodology Used for Heat Hotspots Assessment

Heat Hotspots Assessment	
Indicator	**Methodology**
Air Temperature Trend and Future Scenario (Section 4.2.1.1)	**Methodology**: Historic trend analysis of annual air temperature (including minimum, mean, and maximum temperature). **Data Used**: Daily air temperature data from 1994 to 2024. **Data Source**: IMD Station at Gannavaram.
Land Surface Temperature (LST) Baseline Analysis	**Methodology**: Pixel-based statistical analysis of satellite imagery for daytime over the years 2023, 2024, and 2025 was conducted to understand the spatial distribution of LST. A mean LST was developed using the results from these three years, which gives an average value for each pixel to neutralise variations in temperature at the time of capturing the satellite information. A gradual increase in expansion in hotter land surface temperatures, especially over those hotter surfaces, was used as an indication of a temperature hotspot. **Data Used**: 30m x 30m resolution Landsat 8 & 9 imagery from May 2023, May 2024, and April 2025 for Daytime Surface Temperature **Data Source**: Earthexplorer.USGS
Land Surface Temperature (LST) projected for 2058	**Methodology**: **Step-1: Land Surface Temperature (LST) for the current scenario** A mean LST has been generated considering the Landsat 8 & 9 satellite imageries for May 2023, 2024 and 2025 using the raster calculator in ArcGIS. The LST for the existing settlements, protected and natural features is considered from the mean LST. **Step-2: Calibration from reference cities**

<table>
<tr><th colspan="2">Heat Hotspots Assessment</th></tr>
<tr><th>Indicator</th><th>Methodology</th></tr>
<tr><td></td><td>To develop an estimated temperature model for future built-up areas in Amaravti, LST data from cities with similar urban features – Vijayawada, Hyderabad, and Chandigarh were referred to. Rationale for considering the cities is as follows
Vijayawada – Selected for its similar climatic conditions and being adjacent to Amaravati, provides a reliable thermal baseline for the built-up areas under similar geographic conditions.
Hyderabad – Considered for its established urban heat island studies and mixed peri-urban development. As it is a capital city with similar density and the types of activities would be similar to those in Amaravati.
Chandigarh – A planned city comparable to Amaravati in spatial layout and zoning, provides insights on how the planned urban design and blue-green infrastructure has its impact on the surface temperature of the surrounding areas and mitigate heat stress.
Surface temperatures from these cities is utilised for establishing the impact of blue-green infrastructure in the proposed land use, allowing us to project likely heat conditions under the fully developed scenario.
Step-3: Assigning the differentials values for the future land use
Land use categories from the Amaravati Master Plan were used as the base layer. For each of the land use categories, temperatures from the reference cities were applied, FSI and the type of development that would come in the areas. The impact of the blue-green infrastructure is incorporated into the assigned land use temperatures by assigning differential/ delta values based on the expected heat modulating characteristics.
<table>
<tr><th>Land use Type</th><th>Delta Value (˚C)[55]</th></tr>
<tr><td>Large Green Spaces</td><td>1.3</td></tr>
<tr><td>Small Green Spaces</td><td>1.5</td></tr>
<tr><td>Avenue plantation</td><td>1.5</td></tr>
<tr><td>Water bodies</td><td>2</td></tr>
<tr><td>Canals</td><td>1.3</td></tr>
<tr><td>Roads with avenue plantation compared to roads without plantation</td><td>1.7</td></tr>
</table>
These delta values were used to adjust the surface temperatures relative to one another among different land use categories and simulate the spatial temperature variation aligned with future urban forms.</td></tr>
</table>

[55] Delta value is the estimated difference in temperature for every 100m meters away from the natural features like green spaces, water bodies etc.

Heat Hotspots Assessment	
Indicator	**Methodology**
	GIS tools like Euclidean distance, raster calculator, statistical tools and other tools were used to generate the map. **Data Used**: 30m x 30m resolution Landsat 8 & 9 imagery for 2025 Daytime Surface Temperature. Amaravati's Master plan to identify land surface patterns that correlate with land use patterns. **Data Source**: Earthexplorer.USGS, APCRDA

4.4.1.1 Baseline Land Surface Temperature

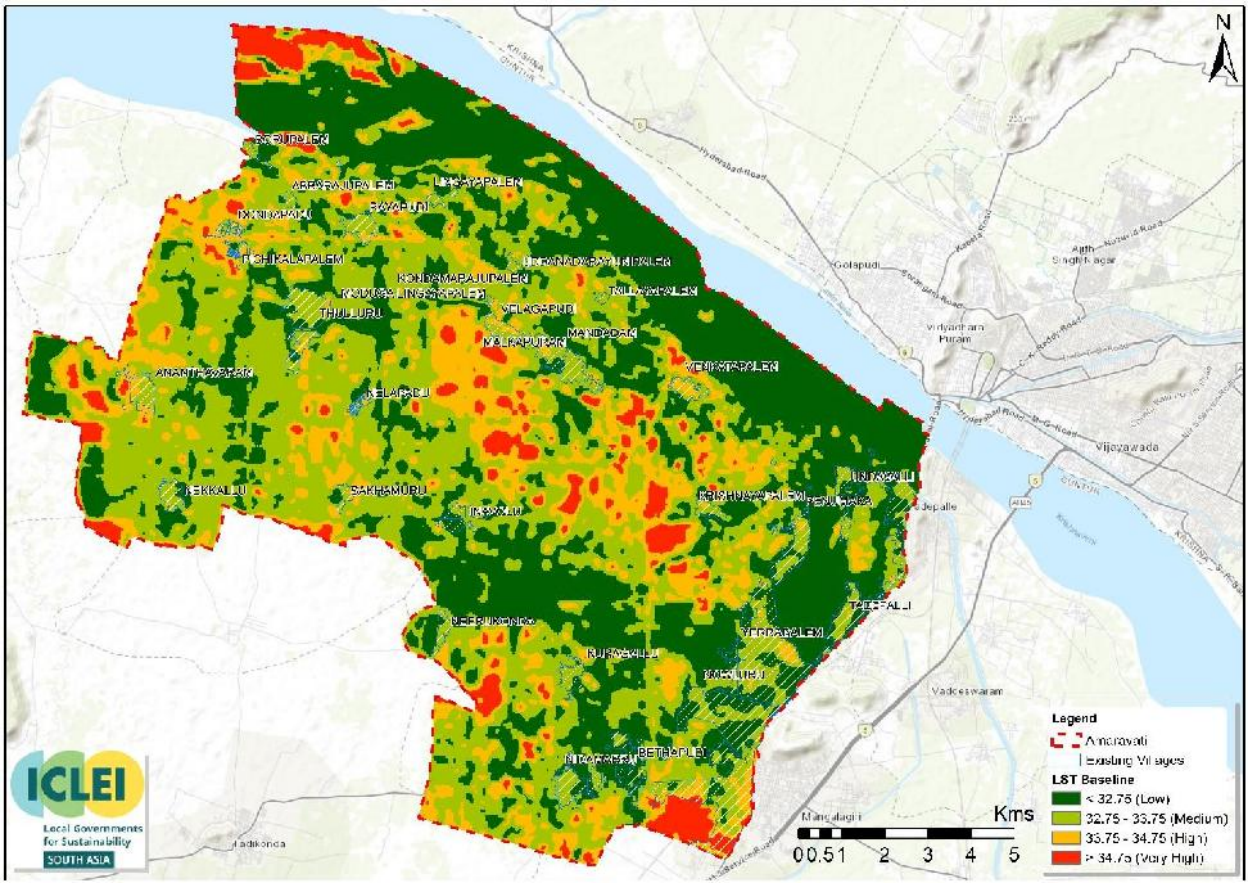


Figure 4-20 Land Surface Temperature Baseline
Source: Prepared by ICLEI South Asia based on Landsat 8 & 9 imagery

In the baseline scenario, LST for Amaravati varies between 27.69°C and 37.03°C. The cooler temperatures are observed in the deep backwaters of Prakasam barrage, while the highest surface temperatures occur in the Lanka villages, primarily due to the exposure of sand beds. Areas currently with no agricultural activity, particularly the region surrounded by the villages of Krishnayapalem, Ainavolu, Nelapadu, Velagapudi, and Lingayapalem, feature Black cotton soil, which is predominant in Amaravati and the Krishna basin has high

thermal conductivity[56], allowing barren land to absorb heat more rapidly during the day and cool down faster at night, resulting in very high LSTs exceeding 34.75°C. Notably, 16.44% of the Amaravati falls within the high LST range, largely due to the low albedo of barren land, which impedes its ability to reflect sunlight. Areas with vegetation and waterbodies reflect the lower LST.

4.4.1.2 Projected Land Surface Temperature for 2058

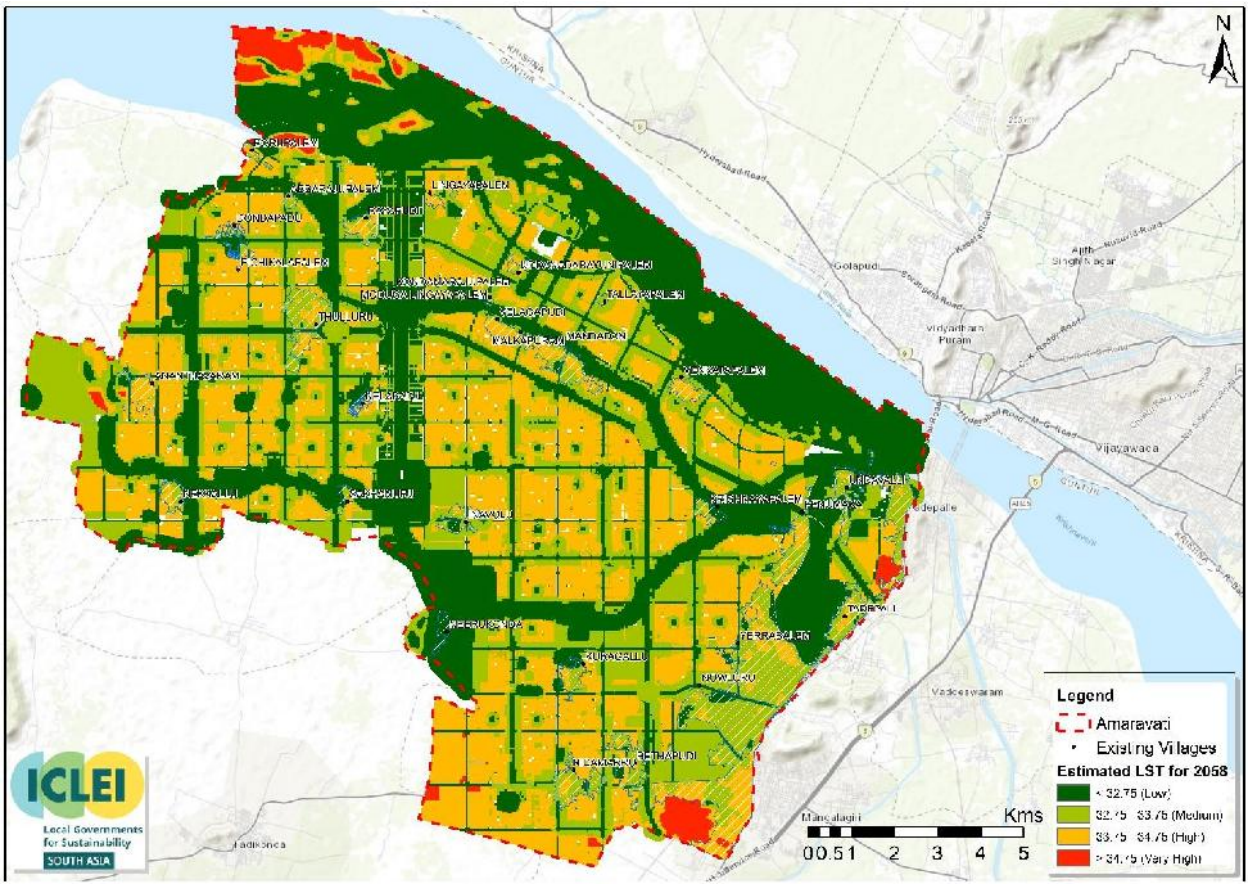


Figure 4-21 Land Surface Temperature projected for 2058

The estimated LST for 2058 was calculated to assess the effects of the proposed Master Plan on the temperature levels. The projected LST for 2058 ranges from 27.65°C to 36.93°C. Areas with very high LST are expected to decrease, as there will be no barren lands left without any activity. This is primarily limited to the villages of Lanka, which are situated in the backwaters of the River Krishna, and city level transport facilities. With the anticipated full development of Amaravati, the area is expected to be dominated by buildings that will produce higher LST values. However, the impact of proposed avenue plantations along the entire road network, as well as both passive and active green buffer areas along water bodies, is expected to play a vital role in lowering LST values. Once fully implemented, these initiatives are expected to significantly influence the microclimate of the Amaravati at the neighborhood level as well.

[56] Thermal conductivity of black soil 2 Days after Saturation (DAS) is 8.61 W m−1K−1 (1.4 Mgm-3 Compaction level) and 14.02 W m−1K−1 (1.2 Mgm-3 Compaction level) and 6 DAS is 3.88 (1.2 Mgm-3 Compaction level) and 5.73 (1.4 Mgm-3 Compaction level) (Pramanik & Aggarwal, 2013).

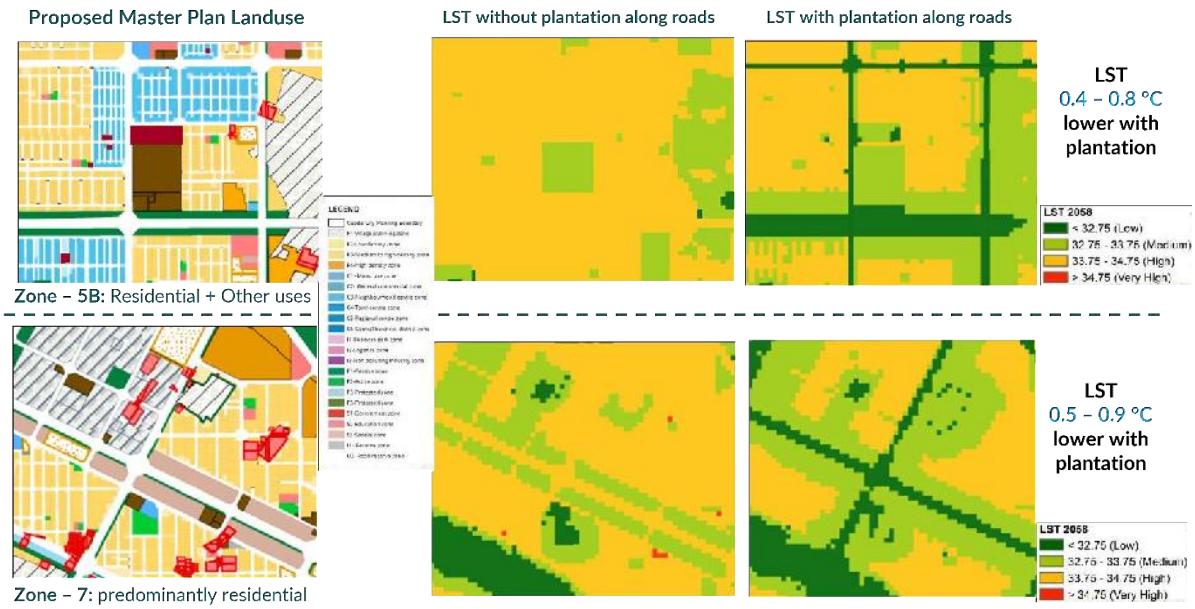


Figure 4-22: Illustration of expected reduction in LST from planned greening measures

The above illustrations demonstrate the modelled impact of the proposed plantation interventions on surface temperature reduction across selected land parcels in zone 5B (residential and mixed-use) and zone 7 (predominantly residential). The analysis compares the projected LST values for 2058 under two scenarios – without and with plantation along roads.

The results indicate that introducing roadside plantations and vegetative buffers could lead to a localized temperature reduction of approximately 0.4 to 0.9°C, depending on the landuse, surface characteristics and green cover. This highlights the importance of integrating nature-based solutions such as avenue plantations, green buffers, and parks into Amaravati's road and open space design. Such measures can mitigate the urban heat island effect, improve pedestrian comfort, and enhance micro-climate resilience as the city develops.

4.4.1.3 Spatial distribution of relatively hotter areas:

The hotspots are identified as areas within the city that exhibit relatively higher LST. Identifying these hotspots is crucial for implementing necessary precautionary measures and for recognizing vulnerable individuals who live or work in these areas for their livelihoods.

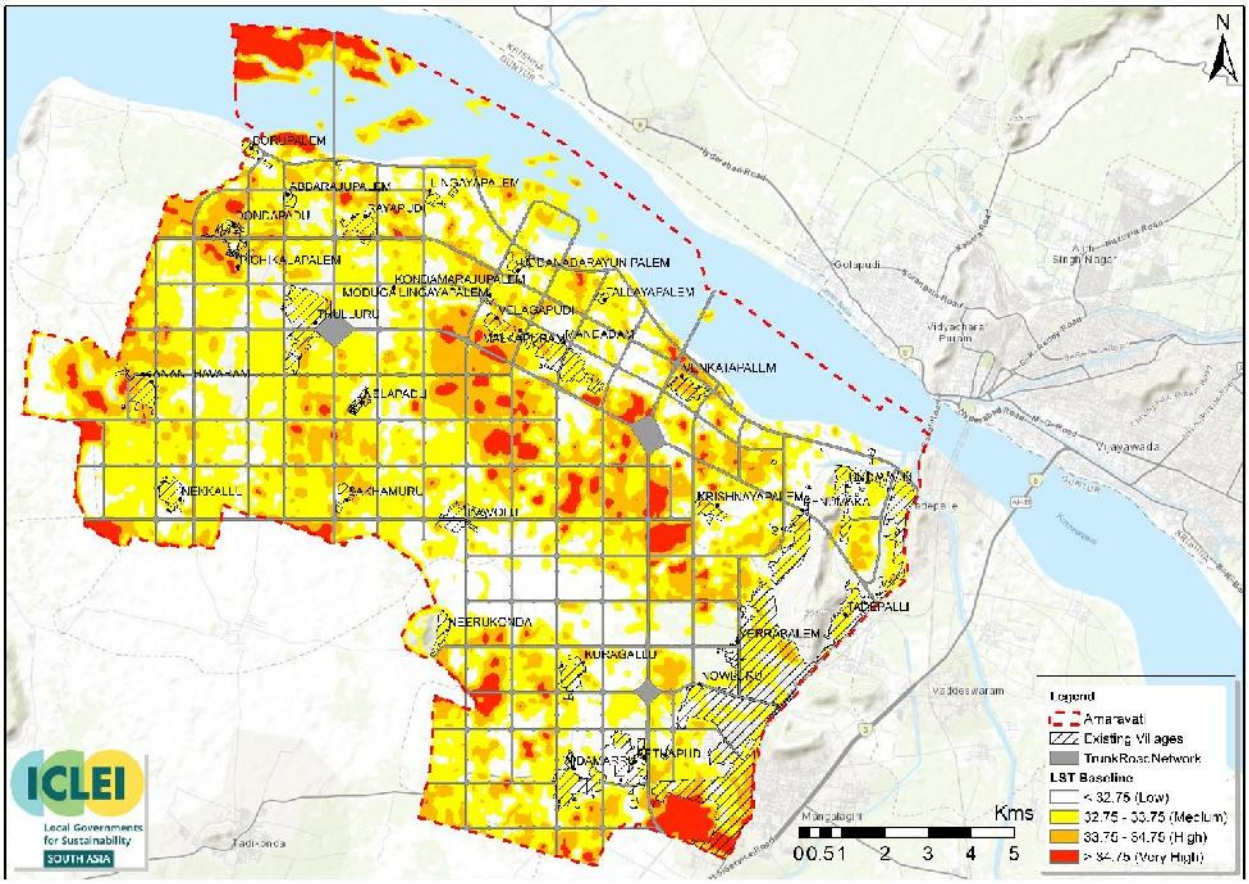


Figure 4-23 Hotspots in the baseline LST

As discussed in section 4.4.1.1, the baseline scenario indicates that the hotspot areas with very high and high LST are primarily open agricultural fields, where activities are currently limited. The existing village settlements display a mean of 33 °C, with values ranging from 28.9 °C in Nidamarru to 36.1 °C in Mangalagiri due to its urban context. With the anticipated construction of infrastructure and buildings, the number of vulnerable individuals is expected to increase. This could lead to negative health impacts such as fatigue, thermal discomfort, and heat strokes, as well as reduced productivity. In the baseline scenario, construction workers, along with village residents, are particularly susceptible to extreme heat. Although converting open lands to buildings may reduce LST to some extent, it is important to address the potential exposure risks during the construction phase as well as try to reduce the heat island effects by using green roofs or cool roofs and increasing green belt cover around built up areas.

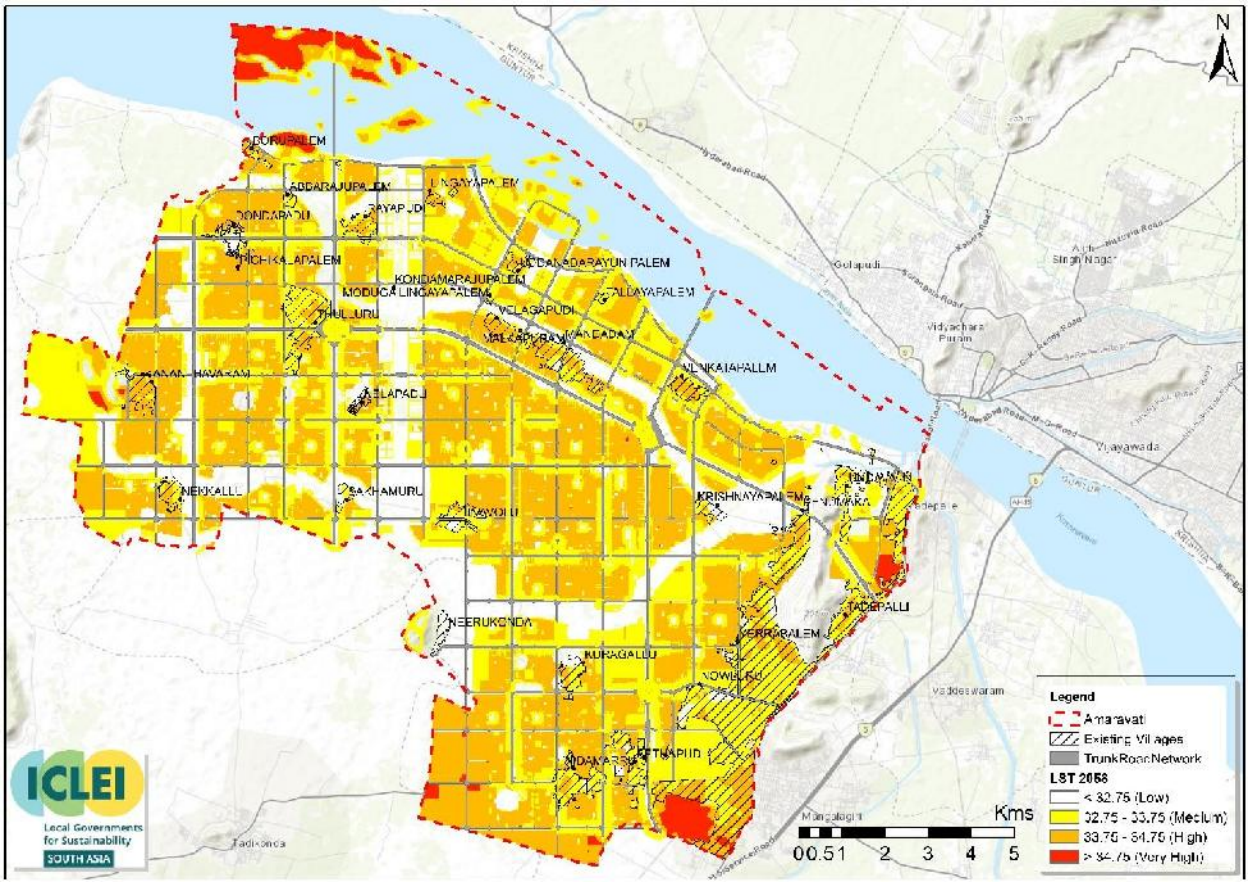


Figure 4-24 Estimated LST hotspots for 2058

Table 4-6 Comparison of areas under baseline and 2058 projected LST ranges

Range	LST Baseline		2058 LST	
	Area (sq. km)	Percentage	Area (sq.km)	Percentage
< 32.75 (Low)	81.99	37.74%	82.5	37.98%
32.75 to 33.75 (Medium)	89.25	41.09%	63.96	29.44%
33.75 to 34.75 (High)	35.72	16.44%	66.68	30.70%
> 34.75 (Very High)	10.27	4.73%	4.09	1.88%

In 2058, LST estimate indicates that the percentage of land area classified as very high heat zones (temperatures exceeding 34.75 °C) decreases from 4.73% in 2025 to 1.88% in 2058. In contrast, the percentage of land falling under high heat zones is projected to increase from 16.44% to 30.7%. This change suggests that a significantly larger portion of the city will experience temperatures in the range of 33.75 °C to 34.75 °C. Consequently, a greater number of residents will be subjected to considerable heat stress, potentially affecting their health and productivity. As the population grows, it is particularly concerning for vulnerable groups, such as the elderly and children, who may be at greater risk from exposure to extreme heat.

Analyzing the relationship between heat hotspots and the master plan reveals that these high heat areas correspond to medium and high-density zones, as well as locations designated for residential and commercial land use. This underscores the importance of implementing policies such as zoning regulations in accordance with Energy Conservation and Building Code (ECBC), which incorporate heat resilience measures. These measures encompass both passive and active thermal comfort strategies aimed at mitigating the effects of extreme heat as well as maintaining green belts and sufficient green cover to regulate the micro climate.

4.4.2 Assessment of Flood

Flooding in the greenfield city of Amaravati primarily occurs due to the low-lying topography and overflow of backwaters to the *vagus* from Krishna River. The flood is further exacerbated by the backflow of water from *vagus* when the Prakasam Barrage gates are closed, impacting the residents in the existing village settlements. As the village settlements get flooded, residents divert the water to nearby agricultural fields using pumping motors. The fields are inundated for a prolonged period, disrupting agricultural work. When construction activities in Amaravati city began in 2024, there was a temporary blockage and diversion of the natural drainage channel of the *vagus*. Rapid urbanization and encroachments on natural flood paths have hindered the natural drainage of floodwaters, resulting in the recent flooding event in September 2024[57][58].

The following analysis aims to identify areas that have experienced persistent waterlogging over the past 30 years and compare these waterlogged areas with the September 2024 flood event[59] to analyse the changes in recurring inundation patterns and assess waterlogging occurrences during ongoing construction in Amaravati.

Methodology for occurrence and recurrence flood analysis

Step 1: Data Acquisition and Preprocessing

An extensive archive of Landsat satellite imagery from 1984 to 2021 has been gathered. The collected satellite imagery, in spite of the presence of extensive cloud cover and atmospheric interference, was processed using radiometric calibration, atmospheric correction, and quality filtering to remove cloud cover.

Step 2: Water Classification via an Expert System

Each pre-processed Landsat imagery is then analysed pixel by pixel using an expert system specifically designed to detect water. The system uses spectral properties and signatures of water, incorporating indices such as Normalized Difference Water Index (NDWI), to classify each pixel as water or non-water.

Step 3: Temporal Aggregation to Generate Water Occurrence and Recurrence Datasets

After water has been detected in individual images, the results are aggregated over time.

[57] Rainfall inundating 25 out of its 29 villages in Amaravati city, Hindustan Times, September 2024, Accessed June 2025
[58] Budameru causes flooding in Vijayawada again after 20 years, The Times of India, September 2024, Accessed June 2025
[59] The most recent flood event is selected for the study as it recorded 28 cm of rainfall at the Amaravati weather station on 31 August, with 15 cm falling in just three hours due to cumulonimbus clouds and a Bay of Bengal depression. Torrential rain in the Krishna River's upper catchment submerged land in 25 of 29 villages, with floodwaters taking over a week to recede

• **Water Occurrence Dataset[60]:** At every pixel, the water occurrence value is determined as the ratio between the number of times water was detected and the total number of clear-sky, valid observations. This ratio is then expressed as a percentage, providing a long-term statistic of the presence of water at that location during the entire period of observation.

• **Water Recurrence Dataset:[61]** To capture seasonal dynamics, the water occurrence data are further organized by month. Specifically, the system calculates the percentage of years in which water was observed in each of the 12 calendar months of the year. The monthly recurrence metric is used to understand the regular seasonal patterns and variability of water presence.

Step 4: Risk assessment and adaptive capacity

The water occurrence and recurrence maps are overlaid with existing village settlements to assess exposure and adaptive capacity of the vulnerable sections.

Limitations to this process followed are noted below:

- A 30-meter pixel resolution cannot capture ponds, narrow streams or small irrigation channels
- Landsat captures images every 16 days, so waterlogging events lasting less than two weeks may be missed entirely
- Cloud cover reduces the number of clear-sky observations, causing waterlogging occurrences to be lower

4.4.2.1 Occurrence and Recurrence of Flooding

Amaravati city experienced a high-intensity rainfall event in September 2024, the highest in the last decade. Waterlogged areas from the September 2024 event are mapped using Landsat imagery processed in Google Earth Engine and ArcGIS. The September 2024 floods have affected approximately 8% (17.5 square kilometer) of the total Amaravati city area (Figure 4-25). During the focus group discussion,[62] village residents of Rayapudi and Velagapudi reported that the embankments and other construction activities along the two *vagus* are hindering natural water flow, causing waterlogging in the settlement area.

The village residents pump and divert the water from the settlements to the nearby agricultural fields, causing waterlogging for 3–5 days. Primarily, the north central part of the city is observed to be severely inundated due to the overflow of the *vagus*.

[60] The Water Occurrence shows where surface water occurred between 1984 and 2021 and provides information concerning overall water dynamics. This dataset captures both the intra and inter-annual variability and changes.
[61] The Water Recurrence provides the inter-annual behavior of water surfaces between 1984 and 2021 and captures the frequency with which water returns from year to year.
[62] Focus Group Discussions were held with key stakeholders to gather valuable insights, local knowledge, and sector-specific perspectives that will inform the existing Climate Risks and Vulnerabilities Annexure M.

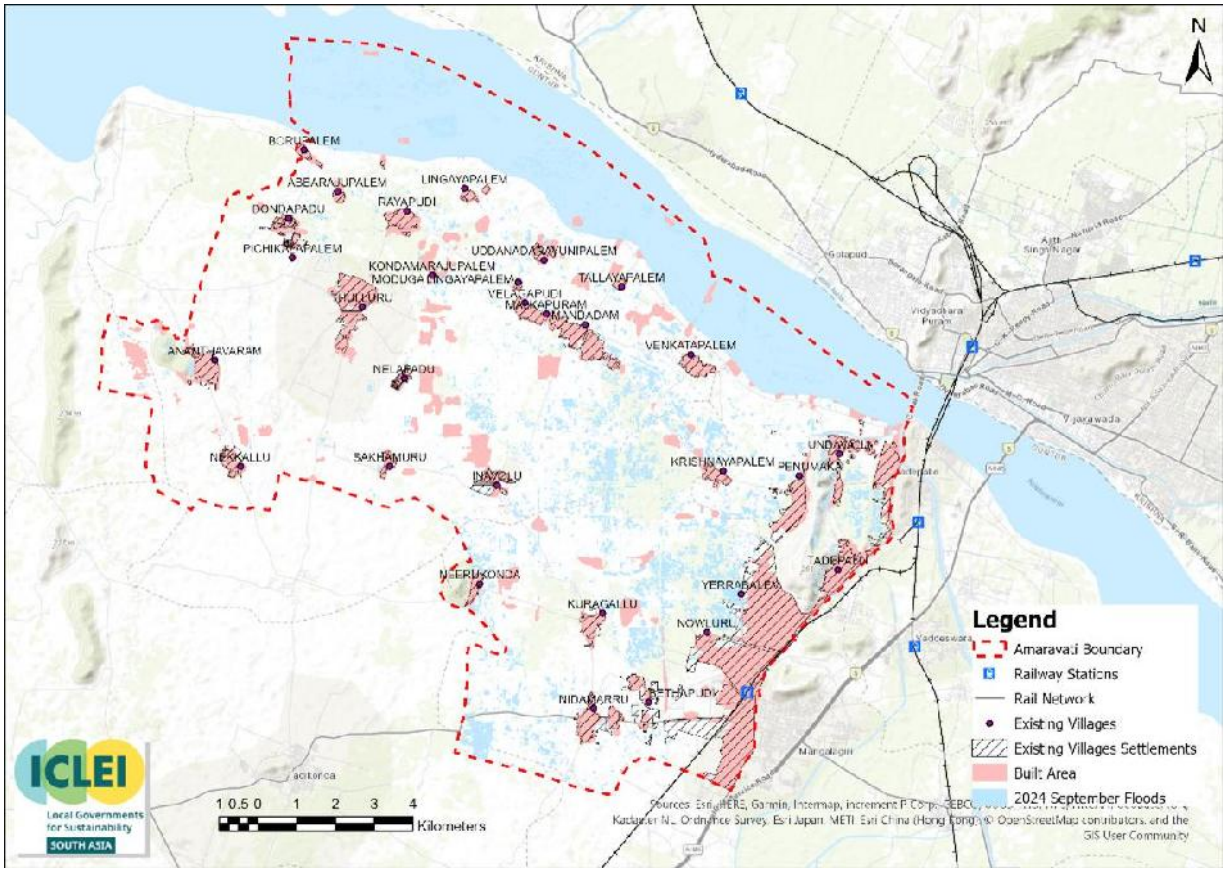


Figure 4-25 Waterlogging in September 2024

Source: Map prepared by ICLEI South Asia, based on data sourced from APCRDA and Sentinel-1 imagery processed using Google Earth Engine

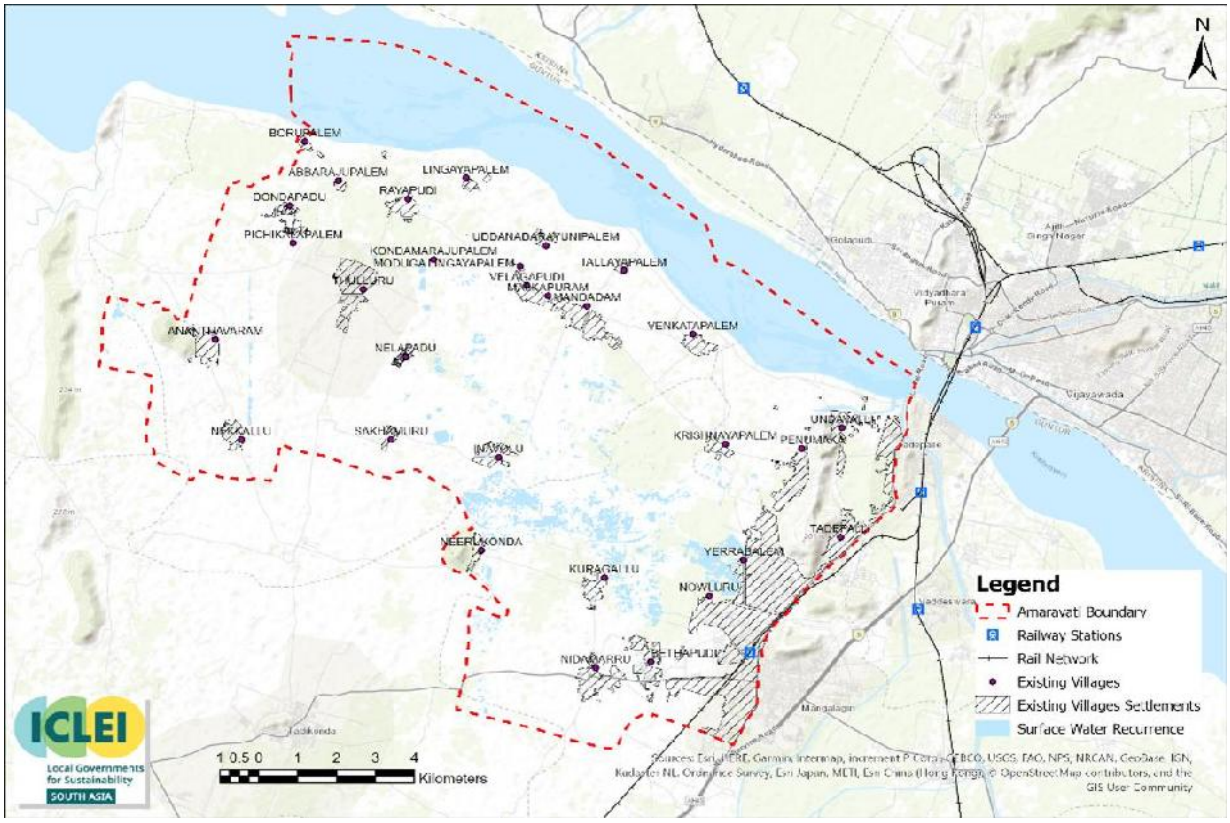


Figure 4-26 Recurrence of Waterlogging (1984-2021)

Source: Map prepared by ICLEI South Asia, based on data sourced from APCRDA and raster data sourced from Global Surface Water Explorer.

The recurrence of waterlogged areas from 1984 to 2021 is mapped using Landsat imagery and processed in Google Earth Engine and ArcGIS. Landsat imagery is used to generate the 100% waterlogging recurrence[63] map. In Figure 4-26, it is seen that the south and central part of the city is severely waterlogged, particularly impacting village settlements such as Neerukonda, Kuragallu, Yerrabalem, and Nowluru that are adjacent to the vagus. Approximately 6% (14.2 square kilometers) of the total Amaravati city area is seen waterlogged in the recurrence scenario.

[63] Water recurrence measures how often a body of water appears in the same location over many years, expressed as a percentage. 100% water recurrence means that water is observed every year during the water season. It is calculated by dividing the number of water years by the total number of observation years; if these numbers match, water recurrence is 100%.

Figure 4-27 Weeds obstruct the natural flow of water in Kondaveeti Vagu during heavy rainfall events, as dated 02nd June 2025

Figure 4-28 Weeds obstruct the natural flow of water in Pala Vagu during heavy rainfall events, as dated 02nd June 2025

The analysis presented in Figure 4-5 and Figure 4-6 shows that the pattern of flooding has changed, with a shift evident in inundated areas from the southern part of the city towards areas in the north central part. Infrastructure development for the capital city has altered *vagus* pathways and flow patterns, diverting rainwater away from retention ponds. The obstruction of water flow caused by excessive weed growth in the *vagus* is impeding water flow and increasing retention time and inundation, leading to severe waterlogging. Effective planning is crucial to prevent waterlogging in existing settlements until a integrated stormwater system is established. (Figure 4-27~~Figure 4-27~~ and Figure 4-28~~Figure 4-28~~).

4.4.2.2 Spatial analysis of flood risk

As Amaravati develops, it is crucial to assess flood extent to determine which parts of the city and settlements might be at risk, and to plan measures that reduce vulnerability and enhance the city's resilience to flooding. The analysis in this section is based on the inferences from the spatial flood analysis in the Kondaveeti Vagu flood management report.[64]

Baseline flood analysis:

Amaravati baseline analysis examines the entire Kondaveeti Vagu catchment area, with 2% imperviousness. Existing natural drainage network of Kondaveeti vagu and Pala vagu with planned outflow through the

[64] KONDAVEETI VAGU FLOOD MANAGEMENT, UPDATING OF THE BLUE MASTER PLAN, Final Report on Phase-1 & Phase-2, Flood Management Works within ACC, ADCL, APCRDA

Krishna West Distribution Canal and Undavalli pumping station, which is equipped with 15 pumps with a total discharge capacity of 150 cumec is major infrastructure in place considered for analysis. A design rainfall of 277 mm over 24 hours in the Kondaveeti vagu catchment, based on a 100-year return period, has been identified. These parameters serve as the foundation for the HECRAS analysis to determine the extent of flooding, with the results presented below (Figure 4-29 and Figure 4-30).[65]

The analysis indicates that flooding severity is concentrated along the Kondaveeti Vagu and Pala Vagu channels, primarily due to inadequate cross-sectional capacity to accommodate the generated runoff. Additionally, adjacent settlements in Neerukonda, Kuragallu, Bethapudi, Nowluru, and Yerrabalem are at risk of flooding and inundation due to overflow from existing water bodies. The backwater flow observed at Undavalli results from peak runoff volumes exceeding the designed hydraulic capacity of the installed pumping infrastructure.

[65] Draft Report on Phase-1 & Phase-2 Works of Kondaveeti Vagu Flood Management, ADCL, APCRDA.

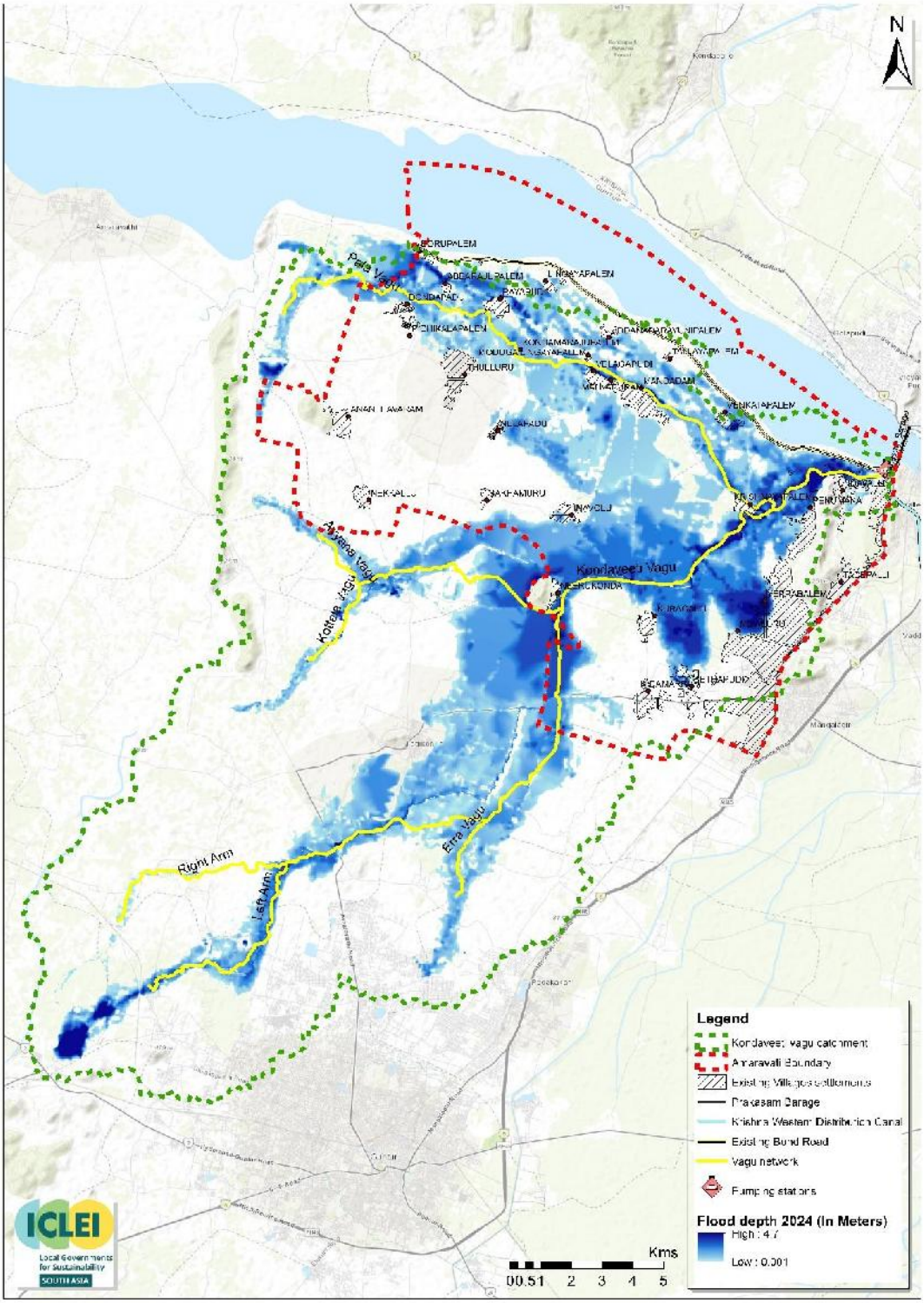


Figure 4-29 Flood analysis of Kondaveeti vagu catchment for baseline scenario 2024 for a 100-year return period rainfall

Source: Map prepared by ICLEI South Asia, based on 2024 scenario from Report on Phase-1 & Phase-2 Works of Kondaveeti vagu flood management, ADCL, APCRDA.

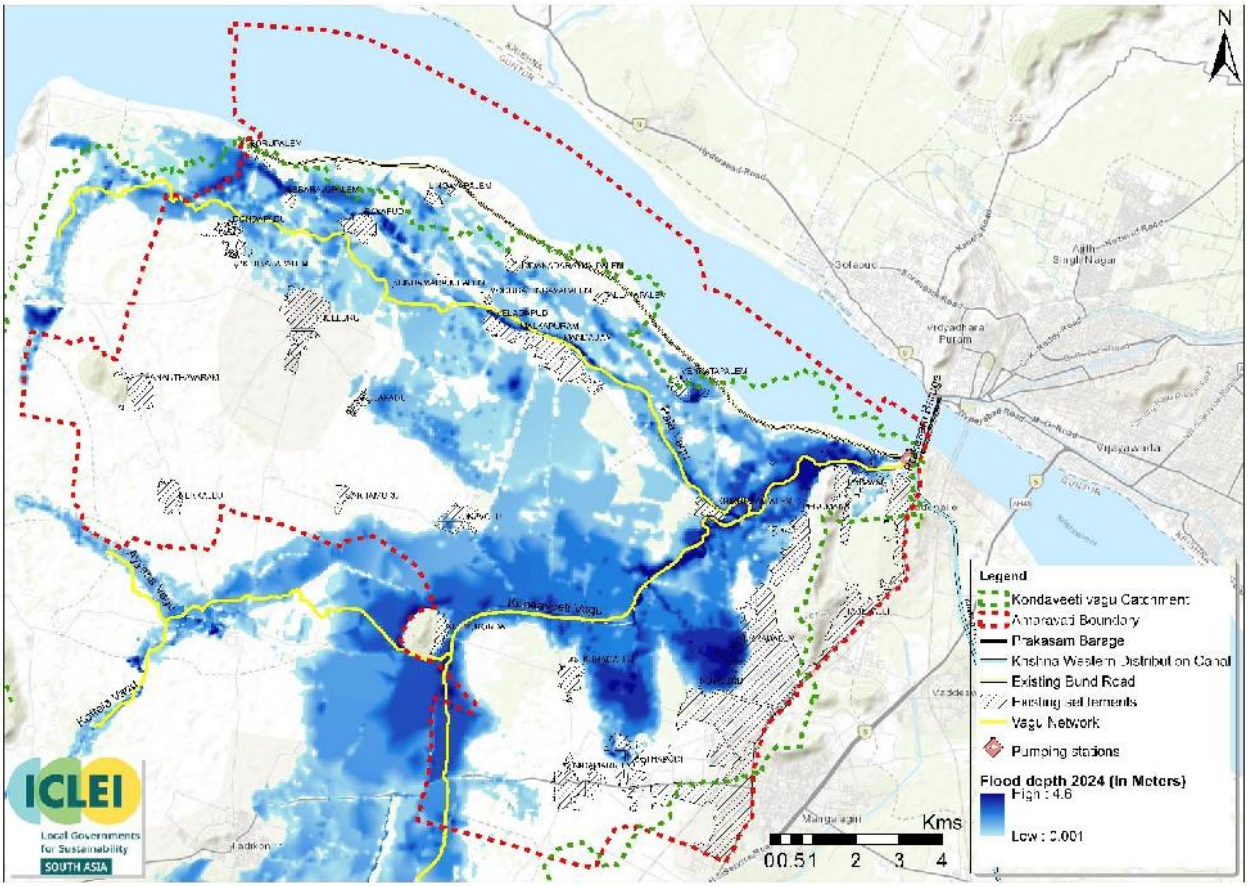


Figure 4-30 Flood analysis of Amaravati for baseline scenario 2024 for a 100-year return period rainfall
Source: Map prepared by ICLEI South Asia, based on 2024 scenario from Report on Phase-1 & Phase-2 Works of Kondaveeti vagu flood management, ADCL, APCRDA.

Near future scenario:

Analysis for the near future scenario is for the period of ongoing first phase of network construction, such as widening of Kondaveetivagu and Pala vagu, and enhancement of pumping capacity at Undavalli to 360 cumec from the existing 150 cumec, along with reservoirs at Krishnayapalem, Sakamuru, Nowluru, Yerrabalem, and Neerukonda. Also, the construction of the gravity channel is part of the first phase works.

In this scenario, it is observed that road junctions of E10, E11, E12 with N4, N6, N7, N8, N9 are prone to waterlogging. Additionally, the existing settlements in Ainavolu, Krishnayapalem, Nowluru, and Yerrabalem are prone to flooding, making them vulnerable to this hazard.

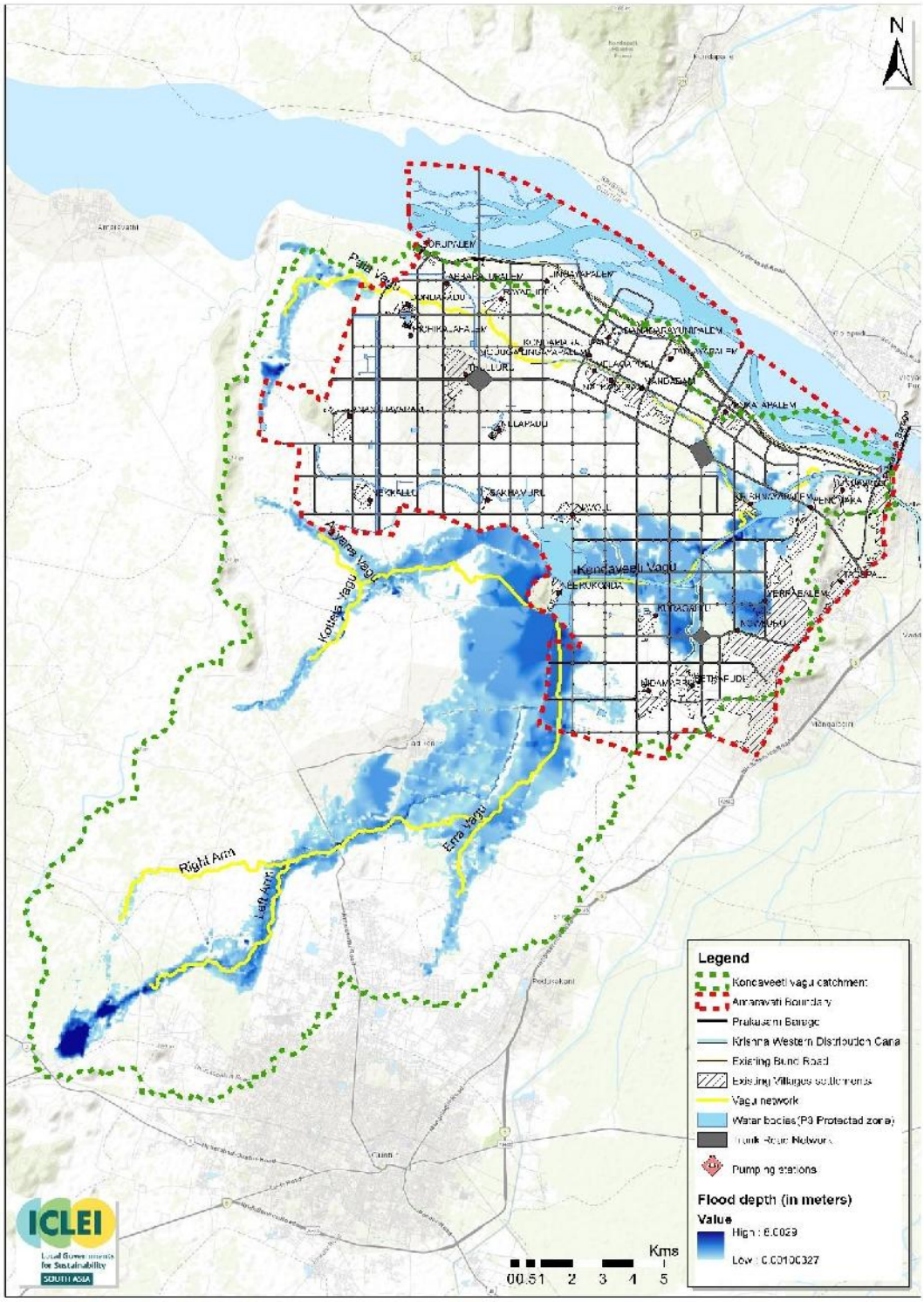


Figure 4-31 Flood analysis of Kondaveeti vagu catchment for near future scenario for a 100-year return period rainfall

Source: Map prepared by ICLEI South Asia, based on 2025 scenario from Report on Phase-1 & Phase-2 Works of Kondaveeti vagu flood management, ADCL, APCRDA.

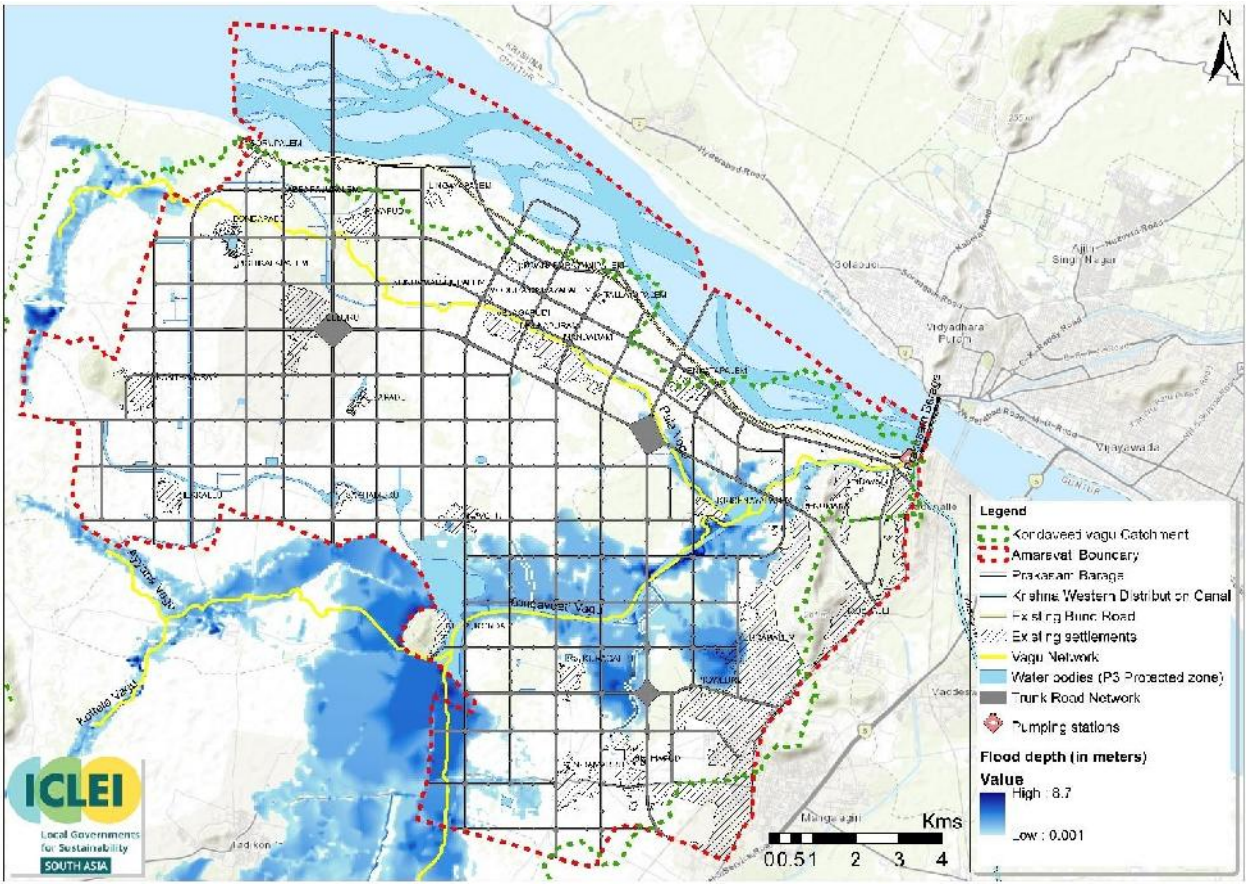


Figure 4-32 Flood analysis of Amaravati for near future scenario for a 100-year return period rainfall
Source: Map prepared by ICLEI South Asia, based on 2025 scenario from Report on Phase-1 & Phase-2 Works of Kondaveeti vagu flood management, ADCL, APCRDA.

The vulnerability of the areas on the upstream of the Amaravati has seen no change, as there are no infrastructure upgradation plans in the first phase. Areas continue to have the same risk as before in the baseline scenario.

4.4.3 Existing villages' vulnerability to climate risks

The vulnerability of existing villages to higher temperatures and flood risk requires different interventions to mitigate these risks. With the anticipated urbanisation, the relative risk level compared to the Amaravati jurisdiction might change over time with infrastructure and interventions in place. Still, in the near future, these vulnerable villages can be targeted for immediate interventions and data collection to identify changes that can be studied and analyzed, which will help in developing new policies and interventions.

Table 4-7 Existing villages' vulnerability to climate risks

Vulnerability to high temperature	**Vulnerability to flood risk**
Pichukalapalem, Dondapadu, Ananthavaram, Velagapudi, Venkatapalem.	Krishnayapalem, Sakamuru, Nowluru, Yerrabalem and Neerukonda

4.5 Consequences of Projected Climate Change on urban services infrastructure

4.5.1 Projected Climate Change

Projected climate scenarios indicate a trend of rising maximum and minimum temperatures over time, which may lead to the emergence of more hotspots. By overlaying identified hotspots with planned infrastructure, we can analyze the potential impacts on various urban service infrastructures, which could affect service levels.

According to the rainfall projection studies detailed in Section 4.3, there is an overall change in rainfall patterns due to climate change. The RCP scenario from the IIT Madras study indicates a decrease in average annual rainfall of 40-70 mm and an increase in high-intensity rainfall events, exacerbating extreme flood events. This is also evident from the recurrence and occurrence spatial maps, which demonstrate an increase in inundation areas due to climate change (Section 4.4.2.1).

Impact on water supply and wastewater

As temperatures increase, water usage also rises. The estimated demand for clear water includes an additional 10% buffer, which is vital for maintaining the distribution network and quickly addressing any interruptions or repairs. The Prakasam Barrage and the proposed Vykuntapuram Barrage are expected to meet the supply water demand for Amaravati. In existing settlements, groundwater is commonly used to supplement supply gaps. Once the water network is operational, groundwater conservation should be prioritized, especially as drought years are likely to increase. Reusing treated wastewater can help ease pressure on the water system during droughts. The water treatment plant in Venkatapalem is vulnerable to flooding, any failures could disrupt the drinking water supply for most of the city. Additionally, STPs in zones 10, 12, and 12a are at risk of flooding, requiring design improvements to minimize operational disruptions. Several water and wastewater pumping stations along Kondaveeti Vagu are also vulnerable to flooding, which could affect service even in non-risk areas. These stations should be designed with higher plinth levels to decrease flood impact, ensuring reliable operation during extreme weather events.

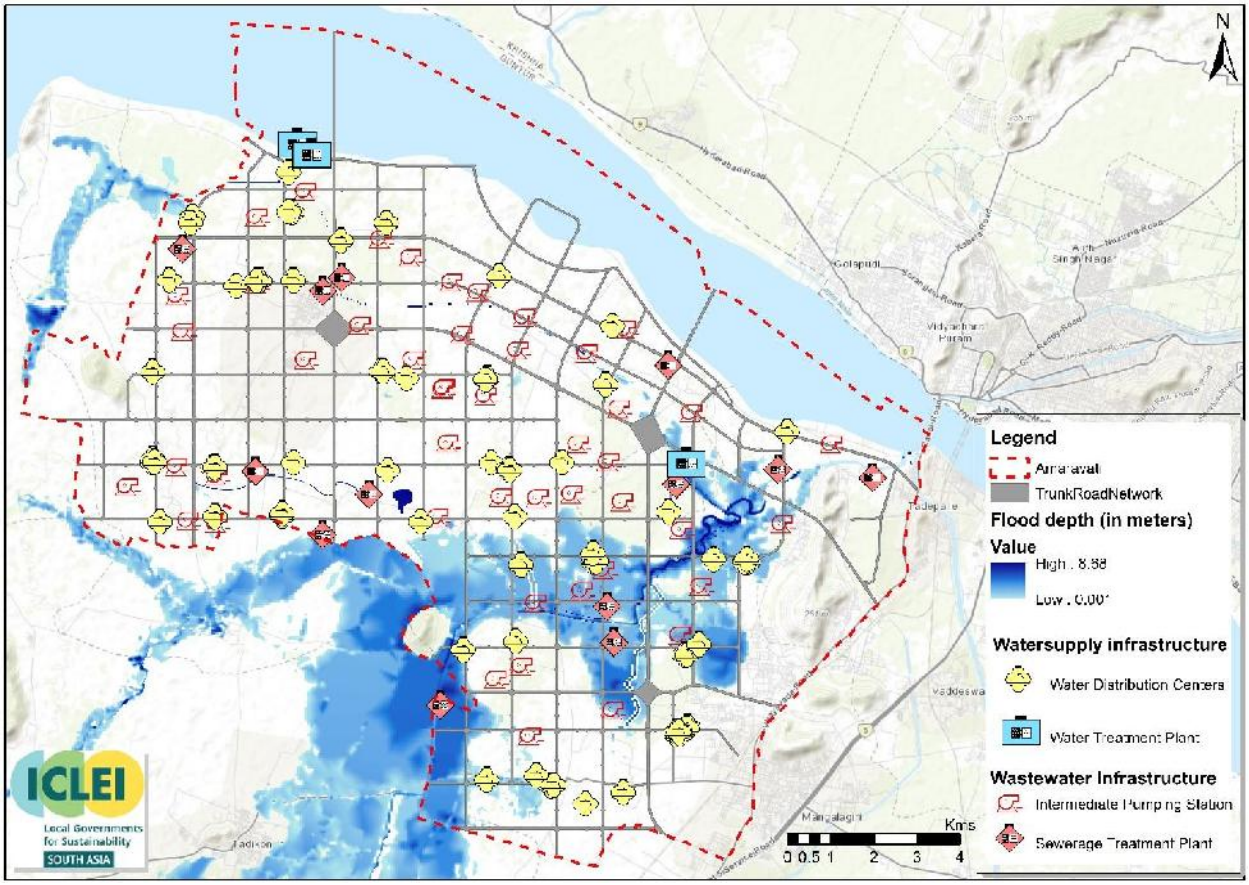


Figure 4-33 Water supply and wastewater infrastructure in the near future flood vulnerable areas.
Source: Prepared by ICLEI South Asia based on data received from APCRDA and ADCL.

Impact on mobility

Figure 4-34 shows that at least 12 out of the 15 proposed city bus depots lie in high heat hotspot (orange) areas. Extreme heat conditions are likely to shift commuters away from public transit and non-motorized transport modes towards private transit modes, especially cars and intermediate transit like taxis. In the absence of shaded bus stops, extreme heat can also affect commuters of the elderly age group, women, and children who remain highly vulnerable. Given that Amaravati is aiming for a 35% mode share for public transport and 40% for NMT by 2050, the city should ensure that, along with avenue plantations, footpaths can also include water kiosks and shaded rest areas.

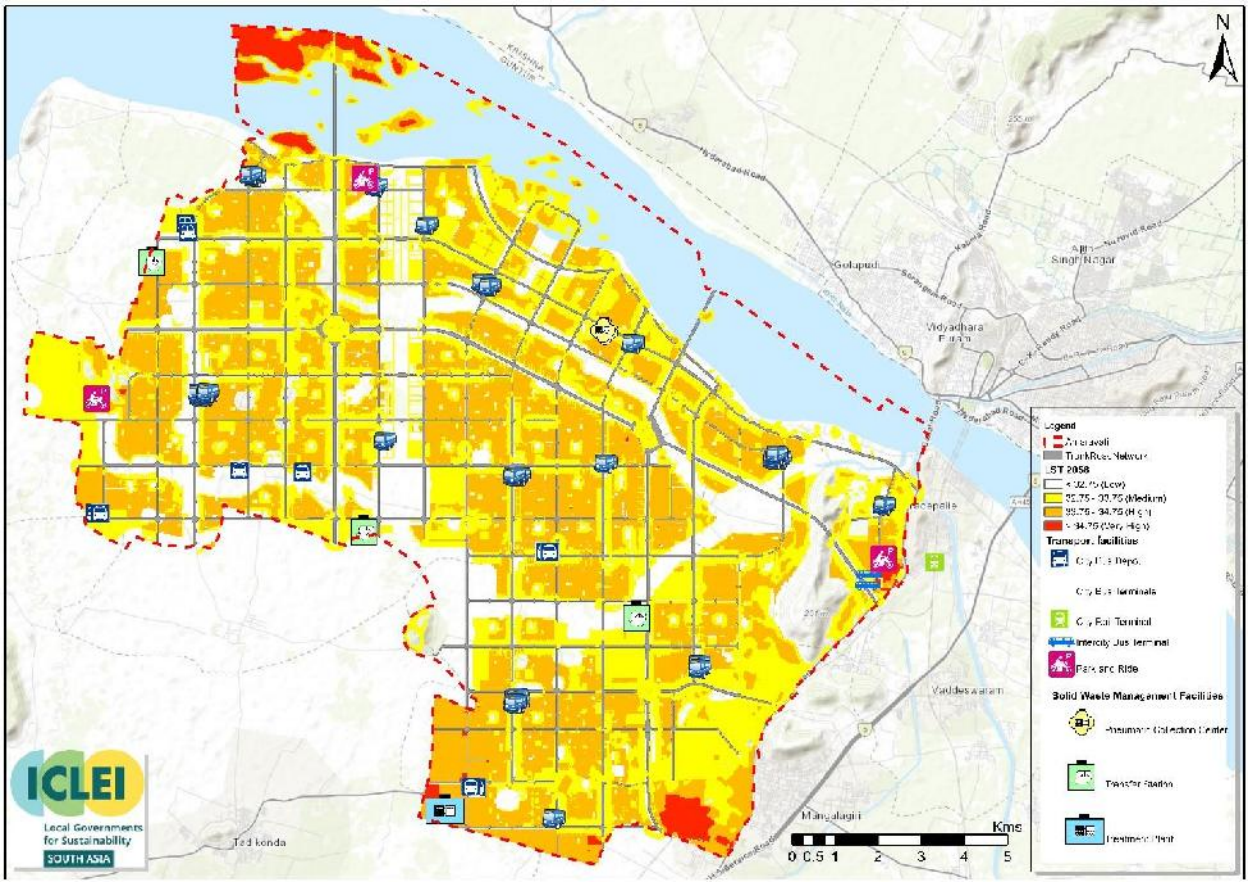


Figure 4-34 Transport and Solid waste management infrastructure in the vicinity of estimated LST hotspots for 2058

Source: Prepared by ICLEI South Asia based on data received from APCRDA.

The planned bus depots should have shading and fans where possible to minimize the impact of extreme heat on public transport users. The intercity bus terminal planned also falls under a very high heat zone, highlighting the need for adequate heat mitigation measures like shading and vegetation. Also, out of two proposed park and ride facilities, one falls under a very high heat hotspot, while another lies in a high heat zone. The city should ensure that these facilities have shading, to enable more users to avail this facility and increase last mile access for mass transit.

The high rainfall event in 2024 affected residents along the Krishna River basin, with 12 feet high water levels, and settlements were surrounded by water, leaving no emergency evacuation routes or communication, and resulting in residents being stranded and isolated.

In a future flooding scenario, roads E10, E11, E12, N3, and N10 are particularly vulnerable. Vulnerability is distributed along the Kondaveeti Vagu, putting nearby bus depots and terminals at risk of flooding. Since the Kondaveeti Vagu divides the city into two parts, flooding can disrupt connectivity entirely, delaying response efforts. Elevating transport hubs and road networks is necessary to reduce this vulnerability, and mechanical pumping measures may be used depending on the severity of the flooding.

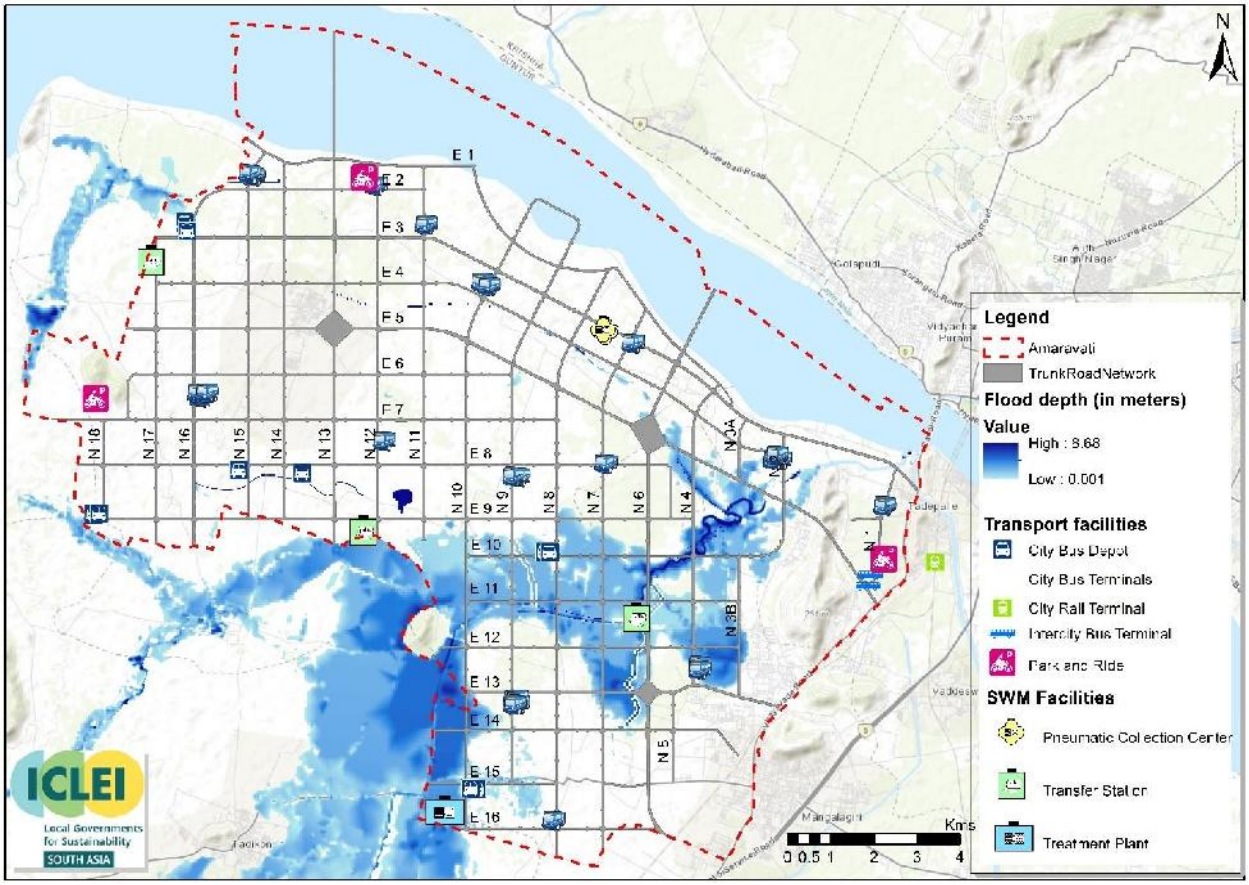


Figure 4-35 Transport and Solid waste management infrastructure in the near future flood vulnerable areas.

Source: Prepared by ICLEI South Asia based on data received from APCRDA and ADCL.

Impact on sanitation

The map indicates that the waste treatment facility and some of the transfer stations lie in high or very high heat hotspots (Figure 4-34). Extreme heat can impact both the infrastructure and operations of waste treatment plants and transfer stations. In terms of infrastructure, extreme heat can overheat equipment like shredders or conveyers particularly in the proposed Material Recovery Facilities (MRFs) located at bulk transfer stations. It can also lead to faster decomposition of wet waste, leading to foul odour and affect treatment efficiency through the proposed bio methanation and composting facilities.

Extreme heat can also affect worker health and productivity, leading to dehydration and fatigue, particularly for workers working outside. The city should ensure that these waste treatment facilities and transfer stations have adequate heat mitigation measures in place, such as insulated roofs, cooling and ventilation systems, along with rest zones and drinking water availability for workers.

The identified parcel of land designated for solid waste treatment facilities is prone to flooding, which could affect the entire city's waste management system since it is a centralized facility. Additionally, the transfer station intended to serve the southeastern and southern parts of the city is also at risk, further exacerbating waste management challenges. Transportation of solid waste from Amaravati city in the northern part of

Kondaveeti Vagu could be disrupted during surges in the Vagu. Water contamination of waste reduces processing efficiency for both wet and dry waste.

Increased frequency of waterlogging and changes in drainage patterns may pose risks to water contamination, particularly in Neerukonda and Kuragallu. Water logging can contaminate ground water, potentially impacting future water requirements. Prolonged waterlogging creates breeding grounds for disease causing vectors, risking public health through water borne and vector borne diseases.

Impact on social infrastructure

Social infrastructure especially the Anganwadis, schools and PHCs where the vulnerable groups like children, elderly and unhealthy people visit, when located in hotspots can pose a greater risk on their health. Currently existing and proposed health centres is serviceable[66] to only 19% of the Amaravati, which suggests requirement of more health facilities to come up spatially covering the entire city. The staff in the health facilities should conduct awareness programmes on safety precautions to be taken during hotter days and knowledge dissemination about the warnings issued by the IMD and State or District disaster management authorities. Also, 11 health facilities are falling in the high-risk hotspot area out of total 19[67] and 29 educational facilities out of 57[68] are falling in the high-risk hotspot area. Facilities located in the hotspot areas should include the thermal insulation features in the building infrastructure.

[66] HWCs should be located preferably within 1 kilometer radius from the periphery of under-served population in vulnerable pockets, Indian Public Health Standards, Health and Wellness centres Sub Health centres, Volume 4, 2022.
[67] 19 health facilities include 18 E Health centres and 1 PHC.
[68] 57 Education facilities include 30 Anganwadi centres, 24 schools and 3 school playgrounds.

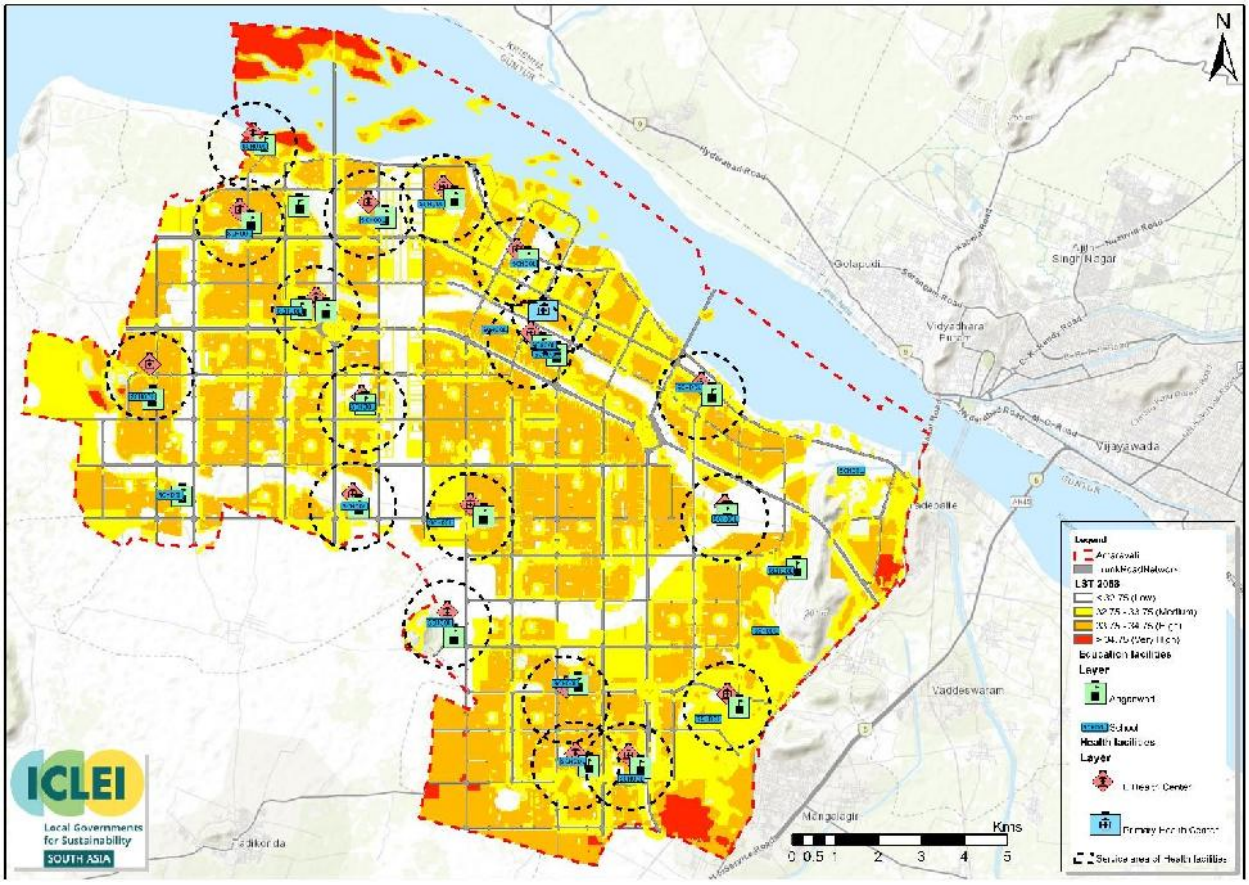


Figure 4-36 Social infrastructure (Health and Educational facilities) in the vicinity of estimated LST hotspots for 2058

Source: Prepared by ICLEI South Asia based on data received from APCRDA.

Educational and health facilities in the Neerukonda and Krishnayapalem villages are located in the flood vulnerable zone. These facilities which act as rehabilitation centers to relocate vulnerable groups when flooded will make immediate responses difficult to access. Also due to disrupted mobility networks leading

to restricted mobility and limited access, vulnerable populations, particularly the elderly, women, and children, will face significant safety concerns.

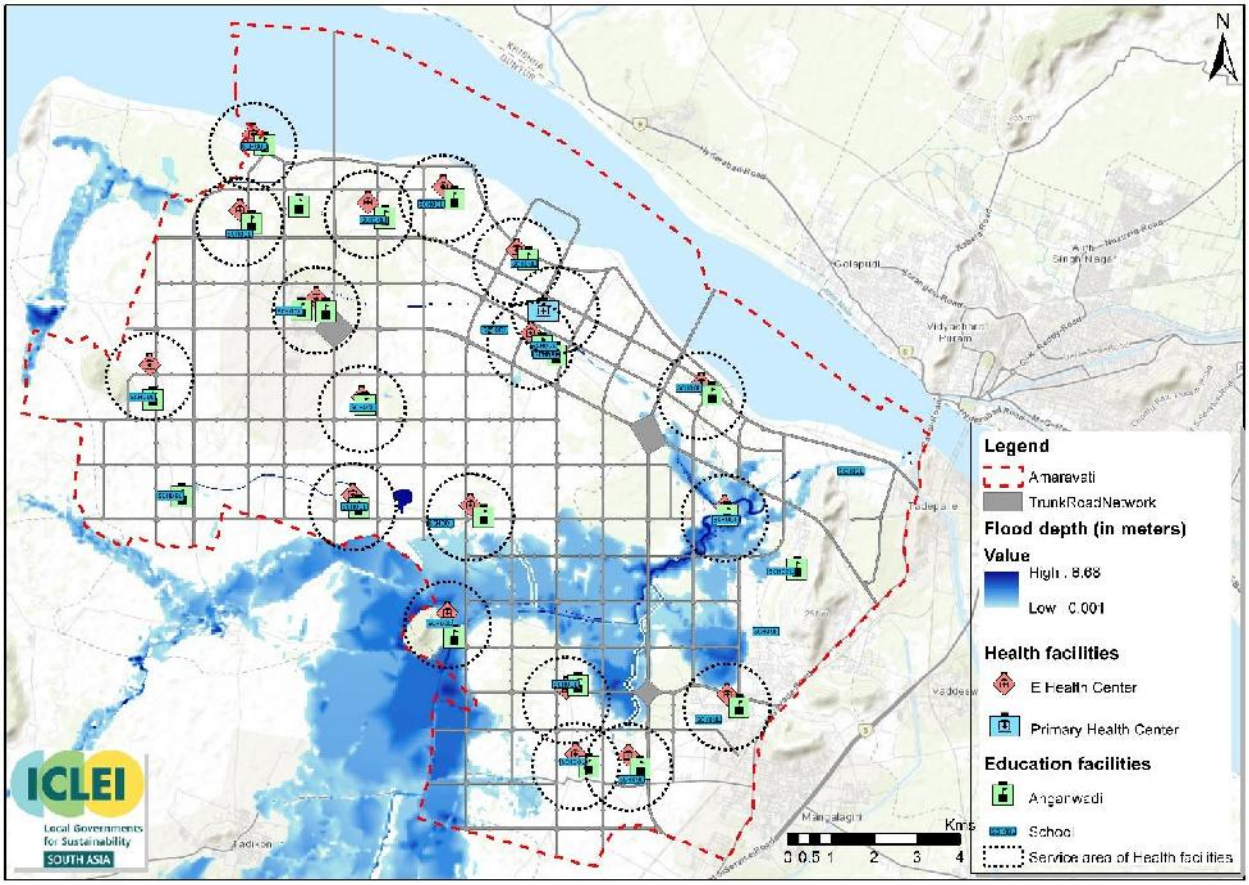


Figure 4-37 Social infrastructure (Health and Educational facilities) in the near future flood vulnerable areas.

Source: Prepared by ICLEI South Asia based on data received from APCRDA and ADCL.

4.5.2 Interventions for immediate term

To mitigate impacts on existing settlements, construction workers and other vulnerable groups while infrastructure development is underway, APCRDA could adopt interventions in phased manner in the immediate term.

- Temporary drainage systems can be constructed to ensure water is diverted effectively. Portable pumps can reduce prolonged water stagnation. Additionally, desilting activities in existing natural drainage channels (*vagus*) should be continued as per their standard operating procedure and any obstructions to be avoided if required proper diversion needs to planned, until permanent solutions are in place.
- Installing rainwater harvesting systems will help reduce surface runoff and decrease the pressure on vagus. Retention and detention ponds can regulate water flow, preventing excessive flooding. Permeable pavement solutions in new infrastructure developments will enhance water infiltration, reducing direct runoff into vulnerable settlements

- Deploying automated flood sensors in areas prone to waterlogging can provide real-time insights into water levels, enabling proactive and informed flood management. Hydrological modeling should be used to assess the waterlogging risks.
- Construction of embankments around *vagus* can help prevent excessive overflow into waterlogged prone areas
- An early warning system can be installed to help the residents prepare for potential waterlogging events and associated risks.
- Installing monitoring systems for both temperature and air quality in the identified baseline hotspots and communicating the information to the relevant stakeholders. This includes measures such as directing construction workforce to adjust working hours during peak heat hours and ensuring the provision of drinking water.
- Provide training for vulnerable groups on immediate response strategies in case of risks such as heat stroke. Additionally, capacity building of PHC staff to administer immediate first aid and conduct regular inspections to ensure safety precautions are followed at construction sites.
- Create shaded areas by prioritizing the development of green areas in the baseline hotspot areas.

4.6 Adaptive capacity analysis of vulnerable groups and stakeholders

Climate risks identified in different urban sectors and locations have implications for the existing local village community and population expected to move in over the years. It is therefore vital to address the readiness and capacity of these groups and stakeholders to address climate risks and the related fragility of urban systems. In this section, groups vulnerable to climate risks are identified and their adaptive capacities are assessed, especially for existing villagers, construction workers, children, and the elderly, who are more vulnerable. The capacity of supporting stakeholder groups, including government departments and the private sector, to manage climate risks and sectoral climate vulnerabilities is also assessed.

Vulnerability assessment involves identifying key stakeholders and actors for all the prioritized fragile urban systems and assessing their corresponding adaptive capacity. Based on the adaptive capacity, actors are categorised into two groups:

1. Vulnerable actors to the fragile urban systems and
2. Supportive actors towards building urban resilience.

The adaptive capacity analysis for actors, including the vulnerable groups and supporting stakeholders, is presented in Table 4-8. Annexure A gives further details of adaptive capacities of actors.

Table 4-8 Analysis of Adaptive capacity of identified actors

Urban System	Key Actors	Adaptive capacity (Score)	Adaptive capacity (Status)
Water Supply	APCRDA	27	High
	ADCL	27	High
	AP Irrigation Deptt.	18	High
	Youth	12	Medium

Urban System	Key Actors	Adaptive capacity (Score)	Adaptive capacity (Status)
	AP Ground water & Water Audit department	6	Low
	Existing Villagers	2	Low
	New Settlers	4	Low
	Elderly / Women / Children	1	Low
	Construction Workers	1	Low
	NGOs / SHGs	8	Low
Waste Water	APCRDA	27	High
	ADCL	27	High
	APPCB	18	High
	APIIC	12	Medium
	Existing Villagers	1	Low
	New Settlers	4	Low
	Elderly / Women / Children	1	Low
	Construction Workers	1	Low
	Youth	3	Low
Storm Water	APCRDA	27	High
	ADCL	27	High
	AP Irrigation Deptt.	27	High
	Existing Villagers	6	Low
	New Settlers	1	Low
	Elderly / Women / Children	1	Low
	Construction Workers	1	Low
	Youth	6	Low
Solid Waste Management	APCRDA	27	High
	ADCL	27	High
	New Settlers	9	Medium
	Youth	9	Medium
	Existing Villagers	6	Low

Urban System	Key Actors	Adaptive capacity (Score)	Adaptive capacity (Status)
	Elderly / Women / Children	4	Low
	Construction Workers	2	Low
Road and Transport	APCRDA	18	High
	ADCL	18	High
	APSRTC	18	High
	AP Roads & Buildings Deptt.	18	High
	Indian Railways	9	Medium
	RTO	9	Medium
	IPT Operators	2	Low
	IPT Users	2	Low
	Private Vehicle Users	6	Low
	Existing Villagers	1	Low
	New Settlers	6	Low
	Elderly / Women / Children	1	Low
	Construction Workers	1	Low
	Youth	4	Low
Biodiversity	APCRDA	18	High
	ADCL	18	High
	AP Forest Department	12	Medium
	Andhra Pradesh Greening & Beautification Corporation	4	Low
Public Health	Private Hospitals	27	High
	Govt. Hospitals	12	Medium
	PHCs	1	Low
	Elderly / Women / Children	1	Low
	NGOs / SHGs	2	Low

5 Greenhouse Gas Emissions Inventory

5.1 Introduction

Amaravati, the capital city of Andhra Pradesh, is being developed with a strong focus on environmental sustainability and planned urban growth. The city's larger vision is to develop not just as a world-class capital city in the State, but also as a symbol of a planned, future-ready urban centre in India. The city envisions integrating the best features of urban planning, sustainability, and effective governance to create an inclusive, highly liveable, and world-class urban ecosystem.

As the city's development progresses, the vision remains to create a sustainable, functional, and inclusive capital city that is underpinned by climate-sensitive and environmentally sustainable practices.

To establish the basis for Amaravati's climate strategies and greenhouse gas (GHG) emission reduction targets that will guide its future development, city-wide GHG emission estimates have been prepared for the base year 2024. To evaluate how emissions may evolve up to the city's ultimate planning horizon of 2058, scenario planning has been undertaken, evaluating both Amaravati's planned development trajectory and an alternative "what-if" case representing development as a brownfield city.

The GHG inventory provides an assessment of Amaravati's baseline emissions and the relative contribution of key sectors and activities within the city. In comparison, scenario planning helps to evaluate possible future emission pathways and identify sectoral contributions, supporting the formulation of targeted mitigation strategies and evidence-based climate action.

The GHG emission estimates for both the baseline year and future scenarios include emissions from stationary energy use in different types of buildings and from the transportation and waste sectors.

5.2 Methodology for GHG Emissions Inventory

Developing a GHG emission estimate involves a structured step-by-step process to ensure accuracy and reliability in measuring emissions. The GHG emission estimation process involves three key steps: planning and scoping the inventory framework, collecting and analysing sector-wise data, and reporting emissions in line with global standards.

This section provides an overview of the methodological approach followed for developing GHG emission estimates for Amaravati city.

5.2.1 GPC Framework

Amaravati's GHG emission inventory has been prepared following the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC),[69] a standardised framework that aligns with the Intergovernmental Panel on Climate Change (IPCC) guidelines.

[69] Greenhouse gas protocol, Global Protocol for Community-Scale Greenhouse Gas Inventories.

The GPC is a protocol standard, developed by C40, World Resources Institute, and ICLEI - Local Governments for Sustainability, that provides a robust framework for accounting and reporting city-wide GHG emissions. The GPC ensures consistency, scientific rigor, and comparability of emissions data across cities and towns globally.

5.2.1.1 Accounting and Reporting of GHG Emissions

GHG emissions in cities come from multiple sources, which are primarily categorised into stationary energy, transportation, and waste as per the GPC framework. Each sector contributes to overall emissions through fuel combustion, energy use, and waste decomposition processes. Activities taking place within a city can generate GHG emissions that occur inside as well as outside the city boundary. To distinguish among them, the GPC classifies emissions into three categories based on where they occur: scope 1, scope 2, or scope 3 emissions.

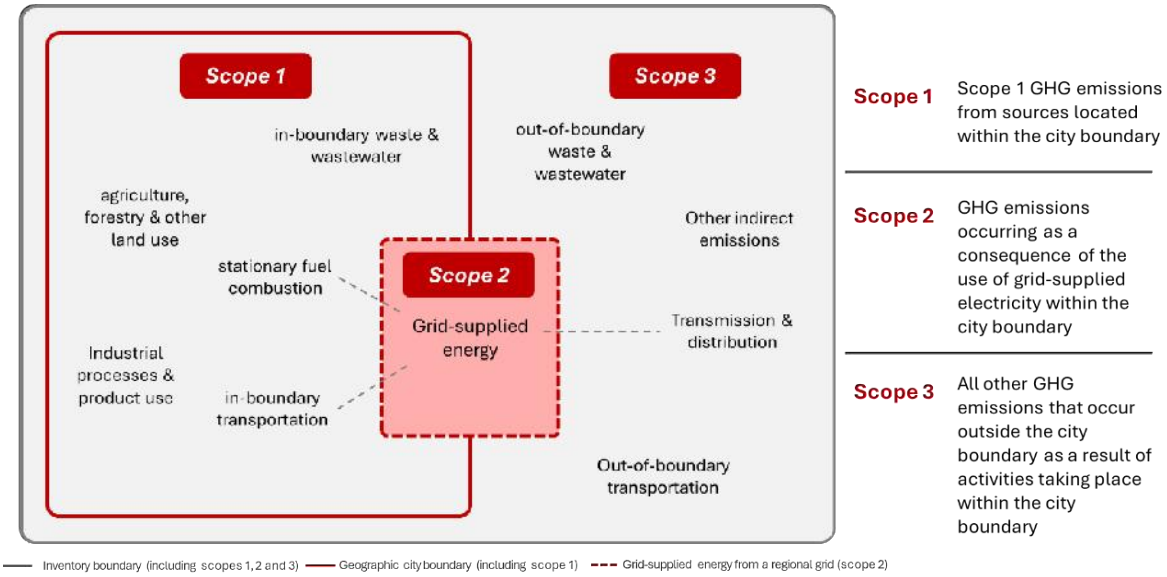


Figure 5-1 Scope-wise sources and boundaries of GHG emissions in GPC inventories[70]

The scopes framework helps to differentiate emissions occurring physically within the city (scope 1), from those occurring outside the city (scope 3), and from the use of electricity, steam, and/or heating/cooling supplied by grids which may or may not cross city boundaries (scope 2). Scope 1 emissions may also be termed “territorial” emissions because they occur discretely within the territory defined by the geographic boundary. Figure 5-2~~Figure 5-2~~ illustrates which emission sources occur solely within the geographic boundary established for the inventory, which occur outside the geographic boundary, and which may occur across the geographic boundary.

Cities can account and report GHG emissions as per two levels of reporting prescribed by the GPC, demonstrating different levels of completeness, known as BASIC and BASIC+.

[70] Greenhouse gas protocol, Global Protocol for Community-Scale Greenhouse Gas Inventories.

- **BASIC level emissions:** The BASIC level covers GHG emissions from sources that occur in almost all cities, including stationary energy, in-boundary transportation, and emissions from in-boundary generated waste, including waste disposed outside the boundary. It offers a practical and structured approach for cities to begin tracking emissions and formulating mitigation strategies.
- **BASIC+ level emissions:** The BASIC+ level has a more comprehensive coverage of emissions sources. It includes the BASIC emission sources plus industrial processes and product use (IPPU), agriculture, forestry, and other land use (AFOLU), transboundary transportation, and energy transmission and distribution losses. This level reflects more challenging data collection and calculation procedures, with limited data and emission factors available in the Indian context, as well as at the regional level.

The BASIC level of GHG accounting is suitable for cities like Amaravati, which are initiating their climate action journey, ensuring methodological consistency while remaining feasible within existing data availability.

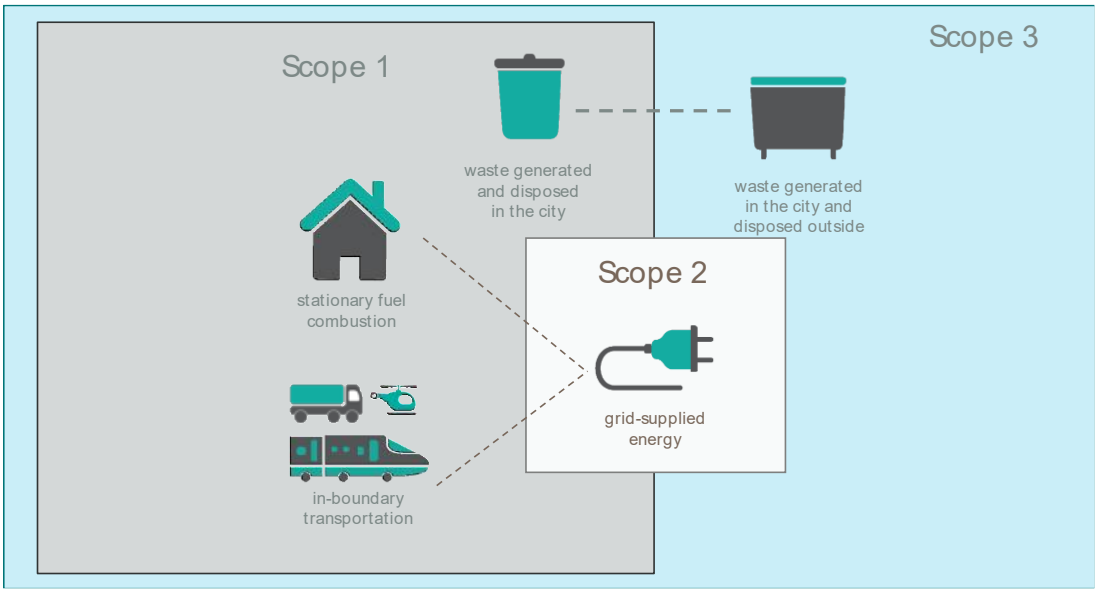


Figure 5-2 GPC reporting level - BASIC sources

5.2.1.2 Calculating GHG Emissions

GHG emissions are calculated by multiplying activity data by an emission factor (EF) associated with the activity, as depicted simplistically in the formula below.

Activity data is a quantity of an activity that results in GHG emissions during a given period of time (for example: kilowatt-hours (kWh) of electricity consumed within a year, fuel consumption, waste generation). Emission factors are used to calculate the quantity of GHG emissions generated for each unit of a specific activity (for example: tonnes of CO_2 equivalent emissions from the use of per unit of electricity, expressed as tCO_2e/kWh).

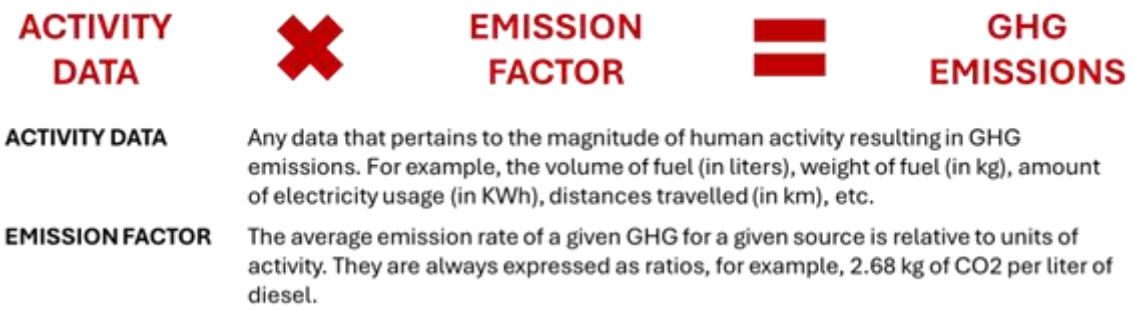


Figure 5-3 Formula for estimating GHG emissions

Once relevant activity data is collected, GHG emissions are calculated by applying relevant activity data. To ensure consistency, non-CO_2 gases like methane and nitrous oxide are converted into CO_2 equivalent (CO_2e) using Global Warming Potential (GWP) factors from IPCC guidelines.

5.3 GHG Emissions for Amaravati

The GHG emissions inventory for Amaravati has been prepared for the baseline year of 2024. The inventory has been developed in accordance with the GPC Framework. This inventory complies with the BASIC level reporting of the GPC, covering Scope 1 emissions from stationary energy sources and inbound transportation, Scope 2 emissions from grid-supplied electricity consumption, and Scope 1 and Scope 3 emissions from waste.

Details of the estimated emissions and the scoping process undertaken for developing Amaravati's GHG emission inventory are presented in the subsequent sections.

5.3.1 Scoping of Amaravati's GHG Emission Estimates

This section outlines the scope, sectoral coverage, boundary, data sources, and emission factors used in estimating Amaravati's GHG emissions.

5.3.1.1 Geographic Boundary and Coverage

The baseline GHG emission estimates have been prepared for the statutory jurisdiction of the Amaravati city boundary, spanning an area of 217.23 square kilometers.

The inventory includes and accounts for three major GHGs — carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) — in line with the GPC guidelines. Additionally, emissions will be reported in carbon dioxide equivalent (CO_2e), using GWP[71] values from the IPCC Fourth Assessment Report (AR4) to ensure consistency and comparability with India's national inventories – Biennial Update Reports (BURs) and National Communications (NATCOMs) to the United Nations Framework Convention on Climate Change (UNFCCC). The GWP values of CO_2, CH_4 and N_2O as per the IPCC AR4 are provided in Table 5-1.

[71] GWP reflects the climate change impact, in terms of the warming effect on the atmosphere, for each GHG with reference to CO_2.

Table 5-1 Global Warming Potential (GWP) values for GHGs

Greenhouse Gas	Global Warming Potential (GWP) [as per IPCC Fourth Assessment Report (AR4)]
CO_2	1
CH_4	25
N_2O	298

5.3.1.2 Time Horizon

Amaravati's GHG emissions have been accounted with FY 2024-25 as the base year or starting year to reflect the existing situation and serve as the reference point for future emissions projections.

5.3.1.3 GHG Emission Sources Covered

Amaravati's baseline GHG emission inventory follows the **BASIC level** of reporting as per the GPC framework. The BASIC level of reporting includes scope 1 and scope 2 emissions from **stationary energy** and **transportation**, as well as scope 1 and scope 3 emissions from **waste**[72]. It additional includes some BASIC+ emissions, where data is available, namely emissions from transmission and distribution losses associated with grid-supplied electricity and fugitive emissions from natural gas storage and distribution.

Table 5-2 Sectors and GHG Emission Sources included in Amaravati's Baseline Emission

Sector	Sub-sector/Sources
Stationary Energy	Residential Buildings; Commercial and Institutional Buildings/Facilities; Manufacturing Industries and Construction; Agriculture; Fugitive Emissions (from piped gas supply); T&D losses from grid electricity supply
Transportation	On-road and off-road transportation (including EVs); Metro; Rail (not included in baseline)
Waste	Solid Waste Disposal and Treatment (Composting, Bio methanation, Bio-CNG.); Waste incineration; Wastewater Treatment

Amaravati's GHG emission estimate adheres to the requirements of the GPC BASIC reporting framework. Based on Amaravati's current urban infrastructure, data availability, and institutional context, emission sources excluded from the scope and categorised elsewhere (within one of the sub-sectors noted above) are as follows:

- Fugitive emissions are not required to be reported in the GPC BASIC level framework. Fugitive emissions from mining and processing of coal and oil are excluded as such activity is not occurring within the city boundary at present. Fugitive emissions due to expected leakages from piped natural gas (PNG) distribution for energy use within the city have been included in the emission estimates for 2028 to 2058 (BAU projection and climate action scenario), when Amaravati is expected to have a piped gas distribution network.

[72] Scope 3 emissions from the waste sector refer to emissions resulting from the treatment and disposal of waste generated within the city but managed outside its geographic boundary.

- GHG emissions from the landing and take-off (LTO) of aircrafts within the city boundary are not occurring as a commercial airport does not exist within Amaravati's geographic boundary.
- Inland water navigation for transportation is not in use at present, and thereby related GHG emissions are not occurring in the base year. Waterborne navigation is not expected to be operational in the planning horizon as per existing information and plans. It is under consideration primarily for recreational purposes and therefore is considered not to occur or negligible.
- In the base year, on-road transportation emissions have been estimated using the fuel sales method, which considers the total fuel sold within city limits. This approach regards fuel sold as an indicator of transportation activities within the city in line with GPC guidance. Base year GHG emissions from off-road transportation are included in the emissions reported under on-road transportation, due to a lack of disaggregated data on fuel consumption for off-road transport within the city.

5.3.1.4 Emission Factors

Emission factors for grid electricity consumption have been sourced from the Central Electricity Authority (CEA) Reports on CO_2 Baseline Database for the Indian Power Sector (Version 20.0), which provides India-specific grid emission factors. For emissions from stationary and mobile fuel use, as well as the waste sector, a combination of IPCC default emission factors and those used in India's national GHG inventories (BURs and NATCOMs) has been used, ensuring alignment with both global and country-specific methodologies (see Annexure L).

5.3.1.5 Approach for Baseline GHG Emissions

Amaravati's GHG emissions for the base year of 2024-25 were estimated by gathering activity data from different data providers for the GHG emission sources included in the scope. The activity data was processed and utilised to estimate GHG emissions for the base year using calculators and appropriate emission factors through the Net-zero GHG Emissions Tool of ICLEI South Asia.

5.3.1.6 Data Collection and Sources

ICLEI South Asia with the support of the APCRDA team engaged with various data providers to source relevant activity data and information, both for the existing situation and prospective scenario. Necessary data requests to data providers were facilitated by APCRDA.

Activity data received was reviewed by ICLEI South Asia during the GHG emission inventory compilation process, with clarifications further sought from data providers to ensure that datasets were applied appropriately for Amaravati's boundary. Information on existing services and basic amenities such as household water supply, wastewater systems and solid waste management were validated in focus group discussions conducted in seven existing settlements in the capital city area. Various infrastructure plans and assessments prepared across sectors were also reviewed to identify and collate data and information for the prospective planning period of 2028 to 2058.

The sources of activity data and other relevant information used in the GHG emission estimation are summarised in Table 5-3~~Table 5-3~~.

Table 5-3 Sources of Activity Data for GHG Emission Estimations

Fuel Type	Sector	Source of Data
Electricity/Power	Residential; Commercial/Institutional Facilities; Industries; Agriculture, Forestry and Fishing Activities (i.e. mainly agriculture); facilities including Water Supply, Wastewater Management, Street Light, District Cooling, Other Utilities	Andhra Pradesh Eastern Power Distribution Company Limited (APEPDCL) Design Basis Report, Zone 7, Power & ICT; Power – Detailed Project Report, 2018; Inputs from ADCL
Diesel and Petrol	Community Transport, Commercial/Institutional Facilities, Manufacturing Industry and Construction	IOCL, HPCL, BPCL
LPG	Residential, Commercial/Institutional Consumers	IOCL, HPCL, BPCL
CNG	Transportation; Commercial consumers	IOCL
PNG	Residential, Commercial, Industries	Gas Master Plan Report
Transportation and Mobility		Draft Master Plan for Traffic & Transportation; Comprehensive Traffic and Transportation Study for APCRDA by JICA, 2022; Vahan Dashboard; MTMC; Inputs from APCRDA
Solid Waste Management		Mangalgiri-Tadepalli Municipal Corporation (MTMC); APCRDA; Solid Waste Master Plan, 2016; APCRDA's Request for Proposal (RfP) document for outsourcing of sanitation services, including solid waste management in 19 grama Panchayats (four clusters)
Wastewater management		MTMC; Wastewater - DPR, 2025; APCRDA and ADCL inputs
Water supply		MTMC; Water supply DPR, 2025

5.3.1.7 Key Assumptions

Most of the data used for the GHG emissions estimation was primarily sourced from data providers and available infrastructure and planning documents. In specific datasets where gaps were observed, suitable assumptions were used to close the datasets and prepare estimates for the appropriate calculation of Amaravati's GHG emissions for FY 2024-25. The key assumption made regarding GHG emissions is provided in Annexure B.

5.3.2 GHG Emission for Base Year 2024

The total GHG emissions of the Amaravati capital city area for the base year of 2024 are estimated to be 242,332 tonnes of carbon dioxide equivalent (CO_2e). The capital city area's per capita GHG emissions in the current scenario in 2024 stand at 1.31 tonnes of CO_2e.

The primary contributor to base year emissions is the Stationary Energy sector, which includes consumption of electricity and fuels in existing buildings and accounts for 80.4% of total emissions. The Transport sector accounts for about 13% of emissions, and the remaining 6.6% emissions result from the Waste sector in 2024.

Scope 1 emissions that occur within the city boundaries are driven by the stationary fuel combustion, transport, and domestic wastewater. Scope 2 emissions from electricity consumption are driven by demand for grid electricity. Scope 3 emissions are most significant in the waste sector, primarily due to the location of the waste-to-energy facility and disposal site, where municipal solid waste is currently managed, being situated outside of Amaravati's geographical boundary. Additionally, T&D losses from electricity consumption contribute to scope 3 emissions in the stationary energy sector.

Table 5-4 Sector-wise GHG emissions for Amaravati, 2024

Sector	**GHG Emission (tonnes of CO_2e)**				**Share**
	Scope 1	**Scope 2**	**Scope 3**	**Total**	
Stationary Energy	23,433	1,60,290	11,220	**1,94,944**	80.4%
Transportation	31,403	1.7	0.12	**31,405**	13%
Waste	7,613	-	8,370	**15,983**	6.6%
Total	**62,449**	**1,60,292**	**19,591**	**2,42,332**	**100%**

A break-up of GHG emissions for 2024 by sub-sector is presented in Table 5-5~~Table 5-5~~ and Figure 5-4. Emissions from the Stationary Energy sector are driven by energy consumption in residential buildings and in commercial and institutional buildings and facilities, which contribute to 42.4% and 32.9% respectively of the capital city area's total base year emissions. Industries have a share of 3.9% and agriculture accounts for 1.2% of the total emissions in 2024. Consumption of diesel, petrol and CNG in on-road vehicles leads to 13% of Amaravati's emissions. In the Waste sector, 3.5% of the capital city area's overall emissions are from solid waste and 3.1% result from wastewater.

Table 5-5 Break-up of Amaravati's sectoral GHG emissions for 2024

Sector and Sub-sector	**GHG Emissions (tonnes of CO_2e)**
Stationary Energy	**1,94,944**
Residential Buildings	1,02,863
Commercial and Institutional Buildings/Facilities	79,742
Industries	9,398
Agriculture, Forestry, and Fishing Activities (i.e. mainly agriculture)	2,941
Transportation	**31,405**
On-road Transportation	31,405

Sector and Sub-sector	GHG Emissions (tonnes of CO_2e)
Waste	**15,983**
Solid Waste	8,370
Wastewater	7,613
Total	**2,42,332**

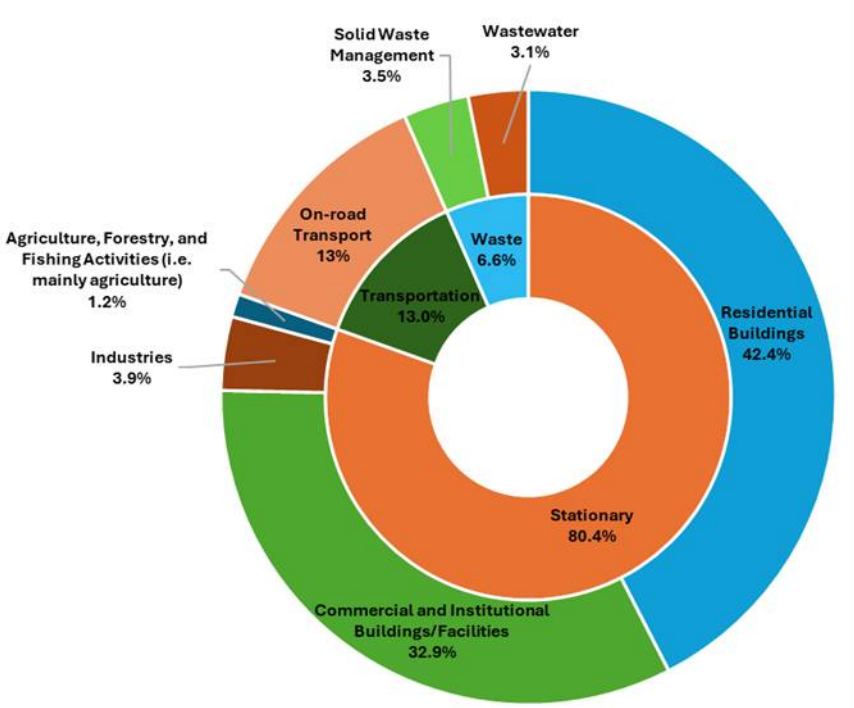


Figure 5-4 Sectoral share of GHG emissions 2024

5.3.3 Insights on Sectoral GHG Emissions for 2024

5.3.3.1 Stationary Energy

Stationary energy is the largest contributor to the capital city area's emissions in the base year. These emissions occur due to the consumption of electricity from the grid and the use of fuels (LPG and diesel) for end-uses such as cooking and power backup in buildings.

Figure 5-5 below shows the breakup of stationary energy-related GHG emissions from different sub-sectors in 2024. Residential households have the highest contribution to emissions from stationary energy, accounting for 52.8% of the emissions. Energy consumption in commercial and institutional buildings and facilities (such as public water works and street lighting) is also significant, with a share of 40.9%. Industrial units account for 4.8% of stationary energy emissions, while agricultural activity contributes 1.5%.

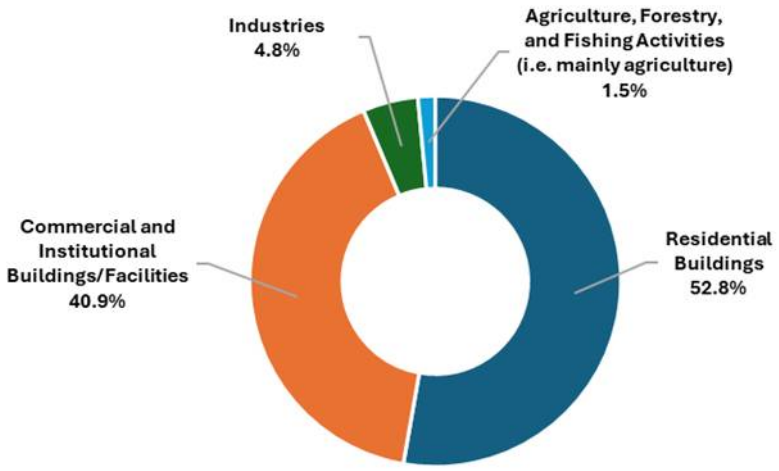


Figure 5-5 Stationary energy emissions by sub-sector 2024

In terms of energy source, electricity is the primary driver contributing to 88% of stationary energy-related emissions, while stationary fuels (LPG and diesel) contribute the remaining 12% of the emissions (see Figure 5-6).

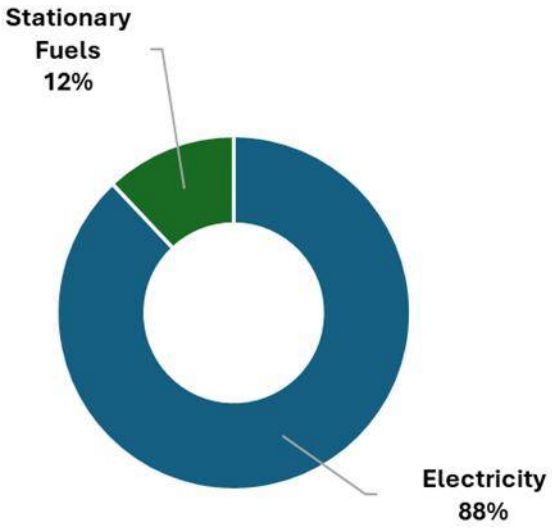


Figure 5-6 Stationary energy emissions energy source 2024

Of the total electricity consumption and associated GHG emission, 47.5% results from households, 45.2% from commercial and institutional buildings and facilities, 5.5% from the industrial sub-sector, and 1.8% from agricultural consumption (see Figure 5-7). With electricity almost solely contributing to most of the stationary energy emissions in buildings, the breakup of electricity consumption and emissions resembles that of overall energy consumption.

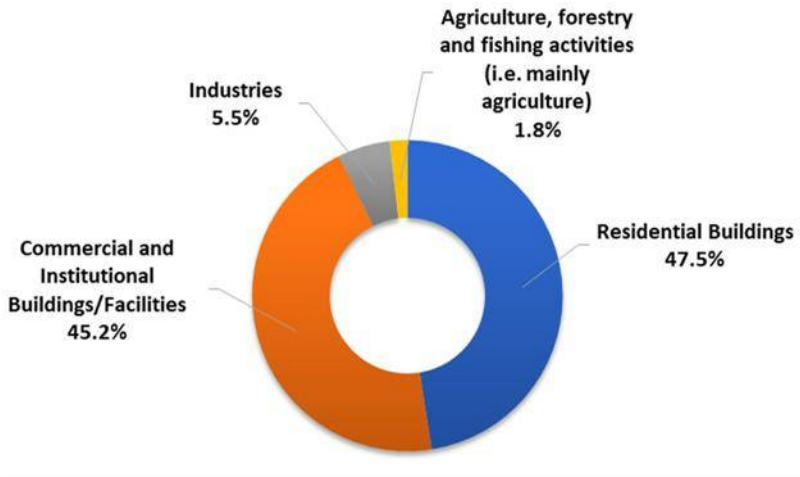


Figure 5-7 Sector wise share of electricity consumption and emissions, 2024

Stationary fuel (LPG, PNG, diesel etc.) consumption accounts for 12% of the stationary energy emissions. LPG consumption leads to 11.9% of emissions from stationary energy use, with a minimal amount of diesel use that occurs in commercial and industrial sub-sectors accounting for the rest.

5.3.3.2 Transportation

Private vehicles and intermediate public transport are prominent transportation modes within the capital city area at present, with the public transport system currently absent. Thereby, GHG emissions from the transport sector primarily result from fuel consumption in on-road vehicles, with a small portion of emissions resulting from electricity consumption for E-vehicles. A fuel sales approach has been used to estimate the GHG emissions from fuel consumption in on-road vehicles, with fuel sales data from fuel stations within the city boundary received from oil companies.

With a cumulative share of 99.9%, consumption of diesel and petrol contributes to nearly all the transport sector emissions in 2024, reflecting that a vast majority of the vehicles currently plying in the area are conventional vehicles. The consumption of CNG and electricity for charging electric vehicles is negligible in 2024.

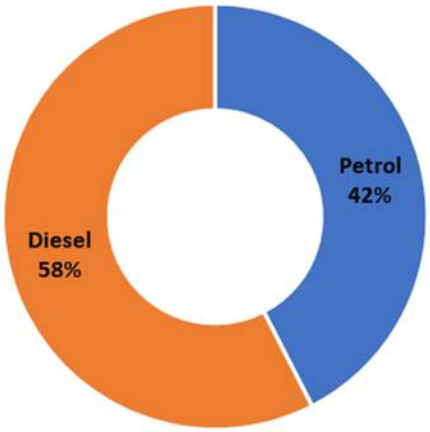


Figure 5-8 Transportation emissions by fuel type, 2024

Note: Emissions from CNG and electricity consumption in the transportation sector have not been included in the representation due to their negligible share.

5.3.3.3 Waste

The Waste sector includes GHG emissions from the management and disposal of municipal solid waste (MSW) and wastewater. Waste treatment produces GHG emissions through aerobic or anaerobic decomposition or incineration.

MSW accounts for 52% of the capital city area's waste sector emissions while domestic wastewater has a share of 48% (see Figure 5-9). The Mangalgiri-Tadepalli municipal corporation (MTMC) area and existing village settlements falling within Amaravati's boundary generate about 70 tonnes per day (TPD) of MSW. MTMC completed remediation of its waste disposal site located at Kolanukonda in 2023-24 and it has since been closed. Solid waste generated in the settlements is presently being transported and treated at the mixed-waste based waste-to-energy plant located at Guntur. No biological treatment facility such as anaerobic digestion or composting is currently operational and thereby GHG emissions from biological treatment of MSW are not occurring in the base year.

Households in the city boundaries use on-site sanitation in the form of septic tanks to discharge and collect domestic wastewater. Wastewater collection network and treatment facilities do not exist at present. Desludging operators collect sludge from septic tanks, and a dedicated faecal sludge treatment facility is not in place currently. Thereby, GHG emissions from domestic wastewater in 2024 are contributed solely by septic tanks.

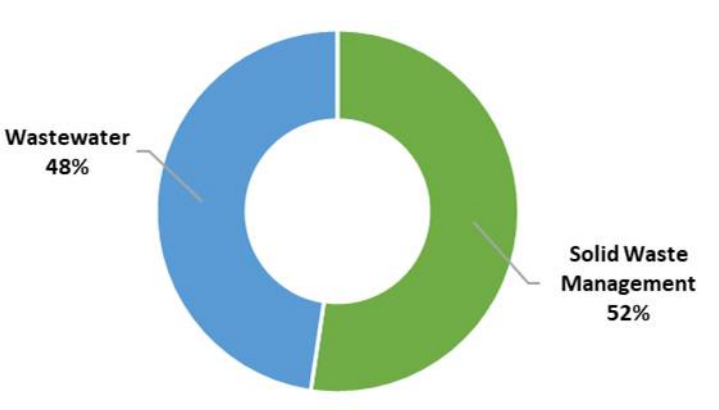


Figure 5-9 Waste emissions by sub-sector, 2024

6 Scenario Planning for Future Emissions Reduction in Amaravati

The baseline GHG emissions inventory helps understand the city's current emissions profile in 2024 as reflected in section 5. Since Amaravati is being developed as a greenfield city, with a significant share of the population and infrastructure yet to be instituted, the baseline GHG emissions need to be complemented by future GHG emissions scenarios to provide a complete picture of the long-term emissions trajectory. The GHG emissions are likely to grow as the city expands. Hence, it becomes essential to understand how these emissions could evolve and how the city can stay aligned with its climate goals. In this context, the development of future GHG emissions scenarios (scenario planning) is crucial to assess future emissions levels in Amaravati.

Scenario planning enables cities to evaluate possible future emissions pathways. It considers essential factors, including population growth, land use changes, infrastructure development, energy consumption, transportation demands, and waste generation. The overall emissions scenario planning process aims to demonstrate to city decision-makers and stakeholders how emission levels are expected to evolve in the future under different scenarios, providing an evidence base to determine the required levels of ambition, targets and climate actions. Scenario planning thus enables the city to assess the long-term implications of its development and climate strategies and actions.

Two different emissions scenarios have been developed for Amaravati using ICLEI South Asia's Net-zero GHG Emissions Tool**: i) Climate Action Scenario and ii) Business-as-usual (BAU) Scenario.** By comparing a business-as-usual growth path with low-carbon interventions identified in its city climate change action plan and master plan, Amaravati can evaluate trade-offs, prioritise mitigation actions, and align sectoral plans with its broader sustainability objectives. This approach supports Amaravati to set itself on a pathway that is resilient, forward-looking, and consistent with national and global climate commitments. Consultations were held with APCRDA and stakeholders in the process of identifying Amaravati's ambitious and practical climate targets and actions.

6.1 Scenarios Identified for GHG Emissions Reduction

The Climate Change Action Plan for Amaravati outlines two scenarios to represent the city's future GHG emissions levels (Figure 6-1). The BAU Scenario represents the baseline and is developed to reflect the future emissions pathway if Amaravati were developed in the same way as other existing, brownfield cities. The BAU scenario assumes no additional interventions or policy changes beyond current national and state policies and growth patterns. In comparison, the Climate Action Scenario represents sustainable, climate-responsive strategies and targets adopted by Amaravati across urban infrastructure and sectors through its Climate Change Action Plan, existing master plan, and infrastructure plans.

- **Climate Action Scenario:** The Climate Action scenario represents the city's expected level of GHG emissions, after the completion of its construction phase, i.e., once Amaravati is fully developed, with all climate strategies and actions outlined in its Climate Change Action Plan implemented. It reflects the level of emissions anticipated with the implementation of enhanced climate actions at the city scale, as compared to the BAU scenario. It considers the level of ambitions and targets outlined in the Climate Change Action Plan being realised. The climate targets and actions for Amaravati have been determined based on proposed plans and measures in Amaravati's planning and infrastructure

documents, goals and targets of national and state policies, current status, level of adoption of solutions.

- **BAU Scenario:** The BAU scenario represent the level of GHG emissions in the future if Amaravati's development took place in the absence of climate and sustainable planning interventions, following conventional patterns similar to other brownfield cities. It assumes that no additional emissions reduction efforts and measures will be undertaken, beyond those already in place. The BAU Projection represents the 'business as usual' condition and serves as a reference point for assessing the impact of emissions reduction scenarios or pathways.

These scenarios form the strategic foundation of the CRCAP, guiding Amaravati in defining and prioritising emission reduction strategies and actions, while committing to a low-carbon, inclusive, and sustainable growth trajectory.

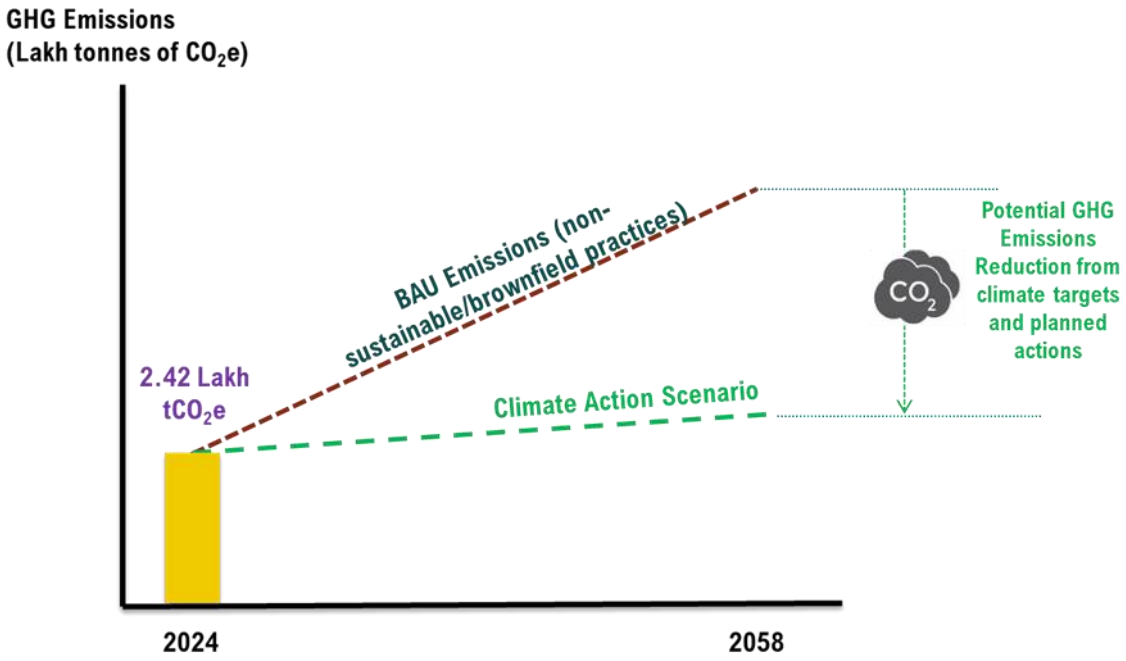


Figure 6-1 Illustrative Depiction of Climate Action Scenario compared to BAU Scenario

6.2 Key Assumptions for Scenario Planning

The scenario planning for Amaravati's GHG emissions is built on a set of assumptions across the key urban sectors: energy, transport, waste, and wastewater. These assumptions help define how emissions will evolve under both the BAU and Climate Action scenarios across the planning period, i.e., from 2028 to 2058.

For the Climate Action scenario, GHG emissions have been projected using Amaravati's population estimates, along with sectoral and infrastructure information currently available (e.g., power requirements, water demand, waste and wastewater generation and treatment, mobility-related metrics), as per the Master Plan and infrastructure plans. It thereby reflects the expected level of GHG emissions during Amaravati's construction phase, i.e., from 2028 to 2058.

The BAU scenario reflects a situation where no significant additional actions are implemented in Amaravati, and thereby the extent and scale of low-carbon actions are limited to current practices and much lower than the Climate Action scenario. For the BAU projections, emissions have been estimated using a combination of sector-specific data from baseline datasets and city documents as well as current trends in the state of Andhra Pradesh. For instance, solid waste generation figures for the years 2028, 2043, and 2058 have been sourced from the city's planning documents, while the expected processing percentages and technology-wise distribution in the absence of additional sustainable waste management measures have been assumed based on the state's current processing levels. These assumptions guide the projections and help ensure that the scenarios are realistic, consistent, and policy-relevant.

Key Assumptions in Scenario Planning

Assumptions – Climate Action Scenario (2028 to 2058)

Stationary Energy

- Power demand for Amaravati in 2058 has been sourced from the DBR report. To estimate electricity consumption (in million kWh), diversity factors provided in the Zonal Design Basis Report (DBR) have been applied. For the intermediate years, 2043 and 2028, electricity consumption has been interpolated based on estimated per capita electricity usage in 2058. T&D losses for electricity have been assumed to be 2.84% as per the DBR.
- Based on envisaged renewable energy (RE) integration to meet power demand as per inputs from APCRDA, it is assumed that 15%, 75%, and 100% of the total electricity consumption will be met through RE, including rooftop, ground-mounted, distributed, and off-site RE power purchases in 2028, 2043, and 2058, respectively.
- PNG consumption figures for 2028 and 2058 have been taken from the Gas Master Plan. Since the plan provides estimates only for 2020 and 2050, these figures have been assumed as proxies for 2028 and 2058, respectively. For 2043, PNG consumption has been estimated using the annual average growth rate (AAGR) and the average gasification rate between 2028 and 2058. As LPG-specific data are not available, LPG consumption has been estimated by assuming that LPG fulfils the remaining unmet gas energy demand (as per the gasification rate).
- Fugitive emissions from PNG distribution have been estimated by assuming a 0.6% loss of the total PNG supplied during distribution.
- Targets have been envisaged for the adoption of electric cooking in residential and commercial buildings, with power sourced from renewable energy, as a good practice to meet cooking energy requirements. Based on inputs from APCRDA, the envisaged targets for electric cooking in residential buildings are 5% of total energy demand for cooking by 2043 and 10% by 2058. For commercial and institutional buildings, the targets are 10% by 2043 and 15% by 2058 of the total cooking energy demand.

Transportation

- The modal share of transport for 2028, 2043, and 2058 has been estimated based on the trip type distribution between Internal-Internal (I-I), Internal-External (I-E), External-Internal (E-I), and External-External (E-E), as provided in the Traffic and Transport Master Plan. The mode-wise shares for each trip type have been incorporated with the provided distribution in the Plan to

determine the overall modal shares. As the Transport Master Plan provides projections for 2020, 2035, and 2050, the corresponding information has been assumed to be applicable for 2028, 2043, and 2058 respectively. Additionally, for 2028, the modal share has been further adjusted (based on consultations with APCRDA) to reflect a lower public transport share. The adjustment has been made on the assumption that, during the initial construction phase, most trips will be from private vehicles as residential settlements gradually come up. This reliance on private cars is expected, as public transport uptake is likely to remain limited in this period, given the time required to establish the necessary ecosystem (e.g., terminals, route rationalisation, service frequency, etc.).

- Metro, bus, and rail-based public transport modes have been assumed to operate entirely on electricity across the planning period. For private vehicles, including cars, two-wheelers, and intermediate public transport (IPT) (taxis), the fuel mix has been estimated based on current and projected electric vehicle (EV) adoption. For 2028, EV penetration has been calculated based on observed trends in Vijayawada and Guntur, as well as targets outlined in Andhra Pradesh's EV Policy, 2024. For 2043 and 2058, the fuel mix has been projected in alignment with national-level targets set by the Government of India (and similar targets outlined in the Net-Zero Action Plan for Vijayawada), as well as the widespread promotion of electric vehicles as envisaged in Amaravati.
- It is assumed that renewable energy will supply 20%, 40%, and 60% of the electricity required to operate EVs in Amaravati in 2028, 2043, and 2058, respectively, based on discussion with APCRDA.

Waste

- Solid waste generation across the planning period has been estimated based on the per capita waste generation. For 2028, per capita waste generation has been assumed at 0.43 kg per capita per day, consistent with baseline estimates. For 2058, per capita waste generation is expected to increase to 0.8 kg per capita per day, based on the Solid Waste Master Plan, which references the CPHEEO guidelines. Waste generation for 2043 has been interpolated using an AAGR of 2.87% between 2028 and 2058, as discussed and confirmed with city officials.
- Estimations of municipal solid waste processing quantities from 2028 to 2058 are based on waste composition and using per capita generation value as per the Solid Waste Master Plan, 2016. In 2028, all waste is assumed to be sent to Waste-to-Energy (WtE) facilities in line with the city's current plans as per inputs by APCRDA. By 2043, WtE capacity is assumed to remain at 2028 levels, with the remaining waste diverted to processing routes based on composition—such as MRFs, composting, and bio-methanation. For 2058, processing capacity is projected to scale up from 2043 levels, with additional treatment through RDF supply to cement plants and the introduction of Bio-CNG facilities. Additionally, it is assumed that 10% of the rejects from the processing facilities, along with all the inert waste, will be directed to a scientifically managed sanitary landfill.
- Mitigation or GHG emission reduction impacts due to co-benefit of energy generation and avoided emissions from solid waste processing infrastructure—including waste-to-energy, bio-methanation, bio-CNG, RDF generation, and recycling—have been incorporated into the emissions estimates.

- Wastewater generation has been estimated by assuming that 80% of the water supplied, after accounting for losses, is discharged as wastewater. To meet CPHEEO norms, an additional 10% of the estimated wastewater has been added to account for possible groundwater infiltration as per the Wastewater DPR 2025, resulting in the final wastewater generation figure.
- For wastewater treatment, 100% sewage network coverage and treatment have been assumed, based on discussions with APCRDA (in line with Wastewater DPR, 2025) and the city's plan for phased development of sewage treatment plant (STP) capacity to cater to projected domestic wastewater volumes. Three treatment technologies identified by APCRDA as per the Wastewater DPR 2025 include SBR (Sequencing Batch Reactor), MBBR (Moving Bed Biofilm Reactor), and A2O (Anaerobic-Anoxic-Oxic). At present, the distribution of treatment capacity and implementation plan across these identified technologies is yet to be finalised by APCRDA. Therefore, the distribution or share of these technologies in the total wastewater treatment capacity has been assumed based on typical system characteristics. It is assumed that SBR and MBBR will function as aerobic systems (noting that SBR can also operate anaerobically), while A2O will operate anaerobically. An equal split of 33.33% across all three technologies has been assumed, resulting in an overall treatment distribution of approximately 66.7% aerobic and 33.3% anaerobic processes throughout the planning period.
- For estimating N_2O emissions from wastewater, per capita protein consumption has been assumed at 20.71 kg per person per year for 2028, based on state-level consumption data from the NSSO report[73]. From 2043 onwards, protein consumption is projected to increase to 28.24 kg per person per year, in line with dietary standards recommended by the Indian Council of Medical Research (ICMR)[74].
- Mitigation impacts from the planned reuse of treated water as per Wastewater DPR 2025 have been accounted for in the overall emission estimates.

Assumptions – BAU Scenario (2028 to 2058)

Stationary Energy

- The assumptions related to electricity demand estimation, T&D losses, PNG consumption, and fugitive emissions from PNG distribution remain the same as outlined in the climate action scenario.
- For the BAU scenario, renewable energy (RE) integration targets for electricity have been assumed to be **3.88% in 2028, 19.60% in 2043, and 44.44% in 2058**. These targets have been derived from Andhra Pradesh's Renewable Purchase Obligation (RPO) trajectory. To arrive at these target numbers, the RPO trend for the state was projected geometrically up to 2058. From the projected RPO levels for 2028, 2043, and 2058, the current RPO level, i.e., 20%, was subtracted and treated as a delta. This gave us the additional RE share required for each year. This approach was used since the current RPO baseline is already reflected in the state's grid electricity emission factor. By treating it as a delta, only the incremental renewable energy beyond the current target is considered, which reflects the actual additional renewable capacity the state would need to add in the future. The approach helps quantify the GHG mitigation potential associated with this additional RE integration.

[73] Nutritional Intake in India 2011-12 National Sample Survey Office.
[74] Dietary Guidelines for Indians, Indian Medical Council Research, 2024.

- No targets are envisaged for electric cooking in the BAU scenario.

Transportation

- The modal share for the BAU scenario has been developed using a combination of Amaravati's projected modal share for 2028 and the existing modal share of Vijayawada. This approach assumes that if Amaravati had not been developed, the designated area would likely have been integrated into Vijayawada or developed in a similar brownfield manner. However, elements from Amaravati's planned mobility structure have still been reflected in the BAU modal share, such as the inclusion of the metro/rail system in the modal share by 2058. The detailed year-wise modal share used for the BAU scenario is provided in Annexure F.
- Metro, bus, and rail-based public transport systems are assumed to run entirely on electricity across the planning horizon (2028, 2043 & 2058). For private vehicles, including cars, two-wheelers, and intermediate public transport (such as taxis and autos), the fuel mix has been estimated based on the state's EV policy and projected EV adoption trends. For the estimation, the EV share was first calculated as a proportion of the total vehicle population in the state for the years 2028, 2043, and 2058, and category-wise (car, 2W, 3W) splits were applied based on current EV distribution trends. The final fuel mix assumed for private vehicles under the BAU scenario is presented in Annexure I.
- In line with trends seen in other brownfield cities, no dedicated renewable energy supply has been considered for EV charging in the BAU scenario. Electricity consumed by EVs is assumed to be drawn entirely from the grid supply.

Waste

- Per capita waste generation assumptions remain the same as the climate action scenario, 0.43 kg/day in 2028 and 0.8 kg/day in 2058, with interpolation for 2043 using AAGR of 2.87%.
- In 2028, 100% of solid waste is assumed to be processed via Waste-to-Energy (WtE) facilities. For 2043 and 2058, processing is split between WtE, composting, and biomethanation based on the current processing mix in Andhra Pradesh. No additional methane recovery or advanced bio-CNG systems are considered.
- Wastewater generation and treatment assumptions are the same as the climate action scenario, based on 80% of water supply with 10% infiltration, and 100% coverage and treatment using SBR, MBBR (aerobic), and A2O (anaerobic) technologies in equal proportion (33.3% each). However, no methane capture is assumed from anaerobic treatment in the BAU scenario.
- Per capita protein consumption is assumed to be the same as in the climate action scenario (20.71 kg in 2028, 28.24 kg from 2043 onward), based on NSSO and ICMR data.

6.3 Climate Action Scenario

The Climate Action Scenario envisions implementation of Amaravati's climate strategies and actions in its Climate Change Action Plan across its proposed development timeline of 2028 to 2058. It represents the city's expected lower level of GHG emissions that would result from the low-carbon and climate-oriented planning approach outlined across sectors. Data for the planning period has been sourced from planning and infrastructure documents, with assumptions made for any missing datasets.

Results and Highlights

As Amaravati develops and its population expands from 4.49 lakh persons in 2028 to 39.95 lakh persons in 2058, the trend of GHG emissions is correspondingly seen to increase over this period. GHG emissions for the city in the Climate Action scenario are projected to reach 12.45 lakh tCO_2e by 2058, compared to 8.12 lakh tCO_2e in 2028. A sectoral breakup of Amaravati's GHG emissions during the planning period is presented in Table 6-1 and Figure 6-2 below.

Table 6-1 Sector-wise GHG emission estimates under the Climate Action Scenario, 2028 - 2058

Sector	GHG Emission (tonnes of CO_2e)		
	2028	2043	2058
Stationary Energy	6,92,862	10,36,106	8,53,140
Transportation	77,821	1,62,665	2,33,094
Waste	41,153	69,222	1,59,031
Total	**8,11,837**	**12,67,992**	**12,45,265**

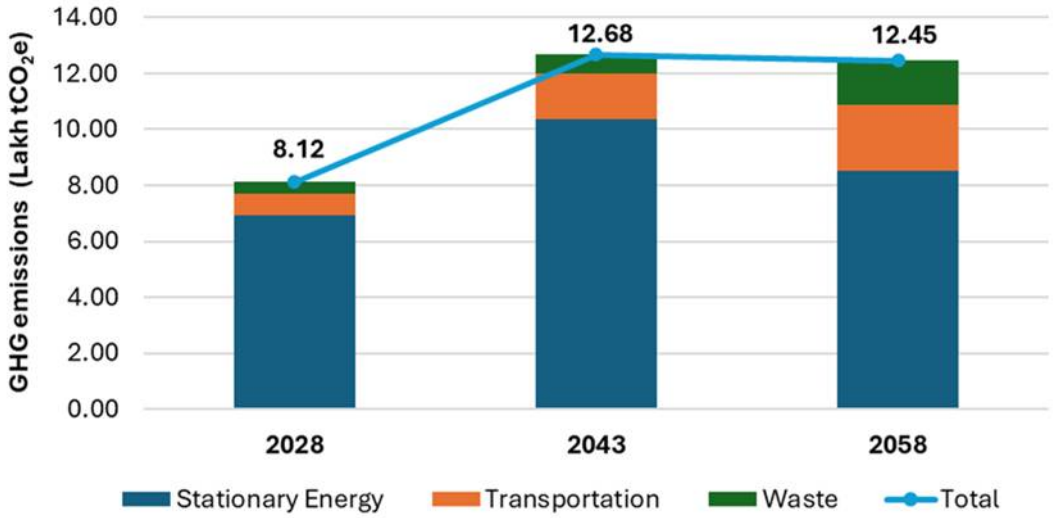


Figure 6-2 Projected trend of GHG emissions under the Climate Action Scenario, 2028- 2058

In the Climate Action scenario, Amaravati's per capita emissions are estimated to be 0.31 tCO_2e by 2058. As compared to its baseline per capita emissions of 1.31 tonnes of CO_2e in 2024, the per capita emissions in the scenario in 2058 represent a significant decline (approx. 76%). This trend substantiates and reflects the low-carbon and sustainable approach that underpins Amaravati's planning, especially considering the capital city area's current primarily greenfield and rural context and the scale of infrastructure improvement, urbanisation, and transformation that Amaravati's development will bring to the region. Amaravati's per capita emissions post its complete development in 2058, under this scenario, are estimated to be much lower when compared to per capita emissions of other national and international brownfield cities (see Table 6-2).

Table 6-2 Amaravati's Per Capita GHG Emissions Compared to Indian and Global Cities

City	Per Capita GHG Emissions (tCO_2e)	Year
Amaravati	1.31	2024
	0.31	2058
Ahmedabad	2.1	2021-22
Chennai	1.9	2018-19
Coimbatore	1.75	2021-22
Hyderabad	2.48	2022-23
Mumbai	1.8	2019
Vijayawada	1.85	2021-22
Bangkok	7.39	2024
London	3.2	2022
Los Angeles	5.4	2020
Montreal	13	2019
New York	11	2019
Singapore	12.3	2021

In 2058, GHG emissions in the Climate Action scenario are expected to be primarily driven by stationary energy consumption in buildings and utilities, which are anticipated to account for about 78.5% of the city's total emissions. The transportation sector is likely to contribute approximately 17% of the emissions in 2058. In comparison, the remaining 4.5% of the emissions are expected to come from the waste sector, including solid waste and wastewater management (Table 6-3 and Figure 6-3).

Table 6-3 Amaravati's sectoral GHG emissions under the Climate Action Scenario, 2028 - 2058

Sector and Sub-sector	GHG Emissions (tonnes of CO_2e)		
	2028	**2043**	**2058**
Stationary Energy	**6,92,862**	**10,36,106**	**8,53,140**
Residential Buildings	2,71,054	3,93,737	2,47,639
Commercial and Institutional Buildings/Facilities	3,23,495	4,74,380	3,50,822
Industries	97,679	1,65,216	2,49,058
Agriculture, Forestry, and Fishing Activities (i.e. mainly agriculture)	-	-	-
Fugitive Emissions (from piped gas supply)	634	2,772	5,622
Transportation	**77,821**	**1,62,665**	**2,33,094**
On-road Transportation	77,821	91,504	1,11,959
Rail/Metro	-	71,161	1,21,136
Waste	**41,153**	**69,222**	**1,59,031**
Solid Waste	36,042	52,904	1,23,245
Wastewater	5,111	16,318	35,786
Total	**8,11,837**	**12,67,992**	**12,45,265**

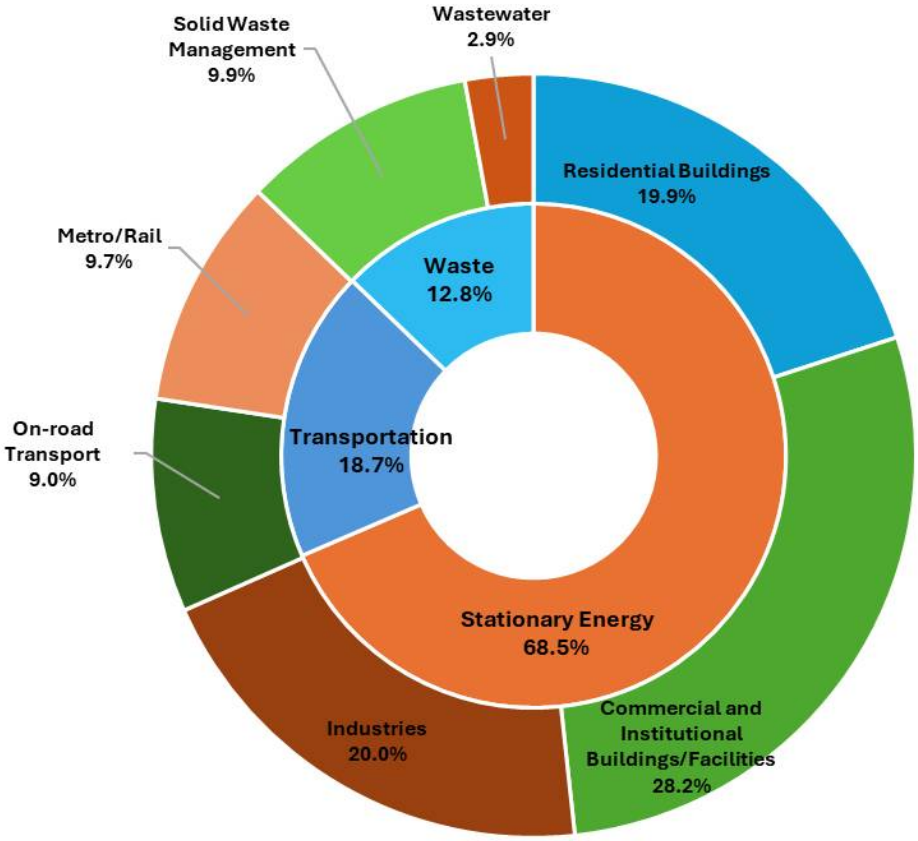


Figure 6-3 Sectoral share of GHG emissions in Amaravati under the Climate Action Scenario, 2058

Note: Fugitive emissions occurring from leakages in PNG supply have not been included in the representation due to its negligible share

With regard to energy use in buildings and facilities, the commercial and institutional buildings and facilities are projected to be the most significant contributors, with a share of 28.2% in total city-wide emissions by 2058. In contrast, emissions from residential buildings are estimated to contribute to 19.9% of Amaravati's GHG emissions by 2058. This is followed by the industry sub-sector, which is expected to contribute around 20% of the total emissions. The remaining 0.4% of the emissions are estimated to result from fugitive sources due to leakages in the PNG supply.

With Amaravati expected to house 39.95 million inhabitants by 2058, the resulting demand and increase in residential housing, utilities, and services, as well as commercial activities and institutional establishments, will drive energy use and resulting emissions. However, the city has committed to adopting measures to optimise energy use in the building sector. Solar integration in the building sector is planned, which will contribute significantly to the decarbonisation of the electricity mix. The city is also prioritising energy-efficient buildings through compliance with the Energy Conservation Building Code (ECBC) and adoption of green certification systems across its building stock. These considerations have been factored into the GHG estimate for the city under this climate action scenario.

The transport sector is estimated to contribute 17% of Amaravati's GHG emissions by 2058. The city is prioritising a multi-modal public transport system alongside non-motorised transport (NMT) options such as walking and cycling. By 2058, public transport and NMT are projected to account for approximately 70% of the modal share. This demonstrates the city's commitment to a significant shift toward low-carbon mobility. Additionally, the city aims to achieve 100% electrification of public transport systems and private internal vehicles, also ensuring that 60% of the required electricity is sourced from renewable energy. However, despite these progressive initiatives, transport emissions are still expected to rise in absolute terms, mainly due to urbanisation and an increase in overall travel demand.

The resident population allied with commercial, institutional, and industrial activities will lead to significant solid waste generation. GHG emissions will also result from the considerable volume of domestic wastewater generated, with infrastructure in place to manage wastewater through a city-wide underground sewage network and treatment facilities.

In the Climate Action Scenario, the primary sources of GHG emissions in Amaravati are projected to be PNG, electricity used for transport, and waste management activities. PNG is expected to remain the dominant contributor, accounting for approximately 68.5% of the emissions; 100% of the emissions from stationary energy use (considering fugitive emissions will arise due to PNG consumption only). Electricity consumption in the transport sector, largely from metro and electric vehicle operations, is estimated to contribute around 18% of total emissions, while waste management processes, including both solid waste and wastewater treatment, will account for about 12.8%. In comparison, emissions from transport fuels such as diesel and petrol are projected to be minimal, representing only 0.7% of total emissions, reflecting the city's strong shift toward electrified and low-carbon mobility systems.

6.3.1 Insights on Sectoral GHG Emissions for 2028 to 2058 – Climate Action Scenario

6.3.1.1 Stationary Energy

In the Climate Action Scenario, stationary energy is expected to be the largest contributor to Amaravati's projected emissions over the planning horizon of 2028 to 2058, as is the case in its base year emission profile. With an influx of population, growing footprint of buildings and infrastructure, demand for utilities, the energy demand, and GHG emissions from stationary energy are expected to increase from 6.93 lakh tCO_2e in 2028 to 10.36 lakh tCO_2e in 2043. However, despite continued growth in population and infrastructure beyond 2043, overall emissions are projected to decline slightly to 8.53 lakh tCO_2e by 2058 (see Figure 6-4). This reduction is attributed to higher adoption of renewable energy sources, enhanced energy efficiency measures in buildings and utilities, and supporting interventions such as improved demand management.

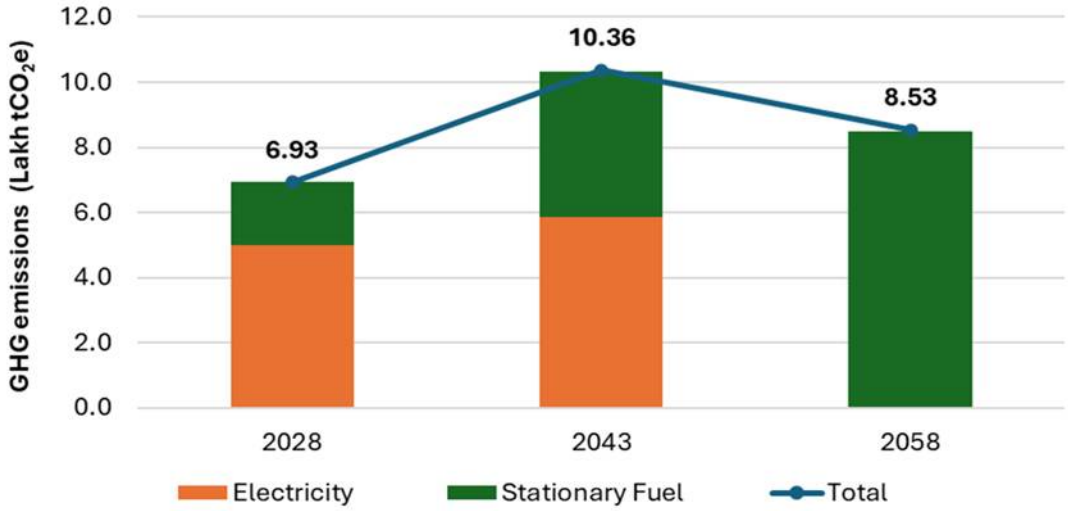


Figure 6-4 Projected trend of GHG emissions in the stationary energy sector under the Climate Action Scenario, 2028 - 2058

Note: Fugitive emissions occurring from leakages in PNG supply have not been included in the representation due to its negligible share

In 2058, commercial and institutional buildings and facilities are expected to be the largest contributor to GHG emissions from stationary energy use, accounting for 42% (see Figure 6-5). Residential buildings and industries will each account for 29% of stationary energy emissions by 2058.

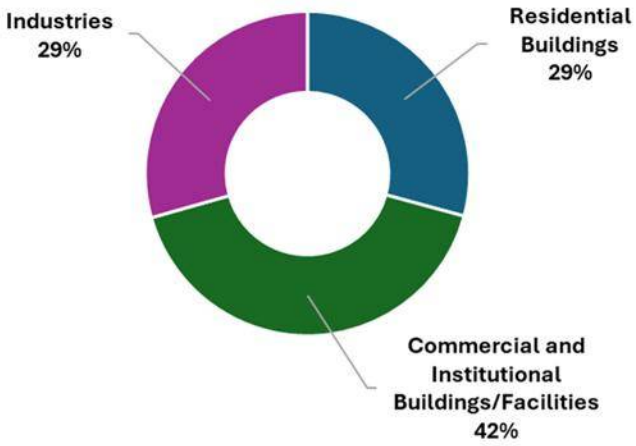


Figure 6-5 Stationary energy emissions by sub-sector under the Climate Action Scenario, 2058

Note: Fugitive Emissions have not been included in the representation due to their negligible share.

Electricity and PNG will be the primary energy source to meet energy demand in buildings and facilities. PNG will account for 100% of GHG emissions from the stationary energy sector in 2058. The contribution of electricity to sectoral emissions will be zero due to the city's plan to source 100% of its electricity from renewable energy sources by 2058.

By 2058, the city's total power demand is projected to reach 2,726.9 MW (see Annexure C), with a power density of 12.56 MW per square kilometer, comparable to global cities like New York or Tokyo. The resulting

electricity consumption by 2058 is estimated to be 10,484.9 million kWh, increasing more than 11 times from 920.3 million kWh in 2028. Demand in commercial buildings is expected to account for 46% of electricity consumption in the stationary energy sector in 2058 (see Figure 6-6). Residential Buildings are expected to be the second-largest consumer, with a share of 37%, followed by the industrial sub-sector with a share of 17%. As Amaravati develops into an urban centre, agricultural power consumption within its boundaries is projected to decrease and have a negligible share in GHG emissions by 2058.

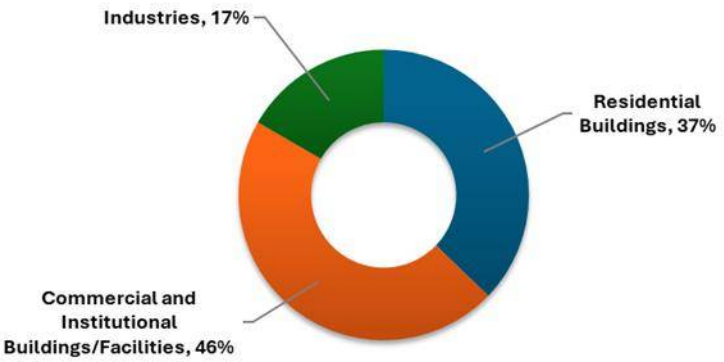


Figure 6-6 Sector-wise electricity consumption and GHG emissions in the stationary energy sector under the Climate Action Scenario, 2058

A city-wide PNG distribution network is planned in Amaravati by 2058 to meet the energy requirements of domestic, commercial, and industrial users. The gas network will be expanded over time, leading to a transition from an energy mix of 50% PNG and 50% LPG in households in 2028 to a 100% PNG and LPG phase-out by 2058. This energy transition to relatively cleaner PNG will result in lower emissions for every unit of energy demand over this time horizon.

PNG consumption-related emissions will be driven by the commercial and institutional buildings and facilities, as well as the residential buildings sector, from 2028 to 2058. Commercial and institutional buildings and facilities will likely account for 44% of the GHG emissions from PNG use by 2058. In comparison, residential and industrial consumers will contribute 29% of the emissions by 2058 (Figure 6-7). As noted earlier, the contribution of LPG consumption to energy demand and resulting GHG emissions is expected to decrease from 45% in 2028 to 0% in 2058.

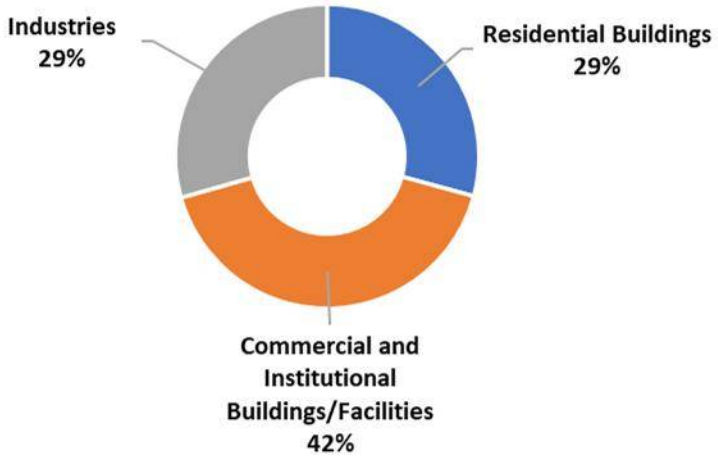


Figure 6-7 GHG emissions from PNG consumption in the stationary energy sector under the Climate Action Scenario, 2058

Additionally, fugitive emissions from expected leakages from PNG distribution within the city have been accounted for in the emission estimates for the period 2028 to 2058. However, they are not represented in the charts due to their negligible share.

Amaravati has laid out specific design targets and mandates for energy efficiency and renewable energy, which are to be integrated into its infrastructure plans. Solar PV has been identified as a major contributor to the city's power mix. The city aims to achieve a 100% renewable energy-based electricity supply for its projected total energy demand by 2058. For 2028 and 2043, the electricity contribution from renewable energy is assumed to be 15% and 75%, respectively (see Annexure D). Additionally, the city has set targets to meet a certain portion of the cooking energy demand through electricity powered by renewable energy sources.

The city has also mandated that buildings follow the ECBC codes and obtain green certifications through LEED, GRIHA and IGBC, and LEED standards. In this context, city-wide electricity savings of about 15% have been assumed in the building sub-sector (residential, commercial & institutions and industries)[75]. In addition, Amaravati has planned to implement District Cooling Systems (DCS) to serve major commercial and institutional areas. DCS will provide centralised cooling to multiple buildings, reducing the need for individual air conditioners and saving significant amounts of electricity. In addition, Amaravati has also laid out plans for digital and integrated energy management through the deployment of Supervisory Control and Data Acquisition (SCADA) systems.

These considerations have been made for establishing the emissions estimates for the climate action scenario. These actions significantly lower Amaravati's projected energy demand and support its transition toward a more sustainable and resilient future between 2028 and 2058.

[75] According to IGBC Green New Buildings and Net-Zero frameworks, buildings can achieve 20–30% savings (IGBC Green New Buildings Rating System, Version 3.0, Abbreviated Reference Guide, September 2016). In comparison, LEED projects often deliver 18–39% improvements. Taking into account both the certification levels (which are being mandated for buildings in Amaravati), real-world operational gaps, partial coverage, varied building types, and behavioural factors, a 15% reduction has been assumed overall.

6.3.1.2 Transportation

Amaravati's mobility strategy focuses on ensuring the significant use of public and NMT modes (see Annexure F). The development of integrated multi-modal transport infrastructure for alternative travel options, as well as smart and accessible transport infrastructure for NMT, is planned.

In the Climate Action scenario, GHG emissions from Amaravati's transport sector are projected to increase over the planning period, reflecting the city's rapid growth and rising travel demand. In 2058, emissions from the transport sector are projected to reach around 2,33,094 tCO_2e from 77,821 tCO_2e in 2028. Of this, approximately 48% is expected to come from on-road transport such as public buses, private vehicles, cars, and taxis, while the remaining 52% will be from metro and rail services, indicating a significant push for public transport in the city (see Figure 6-8).

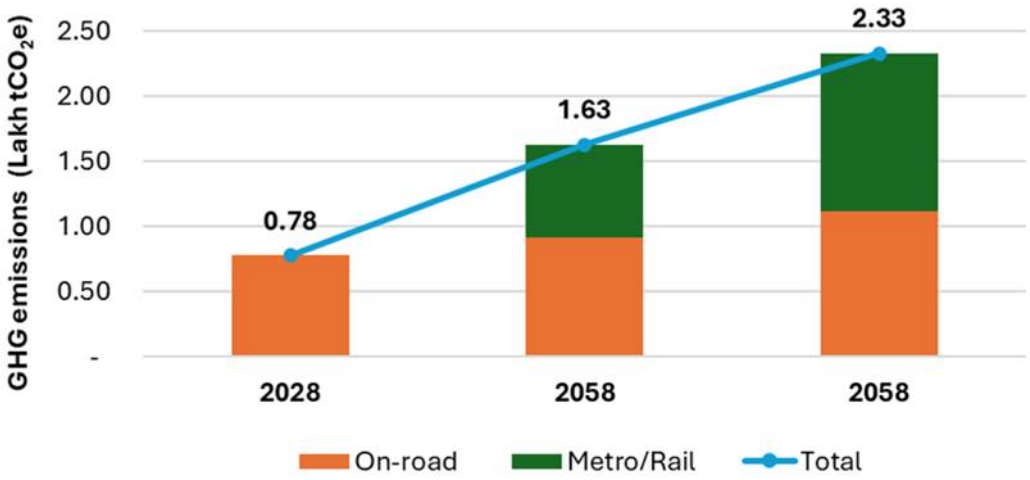


Figure 6-8 Projected trend of GHG emissions in the transport sector under the Climate Action Scenario, 2028–2058

Despite this push for public transport and NMT modes, GHG emissions persist due to the city's plan for widespread electrification of transport systems and the relatively high GHG emission factor of grid-based electricity under India's power mix. However, the city plans to progressively integrate renewable energy into the electricity required for EV operations. Targets have been set to source 20% of the electricity from renewable energy by 2028, further increasing it to 40% by 2043, and reaching 60% by 2058. This phased approach reflects the expected scaling up of renewable energy generation capacity alongside EV adoption, ensuring that the transition to electric mobility is aligned with broader decarbonisation goals.

The projected emissions from the transport sector between 2028 and 2058 are illustrated in Figure 6-8 and summarised in Table 6-4 below. Of the total GHG emissions from the transport sector, electricity is projected to contribute 97%, while the remaining 3% are attributed to transport fuels. The emissions from transport fuels are expected to persist even with the city's target of achieving 100% electrification of its vehicle fleet, as vehicles from external trips, beyond the city's regulatory control, may continue to rely on conventional fuels.

Table 6-4 Projected GHG emissions from the transport sub-sector under the Climate Action Scenario, 2028 - 2058

Sub-sector	GHG Emissions (tCO_2e)			
	2028	2043	2058	Share in 2058
On-Road	77,821	91,504	1,11,959	48%
Rail/Metro	-	71,161	1,21,136	52%
Total	**77,821**	**1,62,665**	**2,33,094**	**100%**

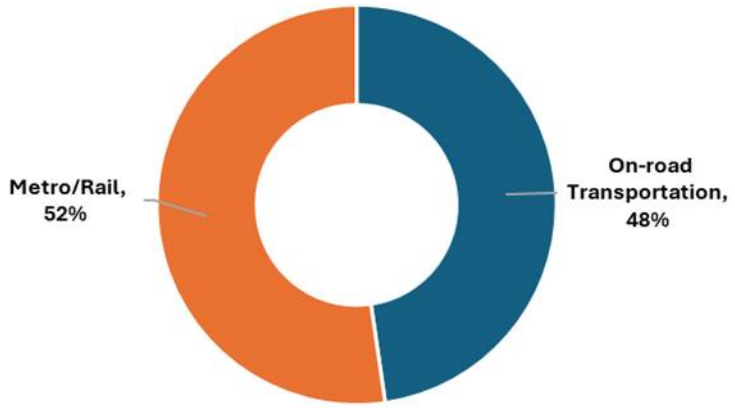


Figure 6-9 Share of on-road and metro/rail modes in transportation emissions under the Climate Action Scenario, 2058

Amaravati's transport planning is centred on creating an efficient and low-emission mobility system. The city has planned for a high-capacity public transport network based on Bus Rapid Transit (BRT) and Mass Rapid Transit (MRT)/Metro. A walkable, compact, and transit-oriented development (TOD) model is being adopted, which will be supported by a strong feeder bus system, intermediate public transport (IPT), and multimodal terminals for smooth transfers. Dedicated cycling and pedestrian infrastructure are also being planned citywide, along with universal street design standards that prioritise safety and accessibility and promote NMT modes.

The integration of electric mobility solutions into the city's overall transportation framework is a high priority on Amaravati's mobility planning agenda. The city has outlined a goal to achieve 80% of passenger trips through NMT, MRT, and electrically powered vehicles by 2050 (see Annexure F). This initiative also creates an opportunity to integrate renewable energy into charging infrastructure, offering the city a significant pathway to advance low-carbon mobility.

These considerations have been factored into the Climate Action scenario while estimating GHG emissions from the transport sector. The assumptions regarding modal share, electric vehicle adoption, and the use of renewable energy for charging have been aligned with Amaravati's sustainable mobility vision. As a result, the emission estimates reflect the city's planned shift toward cleaner transportation modes, increased public transportation usage, and a higher share of non-motorised and electric mobility.

6.3.1.3 Waste

By 2058, the waste sector under the climate action scenario is expected to contribute approximately 4.5% of the city's total emissions. GHG emissions from Amaravati's waste sector are projected to rise over the planning period, from 41,153 tCO_2e in 2028 to around 1,59,031 tCO_2e by 2058.

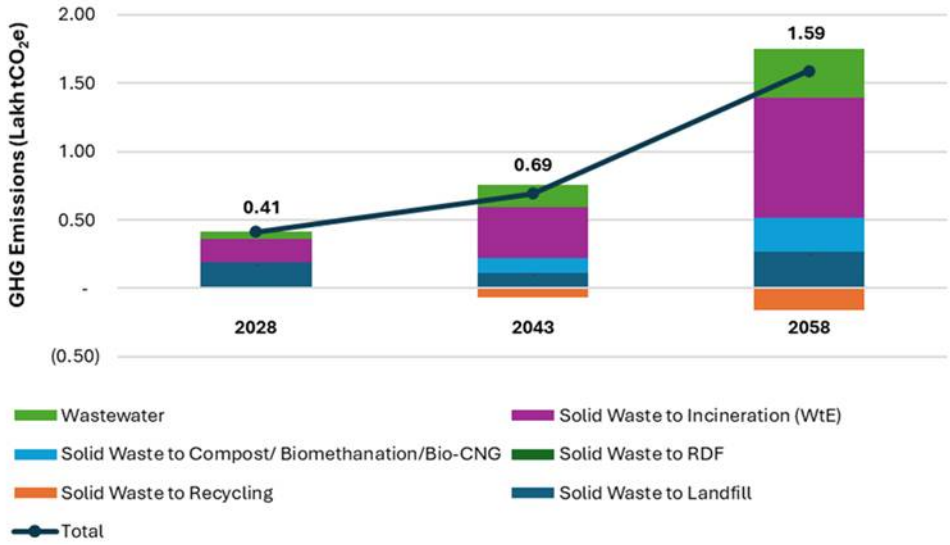


Figure 6-10 Projected trend of GHG emissions in the waste sector under the Climate Action Scenario, 2028–2058

Note: Although the stacked bar in the figure adds up to a higher value (1.7 Lakh tCO_2e in 2058), the total emissions are depicted as 1.59 Lakh tCO_2e due to negative emissions from solid waste treatment processes.

By 2058, solid waste is expected to represent 77% of total waste sector emissions (1,23,245 tCO_2e), while wastewater is projected to account for the remaining 23% (35,786 tCO_2e). A sub-sector breakdown of waste emissions is provided in Table 6-5 below.

Table 6-5 Projected GHG emissions from the Waste sub-sectors under the Climate Action Scenario, 2028 - 2058

Sub-sector	GHG Emissions (tCO_2e)			
	2028	2043	2058	Share in 2058
Solid Waste	36,042	52,904	1,23,245	77%
Wastewater	5,111	16,318	35,786	23%
Total	**41,153**	**69,222**	**1,59,031**	**100%**

Amaravati is estimated to generate 3,955 tonnes per day (TPD) of municipal solid waste (MSW) by 2058[76]. Of this, approximately 2,028 tonnes will be wet waste (51%), and 1,927 tonnes (49%) will be dry waste, which includes recyclables, combustibles, and inert waste (based on the waste composition for Hyderabad as assumed in the Solid Waste Master Plan, 2016). Figure 6-11 below depicts the trend of waste generation and the processing value chain in Amaravati, considered under the climate action scenario.

[76] Total waste generation in the city for 2058 is estimated based on population projections for 2058 and per capita waste generation considered in the SWM Master Plan, 2016.

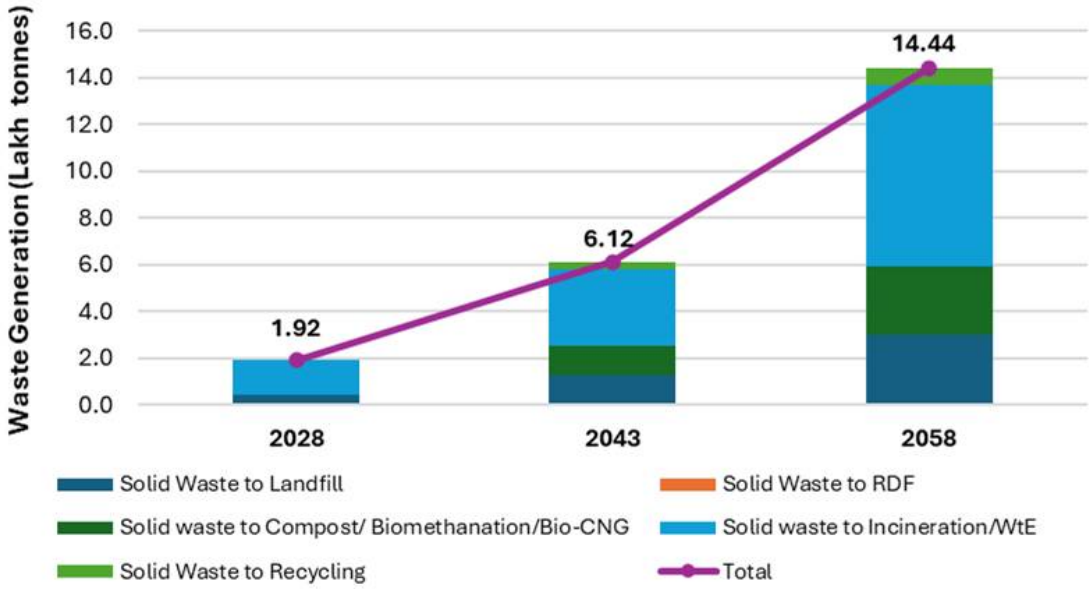


Figure 6-11 Trend of solid waste generation and processing under the Climate Action Scenario, 2028–2058

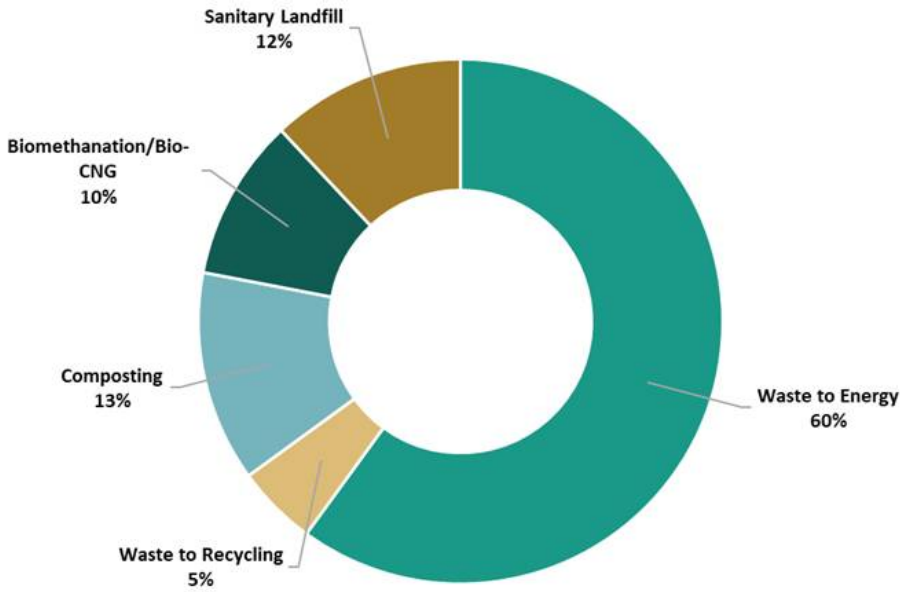


Figure 6-12 Distribution of solid waste by treatment type under the Climate Action Scenario, 2058

From a waste processing perspective, it is assumed that by 2028, all waste will be sent directly to Waste-to-Energy (WtE) facilities for processing, as per the city's current plan, with only inert waste and rejects being sent to the landfill. From 2043 onwards, Amaravati is expected to transition towards a more integrated and low-carbon waste processing system, although WtE will continue to manage the majority of the city's waste. The city plans to introduce Material Recovery Facilities (MRFs) for sorting dry waste and producing RDF, along with biological treatment facilities such as composting, biomethanation, and Bio-CNG plants for

processing wet waste. Scientific landfilling is also proposed for managing inerts and rejects (see Annexure K).

By 2058, as illustrated in Figure 6-12, WtE will continue to constitute the dominant share of the waste processing mix (around 60%). In comparison, other low-emission processes such as composting (13%), biomethanation/Bio-CNG (10%), recycling (5%), and sanitary landfilling (12%) will be incorporated into the system. The gradual diversification of waste processing methods, particularly the introduction of biological treatment and material recovery, is expected to contribute to a significant reduction in methane emissions from the sector compared to a scenario where all waste is processed through WtE or sent to landfill.

Wastewater emissions in Amaravati in this scenario are projected to increase from 5,111 tCO_2e in 2028 to approximately 35,786 tCO_2e by 2058. Methane emissions are expected to be approximately – 38,195 tCO_2e, while nitrous oxide (N_2O) emissions are estimated to be about 73,981 tCO_2e (Table 6-6). A negative trend in methane emissions is observed; this reduction is expected from the recovery of methane from anaerobic STPs and its subsequent utilisation for biogas-based energy generation.

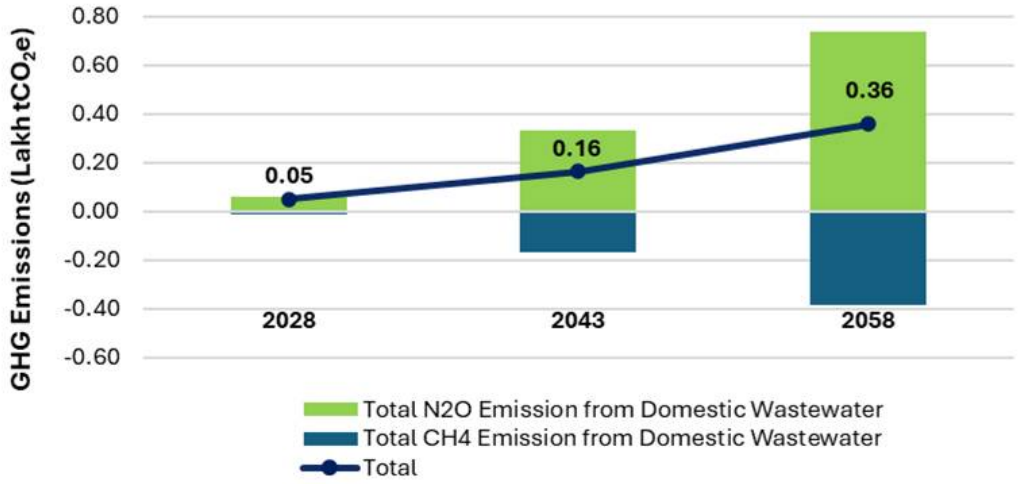


Figure 6-13 Trend of GHG emissions from domestic wastewater under the Climate Action Scenario, 2028–2058

Note: Although the stacked bar in the figure adds up to a higher value (0.7 lakh tCO_2e in 2058), the total emissions are depicted as 0.36 lakh tCO_2e due to negative contributions of methane emissions due to its recovery and reuse in wastewater treatment.

Table 6-6 Projected GHG Emissions from domestic wastewater in Amaravati in the Climate Action Scenario, 2028 to 2058

GHG Type	GHG Emissions (tCO_2e)		
	2028	2043	2058
Total CH_4 Emission from Domestic Wastewater	-994	-16,828	-38,195
Total N_2O Emission from Domestic Wastewater	6,104	33,145	73,981
Total	**5,111**	**16,318**	**35,786**

Amaravati has committed to achieving 100% sewerage network coverage and full treatment of wastewater generated in the city, which is expected to help reduce untreated discharge and associated emissions. Under this scenario, it is assumed that 66.7% of the wastewater will be treated through aerobic processes and the remaining 33.3% through anaerobic systems. The city has also set the objective of achieving 100% sewage treatment, which is expected to further contribute to emissions reduction.

Overall, these measures will help Amaravati establish a cleaner, more climate-resilient waste management system, significantly reducing emissions as the city continues to develop. However, there are opportunities to further reduce these projected emissions, particularly in the wastewater sub-sector, through interventions such as increasing the share of anaerobic treatment systems with methane recovery.

6.4 Business-as-Usual (BAU) Scenario

The BAU scenario represent the level of GHG emissions in the future if Amaravati's development took place in the absence of climate and sustainable planning interventions, following conventional patterns observed in other brownfield cities. It assumes that no additional emissions reduction efforts and measures will be undertaken, beyond those already in place.

This scenario serves as a reference point for assessing the impact of alternative low-carbon strategies adopted by the city as compared to conventional development practices. The BAU scenario assumes "what if" Amaravati were developed not as a sustainable, planned city, no additional emissions reduction efforts and measures will be undertaken, beyond those already in place.

Results and Highlights

In the BAU scenario, GHG emissions in Amaravati are expected to reach approximately 62.79 lakh tCO_2e by 2058. While in 2028 and 2043, emissions are projected to be around 8.13 lakh tCO_2e and 25.46 lakh tCO_2e, respectively. The estimated per capita emission of Amaravati in the BAU scenario is estimated to be 1.57 tCO_2e by 2058. A sectoral representation of Amaravati's GHG emissions in the BAU scenario from 2028 to 2058 is presented in Table 6-7 and Figure 6-14 below.

Table 6-7 Sector-wise projected GHG Emissions in the BAU Scenario in Amaravati, 2028-2058

Sector	GHG Emission (tonnes of CO_2e)			Share - 2058
	2028	2043	2058	
Stationary Energy	**8,22,521**	**25,80,616**	**50,86,174**	**81.0%**
Residential Buildings	3,32,877	11,20,122	18,16,512	28.9%
Commercial	3,73,323	10,82,687	23,24,190	37.0%
Industries	1,15,687	3,75,035	9,39,850	15.0%
Fugitive	634	2,772	5,622	0.1%
Transportation	**79,656**	**2,87,726**	**7,10,347**	**11.3%**
On-road Transportation	79,656	2,87,726	5,48,635	8.7%
Rail/Metro	-	-	1,61,712	2.6%
Waste	**82,118**	**2,09,848**	**4,82,237**	**7.7%**
Solid Waste	36,042	64,239	1,52,996	2.4%
Wastewater	46,076	1,45,609	3,29,241	5.2%
Total	**9,84,295**	**30,78,190**	**62,78,757**	**100%**

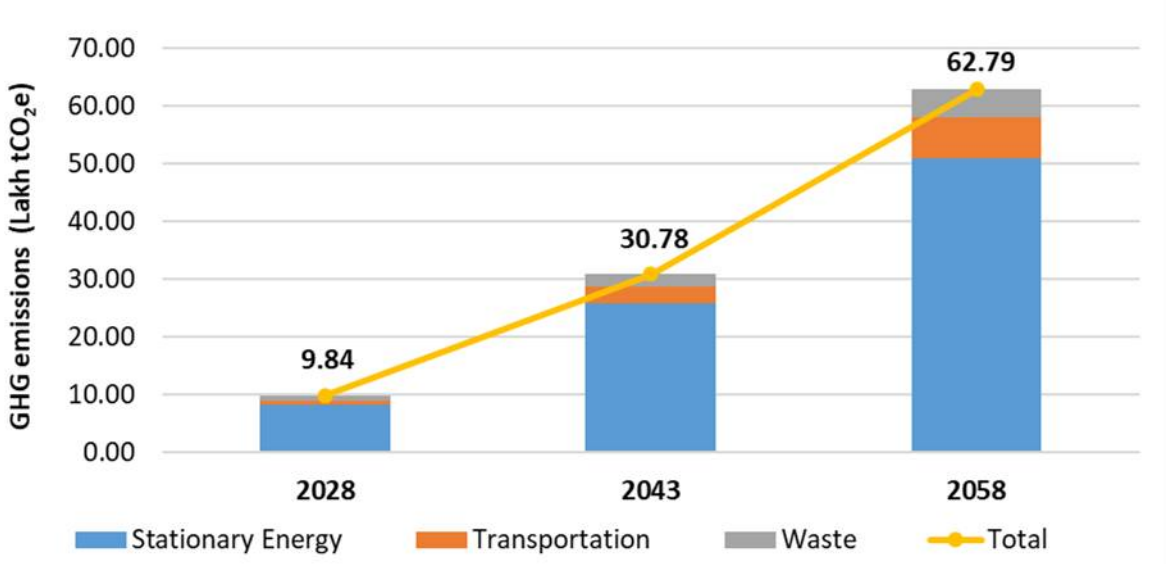


Figure 6-14 Projected Trend of GHG emissions for Amaravati under the BAU Scenario, 2028–2058

Stationary energy is expected to be the dominant source of emissions in Amaravati under the BAU scenario. Emissions from the stationary energy sector are projected to increase from 8.23 lakh tCO_2e in 2028 to more than 50.86 lakh tCO_2e by 2058, accounting for about 81% of the city's total emissions, in contrast to 68.5% in the Climate Action scenario.

The higher level of emissions in the BAU scenario, compared to the Climate Action scenario, is primarily attributed to Amaravati's continued dependence on PNG and grid-based electricity. In contrast to the Climate Action scenario, the uptake of renewable energy in the stationary energy sector under the BAU scenario is assumed to remain limited, with renewables projected to contribute only 3.9% of the total electricity consumption in 2028, 19.6% in 2043, and 44.4% by 2058, in line with Andhra Pradesh's Renewable Purchase Obligation (RPO) trajectory (see Annexure D). In addition, the adoption of ECBC norms and green building certifications such as LEED, GRIHA, and IGBC is assumed to remain limited in the BAU scenario. Accordingly, a city-wide electricity saving of only about 5% has been considered across the stationary energy sector, as compared to 15% in the climate action scenario.

All considerations concerning the expansion of the PNG network, including the transition from LPG to PNG, the sectoral distribution of PNG consumption, and the related emissions, are assumed to remain unchanged in the BAU scenario compared to the Climate Action scenario. Additionally, no target for electric cooking has been specified in the BAU scenario. Electricity is thus estimated to be the dominant emission source in the stationary energy sector, contributing about 82% of total sectoral emissions, while PNG is expected to account for the remaining 18%. This represents a significant contrast to the Climate Action scenario, where 100% of the stationary energy emissions are projected to arise from PNG consumption.

Transport sector emissions in the BAU scenario are projected to contribute 11.3% of the emissions by 2058, rising steeply, from 79,656 tCO_2e in 2028 to 7,10,347 tCO_2e in 2058. In 2058, on-road transportation, including private vehicles and buses, is expected to account for the largest share of sectoral emissions, at 77% of the total, while rail/metro is estimated to account for the remaining 23%. As compared to the

Climate Action scenario, emissions from the transport sector under the BAU scenario are projected to be substantially higher, nearly three times higher. This is primarily due to the lower assumed share of PT and NMT, 42% compared to 71% in the Climate Action scenario, and a correspondingly higher share of private transport, 58% compared to 29% in the Climate Action scenario. The difference is further highlighted by the assumed fuel mix and the relatively limited adoption of EVs in the BAU scenario compared to the Climate Action scenario. The detailed modal share and fuel mix projections for the BAU scenario across the planning period are presented in Annexure F and Annexure I, respectively.

EV adoption is assumed to be 100% in public transport, similar to the Climate Action scenario; however, EV adoption in private vehicles follows state-level trends. Renewable energy supply for EV charging has not been considered, consistent with current patterns in brownfield cities. The assumptions used for estimating the fuel mix and modal share are provided in Section 6.2.

The remaining 7.7% of the emissions in 2058 in the BAU scenario are estimated to come from the waste sector. By 2058, the waste sector emissions are projected to be 482,237 tCO_2e in the BAU scenario, which is approximately three times the emissions from the sector in 2058 in the Climate Action scenario. Wastewater emissions are projected to dominate the waste sector in 2058, making up about 68% of total emissions, in contrast to 23% in the Climate Action scenario.

In the BAU scenario, 43% of Amaravati's waste is projected to be processed through Waste-to-Energy (WtE), which is 17% lower than in the Climate Action scenario. Composting is estimated to constitute a significantly higher share, at 37% (compared to 13%), while bio-methanation/bio-CNG processing, a cleaner option with methane recovery potential compared to composting, is estimated to account for a much lower share, at 3% (compared to 10%). Sanitary landfilling and recycling are estimated to account for 12% and 5%, respectively. The estimated limited adoption of low-emission and energy-recovering technologies is expected to contribute to higher GHG emissions from solid waste under the BAU scenario.

Under the BAU scenario, wastewater-related emissions are projected to reach 3,29,241 tCO_2e by 2058. While 100% sewerage coverage and treatment are assumed, similar to the Climate Action scenario, the key difference lies in the absence of methane recovery or energy generation from anaerobic treatment. Consequently, methane emissions are estimated at 2,55,260 tCO_2e in 2058, compared to −38,195 tCO_2e in the Climate Action scenario, leading to significantly higher overall emissions from the wastewater sub-sector.

6.5 Comparison between Climate Action Scenario and BAU Scenario

Figure 6-15 presents the comparative GHG emission trajectories for Amaravati under the BAU and Climate Action scenarios during the period 2028–2058. In the BAU scenario, total GHG emissions are projected to increase from 9.84 lakh tCO_2e in 2028 to 30.78 lakh tCO_2e in 2043 and further to 62.79 lakh tCO_2e by 2058, primarily due to population growth, rising energy demand, and a continued dependence on conventional energy sources.

In contrast, under the Climate Action scenario, GHG emissions are projected to rise at a much slower rate, from 8.12 lakh tCO_2e in 2028 to 12.68 lakh tCO_2e in 2043, stabilising around 12.45 lakh tCO_2e by 2058, driven by increased renewable energy adoption, energy efficiency measures, and a larger modal share of

sustainable transport. The implementation of low-emission technologies, improved waste management systems, and enhanced energy efficiency across sectors contributes significantly to this lower emissions trajectory.

As illustrated in Figure 6-15, by 2058, Amaravati is projected to achieve an overall emissions reduction of 80.2% (50.33 lakh tCO_2e) compared to the BAU scenario, with reductions of 17.5% in 2028 and 58.8% in 2043 along the way**.** This puts Amaravati well in line with the state's net-zero ambition.

The Climate Action Scenario results in the following levels of emission reduction compared to BAU levels:

- **GHG emissions in 2028:** *17.5% lower* than BAU
- **GHG emissions in 2043:** *58.8% lower* than BAU
- **GHG emissions in 2058:** *80.2% lower* than BAU

With implementation of its climate actions, Amaravati's **per capita emissions** are estimated to be **0.31 tCO_2e by 2058**. This is much lower than the existing baseline situation, with per capita emissions of 1.31 tonnes of CO_2e in 2024 and represents a significant decline (about 76%), especially considering the infrastructure improvement and transformation that the capital city will bring to the region.

Through the low-carbon and climate-oriented planning approach under its CCAP, Amaravati's per capita emissions on completion of its development in 2058 are estimated to be much lower as compared to that of brownfield Indian and global cities (see Table 6-3).

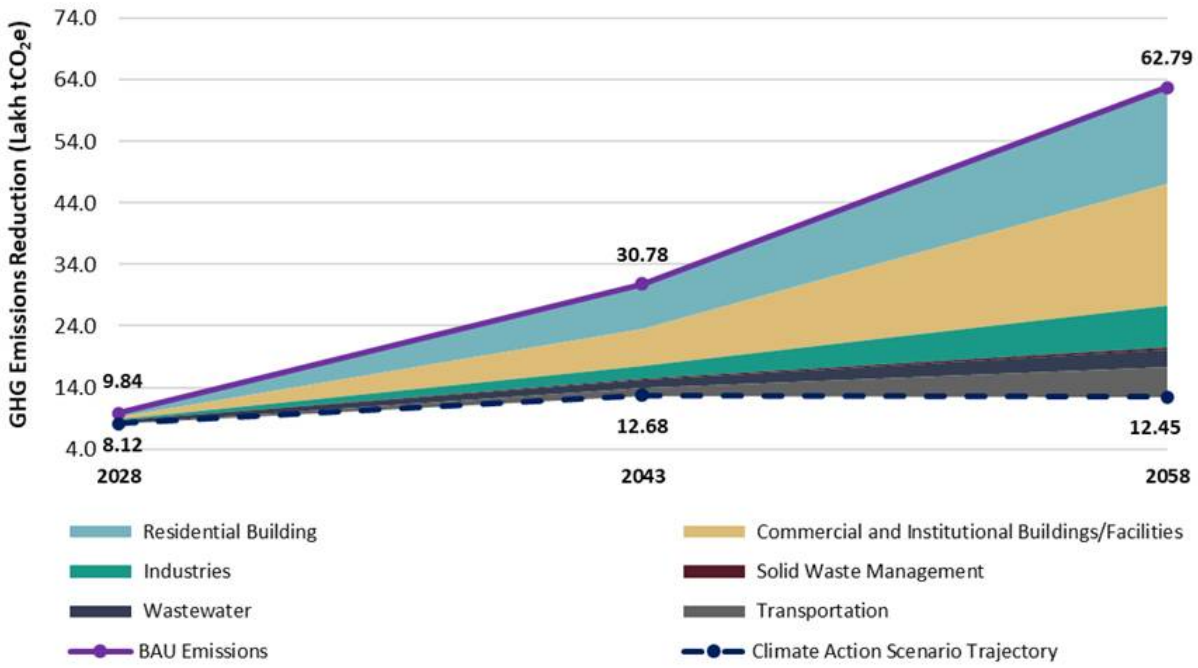


Figure 6-15 GHG Emissions reduction potential of actions in the Climate Action Scenario compared to the BAU Scenario, 2028 - 2058

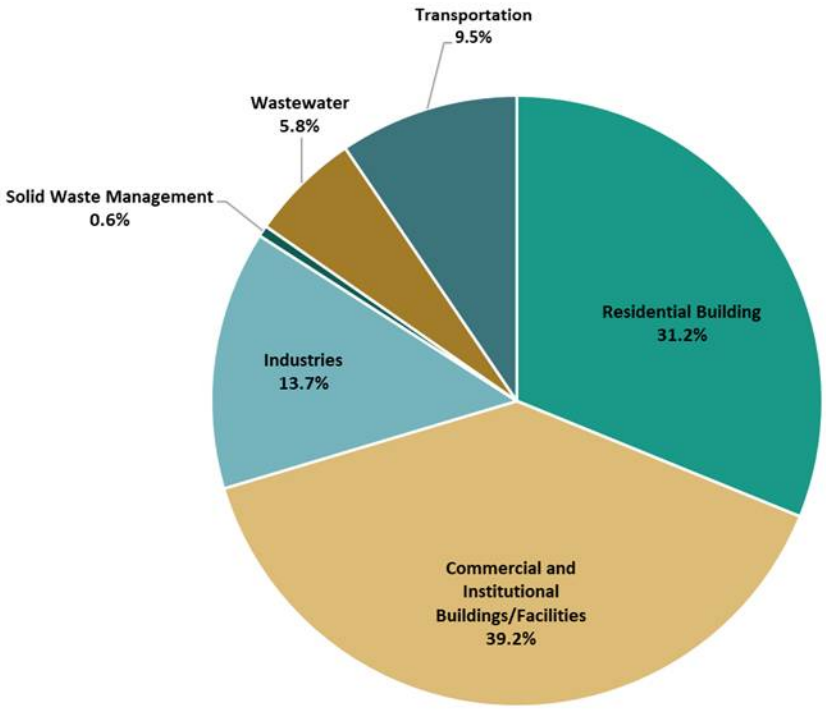


Figure 6-16 Sector contribution to GHG emissions reduction from the BAU levels, 2058

Amaravati's emission reduction from BAU levels is expected to be primarily driven by interventions in the stationary energy sector. The sector is estimated to contribute over 84.1% of the total reduction potential in 2058. Of this, the commercial and institutional buildings/facilities sub-sector is expected to contribute 39.2% of the total emissions reductions, followed by residential buildings with 31.2% contribution and industries with 13.7% contribution (Figure 6-16). The transport sector is estimated to contribute 9.5% of the total emissions reductions, driven by increased adoption of electric vehicles and modal shifts towards public and non-motorised transport. The waste sector (wastewater and solid waste management) is estimated to account for 6.4% of the reduction potential through improved treatment technologies and resource recovery.

Per capita emissions follow a similar downward trend under the climate action scenario, falling from 1.31 tCO_2e in 2024 (baseline) to 0.31 tCO_2e by 2058. In contrast, the BAU scenario projects per capita emissions to be 1.57 tCO_2e by 2058. This comparison underscores the transformative impact of sustained climate action measures in achieving deep decarbonisation across sectors, as opposed to the emission-intensive growth pathway under the BAU scenario.

7 Way Forward

Amaravati, as a planned greenfield capital city, is envisioned to embody principles of environmental sustainability, quality infrastructure, and resilient urban systems. The city's strategic location on the Krishna River, along with proximity to Vijayawada and Guntur, ensures strong multimodal connectivity and the foundations for an economic, administrative, and knowledge-driven urban hub. Its Master Plan prioritizes several sustainability measures including water security, decentralized wastewater management and reuse, robust stormwater infrastructure, integrated solid waste management, and buildings and transport systems powered by renewable energy. Environmental compliance with NGT and EC directives is achieved through robust land use and zoning regulations norms that preserve blue and green networks, wetlands, and forests, embedded with nature-based climate resilience measures.

This Volume I of the Climate Change Action Plan for Amaravati outlines the comprehensive Climate Risk and Vulnerability Assessment, which identifies climate projections indicate rising temperatures up to 2.4°C by mid-century, increasing frequency of extreme rainfall events, along with significant shifts in rainfall pattern and flood risks, particularly in rapidly urbanizing, low-lying regions, including areas alongside the Kondaveeti Vagu and Pala Vagu.

The climate risk and vulnerability assessment, based on current conditions and future scenarios, reveals that climate change presents substantial challenges to Amaravati. It identifies areas of physical and social infrastructure that are susceptible to hazards, emphasizing that vulnerable communities—such as the elderly, children, and migrant workers—are at the greatest risk from heatwaves and floods. This information guides targeted strategies to reduce vulnerability. Urban systems are increasingly stressed, with higher temperatures directly affecting vital services like water and healthcare. Additionally, sectors like transport, wastewater, and solid waste management experience indirect impacts.

The analysis further indicates that government institutions possess greater adaptive capacity, whereas vulnerable groups, including the elderly, children, women, and construction workers, are less equipped to cope with climate risks. While public agencies are relatively well-equipped, consistent capacity-building efforts are required for them and vulnerable communities. To strengthen the resilience of urban infrastructure and communities, APCRDA must adopt a proactive and holistic approach to both mitigate and adapt to identified climate risks. The assessment underscores the necessity for immediate, targeted interventions such as enhanced stormwater networks, rapid heat and flood response protocols, and climate resilience of social infrastructure. Also, the adoption of nature-based solutions, such as the integration of green corridors with rain gardens and bioswales, the use of permeable surfaces, and the widespread adoption of rainwater harvesting, should be prioritized, especially in high-risk neighbourhoods. These strategies should be seamlessly integrated into ongoing development programs and projects, rather than functioning as standalone projects. Implementation should be phased according to the vulnerability to heat hotspots and waterlogging, with immediate attention given to those areas most at risk, followed by subsequent interventions in other settlements as required.

The GHG emissions inventory estimates Amaravati's current baseline per capita GHG emissions at 1.31 tCO_2e, with stationary energy demand primarily from buildings being the largest contributor to emissions, followed by transport and waste. With an Amaravati adopting an ambitious climate action pathway,

including widespread renewable energy integration, energy-efficient buildings compliant with ECBC/LEED/GRIHA/EDGE norms, electrified public and private transportation, and circular waste management, Amaravati can cut per capita emissions from 1.57 tCO_2e in the BAU scenario to 0.31 tCO_2e by 2058. This represents an 80% reduction from the BAU scenario baseline, leading to much lower per capita emissions than comparable Indian and international cities. Sectoral strategies focus on advancing toward 100% renewable energy, implementing a city-wide PNG network, increasing the adoption of electric vehicles, and modal shifts towards public and non-motorised transport. It also includes decentralised STPs with methane recovery and shifting towards segregated and decentralized waste processing designed for methane capture.

To address its climate vulnerability and GHG emissions trajectory, Amaravati should establish a regular monitoring and updation process for its demographic, urban systems, climate risk and vulnerability and GHG emissions datasets, thereby creating robust, coordinated data management systems. Climate adaptation and mitigation must be mainstreamed into all infrastructure and zoning regulations, supported by strong cross-sectoral linkages and alignment among departments and stakeholders. Capacity building for local institutions and vulnerable communities is imperative, along with phase-wise prioritization of climate actions and scalable intervention models. Periodic stakeholder engagement, including government bodies, civil society, academia, the private sector, and vulnerable communities, will ensure participatory planning and the effective formulation and implementation of climate-resilient projects. The establishment of integrated monitoring, evaluation, and reporting frameworks will be critical to track climate risks and emissions, support evidence-based decision making, and facilitate iterative improvements.

Building on information presented in this Volume I report, Volume II of the Amaravati's City Climate Change Action Plan elaborates on climate strategies and actions, along with quantitative targets, across nine key sectors, covering energy and buildings, water supply, wastewater, stormwater, solid waste, transportation, urban greening and biodiversity, health and air quality. For instance, the energy and buildings strategy aims to achieve 100% renewable electricity for all buildings and utilities by 2058, supported by the deployment of energy-efficient appliances and mandatory green certifications for new constructions. In the water sector, the city aims to reduce non-revenue water to below 10%, ensure all connections are metered, install rainwater harvesting in every property, deploy SCADA, and have all water utilities operate on efficient and renewable power.

Each of these strategies, actions, and targets is aligned with national and state policies and targets, and with local infrastructure plans, policies, and ongoing projects. The action table specifies action descriptions and rationale, indicative implementation locations, implementing entities, climate-resilience benefits, robust monitoring indicators, and lessons drawn from international and Indian good practices. A practical governance framework is designed to facilitate and support the phased implementation of proposed climate actions. The governance and coordination structure that includes relevant public departments and stakeholders will enable strategic policy coordination, project prioritization, and interdepartmental collaboration. The framework emphasizes mainstreaming climate considerations into all planning processes, from zoning and design approvals to procurement, operations, and maintenance. These climate interventions are implemented through an Integrated Command and Control Centre, which mainstreams the climate-resilient infrastructure framework. This framework incorporates performance measurement indicators to ensure monitoring and evaluation of climate action implementation. Amaravati's phased and

integrated approach to climate resilience, developed with robust baseline assessments and sectoral strategies, will achieve its goal of becoming a climate-resilient, net-zero, inclusive, and liveable model city for India and the world.

Annexure A. Analysis of Adaptive Capacities of Identified Actors

Actors' capacities rating and scoring against the three criteria - Capacity to Organise and Respond, Resources, and Access to Information, to determine the capacity of a particular actor is Low, Medium or High is indicated in the Table A-1 below.

Table A-1 Actors' Capacities Rating and Scoring

Key Capacities of Actors	Score
Capacity to Organise and Respond	
Low capacity to organise and re-organise in response to threat or disruption	1
Medium capacity to organise and re-organise in response to threat or disruption	2
High capacity to organise and re-organise in response to threat or disruption	3
Resources	
Low access to the resources necessary to respond (manpower, technology, funds)	1
Medium access to the resources necessary to respond (manpower, technology, funds)	2
High access to the resources necessary to respond (manpower, technology, funds)	3
Access to Information	
Low availability of data and information necessary to develop effective plans and actions and to improve responses to disruptions	1
Medium availability of data and information necessary to develop effective plans and actions and to improve responses to disruptions	2
High availability of data and information necessary to develop effective plans and actions and to improve responses to disruptions	3

Based on the Adaptive Capacity Scores of each of the actors, for a particular fragile system, you can determine which actors have a High, Medium and Low adaptive capacity.

Table A-2 Levels of Adaptive Capacity of Urban Actors

Adaptive Capacity Score	Level of Adaptive Capacity
1 – 8	Low
9 – 17	Medium
18 – 27	High

Actors with a **'Low'** level of adaptive capacity would be those who need to be ***specifically targeted*** in the *actions* (or resilience strategies) that are undertaken to reduce the fragility of the identified urban system.

Actors with a **'High'** level of adaptive capacity can be engaged in the proposed actions, as they can respond to the impacts of the fragile systems. Similarly, those falling in the **'Medium'** category may also need to be specifically targeted *or* can be engaged in the proposed actions, depending on which end of the range they are closer to, i.e., closer to the 'low' category or closer to the 'high' category.

Table A-3 Scoring of Actors

Urban System	Key Actors	Capacity to organize and respond	Access to resources	Access to information	Adaptive capacity (Score)	Adaptive capacity (Status)
		A	B	C	A x B x C	
Water Supply	APCRDA	3	3	3	27	High
	ADCL	3	3	3	27	High
	AP Irrigation Deptt.	2	3	3	18	High
	Youth	3	2	2	12	Medium
	AP Ground water & Water Audit department	1	2	3	6	Low
	Existing Villagers	2	1	1	2	Low
	New Settlers	1	2	2	4	Low
	Elderly / Women / Children	1	1	1	1	Low
	Construction Workers	1	1	1	1	Low
	NGOs / SHGs	2	2	2	8	Low
Waste Water	APCRDA	3	3	3	27	High
	ADCL	3	3	3	27	High
	APPCB	2	3	3	18	High
	APIIC	2	3	2	12	Medium
	Existing Villagers	1	1	1	1	Low
	New Settlers	2	2	1	4	Low
	Elderly / Women / Children	1	1	1	1	Low
	Construction Workers	1	1	1	1	Low
	Youth	3	1	1	3	Low
Storm Water	APCRDA	3	3	3	27	High
	ADCL	3	3	3	27	High
	AP Irrigation Deptt.	3	3	3	27	High
	Existing Villagers	3	2	1	6	Low
	New Settlers	1	1	1	1	Low

Urban System	Key Actors	Capacity to organize and respond	Access to resources	Access to information	Adaptive capacity (Score)	Adaptive capacity (Status)
		A	B	C	A x B x C	
	Elderly / Women / Children	1	1	1	1	Low
	Construction Workers	1	1	1	1	Low
	Youth	3	2	1	6	Low
Solid Waste Management	APCRDA	3	3	3	27	High
	ADCL	3	3	3	27	High
	New Settlers	3	3	1	9	Medium
	Youth	3	3	1	9	Medium
	Existing Villagers	2	3	1	6	Low
	Elderly / Women / Children	2	2	1	4	Low
	Construction Workers	1	2	1	2	Low
Road and Transport	APCRDA	3	3	2	18	High
	ADCL	3	3	2	18	High
	APSRTC	3	3	2	18	High
	AP Roads & Buildings Deptt.	3	3	2	18	High
	Indian Railways	3	3	1	9	Medium
	RTO	3	3	1	9	Medium
	IPT Operators	2	1	1	2	Low
	IPT Users	2	1	1	2	Low
	Private Vehicle Users	3	2	1	6	Low
	Existing Villagers	1	1	1	1	Low
	New Settlers	3	2	1	6	Low
	Elderly / Women / Children	1	1	1	1	Low
	Construction Workers	1	1	1	1	Low
	Youth	2	2	1	4	Low
Biodiversity	APCRDA	3	3	2	18	High
	ADCL	3	3	2	18	High

Urban System	Key Actors	Capacity to organize and respond	Access to resources	Access to information	Adaptive capacity (Score)	Adaptive capacity (Status)
		A	B	C	A x B x C	
	AP Forest Department	3	2	2	12	Medium
	Andhra Pradesh Greening & Beautification Corporation	1	2	2	4	Low
Public Health	Private Hospitals	3	3	3	27	High
	PHCs	1	1	1	1	Low
	Govt. Hospitals	3	2	2	12	Medium
	Elderly / Women / Children	1	1	1	1	Low
	NGOs / SHGs	2	1	1	2	Low

Annexure B. Key assumptions in GHG emission estimation

Assumptions – Base year 2024

Stationary Energy

- The electricity consumption dataset received from the DISCOM covers both the MTMC area and the villages under the Amaravati city area. However, since only one-third of the current MTMC population falls within the Amaravati city boundary, the dataset has been scaled down using per capita consumption to estimate electricity use specific to the city.
- Transmission and distribution (T&D) losses for electricity have been assumed at 7% as per inputs from DISCOM and associated emissions have been accounted for in the estimates.

Waste

- Solid waste generation for 2024 includes contributions from both the MTMC and the village settlements within the capital city area. Per capita waste generation is estimated at approximately 0.43 kg per person per day.
- Wastewater generation has been estimated based on the assumption that 80% of the total water supply is discharged as wastewater. While data on water supply were available for the MTMC area, the village-level supply has been estimated using a per capita water consumption rate of 70 litres per capita per day (LPCD).

Annexure C. Power Demand of Amaravati in 2058

Classification	Estimated Power Demand (MW)
Residential	1076.6
Commercial	521.4
Government / Institutional	21.3
Industrial	498.9
AGC (Excluding DC)	169.3
Startup Area	202.4
Residential area in commercial & Industrial Zones	36.5
Utilities (Including District Cooling System)	123.2
Line losses @2.84%	77.5
Total Demand	**2726.9**

Annexure D. Renewable Energy (Solar PV) Integration Target for Amaravati in the Planning Period

The table below illustrates the percentage of projected electricity consumption in the city targeted from renewable energy sources in the planning period in Amaravati; in both BAU and Climate Action Scenarios.

Parameter	Climate Action Scenario			BAU Scenario		
	2028	2043	2058	2028	2043	2058
Percentage of electricity consumption targeted from renewable energy (%)	15%	75%	100%	3.88%	19.60%	44.44%

Annexure E. Electric Cooking Target for Amaravati

The table below presents the targeted share of cooking energy demand expected to be met through electricity (powered by renewable energy sources) during the planning period in Amaravati, under both the BAU and Climate Action Scenarios.

Residential Sub-sector

Parameter	Climate Action Scenario			BAU Scenario		
	2028	2043	2058	2028	2043	2058
Percentage of energy demand for cooking met by electricity (%)	-	5%	10%	-	-	-
Percentage of electricity for cooking sourced from renewable energy (%)	100%	100%	100%	-	-	-

Commercial and institutional buildings/facilities sub-sector

Parameter	Climate Action Scenario			BAU Scenario		
	2028	2043	2058	2028	2043	2058
Percentage of energy demand for cooking met by electricity (%)	-	10%	15%	-	-	-
Percentage of electricity for cooking sourced from renewable energy (%)	100%	100%	100%	-	-	-

Annexure F. Estimated Modal Share of Transportation in Amaravati

The table below highlights the estimated modal share distribution across different transport modes, including private vehicles, public transport, and NMT, in both the BAU and Climate Action Scenarios.

Mobility Profile	Climate Action Scenario			BAU Scenario		
	2028	2043	2058	2028	2043	2058
Non-Motorised Transport (Walk + Cycle)	20%	24%	25%	20%	20%	20%
Private Vehicles	56%	30%	29%	58%	58%	58%
Public Transport	24%	46%	46%	22%	22%	22%

Note:

- *In the BAU scenario, the modal share is assumed to remain largely consistent across the planning period.*
- *Only bus-based public transport systems are assumed for 2028 and 2043, while by 2058, metro services are expected to be established, accounting for 45% of the total public transport share.*

Annexure G. Estimated Trip Generation Rates for Amaravati

Parameter	Units	Value
Average trip generation	trips/person/day	1.5

Note: The trip generation rate has been assumed to be constant throughout the planning period in both the Climate Action and BAU scenarios.

Annexure H. Estimated Fuel-Mix of the Vehicles/Transport Modes in Amaravati – Climate Action Scenario

Fleet mix by fuel	2028				2043				2058			
	Petrol	Diesel	CNG	Electric	Petrol	Diesel	CNG	Electric	Petrol	Diesel	CNG	Electric
2-Wheeler	64%	-	-	36%	10.5%	-	-	89.5%	4%	-	-	96%
Car	38%	48%	7%	7%	12%	15%	2%	71%	3%	4%	1%	92%
Bus	-	-	-	100%	-	-	-	100%	-	-	-	100%
Metro	-	-	-	100%	-	-	-	100%	-	-	-	100%
Rail	-	-	-	100%	-	-	-	100%	-	-	-	100%
Taxi/Cabs	-	-	-	100%	-	-	-	100%	-	-	-	100%

Annexure I.Estimated Fuel-Mix of the Vehicles/Transport Modes in Amaravati – BAU Scenario

Fleet mix by fuel	2028				2043				2058			
	Petrol	Diesel	CNG	Electric	Petrol	Diesel	CNG	Electric	Petrol	Diesel	CNG	Electric
2-Wheeler	96%	-	-	4%	79.2%	-	-	20.8%	62%	-	-	38%
Car	40%	51%	6%	2%	37.7%	48.7%	3.7%	9.4%	35%	46%	1%	17%
Auto-Rickshaw	-	-	97%	3%	-	-	82.7%	17.3%	-	-	68%	32%
Bus	-	-	-	100%	-	-	-	100%	-	-	-	100%
Metro	-	-	-	100%	-	-	-	100%	-	-	-	100%
Rail	-	-	-	100%	-	-	-	100%	-	-	-	100%
Taxi/Cabs	40%	51%	6%	2%	-	-	90%	9%	-	-	82%	17%

Annexure J. Renewable Energy (Solar PV) Integration Target for Transportation in Amaravati (2028-2058)

The table below presents the estimated share of renewable energy in meeting the electricity demand of the transport sector in Amaravati under both the BAU and Climate Action scenarios.

Parameter	Climate Action Scenario			BAU Scenario		
	2028	2043	2058	2028	2043	2058
Percentage of electricity consumption targeted from renewable energy (%)	20%	40%	60%	0%	0%	0%

Annexure K. Solid Waste Processing in Amaravati (2028-2058) in the Planning Period

Climate Action Scenario

Type	2028		2043		2058	
	Tonnes	Percentage	Tonnes	Percentage	Tonnes	Percentage
Waste to Energy (WtE)	462	88%	998	60%	2,354	60%
Waste to Recycling	-	-	89	5%	210	5%
Composting Plant	-	-	212	13%	500	13%
Biomethanation/Bio-CNG	-	-	170	10%	400	10%
Sanitary Landfill	66	12%	208	12%	491	12%

BAU Scenario

Type	2028		2043		2058	
	Tonnes	Percentage	Tonnes	Percentage	Tonnes	Percentage
Waste to Energy (WtE)	462	88%	718	43%	1,692	43%
Waste to Recycling	-	-	89	5%	211	5%
Composting Plant	-	-	621	37%	1,464	37%
Biomethanation/Bio-CNG	-	-	41	2%	98	2%
Sanitary Landfill	66	12%	208	12%	491	12%

Note:

- *In 2028, all waste is assumed to be processed through Waste-to-Energy (WtE) facilities as per the city's initial waste management plan.*
- *Approximately 10% of rejects from the treatment facilities are estimated to be sent to the sanitary landfill, in addition to the inert waste.*

Annexure L. Emission Factors

Emission factors have been maintained consistently across the planning period, both BAU and Climate Action Scenario, to ensure methodological uniformity and facilitate accurate comparison with the baseline year.

Emission Factors for Fuels and Grid-Electricity			
Fuel	**Emission factor per unit of fuel**	**Unit**	**Source**
LPG	2.98	tCO_2e/tonne	IPCC
PNG	0.00189	tCO_2e/cubic metre	IPCC
Petrol	2.30	tCO_2e/kilolitre	IPCC
Diesel	2.85	tCO_2e/kilolitre	IPCC
CNG (cubic m)	0.0021	tCO_2e/cubic metre	IPCC
Grid – Electricity (2023-24)	727.00	tCO_2e/million kWh	Central Electricity Authority (CEA) - CO_2 Baseline Database for the Indian Power Sector, version 20.0, 2024 Available at: https://cea.nic.in/wp-content/uploads/2021/03/User_Guide_Version_20.0.pdf

Emission Factors for Biological Treatment of Waste (IPCC Default)				
Type of Biological Treatment	CH4 Emission Factors (g CH4/kg waste treated)		N2O Emission Factors (g N2O/kg waste treated)	
	on a dry weight basis	on a wet weight basis	on a dry weight basis	on a wet weight basis
Composting	10.00	4.00	0.60	0.24
Anaerobic digestion at biogas facilities	2.00	0.80	Assumed negligible	Assumed negligible

Methane Correction Factor (MCF) for Landfill (IPCC Default)	
Type of Site	**(MCF) Default Values**
Managed – anaerobic	1

Annexure M. Minutes of Focus Group Discussions

Village: Rayapudi

Location: Grama Sachivalayam, Rayapudi

Date: 02/06/2025

Participants: Ms. Gowri Shanti, MPDO, Panchayat Secretary, ICLEI SA team, 40 villagers

Discussion points:

- **Flood Impact:** The fisherman colony is vulnerable to flooding. During the rainy season, water surrounds the area for 2 to 4 days every year. During the September 2024 floods, water levels rose as high as 1.5 meters, around 135 families were relocated to rescue shelters by the government. Accessibility of the community is disrupted due to the flood water on the road connecting this area with other parts of the village. The severity of flood events was exacerbated by the diversion of Pala Vagu for the construction of E1 road. Inadequate maintenance of the lock gates at the Pala vagu outfall into the Krishna River can worsen the situation, timely operation could help reduce flood impact.
- **Impact of infrastructure construction on Flooding:** Abbarajupalem is experiencing waterlogging due to the diversion of Pala vagu for the trunk road network construction. No intermediate measures are taken to let the flow of storm runoff into the downstream. Encroachments of the existing natural drainage further increase flood severity. Due to the lack of funds as the village became part of Amaravati, minor measures like the construction of ditches to divert the flood water are also not possible. Additionally, the construction of the seed access road without provisions for stormwater passage has led to dependency on the mechanical pumps.
- **Recommended Interventions for flood management:** Strengthening and repair works for embankments damaged during the 2024 floods. Repair and maintenance works of the lock system in Pala Vagu to be completed before the onset of monsoon. Desilting of the vagus to improve the runoff flow and reduce waterlogging.
- **Temperature Rise:** Villagers reported experiencing higher temperatures over the years and perceived a correlation between rising temperatures and the decline in agricultural activities.

- **Water supply:** The village has abundant water supply from the ground water resources and the quality of the water supplied is suitable for potable needs.
- **Wastewater Management:** The street-level surface drainage network is in place, whereas drainage along the main R&B road is missing, resulting in waterlogging at the nodes of streets. Although all households are equipped with septic tanks, faecal sludge is often discharged untreated by desludging vehicles into Pala Vagu on the village outskrits.
- **Solid waste management**: Services are provided by the APCRDA, with collection activities done by the Panchayati sanitary staff.
- **Health:** Auxiliary Nurse Midwife (ANM) conducts the fever surveys during the rainy season or after the event of flooding. The village lacks a PHC, residents travel to Mangalagiri and Vijayawada for medical care.
- **Pollution:** Residents in the villages are experiencing the severity of air pollution due to the ongoing construction activities. Currently, there are no air monitoring sensors in the village to measure pollution levels.
- **Disaster Management:** Village has an audio alert system that provides instructions/ warnings to the residents before the event. Residents also receive information through mobile SMS from the Andhra Pradesh State Disaster Management Authority.

Village: Borupalem
Location: Panchayat Office, Borupalem
Date: 02/06/2025
Participants: MPDO, Panchayat Secretary, ICLEI SA team, 40 villagers
Discussion points:

- **Severe Flooding:** In 2019, Peddalanka faced severe flooding, with water levels rising upto 12 feet, submerging homes for an entire week. The village was entirely surrounded by water, cutting off communication and evacuation routes, leaving residents stranded. Kotha Colony was the worst affected, with 60 families waterlogged for a week.
- **Transport:** The only available modes of transport are two-wheelers and autos; however, autos become inaccessible when the roads are covered with silt. In the recent 2024 flooding event, houses were demolished, forcing residents to be evacuated by helicopter to shelters in Vijayawada. Presently, the village doesn’t have an ambulance services, posing a serious risk during emergencies.
- **Maintenance of Natural drain :** Poor maintenance of Pala vagu has been a main reason for recurrent waterlogging since 2019. The absence of major drainage network prevents effective stormwater discharge from secondary drains. Residents depend on pump motors to drain the water from the houses, which often results in waterlogging in neighbouring houses.
- **Social infrastructure:** The village doesn't have high and upper primary schools, students travel to Mangalagiri for education. NGOs such as the Rotary Club and Arsyam Center have supported the village by renovating local schools and community centers.
- **Health**: Prolonged waterlogging for 4 to 5 days leads to the spread of fever cases among residents.
- **Community Livelihoods**: Following the land pooling of villages in the capital city, many residents from Borupalem, along with those from nearby areas such as Dondapadu and Abbarajupalem, have moved to other areas to continue farming.

- **Role of Youth in Disaster Management:** Presently, there is no disaster response training provided to youth. Given the lack of communication during disasters, training youth could significantly improve emergency response.

Village: Neerukonda
Location: Panchayati Office, Neerukonda
Date: 02/06/2025
Participants: Panchayat Secretary, ICLEI SA team, 14 villagers
Discussion points:

- **Water Supply & Quality:** In Neerukonda extracted groundwater is reportedly contaminated with high fluoride levels. Hence, residents buy their drinking water from the NTR Sujala water plant.
- **Solid Waste Management:** Five sanitation workers collect and transport waste using tricycles to nearby dumper bins. Sometimes these staff are deputed to nearby villages, causing manpower shortage and irregular waste collection.
- **Flood occurrence due to the growth of weed plants:**
- During the 2024 floods, the SC colony was severely affected, with water levels reaching 3–4 feet and remaining for up to 15 days. Overflowing of the Kondaveeti Vagu and blockage caused by aquatic weeds delayed runoff discharge by 4–5 days.
- **Livelihood:** Following the land pooling and restricted farming activities, approximately 200 residents are working as supporting staff at SRM University.
- **Health:** The residents travel to Mangalagiri for medical services due to the absence of primary healthcare facilities.

Village: Velagapudi
Location: Sachivalayam Office, Velagapudi
Date: 02/06/2025
Participants: MPDO, Panchayat Secretary, ICLEI SA team, 20 villagers
Discussion points:

- **Monitoring of encroachments around water bodies:** The Severity of flooding is increasing due to the rising encroachments along the vagus. Strict monitoring is required to monitor the development nearby the vagus and water bodies.
- **Education**: The absence of a local high school forces residents to travel to Mandadam for secondary education.
- **Healthcare:** Without a primary health centre in the village, residents travel to Thulluru for medical services.
- **Power Supply:** The current electrical infrastructure is limited to single-phase power. In the absence of three-phase power, there have been outages.

Village: Krishnayapalem
Location: Panchayat Office, Krishnayapalem
Date: 03/06/2025
Participants: Admin Secretary, ICLEI SA team, 12 villagers
Discussion points:

- **Flood Risk:** No flooding events have been reported since 1950, after the convergence of two water channels, namely Kondaveeti Vagu and Pala Vagu.
- **Water Supply & Quality:** The village lacks a local source of potable water, residents purchase RO water for daily consumption.
- **Education:** Only one elementary school is available locally, while primary school students travel to Penumaka
- **Healthcare Access:** With no hospital in the village, residents travel to Mangalagiri for treatment at AIIMS and private hospitals
- **Desludging Practices leading to contamination of water:** Every household is equipped with a septic tank, and desludging operators collect sludge from septic tanks. However, there are instacnes of operators dumping the faecal sludge untreated in open fields or vagus near the village. The probability of contamination of water sources as these vagus outflows into the Prakasam barrage, which is the water supply source for Vijayawada.

Village: Penumaka
Location: Sachivalayam Office, Penumaka
Date: 03/06/2025
Participants: Panchayat Secretary, Admin Secretary, TDP local leader, ICLEI SA team, 30 villagers
Discussion points:

- **Flood Risks and Management:** The lift pumping station at Undavalli effectively prevents flooding in Penumaka village. During backflow of water from the vagus due to overflow of the Krishna River, motor pumps are used to divert water into the nearby agricultural fields. The primary cause of flooding is due to irregular cleaning of the vagus.
- **Livelihood & Skill Development:** After land pooling, livelihood opportunities have declined due to lack of skills. Residents suggested establishing a skill development centre to enhance employment opportunities. Additionally, special support for women, such as assistance in purchasing sewing machines will support their livelihood till they acquire skills for other opportunities. Residents also suggested to recruit the village residents for gardening and greening initiatives in the development of Amaravati.

Mangalagiri- Tadepalli Municipal Corporation (MTMC) : Babunaiahnagar colony
Location: Babunaiahnagar Sachivalayam Office, MTMC
Date: 03/06/2025
Participants: Ward Admin Secretary, ICLEI SA team, 20 residents
Discussion points:

- **Impact of flooding on low-lying areas:** The Bapunaiahnagar colony area has a low-lying geography and is poorly connected to drainage systems, resulting in frequent flooding. The absence of a dedicated stormwater outlet has exacerbated the flooding.
- **Health:** Babunaiahnagar is served by two primary health centers. For advanced medical care, residents travel to nearby facilities such as the Government General Hospital (GGH) and NRI public hospitals.

Climate Change Action Plan for the Capital City of Amaravati

Volume II: Amaravati's Climate Strategies and Goals

AMARAVATI
THE PEOPLE'S CAPITAL

ICLEI
Local Governments for Sustainability
SOUTH ASIA

October 2025

Message from APCRDA Commissioner

Message from APCRDA Additional Commissioner

Message from Executive Director, ICLEI South Asia

Acknowledgement

Developing the Amaravati City Climate Change Action Plan (CCAP) for Andhra Pradesh Capital Region Development Authority (APCRDA) marks a significant step towards developing a climate-resilient and net-zero capital city over the coming decades. This plan represents a united effort to address the impacts of climate change and enhance Amaravati's resilience. APCRDA has engaged ICLEI - Local Governments for Sustainability, South Asia, for the preparation of a comprehensive city-level CCAP for Amaravati city. This collaborative effort has been instrumental in shaping the CCAP, bringing in internationally accepted climate action planning approaches that enhance its scope and feasibility, helping lay out ambitious yet attainable targets. Heartfelt gratitude is extended to all the departments and staff within APCRDA, as well as to all the stakeholders who contributed towards developing this plan. APCRDA is committed to leading by example, implementing the strategies outlined in this plan, and continuing the collaborative efforts to build a climate-resilient, net-zero and inclusive Amaravati for present and future generations.

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Disclaimer:
This report is based on information extracted from the Master Plan, Zoning Plan, Infrastructure Plans, Detailed Project Reports (DPRs), and other related documents and datasets shared by APCRDA, some of which are currently under revision or being updated. Accordingly, the analyses, inferences, findings, and interpretations presented herein are subject to change in line with future updates to these source documents and the receipt of additional data during the project period. The contents of this report may be revised based on further data sharing and continued consultation with APCRDA and Amaravati Development Corporation Limited (ADCL). No conclusions should be regarded as final until all relevant information has been comprehensively updated, reviewed, and validated.
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Contents

List of Abbreviations iii
1 Amaravati's Goals and Strategies for Climate Resilient, Net-zero Development 7
1.1 Climate Vision and Goals 7
1.2 Overview of Sectoral Climate Targets and Strategies 9
1.2.1 Energy and Buildings 10
1.2.2 Water Supply 13
1.2.3 Wastewater Management 15
1.2.4 Stormwater Management 17
1.2.5 Solid Waste Management 18
1.2.6 Transportation 21
1.2.7 Biodiversity and Urban Greening 23
1.2.8 Health 25
1.2.9 Air Quality Management 27
1.3 Integrating Interventions to Build Resilience to Climate Risks 29
1.4 Advancing towards Net-Zero Greenhouse Gas Emissions through Climate Actions 33
2 Sector-wise Climate Actions and Implementation Details 38
2.1 Energy and Buildings 39
2.2 Water Supply 84
2.3 Wastewater Management 98
2.4 Stormwater Management 112
2.5 Solid Waste Management 126
2.6 Transportation 151
2.7 Biodiversity and Urban Greening 174
2.8 Health 192
2.9 Air Quality Management 202
3 Governance and Implementation of Climate Change Action Plan 214
3.1 Effective Governance for CCAP Implementation 214
3.2 Enable Data Collection and Management 218
3.3 Monitoring and Tracking Progress 219
3.4 Strengthen Institutional Readiness for Fast-Tracking Climate Action 221
3.5 Way forward - Realizing Climate Ambitions 223

Annexure A. Feasibility Assessment of the Climate Resilient Interventions 224
Annexure B. Prioritisation of Resilience Actions 234
Annexure C. Power Demand of Amaravati in 2058 248
Annexure D. Renewable Energy (Solar PV) Integration Target for Amaravati 249
Annexure E. Electric Cooking Target for Amaravati 249
Annexure F. Estimated Modal Share of Transportation and Trip Generation Rates 250
Annexure G. Estimated Fuel-Mix of the Vehicles/Transport Modes in Amaravati – Climate Action Scenario 250
Annexure H. Estimated Fuel-Mix of the Vehicles/Transport Modes in Amaravati – BAU Scenario ... 251
Annexure I. Renewable Energy (Solar PV) Integration Target for Transportation in Amaravati (2028-2058) 251
Annexure J. Solid Waste Processing in Amaravati (2028-2058) -*Climate Action Scenario* 251
Annexure K. Emission Factors 252
Annexure L. Meeting Minutes of Stakeholder consultations 254

List of Tables

Table 1-1: Waste Processing Targets 19
Table 1-2: Sector-wise GHG emissions under the Climate Action Scenario, 2028 - 2058..... 35

List of Figures

Figure 1-1: Climate Mitigation and Adaptation Strategies for Energy and Buildings..... 12
Figure 1-2: Climate Mitigation and Adaptation Strategies for Water Supply..... 14
Figure 1-3: Climate Mitigation and Adaptation Strategies for Wastewater Management 16
Figure 1-4: Climate Mitigation and Adaptation Strategies for Stormwater Management..... 17
Figure 1-5: Climate Mitigation and Adaptation Strategies for Solid Waste Management..... 20
Figure 1-6: Climate Mitigation and Adaptation Strategies for Transportation..... 22
Figure 1-7: Climate Mitigation and Adaptation Strategies for Biodiversity and Urban Greening..... 24
Figure 1-8: Climate Mitigation and Adaptation Strategies for Health..... 26
Figure 1-9: Climate Mitigation and Adaptation Strategies for Air Quality Management..... 28
Figure 1-10: Interventions to mitigate Urban Heat Stress 29
Figure 1-11: Interventions for Urban Flooding 31
Figure 1-12: GHG Emissions reduction potential of actions in the Climate Action Scenario compared to the BAU Scenario, 2028 - 2058..... 36
Figure 1-13: Sector contribution to GHG emissions reduction from the BAU levels, 2058 37
Figure 2-1: Interventions to mitigate Urban Heat Stress 65
Figure 2-2: Interventions for Urban Flooding 124

List of Abbreviations

ADB	Asian Development Bank
ADCL	Amaravati Development Corporation Limited
AGC	Amaravati Government Complex
AI	Artificial Intelligence
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
AP DTCP	Andhra Pradesh Directorate of Town and Country Planning
APCPDCL	Andhra Pradesh Central Power Distribution Company Limited
APCRDA	Andhra Pradesh Capital Region Development Authority
APFC	Automatic Power Factor Correction
APGENCO	Andhra Pradesh Power Generation Corporation Limited
APMRC	Andhra Pradesh Metro Rail Corporation
APPCB	Andhra Pradesh Pollution Control Board
APSECM	Andhra Pradesh State Energy Conservation Mission
APSRTC	Andhra Pradesh Road Transport Corporation
APTRANSCO	Andhra Pradesh Power Transmission Corporation Limited
AQI	Air Quality Index
BAU	Business as Usual
BCC	Behavior Change Communication
BEE	Bureau of Energy Efficiency
BIPV	Building-Integrated Photovoltaics
BLDC	Brushless Direct Current Motor
BMTPC	Building Materials Technology Promotion Council
BoQ	Bill of Quantities
BRT	Bus Rapid Transit
BWG	Bulk Waste Generator
CAPEX	Capital Expenditure
CBI	City Biodiversity Index
CCAP	Climate Change Action Plan
CCC	Command Control Centre
C&D	Construction and Demolition
CNG	Compressed Natural Gas
CPCB	Central Pollution Control Board
CRVA	Climate Risk and Vulnerability Assessment

CSR	Corporate Social Responsibility
D2D	Door-to-Door
DMA	District Metered Area
DPR	Detailed Project Report
EBWGR	Extended Bulk Waste Generator Responsibility
ECBC	Energy Conservation and Building Code
ECSBC	Energy Conservation and Sustainable Building Code
EDGE	Excellence in Design for Greater Efficiencies
EE	Energy Efficiency
EESL	Energy Efficiency Services Limited
EMS	Energy Management System
EPC	Energy Performance Contracting
EPI	Energy Performance Index
EPR	Extended Producer Responsibility
ESCOs	Energy Service Companies
ETM	Electronic Ticketing Machine
EV	Electric Vehicle
FC	Finance Commission
FRS	Facial Recognition System
FSTP	Faecal Sludge Treatment Plant
GEF	Global Environment Facility
GeM	Government e-Marketplace
GHG	Greenhouse Gas
GIS	Geographic Information System
GPS	Global Positioning System
GRIHA	Green Rating for Integrated Habitat Assessment
HVAC	Heating, Ventilation, and Air Conditioning
IEC	Information, Education, and Communication
IGBC	Indian Green Building Council
IIT	Indian Institute of Technology
IMD	Indian Meteorological Department
IPT	Intermediate Public Transport
IT	Information Technology
LBSAP	Local Biodiversity Strategy and Action Plan
LED	Light Emitting Diode

LEED	Leadership in Energy and Environmental Design
LPS	Land Pooling Schemes
LRT	Light Rail Transit
MNRE	Ministry of New and Renewable Energy
MRF	Material Recovery Facilities
MRT	Mass Rapid Transit
MSW	Municipal Solid Waste
NBC	National Building Code
NDC	Nationally Determined Contributions
NFC	Near Field Communication
NGT	National Green Tribunal
NIT	National Institutes of Technology
NMT	Non-Motorized Transport
NREDCAP	New and Renewable Energy Development Corporation of Andhra Pradesh
OPEX	Operational Expenditure
PAYT	Pay As You Throw
PBS	Public Bicycle Sharing
PIBOs	Producers, Importers and Brand Owners
PPP	Public-Private Partnership
PV	Photovoltaic
QR	Quick Response
RCP	Representative Concentration Pathways
RDF	Refuse Derived Fuel
RE	Renewable Energy
REFIT	Renewable Energy Finance and Investment Tool
RESCOs	Renewable Energy Service Companies
RFID	Radio Frequency Identification
RPO	Renewable Purchase Obligation
RWA	Resident Welfare Association
RWH	Rainwater Harvesting
SAC	Swachh Andhra Corporation
SBM	Swachh Bharat Mission
SCADA	Supervisory Control and Data Acquisition
SDGs	Sustainable Development Goals
SHG	Self-Help Group

SOPs	Standard Operating Procedures
SPA	School of Planning and Architecture
STP	Sewage Treatment Plant
TPD	Tonnes Per Day
UDAG	Urban Design and Architectural Guidelines
UDC	Urban Design Committee
UJALA	Unnat Jyoti by Affordable LEDs for All
VFDs	Variable Frequency Drives
WHO	World Health Organization
WtE	Waste to Energy

1 Amaravati's Goals and Strategies for Climate Resilient, Net-zero Development

Amaravati, the planned greenfield capital of Andhra Pradesh, has been proactively steering its development towards becoming a climate-resilient, inclusive and sustainable city from the very outset, recognizing the growing urgency to address climate change and its impacts. The city 's Master Plan and development are being implemented in a phased manner with a plan period of 30 years, from 2028 to 2058. The first phase, until 2028, includes the construction of essential trunk infrastructure, which is currently underway, encompassing road networks, public transportation systems, measures for flood prevention, and wastewater management. These developments are being implemented by integrating innovative, environmentally friendly technologies and design practices. Infrastructure and development will continue thereafter until the interim milestone of 2043, to help accommodate a population of 17.9 lakh people. The full build-out of the city and its infrastructure is expected to be completed by 2058, capable of housing 39.95 lakh inhabitants.

Within this context, the Amaravati Climate Change Action Plan (CCAP) provides a comprehensive, data-driven roadmap to guide the city's development towards a net-zero and climate-resilient future. While Volume 1 of the CCAP presented the analytical foundation, including the Urban system analysis, Climate Risk and Vulnerability Assessment (CRVA), GHG emissions inventory, and future emissions modelling. Volume 2 translates these findings into sectoral strategies, targets and actions for implementation across key sectors such as water, wastewater, stormwater, solid waste, energy and buildings, transport, biodiversity and urban greening, health and air quality. The plan adopts an integrated mitigation and adaptation approach, ensuring that the city not only reduces emissions but also strengthens its resilience to climate risks such as urban flooding, heat stress and other climate risks.

The CCAP has been developed through a collaborative, multi-stakeholder approach involving Andhra Pradesh Capital Region Development Authority (APCRDA), Amaravati Development Corporation Ltd (ADCL), various state departments, research institutions, NGOs and community representatives to ensure inclusivity and local relevance. One-to-one discussions and two rounds of joint stakeholder consultations were held, virtually and in person in September 2025 to integrate stakeholder feedback into the Action Plan.

The implementation of the CCAP will be led by APCRDA, in coordination with ADCL, key line departments and agencies responsible for infrastructure and service delivery. A well-coordinated institutional mechanism is essential to ensure alignment, effective decision making, and smooth implementation, particularly for actions beyond APCRDA's direct purview.

1.1 Climate Vision and Goals

The CCAP includes 37 strategies across 9 sectors to achieve Amaravati's vision of transitioning towards a net-zero emissions future and strengthening the climate resilience of the city's urban systems, stakeholders, and communities. The CCAP is aligned to national climate change commitments and state-level efforts and goals, while also contributing to global initiatives like the Paris Agreement and SDGs.

Vision for a Net-Zero Climate Resilient Future: Amaravati envisions becoming a climate resilient, net-zero and inclusive capital city by 2058, balancing sustainable urban growth with low carbon infrastructure, adoption of renewable energy, climate smart mobility and nature-based solutions. The city seeks to protect communities from climate risks, foster green economic opportunities as well as ensure a livable, equitable and sustainable future for all.

Climate Adaptation Goal: Amaravati aims to develop as a climate-resilient capital city by integrating nature-based solutions, climate-smart urban design, and resilient infrastructure to enhance adaptive capacity against urban flooding, heat stress and extreme weather events, while strengthening ecosystem services, risk-informed spatial planning and institutional preparedness.

GHG Emissions Mitigation Target:

- GHG emissions in 2028: 17.5% lower than projected business-as-usual emissions
- GHG emissions in 2043: 58.8% lower than projected business-as-usual emissions
- GHG emissions in 2058: 80.2% lower than projected business-as-usual emissions

APCRDA shall update its targets in future climate action plan revisions to further minimize its GHG emissions through adoption of emerging technologies and additional strategies to advance towards net-zero emissions by 2058.

Wider Benefits of Climate Action Plan

The CCAP recognizes that while addressing GHG emissions and climate risks is essential, targeted climate actions integrated into the city's ongoing development can unlock multiple co-benefits for people, environment and economy. As a greenfield capital city, Amaravati has the unique opportunity to embed low-carbon, resource-efficient, and climate-resilient principles into its planning, design, and infrastructure from the very beginning, ensuring long-term sustainability and livability.

Many of the interventions outlined in the CCAP have been strategically prioritized to align with Amaravati's phased development plan and contribute to the sustainable development goals (SDGs). The recommended actions across key sectors such as energy-efficient buildings, sustainable mobility, integrated water and wastewater management, solid waste management, and biodiversity are designed to conserve resources, improve air quality, enhance resilience to flooding and heat stress, and foster a healthier and safer urban environment.

The successful implementation of the action plan will bring significant socio-economic benefits, drive innovation and the adoption of clean technologies, while enhancing energy and water security. Approximately 40,500 green jobs are expected generate through adoption of renewable energy, clean technologies and green mobility solutions. Encouraging citizen participation through initiatives such as energy-efficient practices, waste segregation adoption of sustainable mobility options, will play a vital role in shaping Amaravati's transition into a climate-resilient and sustainable capital city. As a developing greenfield city, active public engagement from the outset will foster a sense of shared ownership and

environmental responsibility, ensuring that sustainability becomes an integral part of the city's lifestyle and governance.

By embedding these benefits into its strategies from the planning stage, Amaravati is setting a foundation for climate-resilient and low-carbon urban development that enhances quality of life, promotes equitable economic growth and fosters social inclusion. This integrated approach ensures that the city's transition aligns with its long-term vision and contributes to achieving the SDGs outlined below through the CCAP.

1.2 Overview of Sectoral Climate Targets and Strategies

Amaravati aspires to become a people's capital with sustainable, modern and inclusive urban infrastructure. This requires well-informed design, planning and implementation of policies and projects, while keeping environmental performance and livability at the center and maintaining ecological balance to promote sustainable and harmonized lifestyle.

To realise this vision, Amaravati's climate change action plan includes climate strategies across nine sectors to help reduce its GHG emission footprint and advance to net-zero emissions, while simultaneously ensuring climate-proofing and readiness to climate change impacts. The sectoral strategies have actions further delineated along with targets.

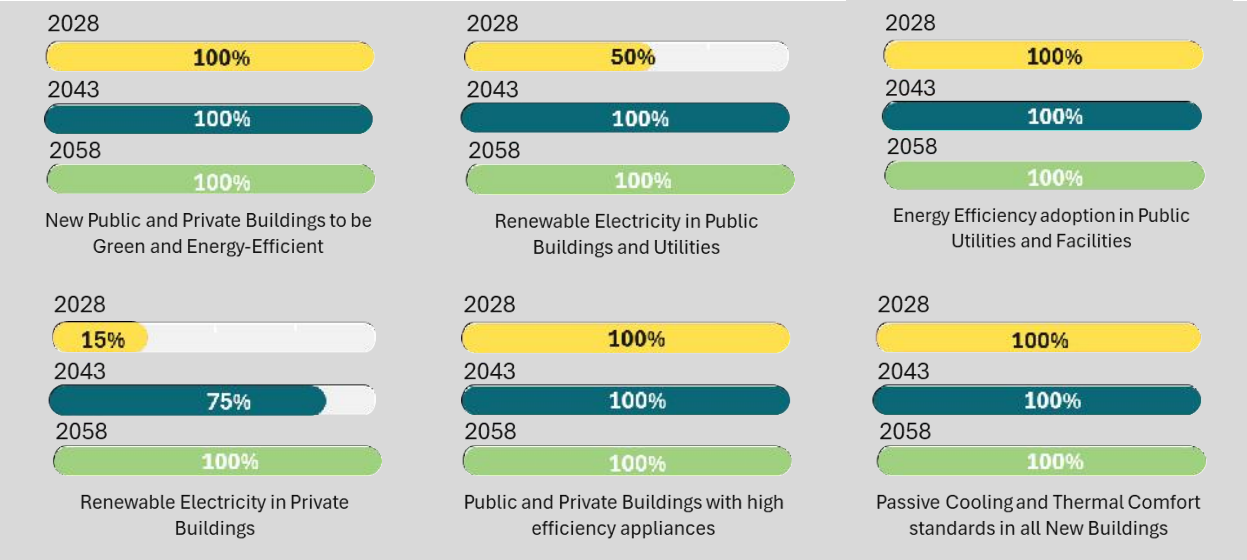
Climate mitigation strategies and actions are identified to reduce or prevent the emission GHGs into the atmosphere from conventional energy use and sources such as waste and wastewater management. **Climate adaptation** strategies and actions to help protect and adjust systems, infrastructure and communities to the actual or expected impacts of climate change, aiming to reduce their vulnerability and enhance climate resilience are outlined for each sector as well. **Quantifiable targets** for high-impact actions have been identified across sectors to reflect the city's ambition and help steer appropriate level of action. Phase-wise targets are delineated over Amaravati's planning horizon of 2028 to 2058, with 2043 as an interim milestone as per the city's planned build-out.

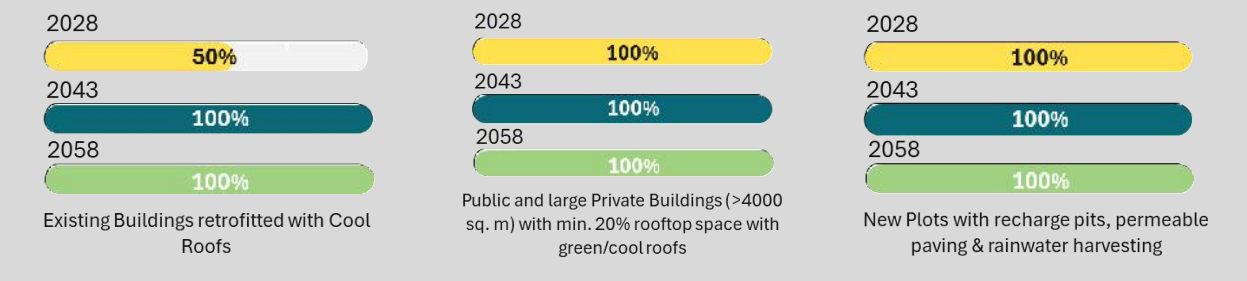
The strategies, actions and targets have been determined based on proposed plans and measures outlined in Amaravati's planning and infrastructure documents, while supporting achievement of sectoral goals and implementation of envisaged sustainable and climate-oriented interventions. Goals and targets of national and state policies, programmes, and missions have been considered for alignment and to enable ambitious and practical target setting.

The following section provides an overview snapshot of Amaravati's climate strategies and key targets across the nine sectors to help realize Amaravati's vision and its overarching climate goals and targets. Detailed information on each of the sectoral strategies and actions along with implementation details can be found in section 2.

1.2.1 Energy and Buildings

Key Climate Targets

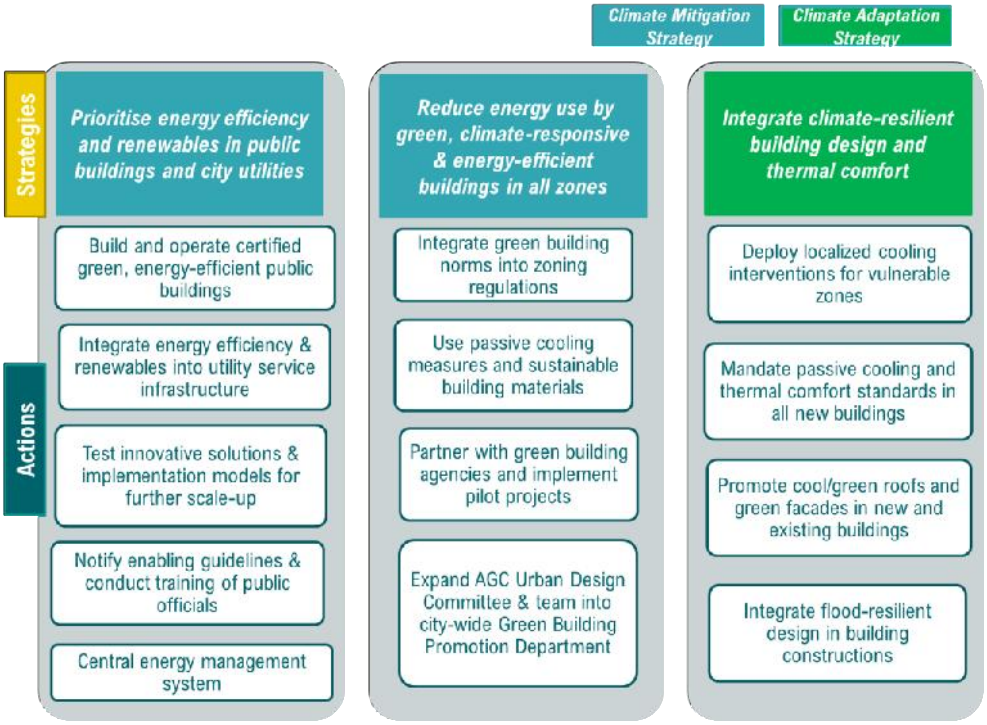




Amaravati aims to become a fully renewable-powered city by 2058, with 100% of electricity for buildings and infrastructure met through green energy. Its strategy prioritizes reducing energy demand first, followed by renewable integration. This will require large-scale adoption of climate-responsive, energy-efficient building designs, high-energy performance appliances, and sustainable construction practices.

The public sector will need to take the lead initially, ensuring all government buildings are designed and operated sustainably. Both on-site and off-site renewable solutions will be scaled up to power buildings, while urban services and utilities integrate efficiency and clean energy from the outset through procurement and planning. Achieving this vision will demand strong coordination between state agencies, urban planners, and power sector institutions.

City-wide deployment of energy efficiency and renewables will lower overall energy use and GHG emissions. Complementary measures such as urban cooling, green and cool roofs, rainwater harvesting, flood-resilient designs, and regulated development will improve thermal comfort, enhance resilience to heat stress and flooding. Together, these Energy and Buildings sector strategies and actions will support Amaravati to become an energy-smart, renewable-powered and climate-responsive capital city.



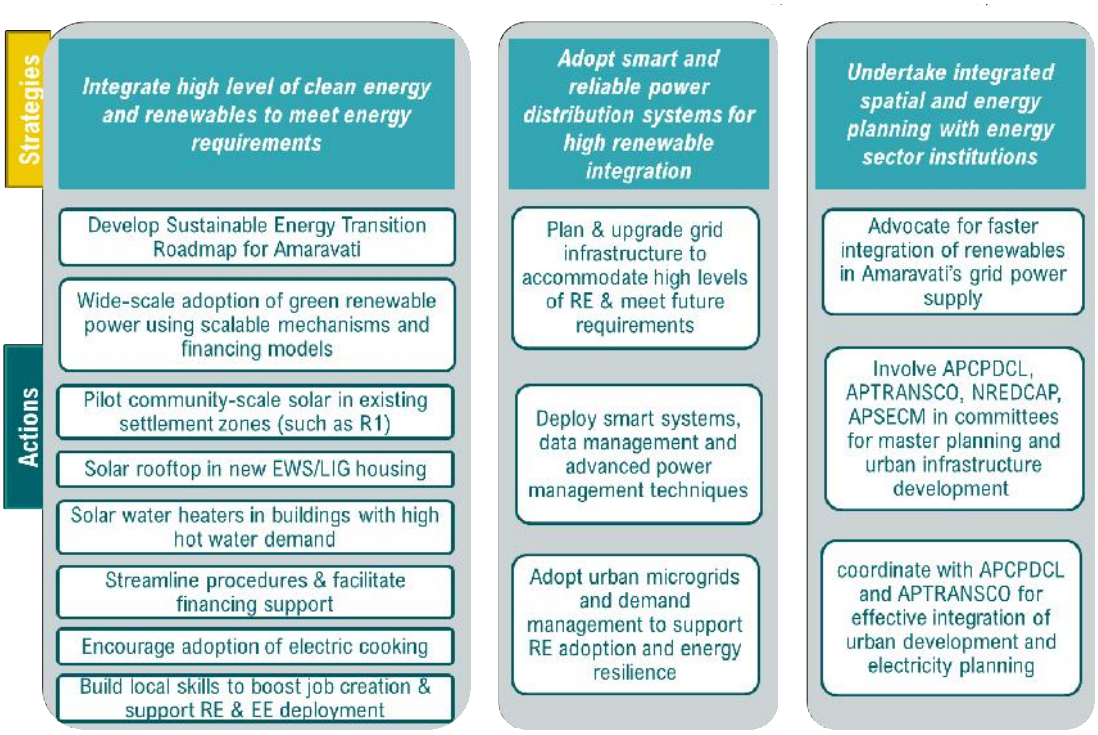


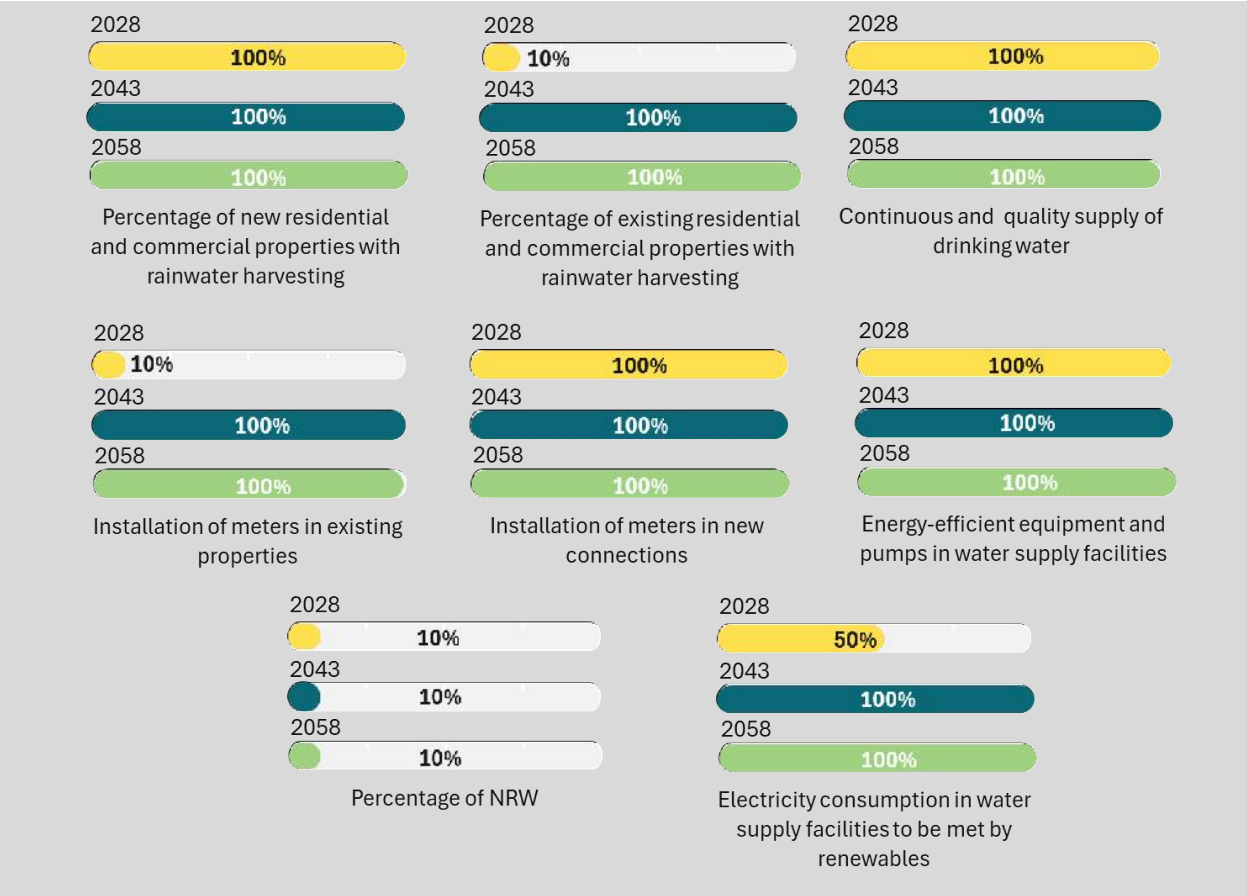
Figure 1-1: Climate Mitigation and Adaptation Strategies for Energy and Buildings

Strengthened resilience to climate hazards: Heat stress, urban flood

Good Practices	
Singapore - Large-scale adoption of green and energy efficient buildings through targeted policy schemes and incentives	Melbourne - Joint large-scale renewable procurement by large energy users from wind-farms. 100% renewable-based municipal operations
Vijayawada - Technical guidelines with passive and active measures for heat-resilient and sustainably cooled buildings, adoptable in Amaravati	Ahmedabad and Surat - Significant renewable energy adoption in municipal operations (city service utilities, municipal buildings)
London – Program to aggregate and implement energy efficiency and renewable energy projects in multiple public buildings through third-party ESCOs	Vancouver - 100% renewable energy use target by 2050 supported by Renewable City Strategy document
Palo Alto and London - Requirements to salvage and reuse building components and materials at end-of-life through planning/permits	New Delhi – Facilitation of rooftop solar adoption by consumers through single point web portal. Battery energy storage installed at substation for power quality, reliability, network decongestion

1.2.2 Water Supply

Key Climate Targets



Amaravati, as a pioneering greenfield capital city, possesses the unique advantage of establishing a circular and climate-resilient water infrastructure from the outset. The city's strategy approach centers on developing a diversified water portfolio that integrates multiple sustainable sources, including tertiary treated wastewater recycling, systematic rainwater harvesting across all buildings, and managed groundwater recharge systems. This multi-source strategy significantly reduces dependence on conventional freshwater supplies while building redundancy against climate-induced supply disruptions.

The implementation of mandatory water-efficient fixtures throughout residential, commercial, and institutional buildings, coupled with dual plumbing systems that separate potable and non-potable water distribution, will substantially reduce overall freshwater consumption. A state-of-the-art smart metering and monitoring network will ensure a continuous, 24/7 water supply while detecting and minimizing distribution losses through real-time leak detection and pressure management systems.

Net zero is central to this vision, with the entire water supply infrastructure powered by renewable energy sources, including solar and wind installations, creating an operationally carbon-neutral and financially self-sustaining system. Concurrently, robust environmental protection measures safeguard the Krishna River

ecosystem, preserve urban water bodies, and maintain aquifer integrity through strict wastewater discharge standards, comprehensive wetland conservation programs, and strategic groundwater recharge initiatives, ensuring long-term water security during the city expansion. The water supply sectoral strategies and actions will make Amaravati a water-secure, climate-resilient, and inclusive capital, ensuring equitable access to safe drinking water while protecting the Krishna River ecosystem and its underlying aquifers.

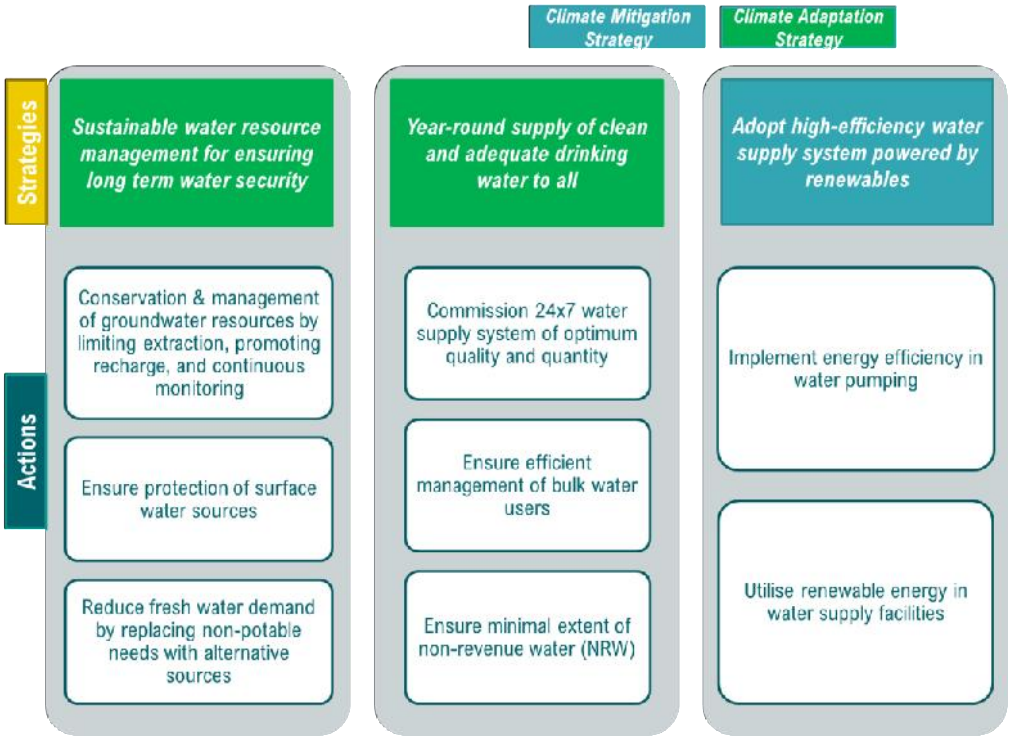


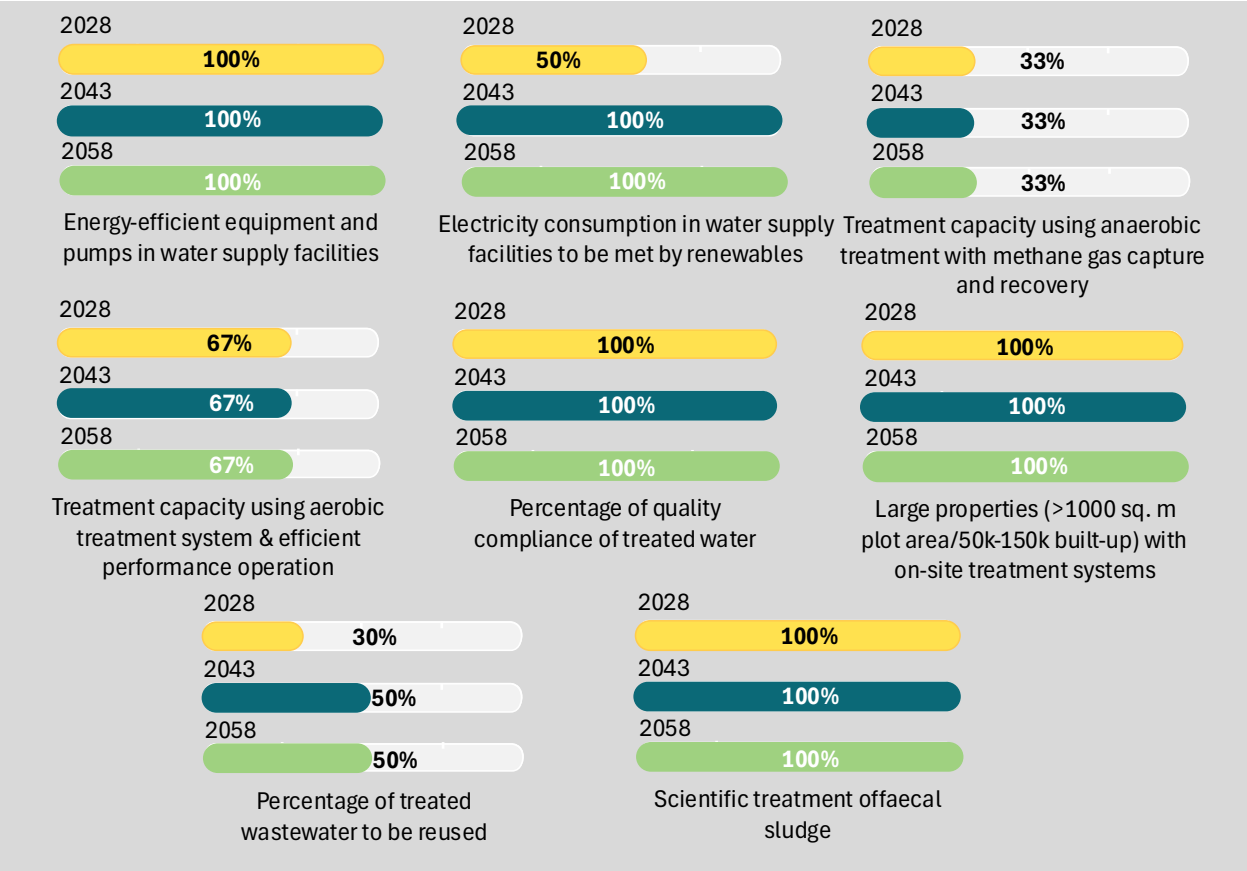
Figure 1-2: Climate Mitigation and Adaptation Strategies for Water Supply

Strengthened resilience to climate hazards: Heat stress, urban flood

Good Practices	
Shimla – Multiple water sources to meet growing water demand from rapid urbanisation and achieve resilience and flexibility.	Jerusalem - Installation of rooftop rainwater collection in schools for non-potable uses.
Austin – Mandate large-scale commercial and residential buildings to incorporate dual plumbing systems for non-potable reuse water.	Seosan – Establishment of District Metered Areas (DMAs) equipped with advanced smart water meters to monitor consumption and minimize non-revenue water losses
Brazil – Enhancing Energy Efficiency in Water Distribution through Automation and High-Efficiency Equipment	Adelaide – Installation of moveable solar PV to reduce energy savings and emissions in water supply systems

1.2.3 Wastewater Management

Key Climate Targets



Amaravati is advancing towards a climate-resilient and circular wastewater management system that emphasizes efficiency, safety and sustainability across collection, treatment and reuse. A city-wide sewer network will prevent contamination during flooding, guided by geo-hydrological planning, SCADA enables monitoring and an automated cleaning system to ensure reliability and timely maintenance.

Treatment plants will incorporate low-carbon and innovative solutions such as anaerobic digestion, methane recovery, and renewable energy integration to reduce emissions and enhance energy efficiency. In parallel, decentralized wastewater systems will serve large developments. The mandated reuse of treated wastewater for construction, landscaping, and district cooling, while faecal sludge will be processed scientifically through FSTPs or co-treatment facilities. Together, these interventions will make Amaravati a zero-discharge, low-emission and water secure city, resilient to future climate challenges.

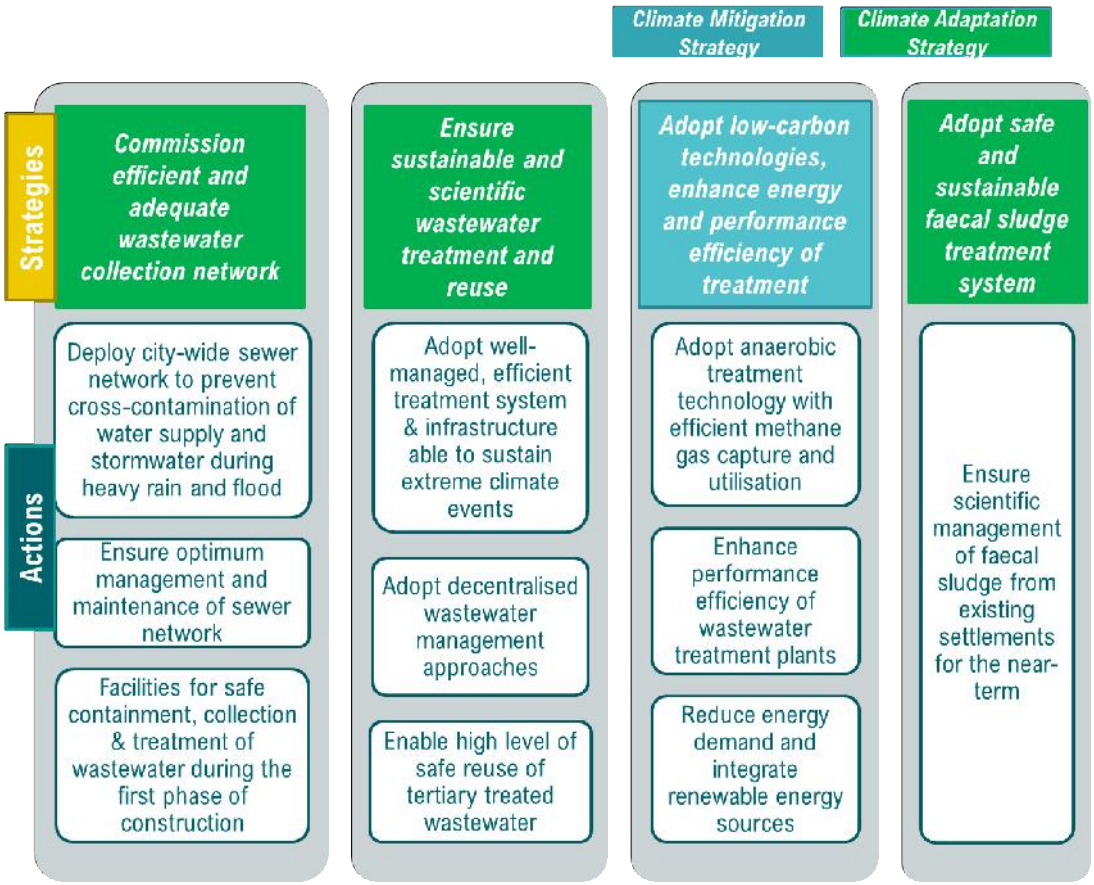


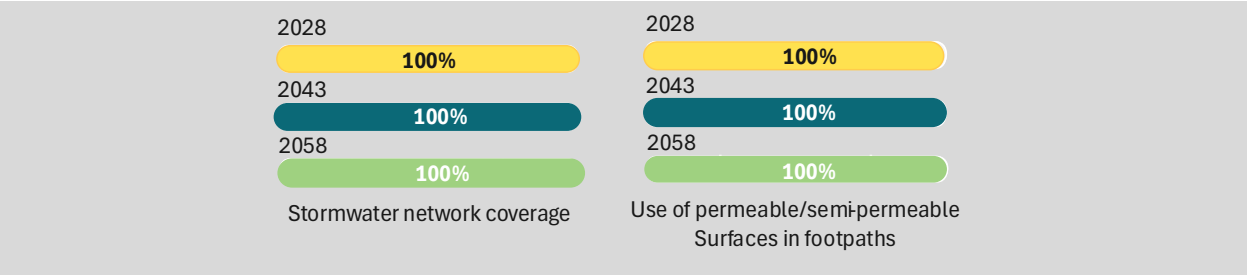
Figure 1-3: Climate Mitigation and Adaptation Strategies for Wastewater Management

Strengthened resilience to climate hazards: Urban flood

Good Practices	
Madurai – HomoSEP robotic cleaning system mechanized manhole maintenance, eliminating manual entry and improving efficiency.	Banka (Bihar) – BioLoo bio-digester toilets treat waste onsite, producing pathogen-free water and biogas for reuse.
Pune – Double-storey 20 MLD SBR STP optimized land use and ensured flood-resilient wastewater treatment.	Singapore – NEWater initiative treats wastewater via microfiltration, RO, UV to supply 40% national demand.
Surat – Treated wastewater from four tertiary treatment plants reused for industry, lakes, and greening.	California (Riverbank) – SCADA-integrated wastewater plant achieved 75% energy savings through automation and fine-bubble diffusers.
hennai – Anaerobic sludge digestion across seven STPs generates biogas for power, reducing operational emissions.	Maharashtra – Co-treatment of faecal sludge in existing STPs improved efficiency, reduced costs, and ensured sustainability.

1.2.4 Stormwater Management

Key Climate Targets



Amaravati is situated on the banks of the River Krishna, upstream of the Prakasam Barrage, and within the catchment areas of the Kondaveeti Vagu and Pala Vagu. The Pala Vagu joins with the Kondaveeti Vagu at Krishnayapalem, which ultimately flows into the Krishna River at Undavalli. With planned urbanisation of Amaravati, it is expected that rainfall runoff will increase, potentially surpassing the existing capacity of these vagus and compromising the city's resilience. Measures are planned to manage a rare, one-in-a-hundred-year rainfall event. These include increasing the capacity of both the Kondaveeti Vagu and Pala Vagu, constructing five reservoirs in the Kondaveeti Vagu catchment (three of which will be within Amaravati), upgrading the pumping capacity at Undavalli, and constructing a new pumping station at Vykuntapuram. Moreover, a gravity diversion channel from the Lam Reservoir is proposed to redirect runoff from upstream areas to the Vykuntapuram pumping station. An underground stormwater drainage network is also planned across the city to channel runoff into the Kondaveeti vagu and Pala vagu at various locations vagus.

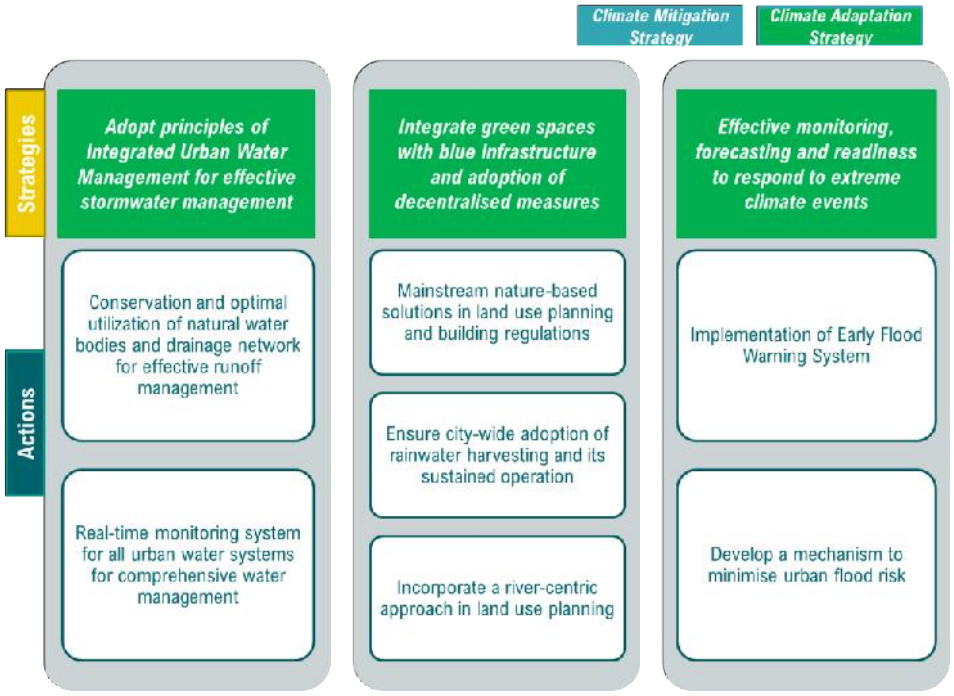


Figure 1-4: Climate Mitigation and Adaptation Strategies for Stormwater Management

Strengthened resilience to climate hazards: Urban flood, Cyclone, Heat stress

Good Practices	
Chennai, India – Sponge parks capture rainwater runoff, enabling infiltration and groundwater recharge in urban areas.	Johannesburg, South Africa – Canal rehabilitation using eco-engineering for 100-year flood protection and erosion control
Kochi, India – Canal rejuvenation through desilting, widening, and culvert reconstruction to enhance flood resilience.	Vancouver, Canada – Raincity Strategy manages rainwater via green infrastructure to capture 90% annual rainfall.
Amsterdam, Netherlands – Waternet integrates the entire urban water cycle for sustainable and efficient management	Canada (RainGrid) – Smartgrid stormwater system harvests rooftop runoff, reducing discharge and providing reuse opportunities.
Kanpur, India – Urban River Plan protects Ganga and Pandu riverfronts through no-development buffer zones.	Semarang, Indonesia – Community-based flood warning system builds local preparedness and early-response capacity.

1.2.5 Solid Waste Management

Key Climate Targets

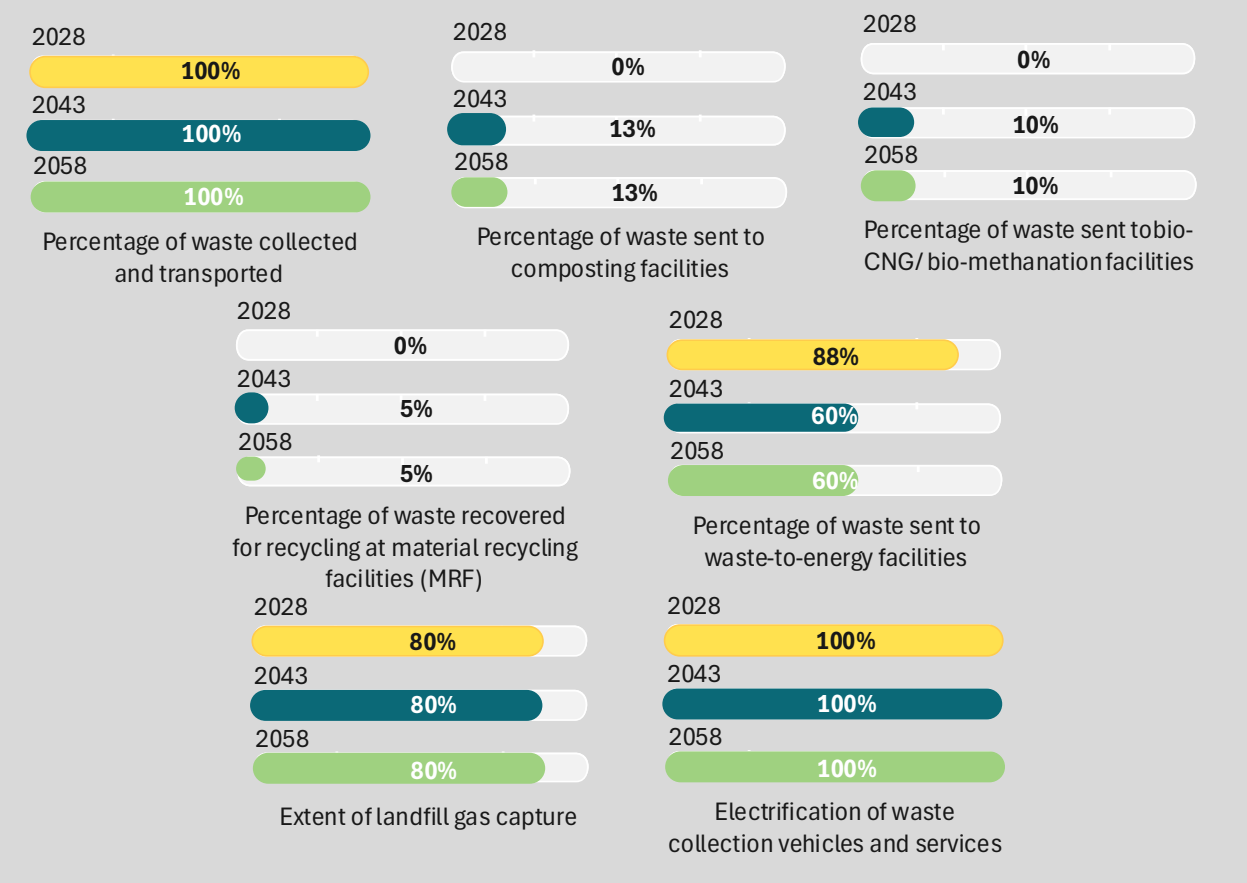


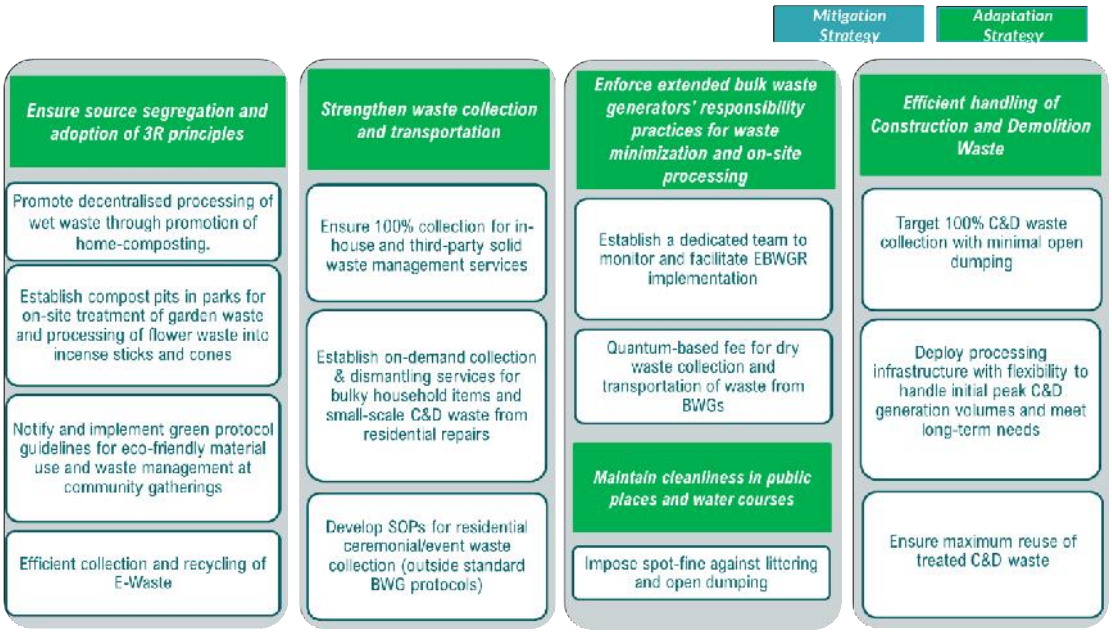
Table 1-1: Waste Processing Targets

Waste Type	Processing or disposal solution	2028		2043		2058	
		TPD	Share	TPD	Share	TPD	Share
Dry Waste	Waste to Energy	462	88%	998	60%	2,354	60%
	Waste to Recycling	-	-	89	5%	210	5%
Wet Waste	Composting	-	-	212	13%	500	13%
	Biomethanation / Bio-CNG	-	-	170	10%	400	10%
Inerts	Sanitary Landfill	66	12%	208	12%	491	12%

**TPD – tonnes per day*

Amaravati, as a new greenfield capital city, aims to build a climate-friendly and circular solid waste management system from the outset. City's approach prioritises waste prevention and source reduction through extensive household and community-level composting programs, localized processing of garden and horticultural waste via neighborhood composting treatment units, and IEC campaigns promoting zero-waste behaviours, proper segregation practices, and community ownership.

The city will achieve 100% door-to-door segregated waste collection by capturing all waste streams through optimized routing systems and dedicated collection schedules for different waste categories. Additionally, transport to various treatment methods will be employed for other types of waste. Robust compliance and monitoring mechanisms will include quantum-based user fees that incentivize waste reduction, real-time digital tracking systems for collection vehicles and waste flows, and immediate spot fines for violations. The entire waste management value chain will be decarbonized through electric collection fleets, renewable energy integration across all treatment facilities, GPS-enabled route optimization, and data-driven operational efficiency improvements that minimize fuel consumption and GHG emissions. Advanced recycling, Bio-CNG production, and scientific landfills with methane capture will help reduce emissions, positioning Amaravati as a national exemplar of circular economy principles in waste management.



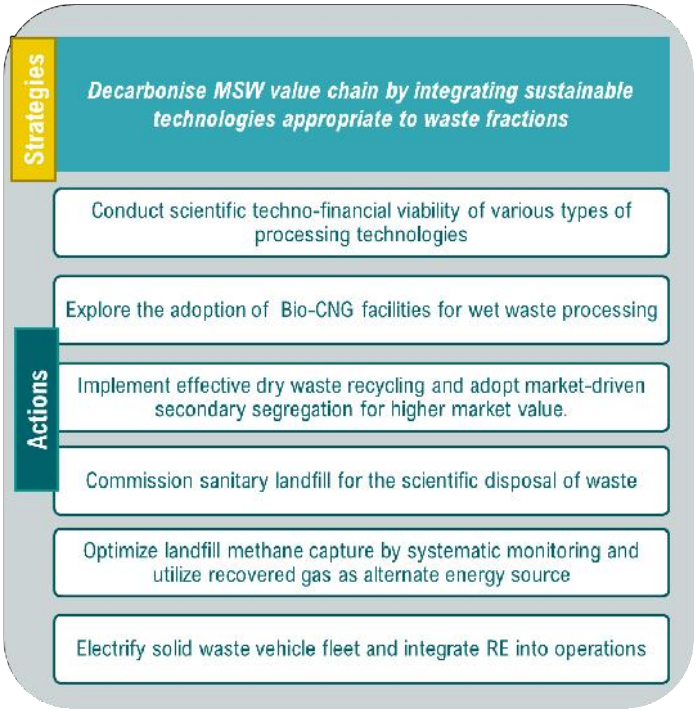


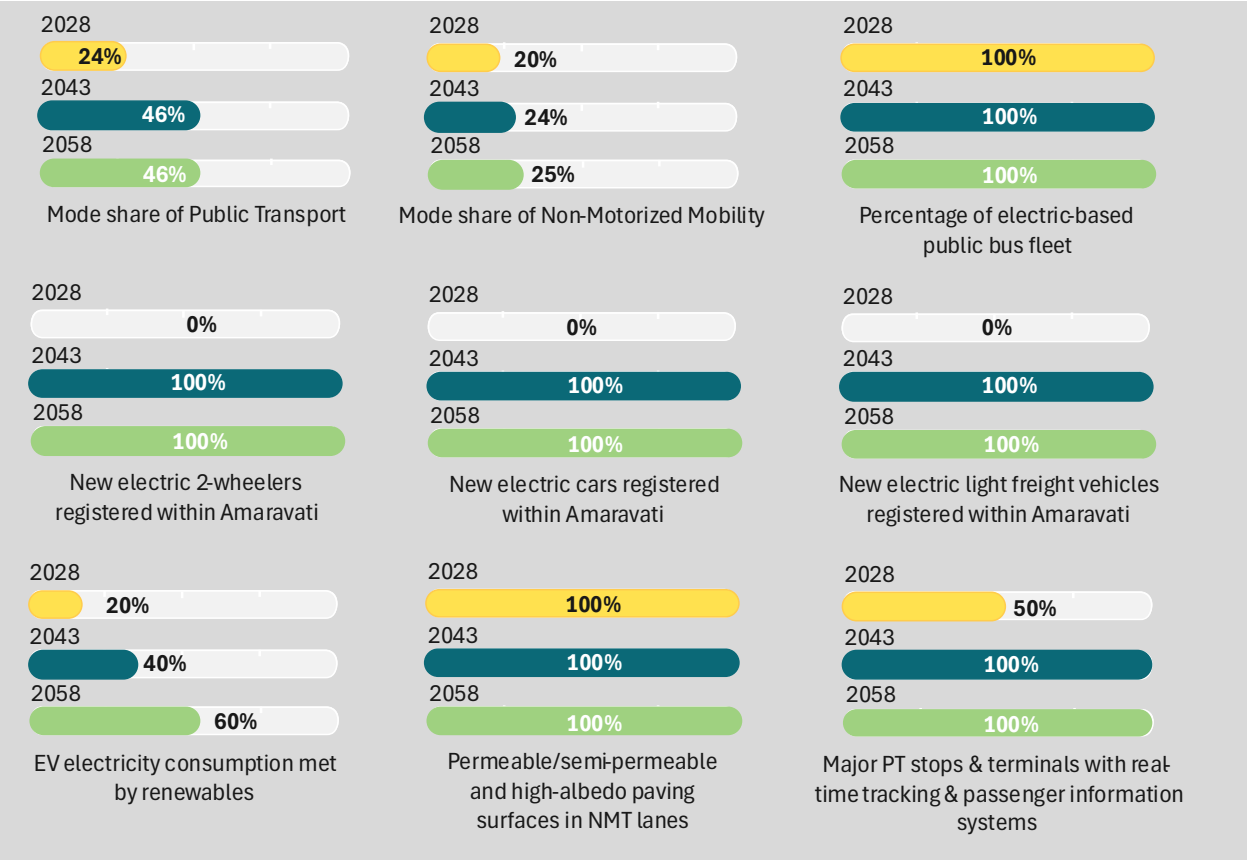
Figure 1-5: Climate Mitigation and Adaptation Strategies for Solid Waste Management

Strengthened resilience to climate hazards: Urban flood and cyclone

Good Practices	
San Francisco –Mandated the residents and businesses to collect waste using three bins through the Recycling & Composting Ordinance enacted in 2009.	Tirupati - Processes 6 TPD of floral waste into agarbattis with plantable packaging and employs 150 SHG Women.
Trichy – Promote source segregation by launching the Students@Clean contest in schools. School-led IEC drives increased segregation from 70% to 100% and reduced waste sent to landfill.	Switzerland – Introduction of a robust national e-waste system under EPR, funded by an upfront recycling fee on electronic purchases, with SWICO and SENS coordinating collection and recycling.
Vijayawada – Deployment of QR-coded RFID tags to track waste pickup, smart bins for monitoring, and GPS-equipped vehicles for optimized routes, ensuring effective door-to-door collection.	Texas – Installation of methane gas detectors at landfill linked to a central data system for continuous emissions tracking, improving methane capture efficiency and ensuring regulatory compliance.

1.2.6 Transportation

Key Climate Targets



Amaravati envisions developing a climate-smart, low-emission, and integrated urban transport system that promotes clean mobility, accessibility, and resilience. The transport strategy focuses on building an efficient public transit network, expanding non-motorized mobility, accelerating the transition to electric vehicles, and ensuring climate-resilient infrastructure and governance to support sustainable urban growth.

The city will prioritize the deployment of a city-wide electric public bus system, supported by multimodal integration across BTT, metro, and feeder networks. Infrastructure will be designed with universal accessibility, real-time monitoring, and energy-efficient technologies. Continuous cycle tracks, shaded walkways, and public bicycle sharing systems will promote active, safe and inclusive mobility.

Amaravati will lead the transition towards electric and low-carbon transport by mandating EV adoption for government fleets, developing renewable-powered charging infrastructure, and piloting low-emission freight and logistics corridors. Roads, depots and terminals will incorporate climate-resilient, nature-based designs to withstand heat and flooding. Together, these strategies will reduce GHG emissions, enhance connectivity, and create a seamless, inclusive and resilient transport ecosystem.

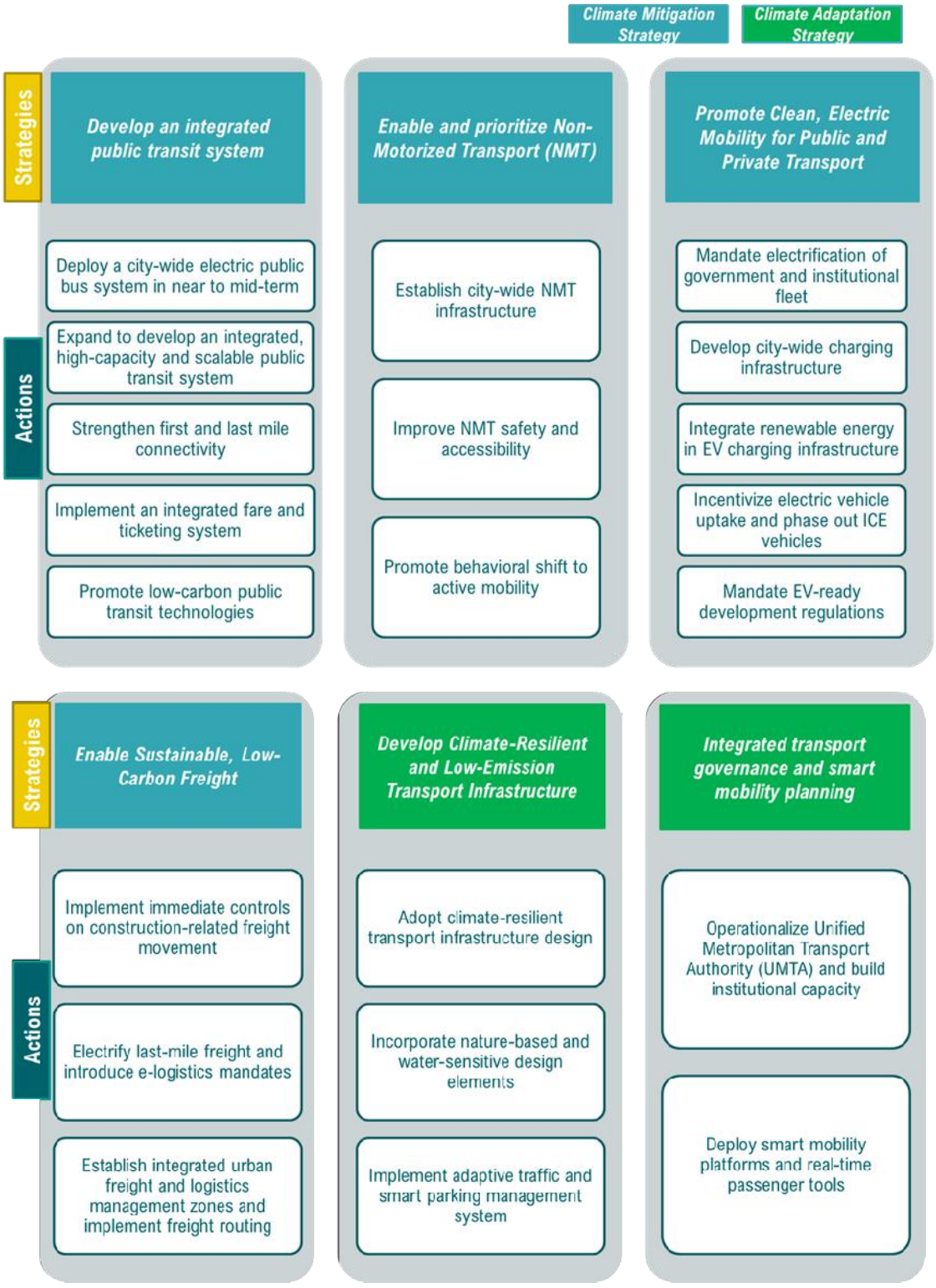


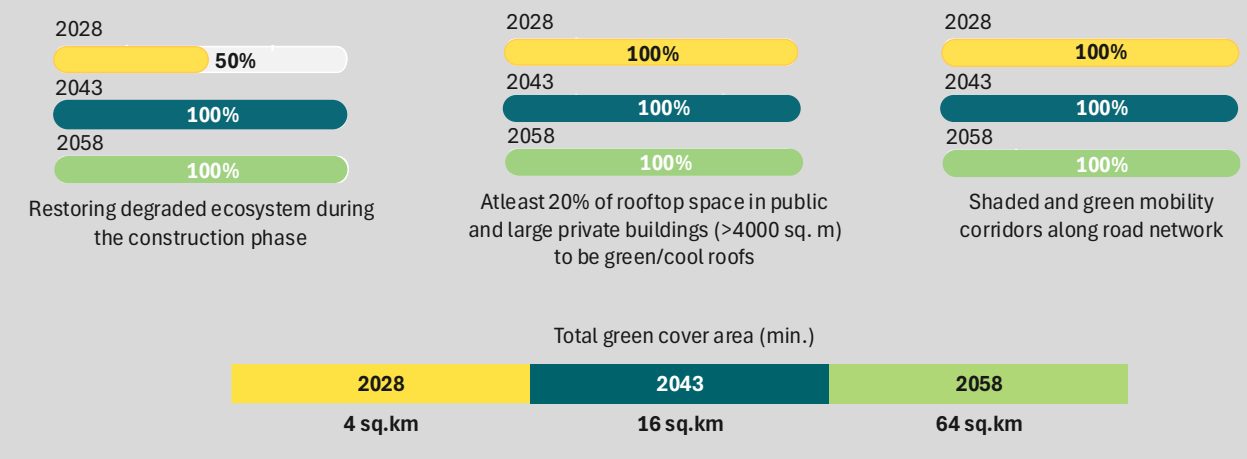
Figure 1-6: Climate Mitigation and Adaptation Strategies for Transportation

Strengthened resilience to climate hazards: Heat stress, urban flood

Good Practices	
Pune – Scaled e-buses with dedicated depots, solar shelters, centralized operations improved reliability. Adopted data-driven Comprehensive Mobility Plan using modelling and GIS for BRT, Metro expansion	Singapore – Implemented Walk-Cycle-Ride strategy integrating cycling paths, pedestrian zones, and shared mobility apps.
Ahmedabad – On-route solar-powered charging pilot reduced dead-kilometres, saved costs and GHG emissions.	Amsterdam – Deployed 3,000 smart chargers powered by renewables with real-time demand management system.
Bhopal – Automated PBS integrated with BRT smart card; seamless first- and last-mile connectivity.	Beijing – Low-Emission Zone restricted high-polluting freight vehicles, improving air quality and health outcomes.
Kochi – Introduced Kochi1 smart card integrating metro, buses, and ferries under a PPP model.	Delhi - Charging/Swapping Infrastructure Action Plan 2022-25 mandates installing EV charging and battery-swapping stations citywide, with 20% of parking in new buildings and 5% of existing parking spaces across agencies required to be EV-ready.
Nagpur – Piloted AI-based adaptive traffic signals, ANPR detection and smart traffic command centre.	Seoul – Operates centralized real-time platform integrating transit cards and sensors for live route management.

1.2.7 Biodiversity and Urban Greening

Key Climate Targets



Amaravati's comprehensive Urban greening and biodiversity strategies and actions will play a vital role in mitigating urban heat and flood risks by enhancing the city's ecological resilience while simultaneously addressing climate vulnerabilities through nature-based solutions. The strategic preservation and restoration of natural water bodies, combined with the systematic integration of blue-green infrastructure throughout the urban fabric, will significantly enhance the city's capacity for rainwater infiltration, groundwater

recharge, and surface runoff management, thereby reducing downstream flood pressures during intense precipitation events.

Large-scale afforestation programs that encourage indigenous species selection, establish native forest clusters to maintain ecological connectivity, and develop extensive green mobility corridors will substantially expand urban tree canopy coverage across residential, commercial, and institutional areas. These interventions will directly counteract urban heat island effects through evapotranspiration, provide essential shade cover for pedestrians and public spaces, improve ambient air quality through carbon sequestration and pollutant filtration, and create wildlife habitats that support urban biodiversity conservation goals. Green roofs, facades and urban agriculture will integrate nature into the built environment, enhancing cooling and stormwater retention.

These climate actions will help Amaravati city tackle heat stress through an extensive tree canopy that provides cooling through evapotranspiration and shade while reducing ambient temperatures, and address flooding by creating natural retention systems, permeable surfaces, and enhanced infiltration capacity that absorbs and slowly releases stormwater, preventing overwhelmed drainage systems during extreme rainfall events.

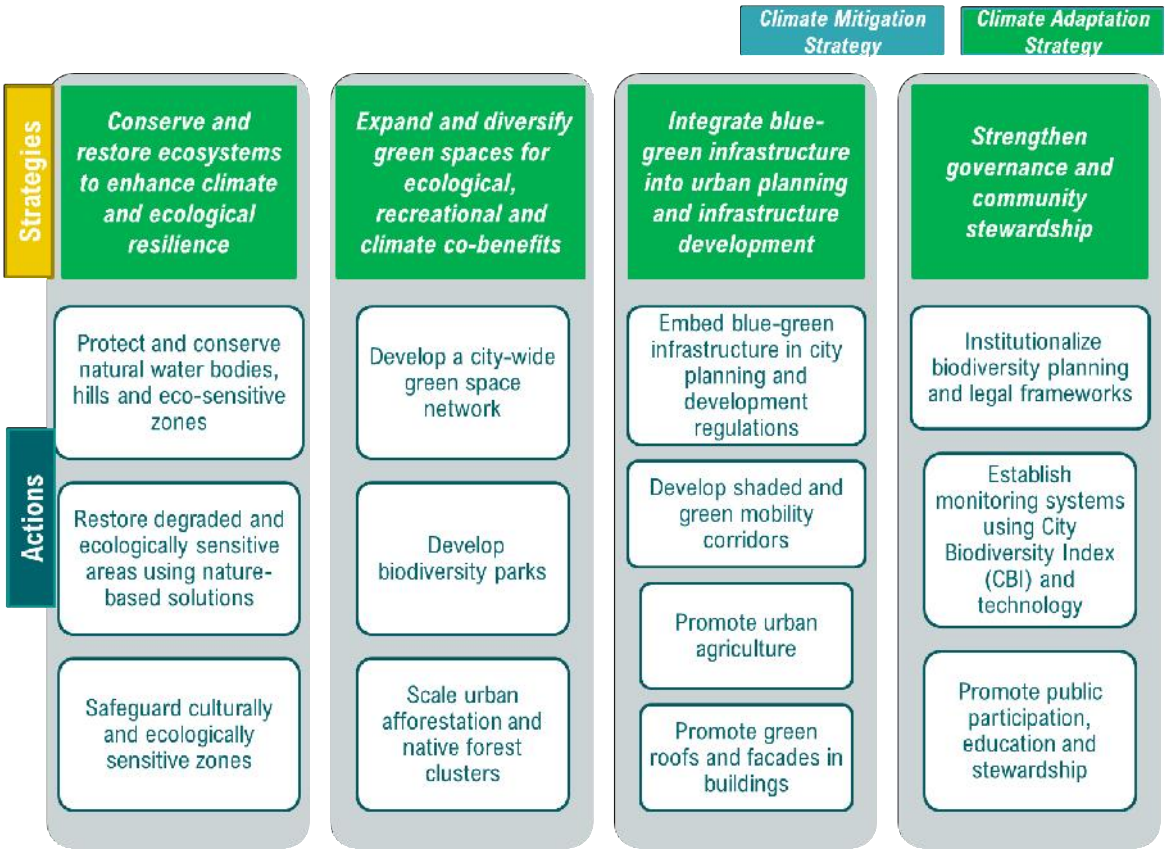


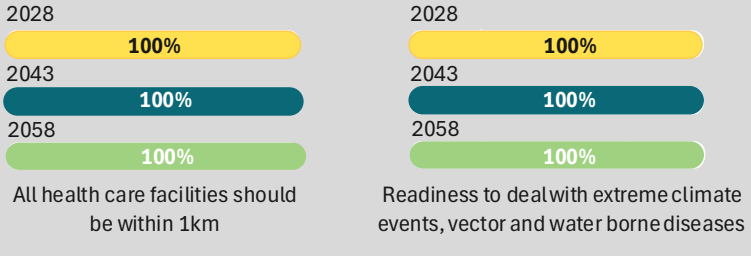
Figure 1-7: Climate Mitigation and Adaptation Strategies for Biodiversity and Urban Greening

Strengthened resilience to climate hazards: Heat stress, urban flood

Good Practices	
Hyderabad – Neknampur Lake was revived by Dhruvansh organisation through biodiversity restoration, water retention measures, and community recreation, using phytoremediation, floating treatment wetlands, desilting, and garbage removal.	Tennessee - A stretch of the French Broad River suffered severe flood-induced bank erosion during bridge construction, threatening the bridge and nearby railroad. To stabilize the slope, a vegetative riprap system is installed to reinforce the stream bank
Baltimore – Uses GIS and satellite imagery to manage its urban forest, inventorying over 1.2 lakh trees, stumps, and sites into TreeKeeper and updating canopy maps to target planting and maintenance; with i-Tree Streets, the city estimates $9.3 million in annual benefits from energy savings, stormwater control, and cleaner air, guiding canopy expansion and long-term forest health.	Chennai – Adyar Eco Park is a 358-acre restored wetland along the Adyar estuary, which reintroduces mangroves, mudflats, marshes, and tropical dry evergreen forest with 172 native species to store carbon and keep places cooler through shade and evapotranspiration.
Prayagraj – Prayagraj Municipal Corporation created dense Miyawaki forests across 55,800 sq m for Mahakumbh 2025, planting 1.2 lakh trees with 63 species in Naini and 27,000 trees with 27 species at Baswar after clearing a dump. These fast-growing groves can lower temperatures by 4–7°C, enhance biodiversity, and accelerate environmental restoration.	Toronto – LEAF organisation runs an Adopt-A-Street-Tree program that engages residents and businesses in post-planting care, improving street-tree survival through community monitoring and maintenance. LEAF handles planting and education, while community adopters handle tasks such as watering, weeding, removing litter, and tracking tree health.
Kochi – The city has developed a baseline City Biodiversity Index (CBI) in 2020, scoring 45/72 across 18 indicators. The index has highlighted the need to protect biodiversity, expand green cover, and strengthen governance, with projects and budgets aligned to LBSAP via the CBI monitoring tool.	Tokyo - Mandates green roofs on private buildings over 1,000 m² and public buildings over 250 m², with at least 20% of the rooftop area greened. This helps the city to lower ambient temperatures, reduce building energy demand, retain stormwater to reduce flooding, improve air quality and biodiversity.

1.2.8 Health

Key Climate Targets



Amaravati aims to strengthen its health systems to withstand climate hazards such as heatwaves, floods and disease outbreaks while building long-term resilience and institutional capacity. The strategy focuses on improving accessibility, preparedness and adaptive capacity of healthcare services for all communities, particularly the urban poor, elderly, women and children. Key actions include ensuring universal access to health centres, implementing a citywide Heat Action Plan, and integrating climate risk and disease surveillance into health sector planning. Public health infrastructure will be upgraded with cool roofs, renewable power, flood-resilient designs, and mobile health units to ensure service continuity during emergencies. Amaravati also prioritizes capacity building for health professionals, community awareness and real-time monitoring through a climate health dashboard and early warning systems. Together, these measures will safeguard public health and ensure a climate-resilient, inclusive and responsive healthcare system.

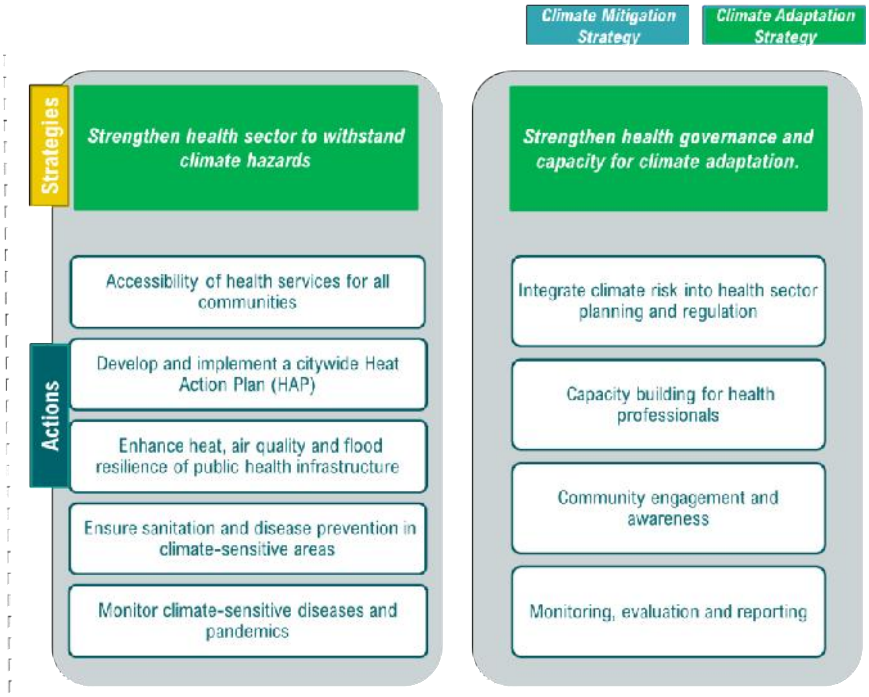


Figure 1-8: Climate Mitigation and Adaptation Strategies for Health

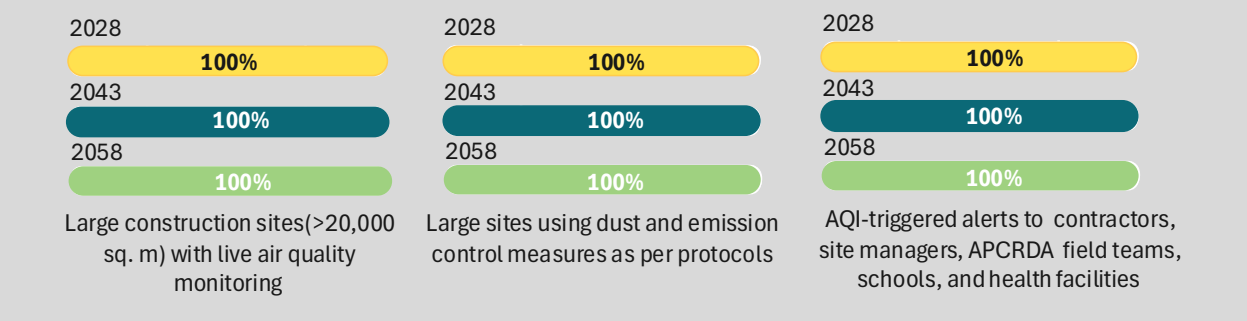
Strengthened resilience to climate hazards: Heat stress, urban flood

Good Practices	
Bhubaneswar – GIS-based urban health centres within 1 km ensure equitable access for vulnerable communities.	Singapore – Integrated cooling, shaded walkways, and heat-health campaigns enhance urban climate resilience.
Ahmedabad – Pioneered Heat Action Plan with early warnings, awareness drives, and reduced heat-related deaths	Melbourne – Citywide heat alert system links communities with hospitals for quick emergency response.

Tamil Nadu – One Health Centre integrates real-time disease and climate data for adaptive policy	Tokyo – Mobile clinics and telemedicine ensure continuous healthcare during heatwaves and typhoons.
Kerala – Elevated, solar-backed PHCs ensured uninterrupted medical services during floods and heavy rainfall	Odisha – CLTS model empowered SHGs for sanitation, reducing disease outbreaks in flood-prone areas.

1.2.9 Air Quality Management

Key Climate Targets



Amaravati aims to ensure clean air throughout its urban development process, aligning with its broader vision of becoming a climate-resilient and sustainable capital city. The city's air quality strategy focuses on minimizing dust and emissions from construction, integrating pollution resilient urban design, and establishing strong governance and adaptive management systems.

The approach begins with enforcing stringent dust and emissions control at all construction and infrastructure sites through comprehensive construction environment management plans, real time monitoring, and anti-smog measures. Low-emission equipment, reuse of treated wastewater for dust suppression, and material handling regulations will further reduce particulate pollution.

To build long-term resilience, the city will integrate air quality considerations into urban and building design such as air filtration in buildings, vegetative buffers and green corridors to reduce dust re-suspension. Strong institutional mechanisms will support these actions through management cell, AQI-linked alerts and compliance monitoring. Together, these measures will enable Amaravati to evolve as a clean and low-emission city, ensuring that rapid growth does not compromise environmental and public well-being.

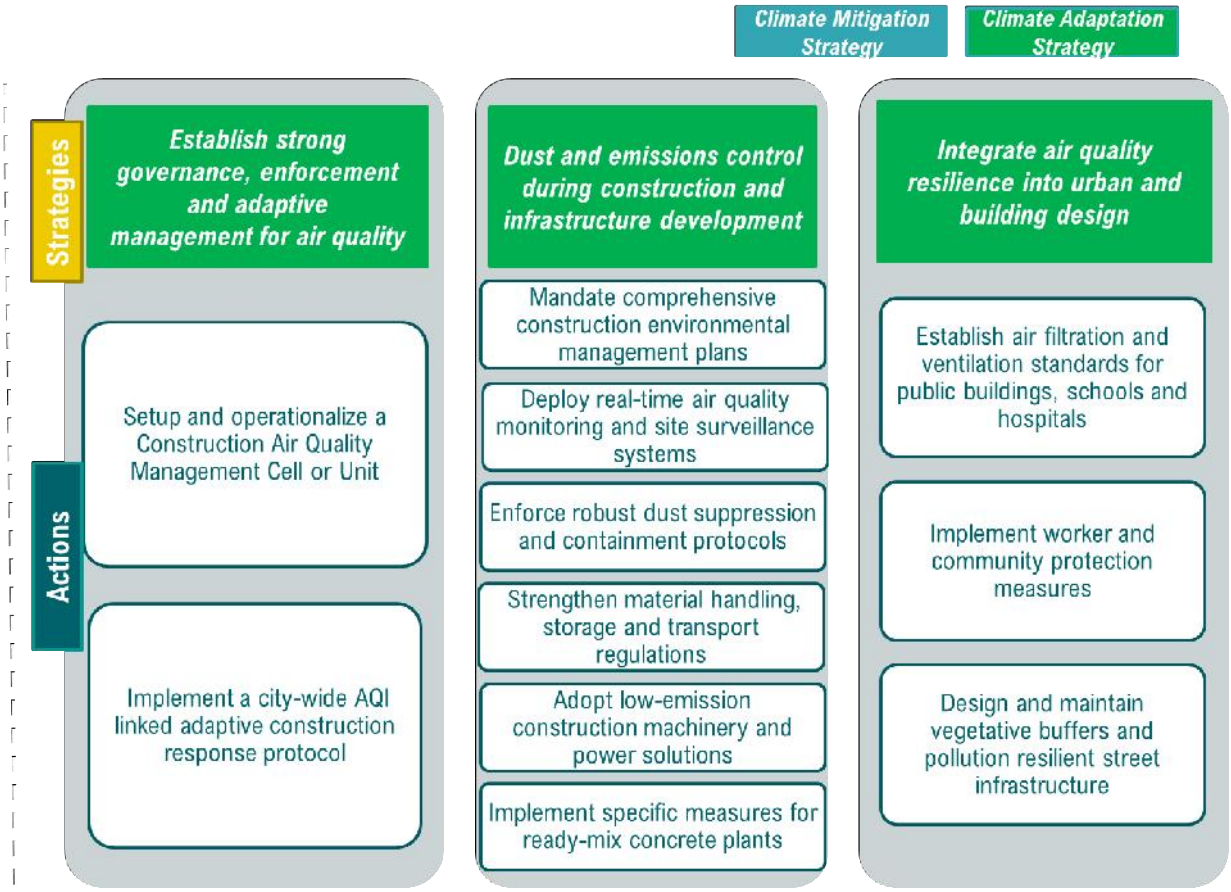


Figure 1-9: Climate Mitigation and Adaptation Strategies for Air Quality Management

Strengthened resilience to climate hazards: Heat stress, urban flood

Good Practices	
NCR Delhi: Graded, AQI-based curbs—from extra misting to halting earthworks—plus automated alerts	Ahmedabad – Municipal 'Good Construction Practices' policy mandated dust control, air monitoring, and compliance audits for large sites
London – Green construction framework enforces low-emission equipment, on-site air sensors, and strict contractor compliance.	Pune – Nyati Group's RMC plant used bag filters, paved roads, and real-time air monitoring to cut fugitive dust

1.3 Integrating Interventions to Build Resilience to Climate Risks

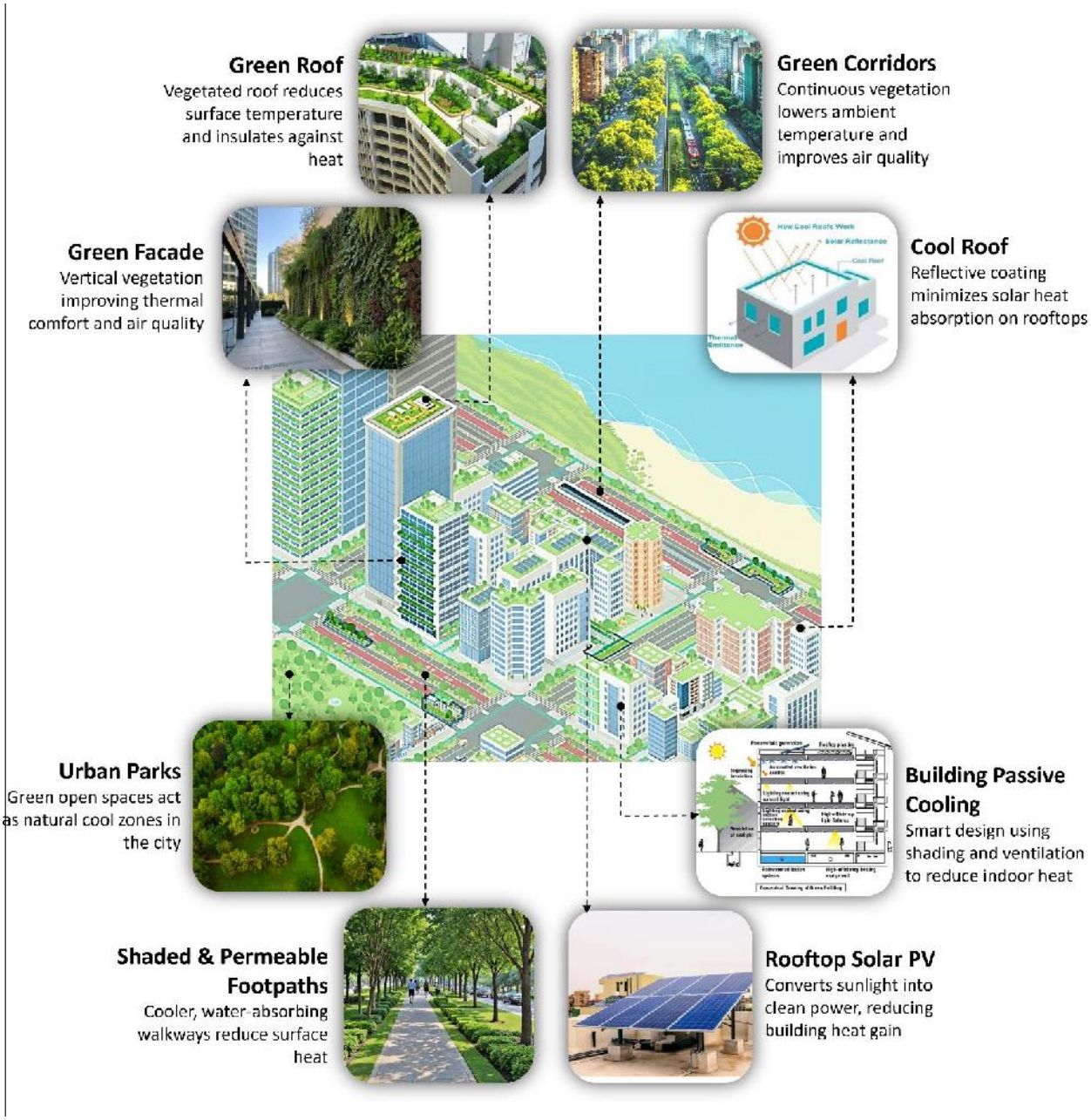


Figure 1-10: Interventions to mitigate Urban Heat Stress

Interventions for Thermal Comfort and Reduced Heat Stress

Amaravati's rapid development as a greenfield capital presents both opportunities and challenges in addressing urban heat, water scarcity, and livability concerns. As construction activity expands, increasing impervious surfaces, limited vegetation, and reduced airflow heighten urban heat island effects, aggravating heat stress and energy demand. These issues are further compounded by climate projections indicating a rise of 1 to 2.4°C in maximum temperatures by 2078 and more frequent heatwaves[1]. To mitigate these risks, it is important that Amaravati's urban design adopts an integrated, multi-layered cooling approach that links built form, landscape, and renewable energy systems.

City and Neighbourhood Scale Interventions

At the city level, Amaravati promotes a blue-green network that integrates green corridors, urban parks, and shaded, permeable footpaths to regulate microclimate and manage stormwater. These interconnected systems form ecological spines that link open spaces, water channels, and vegetation belts across the city.

- Green corridors—tree-lined streets and vegetated links—facilitate air circulation, lower surface and ambient temperatures, and act as wind channels that disperse trapped heat and pollutants.
- Urban parks and open spaces serve as thermal sinks that absorb carbon dioxide and provide shade, while also functioning as community recreation zones that improve well-being.
- Permeable and shaded footpaths use high albedo materials and vegetation to reduce heat storage, allow groundwater recharge, and offer pedestrian comfort even during peak heat hours.

Building-Level Interventions

At the building scale, Amaravati's planning and design guidelines promote energy-efficient and climate-responsive buildings through a mix of green infrastructure and passive cooling techniques:

- Green roofs add a vegetative layer that insulates buildings, reduces rooftop temperature, and minimizes heat absorption while providing stormwater retention benefits.
- Cool roofs coated with reflective, high-SRI materials deflect solar radiation, lowering indoor temperatures and air-conditioning loads.
- Green facades improve air quality, reduce wall heat gain, and enhance aesthetics while acting as noise and dust barriers.
- Passive design measures - optimized orientation, cross-ventilation, shading devices, and insulated envelopes - reduce reliance on mechanical cooling systems and create thermally comfortable indoor environments.
- Rooftop solar PV systems generate renewable energy while shading roofs, further reducing heat absorption and emissions from grid-based power use.

These measures not only improve building energy performance but also contribute to urban-scale heat mitigation, demonstrating how design decisions at the micro level influence macro-level climate resilience.

By embedding these measures into master planning, development control regulations, and building codes, Amaravati can ensure that every layer of its urban fabric—streets, buildings, and open spaces—contributes to climate adaptation and mitigation. This approach not only reduces urban heat and enhances livability.

[1] Climate projections as per Hydrological and Climate Modelling of Solapur and Vijayawada cities by IIT Madras, 2019 under RCP 4.5 and RCP 8.5. Representative Concentration Pathway (RCP) scenarios describe different trajectories for greenhouse gas concentrations and the resulting radiative forcing (energy added to the climate system) by 2100.

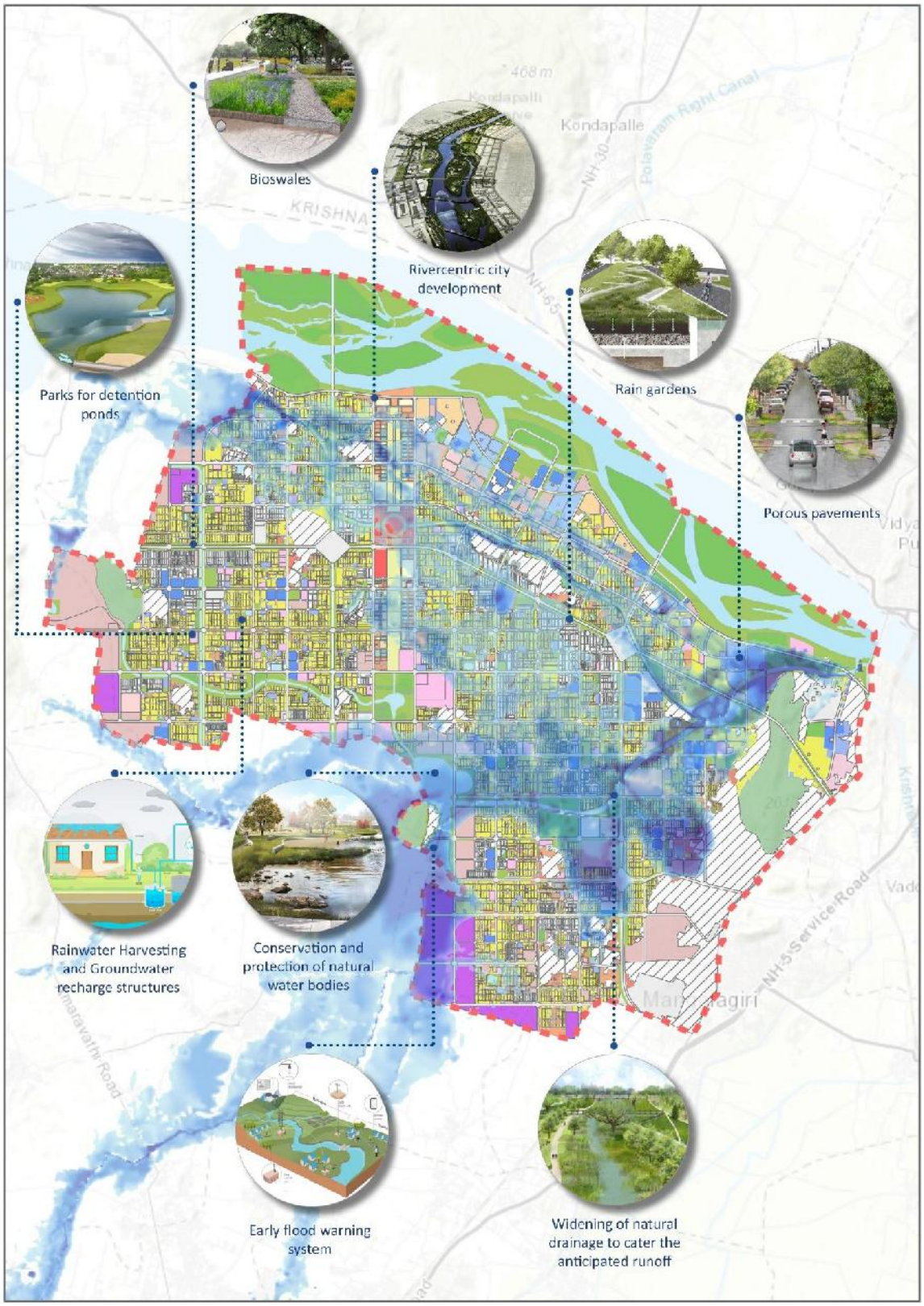


Figure 1-11: Interventions for Urban Flooding

Interventions to Improve Resilience to Urban Flooding in Amaravati

Addressing rainwater runoff surcharging the Vagu network is essential to reducing flood risk vulnerability. It is important to implement actions that focus on minimizing runoff generation and effectively managing runoff through engineering and nature-based solutions. Stormwater management planning starts with conserving and protecting natural water bodies and drainage systems.

Amaravati is situated on the banks of the River Krishna and upstream of the Prakasam barrage. A river-centric design that protects the river's ecology and encourages interaction between citizens and nature needs to be planned, with the capacity of its existing bund road running along the River Krishna to be enhanced to accommodate higher traffic movement and enhance protection of surrounding areas against backwater of the Prakasam barrage. Identifying and notifying the boundaries of lakes and vagus in the city is crucial for protection and legal enforcement against encroachments over time. Since Amaravati lies in the lower reaches of the Kondaveeti Vagu catchment, most runoff passes through the city before reaching the River Krishna. The design measures for widening of Kondaveeti Vagu should accommodate upstream runoff and the anticipated runoff from developed spaces and infrastructure in Amaravati. Additionally, the existing irrigation canals that previously served the irrigation needs should be preserved, even though the irrigation demand is expected to significantly reduce once urbanization increases. However, the canals will still assist in channeling rainwater runoff out of the city.

Reducing runoff generation is fundamental to effective stormwater management. Using nature-based solutions is both effective and cost-efficient. Incorporating bio-swales and rain gardens in green buffer zones along the roads E5, E10, N6, N7, N9, and N13 can help. Maintaining land cover porosity through porous pavements and parking areas aids in groundwater recharge and aquifer replenishment, which will be crucial during events of erratic and low rainfall. Decentralized solutions such as rainwater harvesting structures and recharge pits should be mandated across properties through building guidelines and codes. Additionally, strict enforcement through monitoring cells once properties are occupied is essential to ensure compliance and continued utility of such solutions.

Detention ponds in parks can serve as temporary storage basins that capture and slowly release stormwater, reducing peak runoff and mitigating urban flood risks. Planning a detention pond network that spans across parks in different zones and neighbourhoods is important. This intervention requires a detailed study, identification of relevant priority parks, and designing runoff diversion systems. An early flood warning system provides additional preparation time and enables communication with vulnerable groups to increase proofing measures and coordination with authorities. Automatic rain gauges and sensors should be installed throughout the Kondaveeti Vagu catchment to monitor rainfall, water levels, velocity, and rainfall on a real-time basis, especially as high-intensity rainfall events are anticipated to become more common. The data specific to each rainfall event, including information on the spatial extent of waterlogging, depth, and duration, must be collated and made available for effective mitigation measures in the future. This meticulously recorded long-term historical data helps validate models and in turn supports flood protection.

1.4 Advancing towards Net-Zero Greenhouse Gas Emissions through Climate Actions

Amaravati is envisioned as a world-class capital city for the State and a model planned, future-ready urban centre in India. The city envisions integrating the best features of urban planning, sustainability, and effective governance to create an inclusive, highly liveable, and world-class urban ecosystem. Amaravati's infrastructure aims to meet global standards with efficient, eco-friendly utilities and technology-driven development. Current plans include green spaces, the preservation of water bodies, mixed-use areas to reduce travel and energy use, and a focus on non-motorized and public transportation. The city emphasises adoption of energy-efficient infrastructure, renewable energy, flood protection, wastewater reuse, and urban cooling for resilience.

This vision aligns with Andhra Pradesh's Swarn Andhra Policy, 2024 and the Integrated Clean Energy Policy, 2024, both of which focus on low-carbon urban development, renewable energy integration, and state-wide long-term carbon-neutral growth.

Amaravati's Baseline GHG emissions in 2024

Baseline GHG emissions for the capital city area are estimated to be 2.42 lakh 332 tonnes of carbon dioxide equivalent (CO_2e). Per capita emissions in the current scenario in 2024 stand at 1.31 tonnes of CO_2e.

Primary contributor to emissions is the Stationary Energy sector, which includes consumption of electricity and fuels in existing buildings and accounts for 80.4% of total emissions. The Transport sector accounts for about 13% of emissions, and the remaining 6.6% emissions result from the Waste sector in 2024.

Amaravati's Climate Pathway from 2028 to 2058

Amaravati's GHG emission reduction target (noted in section 1.1) emphasizes its ambition to advance towards net-zero GHG emissions. Through its overarching climate targets and sectoral climate strategies and actions, the city is committed to adopt a pathway that supports deep-cuts in its GHG emissions during its planning horizon of 2028 to 2058. Amaravati aims to progressively reduce GHG emissions through decarbonisation of energy, sustainable mobility, and improved waste management.

In the climate action planning process, Amaravati's climate strategies and targets were identified as part of its **Climate Action Scenario**. The city's future GHG emissions were modelled based on this Climate Action Scenario, assuming implementation of all its sectoral climate strategies and actions outlined in the CCAP (see Volume 1, section 6 for further details). Implementing its Climate Action Scenario will help Amaravati to achieve deep GHG emissions reduction at the city-scale, as much as 80.2% as compared to the BAU by 2058.

The Climate Action Scenario, that envisions implementation of Amaravati's climate strategies and actions in the CCAP, helps to reduce the city's GHG emissions across its planning horizon of 2028 to 2058.

By 2058, total GHG emissions are expected to decline from 62.79 lakh tCO_2e in the BAU scenario to 12.45 lakh tCO_2e, reflecting an 80.2% reduction (50.33 lakh tCO_2e).

The Climate Action Scenario results in the following levels of emission reduction compared to BAU:

- **GHG emissions in 2028:** *17.5% lower* than BAU
- **GHG emissions in 2043:** *58.8% lower* than BAU
- **GHG emissions in 2058:** *80.2% lower* than BAU

With implementation of its climate actions, Amaravati's **per capita emissions** are estimated to be **0.31 tCO_2e by 2058**. This is much lower than the existing baseline situation, with per capita emissions of 1.31 tonnes of CO_2e in 2024 and represents a significant decline (about 76%), especially considering the infrastructure improvement and transformation that the capital city will bring to the region.

Through the low-carbon and climate-oriented planning approach under its CCAP, Amaravati's per capita emissions on completion of its development in 2058 are estimated to be much lower as compared to that of brownfield Indian and global cities.

Amaravati's Projected Per Capita GHG Emissions Compared to Indian and Global Cities

City	Per Capita GHG Emissions (tCO_2e)	Year
Amaravati	0.31	2058
Ahmedabad	2.1	2021-22
Chennai	1.9	2018-19
Coimbatore	1.75	2021-22
Hyderabad	2.48	2022-23
Mumbai	1.8	2019
Vijayawada	1.85	2021-22
Bangkok	7.39	2024
London	3.2	2022
Los Angeles	5.4	2020
Montreal	13	2019
New York	11	2019
Singapore	12.3	2021

If Amaravati's development took place as per the BAU scenario following conventional patterns in the absence of climate and sustainable planning interventions, emissions are projected to reach 62.79 lakh

tCO_2e by 2058 (see Table 1-1 and Figure 1-1). Adoption of climate actions across sectors would help limit GHG emissions to 12.45 lakh tCO_2e by 2058 in the Climate Action scenario. A comparison of the two scenarios highlights Amaravati's clear shift toward a low-carbon growth pathway.

Table 1-2: Sector-wise GHG emissions under the Climate Action Scenario, 2028 - 2058

Sector and Sub-sector	Climate Action Scenario				BAU emissions	Reduction from BAU levels
	GHG Emissions (tonnes of CO_2e)			Share of emissions		
	2028	2043	2058	2058	2058	2058
Stationary Energy	**6,92,862**	**10,36,106**	**8,53,140**	**68.5%**	**50,86,174**	**83.2%**
Residential Buildings	2,71,054	3,93,737	2,47,639	19.9%	18,16,512	**86.4%**
Commercial and Institutional Buildings/Facilities	3,23,495	4,74,380	3,50,822	28.2%	23,24,190	**84.9%**
Industries	97,679	1,65,216	2,49,058	20.0%	9,39,850	**73.5%**
Fugitive Emissions (from piped gas supply)	634	2,772	5,622	0.4%	5,622	**0.0%**
Transportation	**77,821**	**1,62,665**	**2,33,094**	**18.6%**	**7,10,347**	**67.2%**
On-road Transportation	77,821	91,504	1,11,959	9.0%	5,48,635	**79.6%**
Rail/Metro	-	71,161	1,21,136	9.7%	1,61,712	**25.1%**
Waste	**41,153**	**69,222**	**1,59,031**	**12.8%**	**4,82,237**	**67.0%**
Solid Waste	36,042	52,904	1,23,245	9.9%	1,52,996	**19.4%**
Wastewater	5,111	16,318	35,786	2.9%	3,29,241	**89.1%**
Total	**8,11,837**	**12,67,992**	**12,45,265**	**100%**	**62,78,757**	**80.2%**

In the Climate Action scenario, about 68.5% of emissions would result from stationary energy sector, while transportation and waste are estimated to contribute 18.7% and 12.8%, respectively. The main emission sources are anticipated to be PNG (68.6%), electricity used for transport (18%), and waste management (12.8%), while transport fuels will contribute minimally at 0.6%, reflecting a strong transition toward cleaner and electrified systems.

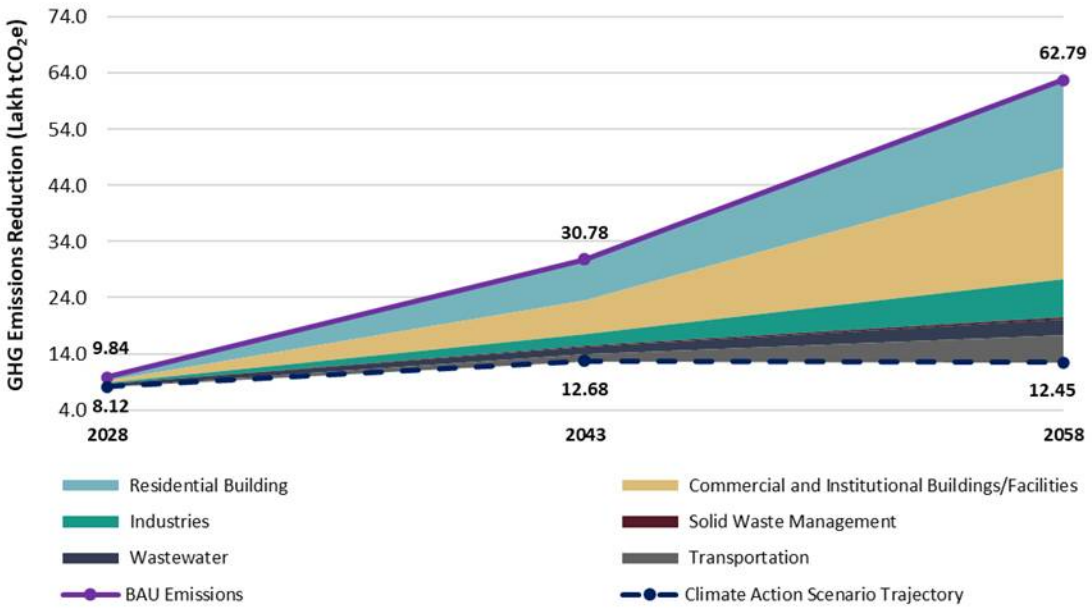


Figure 1-12: GHG Emissions reduction potential of actions in the Climate Action Scenario compared to the BAU Scenario, 2028 - 2058

Emission Reductions by Sector

The emission reductions in Amaravati's Climate Action Scenario can be analysed across three key sectors: **stationary energy, transportation, and waste**.

The stationary energy sector is expected to be the primary driver of emission reductions, mainly from large-scale integration of renewable energy, improved building energy performance, the adoption of energy-efficient technologies, and the switch to cleaner energy sources to meet the energy demand. The sector is estimated to contribute over 84.1% of the total reduction potential in 2058. Of this, proposed climate actions in commercial and institutional buildings and facilities are estimated to contribute 39.2% of the total emissions reductions, followed by residential buildings with a share of 31.2%, and industries accounting for 13.7%.

The transport sector is projected to account for 9.5% of the total emissions reduction from BAU levels, primarily through the shift to public and electric mobility, supported by renewable-powered charging infrastructure. In the waste sector, adopting scientific processing technologies for solid waste, such as composting, bio-methanation, and material recovery, will significantly reduce methane emissions and promote a circular economy. In addition, the target for methane recovery from wastewater treatment for energy generation will also help reduce emissions in the city. The overall contribution of the waste sector to emissions reduction is estimated to be 6.4% (see **Error! Reference source not found.**).

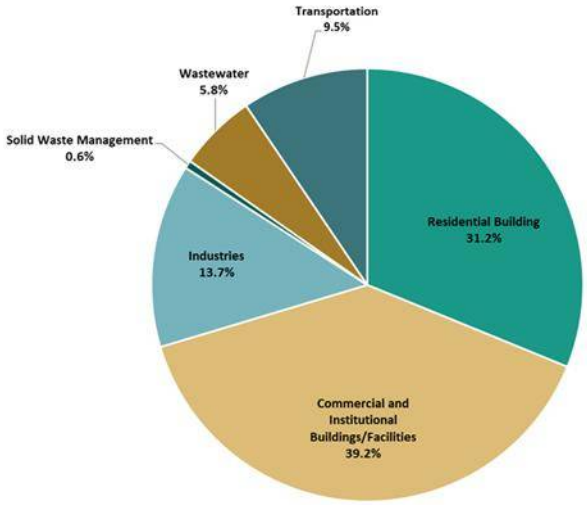


Figure 1-13: Sector contribution to GHG emissions reduction from the BAU levels, 2058

2 Sector-wise Climate Actions and Implementation Details

The Amaravati CCAP outlines 37 strategies across 9 sectors to guide the city towards strengthening it climate resilience and achieving net-zero GHG emissions. Each sectoral strategy is accompanied by defined targets, with actions detailed to reduce emissions and enhance resilience to climate change. Wherever possible, these strategies and actions have been aligned with existing state and national policies, master plan and infrastructure development plans to ensure convergence and effective implementation of climate actions.

Actions for implementation in the CCAP are identified and prioritised based on their benefits for climate resilience, feasibility (including technical, political, and financial aspects), and the time required for these actions to yield results (short, medium, and long term).

The feasibility of each intervention is evaluated based on technical, financial, and political aspects, as well as the timeframe needed to achieve the intended impact in the city. Overall feasibility is determined by the availability of accessible and affordable technology, the presence of allocated or easily obtainable funding, and the ability to secure political and social support. The timeframe for impact considers whether an intervention can enhance the resilience of an urban system in the short term (by 2028), medium term (by 2043), or long term (by 2058).

Further, to establish the priority of the proposed actions, their potential to generate climate resilience benefits was evaluated. This assessment of the climate actions focused on several factors: their capacity to contribute to the redundancy and flexibility of urban systems, their role in informing future planning of these systems, their responsiveness to sudden shocks or stresses, and their potential for reducing GHG emissions. Details of this analysis can be found in Annexures A & B. This approach helped determine the priority of various actions. For instance, actions with significant climate resilience benefits, high feasibility, and a quick impact timeframe should be prioritised for implementation, especially those supported by readily available technology and financing options.

The subsequent sections present the identified climate resilience actions across sectors in the following structure:

- Sectoral snapshot of information reflecting its baseline status including its share of GHG emissions and opportunities, challenges, and gaps; guiding policies and initiatives that align with proposed actions, BAU GHG emissions scenario and the identified climate risks; vulnerable areas and actors and their adaptive capacity; overall GHG emissions mitigation potential and climate resilience impact and co-benefits; and the SDGs that will be met through the proposed actions.
- The sector specific adaptation and mitigation strategies and targets: The adaptation strategies are to help build resilience towards climate risks and urban system vulnerabilities while the mitigation strategies are to address the targeted GHG emission reductions from the sectors. The strategies have a set of targets outlined for the timelines of 2028, 2043 and 2058. Details of implementation for the proposed actions are presented with implementation entities, financing mode and prioritisation and feasibility parameters.

2.1 Energy and Buildings

Baseline Status (2024-25)	**Electricity consumption:** 220.4 million kWh **Share in total energy consumption**: 74% **GHG emissions:** 1,94,944 tCO_2e (80% of total GHG emissions) **Share in GHG emissions from buildings:** Residential buildings (53%), Commercial and institutional buildings/facilities (41%), Industries (5%), Agriculture (2%)
Existing Policy, Plans and Initiatives	**National Policy/Programme/Targets:** • India's NDC: Aims for 50% electric power installed capacity from RE sources by 2030 • UJALA Scheme, EESL's Super-Efficient AC Program (ESEAP) Scheme, BEE star labelling program and awareness supporting penetration for EE appliances. • Ministry of Power's target: all DISCOMs to achieve 43.3% Renewable Purchase Obligation[2] by 2030 • Energy Conservation and Sustainable Building Code (ECSBC), 2024: energy efficiency standards for commercial and office buildings (connected load>100 kW) • Eco-Niwas Samhita, 2024: standards for energy efficiency, renewable energy use, and other green building requirements for residential buildings • India Cooling Action Plan[3]: aim to reduce cooling demand by 20% to 25% (focusing on building envelope design) and cooling energy demand by 25% to 40% by 2038 • PM Surya Ghar Muft Bijli Yojana: supports solar PV installations[4] • Mission LiFe: promotes environmental conscious lifestyle[5] • Pradhan Mantri UJJWALA scheme: supports cleaner fuel adoption • Scheme for Development of Solar Parks and Ultra-Mega Solar Power Projects to support setting up of solar power parks until 2026, enabling grid-scale RE expansion. **State Policy/Programme/Targets:** • Andhra Pradesh Integrated Clean Energy Policy 2024: aims to achieve net-zero by 2047 for the state and promotes RE, including green hydrogen[6] • AP Energy Efficiency and Energy Conservation policy 2023-28: aims to save around 20% of total energy demand by 2028[7] • State target to achieve a renewable purchase obligation (RPO) of 22% by 2026-27 in its electricity supply, comprising 9.5% solar and 12.5% non-solar power[8] • AP Building Rules, 2017 require ECBC compliance for all commercial/non-residential buildings with plot area ≥ 1000 sq. m or built-up area > 2000 sq. m. All multiplexes, hospitals, hotels, and convention centers must be AP ECBC-compliant. • In Andhra Pradesh, Energy Conservation cells have been institutionalised in all government head of department offices, district offices, and corporation/society

[2] Ministry of Power Notification F.No. 09/13/2021-RCM, July 22
[3] India Cooling Action Plan, March 2019, MoEFCC
[4] PM Surya Ghar Bijli Yojana. Accessed August 2025.
[5] Mission LiFE, Accessed August 2025
[6] Andhra Pradesh Integrated Clean Energy Policy 2024, Energy Department, Andhra Pradesh State Energy Conservation Mission, Accessed August 2025.
[7] Andhra Pradesh Energy Efficiency and Energy Conservation Policy, Energy Department, Andhra Pradesh State Energy Conservation Mission, Government of Andhra Pradesh, Accessed August 2025.
[8] APERC Renewable Power Purchase Obligation (Compliance by purchase of Renewable Energy/Renewable Energy Certificates) Regulations, 2022. Accessed August 2025.

	offices. These cells act as a nodal agency to coordinate with the State Designated Agency on energy efficiency and conservation measures.[9] • AP Green Hydrogen & Green Ammonia Policy 2023 aims to promote green hydrogen production within five years using solar and wind energy [10] **City Policy and Initiatives** • Zoning Regulations and Urban Design Guidelines, 2024 notified for Amaravati Government Complex (AGC) include building sustainability measures and requirements for building developments located within the AGC area • Urban Design and Architectural guidelines (UDAG) (draft), 2025 include specific green building features and minimum green building rating certification requirements for public, institutional and private buildings. The measures and norms are aligned with the ECBC, GRIHA, LEED, IGBC • UDAG includes requirements for rooftop solar installations on at least one-third of rooftop area across the city (excluding AGC area) • Upcoming public buildings being constructed in compliance with green building norms (including EDGE standards) • Procurement of high-efficiency rated pumps planned in city utility infrastructure. • Integration of district cooling systems is planned for the AGC area, to enable reduction in cooling-related energy demand.
Opportunities and Gaps	• Significant opportunity to integrate energy efficiency and high level of renewables at the outset in public and private buildings and infrastructure for city utilities. • Projected climate trends necessitate integration of climate-responsive measures such as passive cooling, heat-resilient materials in buildings and community spaces to ensure thermal comfort with anticipated rising temperatures. • Amaravati's policy regulations and guidelines to support low-carbon and green buildings are in place, with robust enforcement and supporting measures required to help ensure widespread adoption. • Energy Conservation and Sustainable Building Code (ECSBC), 2024 (i.e. updated version of ECBC, 2017) and Eco-Niwas Samhita, 2024 can be integrated into Amaravati's guidelines for adoption in commercial, office and residential buildings. • Amaravati is envisioned to be fully renewable-powered capital city. A significant portion of green power will need to be integrated from offsite RE sources to complement on-site/rooftop RE deployment. • Establishing strong institutional frameworks and coordination mechanisms among different urban planning and energy sector institutions such as APCRDA, ADCL, APCPDCL, APTRANSCO, APGENCO, APSECM, NREDCAP, AP DTCP is critical to streamline urban and power infrastructure planning, building code enforcement and energy management. • Significant enabling actions on early-stage planning, policy measures, business models, private sector participation, financing and incentives, local power grid readiness, and monitoring required to achieve ambitious EE and RE adoption.

[9] State Energy Efficiency Index 2023, Bureau of Energy Efficiency, Alliance for an Energy Efficient Economy, 2024, Accessed August 2025.
[10] AP Green Hydrogen & Green Ammonia Policy 2023, Accessed August 2025.

Climate Risk and GHG Emissions Scenario

GHG Emissions:

Sector	GHG Emissions in BAU (tCO_2e)			
	2024	2028	2043	2058
Residential Buildings	102,863	332,877	1,120,122	1,816,512
Commercial and Institutional Buildings/Facilities	79,742	373,323	1,082,687	2,324,190
Industries	9,399	115,687	375,035	939,850
Agriculture, Forestry, and Fishing Activities	2,941	-	-	-
Total emissions from Buildings	**194,944**	**822,521**	**2,580,616**	**5,086,174**

Climate Risk Status: Medium

- Increase in building energy demand, especially for cooling, with growing population and rising temperatures
- High surface and air temperature and related impacts on health due to inadequate heat resilience
- Urban flooding and waterlogging risks due to impermeable surface areas in the built environment

Potential Climate Resilience Impact and Wider Co-benefits of Climate Actions

GHG Mitigation Potential and Indicative Cost of Interventions:

Parameters	Climate Action Scenario		
	2028	2043	2058
GHG Emissions in Climate Action Scenario (tCO2e)	692,862	1,036,106	853,140
GHG emissions reduction from BAU	16%	60%	83%
Total cost of mitigation actions by 2058 (Million INR)	266,566		

Strengthened Resilience to Climate Hazards:

Heat stress, urban flood

Climate Resilience Impact and Co-benefits:

- Reduced dependency on grid for energy; high green power integration
- Improved indoor thermal comfort in buildings and enhanced heat resilience, especially for vulnerable groups in low-income homes
- Improved permeability of surfaces in the built environment and lower flood risk due to protected buildings
- Lower risk to public health from extreme heat

SDGs	GOAL 3: Good Health and Well-being, GOAL 7: Affordable and Clean Energy, GOAL 8: Decent Work and Economic Growth, GOAL 11: Sustainable Cities and Communities, GOAL 12: Responsible Consumption and Production, GOAL 13: Climate Action, GOAL 15: Life on Land

Climate Strategies, Actions and Targets

Strategy 1: Prioritise energy efficiency and renewable energy adoption in public buildings and city utilities

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Green and Energy-Efficient Public Buildings	Public buildings that are certified green buildings and/or AP ECBC/ECSBC-compliant	100%	100%	100%
Renewable Energy in Public Buildings	Electricity consumption in public buildings to be met by renewables	50%	100%	100%
Energy efficiency adoption in public utilities and facilities	Adoption of energy-efficient equipment and pumps in public utility service facilities	100%	100%	100%
Renewable energy in public utilities and facilities	Electricity consumption in public utility service facilities to be met by renewables	50%	100%	100%
LED street lights with control & management systems (voltage controller and timer)	Street-lights with LED lamps and energy efficiency controls	100%	100%	100%

Proposed Actions

Action 1: Build and operate certified green, energy-efficient public buildings

Action details

Amaravati's public buildings should take the lead to implement green building and energy efficiency measures to first reduce their energy demand and then utilise green power to meet energy requirements. This action should be prioritised in all government-owned and managed buildings, including public offices, hospitals, schools, social housing, residential quarters, community facilities (auditoriums, sports complexes, libraries, convention centres). These measures will further emphasise passive design elements such as optimised window placement, reflective roofing materials, natural ventilation, and green landscaping to enhance thermal comfort and reduce reliance on mechanical cooling. These measures are particularly important given Amaravati's exposure to extreme heat, with max. daily temperatures reaching up to 48.8°C.

Existing initiatives

Key public buildings, including APCRDA office, are being designed and constructed as per green building standards (including IFC-EDGE standard)

Sub Actions:

- New public buildings to achieve green building certification (such as GRIHA/EDGE/IGBC/LEED) and comply with AP ECBC/ECSBC, where applicable (plot area ≥ 1000 sq. m or built-up area > 2000 sq. m) **(ongoing/planned)**
- Social/affordable housing and residential quarters built by APCRDA/AP Housing Board should follow guidelines as per Eco-Niwas Samhita, 2024.
- Tender documents for construction of new buildings include clear green building and energy efficiency requirements. Specify targeted certification level (e.g. GRIHA 3-star, EDGE certified/advanced, IGBC/LEED gold or platinum) and link compliance by concessionaire to contractual conditions (e.g. BoQ terms, payment, and approvals). **(ongoing/planned partly)**
- Update zoning and development control regulations to enable ECSBC, 2024 and green building standard compliance and adoption of green building features in different building types as per Amaravati's Urban Design and Architectural Guidelines (UDAG), 2025 (refer Strategy 2, Action 1). **(ongoing/planned)**
- Integrate high levels of on-site renewables such as rooftop solar PV and solar water heaters along with off-site solar and wind energy. Key public buildings to go beyond ECSBC norms and target Net-zero buildings, ECSBC+, super ECSBC adoption to serve as demonstration models. (eg. Super-ECBC compliant APEPDCL training centre at Visakhapatnam).
- Ensure that current contractual provisions remain aligned with the IGBC Platinum rating standard awarded to Amaravati's Master Plan in 2018.
- Identify existing public buildings targeted for energy audits in order to implement renewable energy and energy efficiency improvement projects.

Potential locations: Public-owned and managed buildings within the Amaravati Government Complex and across zones

Implementing entities

Lead: APCRDA

Supporting: ADCL, AP DTCP, AP Housing Board, APSECM, APCPDCL, NREDCAP, Green building certification agencies, contractors, architects

Type of action: Climate Mitigation

Climate resilience benefits: Very High

Timeline: Short term (2028 for AGC phase), Medium term (2043 for city expansion)

Monitoring Indicators:

- Percentage of new public buildings and social housing with green building certification
- Percentage of existing and new public buildings and social housing complying with AP ECBC/ECSBC/Eco-Niwas Samhita
- Rooftop solar PV capacity installed on public buildings
- Percentage of public building energy consumption met by renewable energy sources
- No. of existing public buildings with energy audits followed by actionable energy-saving implementation
- No. of public buildings that are net-zero, ECSBC+ or Super ECSBC compliant

Good Practice:

Indira Paryavaran Bhawan in New Delhi stands as India's pioneering net-zero government building with notable RE integration and green building features**.** Powered by a 930 kWp solar rooftop and features passive design features such as strategic orientation, shaded facades, and high-performance insulation to optimise thermal comfort without mechanical cooling. It deploys innovative systems like chilled beams and geothermal exchange along with green landscaping and rainwater harvesting, earning a GRIHA 5-star rating and serving as a model for climate-responsive institutional building design.

APEPDCL's training centre at Visakhapatnam is Andhra Pradesh's first super ECBC-compliant building. Supported by a significant grant from the Bureau of Energy Efficiency, the facility hosts the state's new Centre of Excellence for Energy Transition and serves as a demonstration model integrating green technologies, energy management solutions, and advanced testing labs.

Action 2: Establish enabling policies for low-carbon government buildings and public procurement

Action details

Introduce zoning regulations and green public procurement policy interventions that address all new public buildings across the city, promoting the adoption of renewable energy and energy efficiency measures. These interventions will enable government buildings to be designed and operated in a climate-sensitive and sustainable manner, shifting towards procurement that prioritises energy efficiency and low carbon footprint in buildings and operations.

Existing initiatives

Zoning Regulations and Urban Design Guidelines, 2024 notified for the Amaravati Government Complex (AGC) outline sustainability measures and requirements for buildings and sites located within the AGC area. Further, for the city area beyond the AGC, the Urban Design and Architectural guidelines (UDAG) have been prepared recently in 2025, which include specific recommendations on green building features and minimum green building rating requirements for different building types, including public and semi-public buildings.

Sub Actions:

- Enforce green building measures and requirements outlined in UDAG, 2025 for all public buildings.
- Develop a green public procurement policy to integrate energy efficiency, renewable energy, and low-carbon materials within Amaravati's government buildings and facilities:
    - Require use of high-efficiency and BEE star-rated electrical equipment and appliances, LED lights, occupancy and daylight sensors, renewable energy, green building materials and components, and building energy management systems.
    - Maintain a list of vendors and reference costs for energy-efficient appliances and fixtures for heating, air conditioning, lighting and ventilation, plumbing, and certified green materials.
    - Use procurement platforms and channels such as EESL's UJALA, GeM (Government e-Marketplace) portal, EESL Mart portal. Prioritise local and regional vendors.

Implementing entities:

Lead: APCRDA (Policy and Regulation)

Supporting: DTCP, APSECM, ADCL, procurement departments

Type of action: Climate Mitigation
Climate resilience benefits: High
Timeline: Short term
Monitoring Indicators: • Notification or publication of Green Public Procurement Policy • Percentage of new public buildings complying with green building requirements in zoning regulations • No. of government buildings adopting renewable energy systems • Percentage of high-efficiency electrical equipment, appliances and lighting fixtures procured • Percentage of public building using certified green materials and low-carbon components
Good Practice: **Vienna's** has successfully implemented an internationally recognized model for sustainable municipal procurement for over two decades through the EcoBuy Vienna Program. It has developed over 100 ecological criteria across 23 categories including energy efficiency, recycled content, organic production, and low-carbon standards – applicable to vehicles, construction materials, office supplies and institutional food services. These sustainability indicators guide the city's €5 billion annual procurement procedures, with the program estimated to reduce 15,000 tonnes of CO_2 and save €1.5 million annually through environmentally sound construction, water-saving devices, efficient lighting, and organic food procurement. **Seoul** has implemented a green procurement policy for all public institutions since 2007, with mandates to prioritize eco-labeled and recycled products in all purchases. By 2017, 42% of Seoul's public procurement spend—KRW 122 billion—was on green products. The city has also advanced integration of EE and RE into public infrastructure, setting ambitious energy performance requirements for public buildings, including mandatory best-in-class green building certification and retrofits, large-scale PV installation, and full transition to LED lighting.

Action 3: Integrate energy efficiency and renewables into utility service infrastructure
Action details Amaravati, envisioned as India's first fully renewable-powered capital city, is integrating energy efficiency and renewable energy into its core utility service infrastructure to meet the projected power demand. Procure high energy efficiency equipment (pumps, VFDs, APFC panels, transformers) and target 100% RE supply for energy-intensive infrastructure. **Sub Actions:** • Procure and operate high energy efficiency equipment in utility services such as water pumping, wastewater treatment plants, street lighting, and flood prevention pumping systems **(ongoing/planned partly)** o Include deployment of high-efficiency pumps, variable frequency drives, automatic power factor correction panels and advanced transformers in public tenders for facilities. o Include energy efficient operation and performance requirements in contracts of third-party operators for relevant facilities (e.g. sewage treatment plants).

• Target 100% RE supply for energy-intensive infrastructure such as water supply and wastewater facilities, streetlights, bus depots, and MRT stations. o Adopt a mix of on-site and off-site RE resources including solar, wind, waste-to-energy to meet diverse energy demand. A solar and wind energy portfolio along with battery energy storage solutions can help provide round-the-clock RE power for continuous operations of water supply and wastewater facilities and cater to night-time street lighting load. o Design facilities to be ready for RE integration (on-site and off-site) from an early-stage including infrastructure (electrical, metering, sanctioned load) and space considerations and reflect requirements in tender documents for their construction.
Potential locations: City-wide in all utility infrastructure and facilities
Implementing entities **Lead:** APCRDA, ADCL **Supporting:** APCPDCL, NREDCAP, utility operators, technology and service providers
Type of action: Climate Mitigation
Climate resilience benefits: Very High
Timeline: Short to Medium term
Monitoring Indicators: • Percentage of utility facilities using high-efficiency equipment (such as pumps, VFDs, APFC panels, transformers) • Electricity consumption per unit service/output indicator (e.g MLD of water or wastewater treated) • Share of renewable energy in total power consumption from city utilities • Installed capacity of on-site and off-site renewable energy catering to utilities • Frequency and no. of energy performance audits for utility facilities • Energy savings, renewable energy based consumption and related GHG emissions avoided in facilities
Good Practice: Adelaide city has implemented high-efficiency equipment in utility services across water pumping stations, wastewater treatment plants, and street lighting. The city's wastewater facilities utilize variable frequency drives and advanced automation to reduce energy consumption, while LED retrofits in street lighting have cut electricity use by over 60%. **Singapore's** MRT system and bus depots are transitioning toward 100% renewable energy through solar installations and off-site RE procurement, supported by RE-ready infrastructure and battery storage. These cities demonstrate how integrating smart technologies and renewable energy portfolios can decarbonize core urban infrastructure while enhancing operational resilience. **Ahmedabad** and **Surat** have pioneered renewable adoption in municipal operations in India. Ahmedabad sourced about 16% of its municipal electricity through a combination of 10 MWp solar PV and 21 MW wind power in 2023–24. Surat achieved a remarkable 25% green power share for municipal operations, powered by 38.7 MW of wind and 19 MWp of solar PV, totaling to 57.7 MW[11]. Both cities intend to scale-up their renewable energy capacity over the next five years.

Action 4: Test innovative solutions and implementation models for further scale-up

[11] Information gathered from Ahmedabad Municipal Corporation and Surat Municipal Corporation

Action details

Explore and pilot scalable innovations in energy and building technologies such as integrated solar PV and wind, battery energy storage, building-integrated PV (BIPV), net-zero buildings, and diverse renewable energy (RE) procurement/business models. Aggregate pilot projects across city assets and sites to enhance cost-effectiveness and demonstrate stronger impact.

Sub Actions:

- Identify sites to implement proof-of-concept pilot projects on technological solutions (solar PV, wind, renewables with battery energy storage, BIPV, net-zero buildings and implementation models to support scalable deployment, potentially attracting technical assistance and concessional finance.
- Identify and develop on-site captive as well as off-site/open access RE projects, including rooftop and ground-mounted solar, wind power plants, to meet daytime energy consumption (mainly through solar energy) and night-time consumption (through wind energy).
- Aggregate projects across multiple sites to reduce costs and enable bulk procurement
    - Partner with technology providers and project developers for aggregated, low-cost deployment of on-site solar PV or green power purchase, where space is limited.
    - Identify a list of regional energy service companies (ESCOs) (such as from BEE's empanelled list) to support aggregated energy efficiency deployment at no/low capital cost, with payment models based on achieved energy savings.
- Test various implementation models such as ESCO/RESCO, CAPEX, OPEX, lease, open access, group captive (multiple connections/consumers source power from one shared RE project) for rooftop solar PV and off-site RE use to determine best-fit for different use-cases.

Potential locations: Existing and imminently planned public buildings and infrastructure facilities within the AGC and in other locations

Implementing entities

Lead: APCRDA

Supporting: ADCL, APSECM, APCPDCL, empanelled ESCOs, technology and service providers, research & academic institutions (e.g., IITs, NITs, SPA Vijayawada)

Type of action: Climate Mitigation

Climate resilience benefits: Very High

Timeline: Medium term

Monitoring Indicators:

- No. of proof-of-concept pilot projects identified and operationalised
- No. or scale of sustainable energy solutions tested/implemented (e.g. solar PV, wind, battery storage, BIPV, net-zero buildings) along with savings and impacts
- Installed renewable energy capacity (rooftop solar + wind) across pilot and aggregated sites
- No. of implementation models tested (CAPEX/OPEX/ESCO/RESCO/open access/group captive) and third-party contracts executed to support energy efficiency and renewable adoption
- Reduction in per-unit procurement cost through aggregation
- No. of partnerships with technology providers, project developers, research institutions and ESCOs to evaluate, pilot and deploy market-ready sustainable building and energy solutions

Good Practice:

London's RE:FIT program uses an Energy Performance Contracting (EPC**)** model, which supports public sector organizations to engage pre-qualified ESCOs to undertake projects on energy efficiency and renewable adoption. The Greater London Authority coordinates the program and aggregates multiple buildings for retrofit, allowing economies of scale and streamlined procurement, with framework contracts with ESCOs that guarantee energy savings over an agreed payback period to building owners. RE:FIT has supported retrofits in over 660 public buildings, with 32,000 tonnes of carbon emissions savings annually from a £100 million investment.

Building-integrated photovoltaics (BIPV) have been successfully deployed in the CtrlS Datacenter in **Navi Mumbai**, with solar PV modules of 863 kWp capacity covering over 50,000 square feet of façade area and generation about 590 MWh per year. Using BIPV technology, this project is able to use an active facade area that is about 7-8 times of that available on the roof. The **Indira Paryavaran Bhawan in New Delhi** also incorporates BIPV in its design.

Action 5: Establish a central energy management system to track energy performance

Action details

A centralised Energy Management System (EMS) can be designed to systematically collect, monitor, and analyse energy consumption data from all public buildings and service facilities in Amaravati. The EMS will track key energy performance metrics and help identify opportunities for energy saving and better renewable energy integration, thereby supporting energy management across public assets and infrastructure. It can be integrated, wher possible, with the city's proposed SCADA systems.

Sub Actions:

- Establish a process to record and report energy consumption data from all public buildings and service facilities, linking with proposed SCADA systems where possible.
- Develop a centralised EMS to support APCRDA in real-time monitoring and analysis of energy performance through metrics such as energy performance index (EPI in kWh per sq. m), energy intensity of water supply, seasonal consumption patterns, and peak power demand, along with energy generation and utilisation.
- The central EMS can track and benchmark energy performance (e.g. EPI < 150 kWh/sq. m per year or kWh per MLD) and help implement targeted interventions for improvement.
- Energy performance report and achievements can be disseminated to private buildings, residents and stakeholders to raise awareness and encourage adoption of solutions.

Potential locations: Centralised data command center hosted within APCRDA to monitor energy performance in all public buildings (schools, hospitals, offices, libraries) and city utility facilities (water pumping stations, STPs, street lights); linked with utility-level SCADA system

Implementing entities

Lead: APCRDA

Supporting: ADCL, utility operators, technology/service providers, IT system integrators and consultants, APSECM (for guidance and standards), SCADA system vendors/partners

Type of action: Climate Mitigation

Climate resilience benefits: Medium

Timeline: Medium term

Monitoring Indicators:

- No. or percentage of public buildings and service facilities integrated into and reporting energy data to an energy management system
- Availability and frequency of real-time energy performance reports
- Reporting and reduction in Energy Performance indicators such as EPI
- Reporting and reduction in energy intensity of urban services and facilities (e.g. kWh/MLD of water supply)
- Public disclosure of renewable energy consumption and energy savings in public buildings & utilities

Action 6: Training of public officials to support the adoption of solutions

Action details

Partner with state agencies (APCPDCL, APSECM, NREDCAP) and other technical institutions to deliver targeted training programs for departmental officials on energy management and supporting implementation of energy efficiency and renewable energy measures.

Implementing entities

Lead: APCRDA

Supporting: APSECM, APCPDCL, NREDCAP, technical partners, training and academic institutions

Type of action: Climate Mitigation

Climate resilience benefits: Medium

Timeline: Short term

Monitoring Indicators:

- No. of departmental officials trained through certified programs
- No. of training sessions conducted in collaboration with state agencies and other institutions
- Percentage of trained departments actively implementing energy efficiency and renewable energy initiatives/projects

Strategy 1 - Financing Modes/Sources

APCRDA budget, APSECM and NREDCAP funds, EESL BEEP Scheme, ESCO and RESCO models, demand aggregation of multiple projects, MNRE's grid connected rooftop solar programme, PM Surya Ghar Muft Bijli Yojana, multilateral grants/assistance

Strategy 2: Reduce energy use by developing green, climate-responsive, and energy-efficient buildings in all zones

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Energy-efficiency in private and institutional and buildings and industries	Residential, commercial, and institutional buildings and industries with energy efficient LED lights	100%	100%	100%
	Residential, commercial, and institutional buildings and industries with high efficiency brushless DC (BLDC) ceiling fans	100%	100%	100%
	Residential buildings with high efficiency cooling appliances (atleast 4-star rated refrigerators and air conditioners)	80%	100%	100%
	Commercial and institutional buildings and industries with high efficiency cooling appliances (atleast 4-star rated refrigerators, efficient HVAC systems and air conditioners)	80%	100%	100%
	Residential, commercial and institutional buildings with energy-efficient water pumps	100%	100%	100%
Buildings built with green building measures and high energy efficiency standards	New residential buildings that are green buildings/Eco Niwas Samhita compliant	100%	100%	100%
	New residential buildings with passive cooling measures	100%	100%	100%
	New commercial and institutional buildings that are compliant to AP ECBC/ECSBC (plot area ≥ 1000 sq. m or built up area > 2000 sq. m) / certified green buildings	100%	100%	100%
	New commercial and institutional buildings with passive cooling measures	100%	100%	100%

Proposed Actions

Action 1: Integrate green building norms into zoning regulations across residential, commercial, business, industrial, logistics and education zones

Action details

In accordance with Environmental Clearance requirements, all the residential buildings, commercial and institutional complexes in Amaravati should be constructed following green building concepts to ensure

energy efficiency, low carbon footprint, and resource conservation. Such adoption will be enabled and promoted through building and zoning policy and regulations.

Sub Actions:

- Enforce green building mandates proposed for all new buildings in the AGC as per the AGC Zoning Regulations and Urban Design Guidelines, 2024 **(ongoing/planned)**
- Include compliance to AP ECBC/ECSBC norms and green building certification systems (GRIHA, EDGE, IGBC, LEED) into Amaravati's zoning regulations - covering energy efficiency, RE use, sustainable building materials, thermal comfort and smart metering, taking guidance from the building sustainability checklist of AGC's Zoning Regulations and Urban Design Guidelines, 2025 **(ongoing/planned)**
  - As per AP Building Rules, 2017, all buildings with plot area ≥ 1000 sq. m or built-up area > 2000 sq. m, whichever is higher, must comply with AP ECBC norms.
  - Multiplexes, hospitals, hotels, and convention centers must be AP ECBC-compliant irrespective of their built-up area as per the AP Building Rules, 2017.
  - Submission of green building and AP ECBC/ECSBC compliance documents required for building permit and approvals.
- Develop a guideline/guidebook for green and energy-efficient design and construction in line with NBC, ECSBC and Eco-Niwas Samhita guidelines:
  - Contextualised to Amaravati's local conditions and including easy-to-follow practical measures across different building sizes and typologies.
  - Include actions across building lifecycle including design, construction, operations and end of life.
  - No-cost/low-cost measures should be highlighted for wide-spread adoption.
- Mandate use of LED lights and promote high-efficiency appliances such as BLDC fans, air conditioners, HVAC/chiller systems, refrigerators, and common utilities (water pumps, common area lighting, lifts) in all buildings **(ongoing/planned)**
- Restrict use of diesel backup generators.
- To promote circularity, include requirements for developers to provide building decommissioning/de-construction plans for end-of-life stage, linking these to building permissions.

Potential locations: City-wide across all residential, commercial, business, industrial, logistics, and educational zones, AGC, townships, and new developments

Implementing entities

Lead: APCRDA

Supporting: AP DTCP, APSECM, APCPDCL, architects and contractors, real estate developers, , Building Materials Technology Promotion Council (BMTPC), green building agencies, technical institutes (e.g. SRM University, Acharya Nagarjuna University, SPA Vijayawada)

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Short term

Monitoring Indicators:

- No. and percentage of new buildings (by typology) meeting AP ECBC/ECSBC/Eco-Niwas Samhita and green certification requirements annually
- No./percentage of building permits processed with green building/EE compliance documentation
- No./percentage of building projects with high-efficiency appliances and equipment adopted

- No. of building projects with deconstruction/circularity plans submitted by developers
- Guideline/guidebook for green and energy-efficient buildings published

Good Practice:

Palo Alto's 2019 Deconstruction Ordinance requires all residential and commercial demolition projects to undergo salvage assessments and mandatory deconstruction with on-site source separation of materials. This policy prioritizes reuse of salvageable components, streamlines material recycling, and maximizes material recovery, serving as a replicable model to promote circularity in construction. In **London**, new large construction and development projects need to submit a Circular Economy Statement which includes how the building will enable disassembly or reuse of components at end-of-life, as part of their planning/permit requirement for approvals.

Action 2: Integrate passive cooling measures to maximize thermal comfort and use sustainable building materials across all zones

Action details

- Prioritize passive cooling strategies in all new building designs across the city zones to minimize heat gain and limit dependence on mechanical cooling due to the city's warm, humid climate and rising temperatures. Passive cooling measures can be incorporated through appropriate orientation, daylighting and ventilation, shading, sizing of windows, and wall and roof materials as follows:

  Walls:
  - Walls of all major buildings (mid to large size) should have a U-value of less than 3.3 W/m^{2}K to improve heat insulation and reduce energy for cooling
  - Buildings with 24-hour use (e.g., hospitals, hotels, call centres) to ensure that the thermal performance of external walls and roofs conforms to ECSBC norms
  - Add thermal insulation like rock wool, glass wool, EPS or XPS panels to the inner or outer surface of external walls
  - Adopt double layered walls with air gaps or insulation material
  - Use of insulated material like autoclaved aerated concrete blocks to reduce heat conductivity

  Roofs:
  - Buildings with 24-hour use to have U-value 0.261 W/m^{2}K (24-hour use) and buildings with day-use to have U-value of 0.409 W/m^{2}K
  - Install high solar reflective index (SRI) tiles or coatings to reflect sunlight
  - Pilot green roofs, ensuring adequate structural load capacity of the walls and waterproofing and drainage to avoid seepage. Native and drought resistance species can be used to minimize water consumption.

  Windows:
  - High performance glazing and glass with low U value < 3.3 W/m^{2}K in all major buildings
  - Provide shading such as overhangs, fins or vegetation
  - Enable cross ventilation by aligning windows and vents with prevalent wind direction

- Use sustainable, low-carbon construction materials, considering the significant building construction to be undertaken
    - Promote use of locally sourced (within a 50-60 km radius) and certified low-carbon building materials, recycled C&D waste and its products.
    - Establish mandates for procurement and use of C&D waste materials in public, commercial, residential and institutional buildings, subject to stringent quality control.
    - Develop protocols for deconstruction and disassembly of old buildings or structures instead of demolition to help salvage and reuse materials.

Potential locations: City-wide across all residential, commercial, institutional, business, industrial, logistics, and education zones, AGC

Implementing entities

Lead: APCRDA

Supporting: AP DTCP, BMTPC, architects, contractors, real estate developers and academic/research institutes (e.g. SPA Vijayawada), green building agencies

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Short to Medium term

Monitoring Indicators:

- Percentage of new buildings by typology adopting passive cooling measures and meeting related standards for building components (from annual building permit records)
- No. and area of green roofs and cool roofs implemented
- Thermal comfort measurements (indoor temperatures) or simulated 'cooling degree days' improvement from cooling measures in completed buildings
- Percentage of new buildings using locally sourced/recycled or certified low-carbon materials
- Mandate for C&D waste utilization developed and published
- Notification or publication of SOP/guideline for demolition/decommissioning plans

Good Practice:

Technical Guidelines to achieve heat-resilient and sustainably cooled buildings in **Vijayawada**, that are suited to the city's warm and humid climate, can be readily applied to Amaravati given the close proximity to Vijayawada. The guidelines are based on field evaluations of diverse building types existing in Vijayawada - including schools, hospitals, auditoriums, and social housing. They have been prepared by ICLEI South Asia in collaboration with Vijayawada Municipal Corporation and support from C40.

The guidelines include passive and active cooling strategies like natural ventilation, shading, reflective materials, insulation, low-carbon and efficient HVAC systems, and renewable energy integration. They are aligned with national standards (ECBC, NBC) and include cost estimates across specific solutions, along with available financial incentives. Designed for application across all building typologies (residential, commercial, institutional, industrial buildings) and include solutions that can implemented at various building stages – design stage, selection of building materials and as retrofit measures.

Action 3: Partner with green building agencies and implement pilot projects

Action details

Partnering with green building agencies will help to understand opportunities, build awareness, demonstrate/pilot solutions, and implement at-scale measures and green building standards. This action will provide enabling support to have all new constructions as green and resource efficient buildings and align with the Amaravati vision of a sustainable city.

Sub Actions

- Partner with green building accreditation agencies (e.g. GRIHA, IFC-EDGE, IGBC or LEED) to support green building adoption through third-party verification, training for architects and city planners, and sharing of best practices **(ongoing/planned).**
- Implement pilot projects in housing, institutional/educational and private buildings projects to demonstrate passive design measures, sustainable building materials, energy efficient equipment, RE interventions, and energy monitoring solutions at the building-scale.
- Adopt sustainable building materials and construction techniques standardized by Building Materials Technology Promotion Council (BMTPC) and relevant organizations such as IGBC, GRIHA. Ensure integration by modifying appropriate clauses of 'Schedule of Rates' notified by Andhra Pradesh public works department as well as guidelines and regulations set by APCRDA for development in Amaravati.
- Develop and publish a list of empanelled green building vendors consisting of material suppliers and technology/service providers, including accredited vendors of IGBC, EDGE, GRIHA, BMTPC.

Potential locations: AGC, affordable/social housing projects, new institutional (schools, universities), public offices, hospitals, and commercial buildings coming up in the near-term

Implementing entities

Lead: APCRDA

Supporting: AP Roads and Buildings, AP DTCP, APSECM, AP Housing Board, IGBC, GRIHA, EDGE, BMTPC, architects/builders, academic/research institutions, contractors, Public Works Dept (for Schedule of Rates modification)

Type of action: Climate Mitigation

Climate resilience benefits: Medium

Timeline: Short to Medium term

Monitoring Indicators:

- No. of pilot green buildings developed and certified by typology (residential, public, private, institutional) and their impacts/benefits (e.g. energy and water saving, GHG reduction)
- No. of architects/planners completing trainings from green building certification/third-party agencies
- Amendments/notification to Schedule of Rates and Amaravati's building regulations/guidelines to incorporate sustainable building materials and construction techniques
- Publication of list of accredited and empanelled green building vendors and materials suppliers

Good Practice:

The **city of Adeliade** has adopted a collective approach to achieve its targets under the Carbon Neutral Adeliade Plan. Low carbon services and solutions can be availed through a publicly accessible directory of 190+ organizations across 13 service categories including energy services, building design, printing, events/venues among others. The Carbon Neutral Adelaide Partner Program enables partners to participate in Adelaide carbon neutrality efforts, recognizing their contribution and commitments.

Singapore's Building and Construction Authority (BCA) publishes a directory of its accredited professionals/suppliers, enabling public agencies and private developers to match green building projects with pre-qualified consultants, materials and service providers.

Action 4: Incentivise green building certification for private buildings
Action details Offering supporting incentives can help promote and accelerate the adoption of green building standards across different types of private buildings. Incentive options offered should motivate building developers and owners to adopt the highest levels of green building certification and energy efficiency standards. **Existing initiative** Incentives offered to AP ECBC-compliant and green certified buildings as per AP Building Rules, 2017 include i) 20% discount on building permit fees, staggered payment of development charges allowed in four installments, and a 20% reduction on stamp duty for property sold within three years. **Sub Actions** • Offer appropriate fiscal and non-fiscal incentives such as fast-tracked approval, building permit fee discounts, tax rebates, additional FSI, reimbursement of certification fees or consulting charges for new apartments, business parks, commercial, industrial, and logistics buildings. • Review incentives periodically in consultation with stakeholders to ensure benefits offered adequately reflect incremental costs and evolving market conditions. • Ensure compliance to green building norms during construction phase and post-occupancy.
Potential locations: New and ongoing private projects across Amaravati city including housing, apartment complexes, business and IT parks, commercial offices, warehousing, and logistics hubs; with initial focus on large-scale developments and projects in growth corridors.
Implementing entities **Lead:** APCRDA **Supporting:** Green building and financial experts, independent verification agency to conduct monitoring and evaluation
Type of action: Climate Mitigation
Climate resilience benefits: Medium
Timeline: Short to Medium term
Monitoring Indicators: • No. of building projects by typology that are provided with appropriate incentives • Frequency of review of green building incentives • No. of new private buildings by typology with green building certification (by rating type) • Percentage of buildings with post-occupancy audits and complying to green building norms

Good Practice:

Singapore's Green Mark Incentive Schemes have helped achieve significant large-scale adoption of green and energy efficient buildings, with the Building and Construction Authority (BCA) offering grants for audits, retrofits, and new high-performance designs, along with regulatory support such as floor area bonuses and reduced development charges. As of end-2022, the Green Mark programs had helped to green about 55% of Singapore's buildings (by gross floor area). Singapore had nearly 2,600 Green Mark–certified buildings in 2025, which together save over 4.2 billion kWh annually. Key highlights of the schemes include incentives that promote higher-tier green rating, strong emphasis of energy efficiency to achieve incentives, and financial support extended for architects and engineers to enable design of sustainable buildings in addition to developers and home-owners.

Action 5: Promote enhanced building energy performance and reporting

Action details

Monitoring of energy performance can help to progressively optimize and reduce energy consumption across buildings in data-driven manner through targeted interventions. Energy performance can be tracked for larger buildings at first and expanded gradually to cover city-wide buildings.

Sub Actions:

- Outline clear requirements in the zoning regulations for all major mid to large-size buildings and complexes to achieve an EPI of less than 150 kWh/sq. m. per year.
  - Promote minimum EPI standards across commercial, institutional, and residential buildings in a phased manner, with mandates established in a time-bound manner.
  - Update EPI standards progressively over time for different building typologies.
  - Include conditions to undertake periodic energy performance improvement and implement actions to meet EPI requirements.
- Promote Building Energy Management Systems in mid to large size buildings and complexes.
- Link smart meters with mobile applications with the support of APCPDCL and APSECM to provide real-time energy use alerts and recommendations to consumers.
- Establish process for private and public buildings to report energy performance periodically (bi-annually/annually).
  - Can target mid to large size buildings in the near-term and extend to city-wide buildings in a phased manner.
  - Track energy use patterns, compare energy performance against local buildings and national benchmarks, and support targeted energy efficiency retrofits.
  - Provide a pool of certified energy auditors, service and solutions providers to support energy audits and identify energy improvement measures in high energy use buildings.
  - Building owners and occupiers can implement solutions to improve energy performance and meet minimum energy use benchmarks.

Potential locations: Central business districts, large public and institutional buildings, high density residential zones, industrial and logistics parks

Implementing entities

Lead: APCRDA

Supporting: APSECM, APCPDCL, BEE, certified energy auditors, building owners and developers

Type of action: Climate Mitigation
Climate resilience benefits: Medium
Timeline: Short to Medium term
Monitoring Indicators: • No. of buildings by typology reporting energy performance annually • No. and floor area of buildings by typology achieving EPI norms or benchmarks • No. or percentage of buildings equipped with smart meters and EMS/BEMS • Annual reduction in EPI and energy saving achieved by buildings • Percentage of non-compliant buildings receiving support for corrective action • No. of energy audits completed and followed by implementation of energy performance improvement measures
Good Practice: The **Frederiksberg Municipality in Copenhagen** had 40% of its energy consumption coming from public buildings. The municipality implemented a central energy management system to track its energy consumption and has achieved 8% electricity savings and 6% reduction in heating demand. This was achieved through installation of smart meters at building and facility level, by analyzing granular data with hourly time intervals, and consultations with public officials and citizens through capacity building and training programs to optimize the equipment use based on analysis provided by the EMS. **Hong Kong's** Energy Use Benchmarking Program provides an online tool that allows building owners to compare their electricity consumption performance with similar building types. This benchmarking initiative covers residential, commercial, and transport sectors, helping users identify energy-saving opportunities and improve efficiency.

Action 6: Expand and institutionalize the AGC Urban Design Committee (UDC) and team into a city-wide Green Building Promotion Department
Action details An Urban Design Committee (UDC) and Urban Design team is in place at present to support adoption of green building and sustainable urban design measures within the AGC area. The role of the AGC UDC and the Urban Design team can be expanded to review, approve and monitor city-wide public and private projects, beyond the AGC area. **Sub Actions:** • A 'City Urban Design or Green Building Promotion' department or team can be institutionalized to promote and ensure compliance with AP ECBC/ECSBC norms and green building standards. • Include subject experts such as green building accredited professionals, low-carbon construction and materials experts into the team to review building project proposals across the city and improve their environmental performance. • Establish a centralised approval and monitoring system for upcoming buildings in Amaravati, using standardized templates for developers/owners, outlining key building energy and sustainability performance criteria to be integrated into the building approval process.

• Conduct periodic performance reviews, identify challenges and implement corrective and enabling actions in consultation with stakeholders.
Implementing entities **Lead:** APCRDA **Supporting:** AP DTCP, APSECM, Green building agencies, external subject experts, BMTPC, academic institutions, architects/builders associations
Type of action: Climate Mitigation
Climate resilience benefits: High
Timeline: Short term
Monitoring Indicators: • Relevant department or team established with staff and experts to support green and sustainable building adoption • No./percentage of building permit applications reviewed and approved including AP ECBC/ECSBC/Eco-Niwas Samhita/green building certification compliance • No./percentage of public/private projects monitored post-occupancy for sustainability performance • Increase in certified green buildings and AP ECBC/ECSBC-compliant permits city-wide • Annual publication of city building sustainability performance on dashboards, websites or other media

Strategy 2 - Financing Modes/Sources

APCRDA budget, APSECM funds, BEE's Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE,) Partial Risk Sharing Facility for Energy Efficiency (PRSFEE) Scheme, EESL's Building Energy Efficiency Programme (BEEP), PPP/building developer and owner/occupant contributions, ESCO model, affordable/green home loans from banks, UJALA Scheme and Energy Efficient Fans Programme, bulk procurement for lower costs, multilateral grants/assistance, CSR for pilots

Strategy 3: Integrate Climate-Resilient Design and Thermal Comfort

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Mandate passive cooling and thermal comfort standards in all new buildings	New buildings complying with applicable passive cooling and thermal comfort standards	100%	100%	100%
Cool roofs in new and existing buildings	New public and residential buildings with high-SRI/ cool roofs	100%	100%	100%

Action Area	Target Parameter	2028	2043	2058
	Existing buildings retrofitted with cool roofs	50%	100%	100%
Green cover and façade greening	At least 20% rooftop area in public buildings and large private developments with plot area > 4000 sq. m to be green roofs	100%	100%	100%
	Buildings with rooftop gardens and façade greening	30%	50%	70%
Integrate flood-resilient design in building constructions	New plots with recharge pits, permeable paving and RWH system	100%	100%	100%

Proposed Actions

Action 1: Deploy localized cooling interventions for vulnerable zones and public spaces
Action details Deploy localised cooling interventions such as cool roof retrofits, enhanced insulation, improved natural ventilation, and increased green cover in heat-vulnerable spaces, including schools, anganwadis (child-care centres), healthcare facilities and street markets. It can help reduce UHI effect, improve thermal comfort and reduce health risks, especially in zones and spaces with high footfall populations and vulnerable groups of population. **Sub Actions** • Identify existing vulnerable buildings such as schools, anganwadi's, health care centres and other buildings for insulation and natural ventilation upgrades, cool roof retrofits. • Undertake periodic monitoring of green space provision in properties/buildings as per Urban Design and Architectural guidelines, Zoning Regulations and other regulations prior to issuing occupancy certificate. • Identify locations of street vendors, public markets and public transit stations to implement facilities (shelters, drinking water, green cover, cool roofs) to reduce heat vulnerability.
Potential locations: All government and private schools, especially in zones with high density and higher land surface temperature; primary health care, hospitals, urban clinics across commercial, institutional and residential zones; major transport terminals and stations; vending zones in mixed-use (C1–C3), town center (C4), and regional center (C5) zones.
Implementing entities **Lead:** APCRDA **Supporting:** ADCL, Health, Education, and Women & Child Welfare Departments, NGOs, RWAs, green building agencies, architects and contractors, solution providers,
Indicative cost:

Cool roof tiles can cost between Rs. 120-150 including product, labour and installation. Cool roof paint can cost around Rs. 1300 for 4 liters.
Type of action: Climate Adaptation
Climate resilience benefits: High
Timeline: Short to Medium term
Monitoring Indicators: • No. of schools, anganwadi's and health facilities with cooling interventions implemented • No. of public markets, vendor sites, and public transport stations with cooling interventions (shelters, shade, drinking water, cool roofs) implemented • No. and percentage of buildings/properties complying to green area provision norms and total sq. m. of green area/spaces provided • Reduction in average and peak temperatures (indoor/outdoor), sampled in targeted locations, buildings, and public spaces
Good Practice: A study in **Ahmedabad's** informal settlements demonstrates that easily implementable cooling interventions such as reflective paint, thermocol insulation or mud roof significantly lower temperatures in informal housing compared to metal or cement roofs, improving heat resilience and offering scalable, cost-effective solutions for low-income settlements.[12]

Action 2: Mandate passive cooling and thermal comfort standards in all new buildings
Action details Mandating passive cooling and thermal comfort standards ensures buildings inherently remain cool and comfortable with significantly reduced dependence on air conditioning or mechanical ventilation. This intervention helps to deliver thermally comfortable environments to citizens with lower energy demand, and supports emissions reduction and mitigation of the urban heat island effect. **Sub actions:** • Enforce compliance with AP ECBC/ECSBC and Eco-Niwas Samhita for thermal comfort requirements • Enforce mandatory use of passive design elements such as building orientation, cross ventilation, external shading, ventilated roof and insulated envelopes in all buildings **(ongoing/planned)** • Include passive cooling requirements in building permit applications, design briefs, and development control regulations.
Potential locations: Applicable to all new residential, commercial, institutional, and industrial buildings across all zones. Could be demonstrated in government complexes and newly developed residential layouts.
Implementing entities

[12] Combating Climate Change-induced Heat Stress: Assessing Cool Roofs and Its Impact on the Indoor Ambient Temperature of the Households in the Urban Slums of Ahmedabad. Accessed 17th August 2025.

Lead: APCRDA **Supporting:** DTCP, APSECM, ADCL, architects, contractors, real estate developers, BMTPC
Type of action: Climate Adaptation
Climate resilience benefits: High
Timeline: Short to Medium term
Monitoring Indicators: • Percentage of new buildings complying with thermal comfort requirements as per AP ECBC/ECSBC/Eco-Niwas Samhita at permit application and completion • Percentage of new buildings with specified passive design features (orientation, shading, insulation, ventilated roofs) implemented • Reduction in average cooling energy intensity (kWh/sq.m) in new buildings
Good Practice: **Surat's** IGBC Platinum-certified office building of the Diamond Bourse incorporates several measures including building orientation, stack ventilation, shaded courtyards, vertical fins, and radiant cooling to reduce energy demand by 50% compared to benchmark consumption in similar buildings as per ECBC.

Action 3: Promote cool roofs in new and existing buildings
Action details Promoting cool roofs across Amaravati involves developing a comprehensive, city-wide implementation plan focused on phased adoption in areas prone to higher heat intensity such as dense urban clusters and vulnerable settlements. Cool roofs can help lower surface and indoor temperatures, reduce energy demand for cooling, improving health and comfort for residents, and reduce urban heat island effect. **Sub Actions:** • Develop a city-wide cool roof implementation plan targeting phased coverage in high-heat intensity zones. • Provide incentives and guidelines for both builders and homeowners to install cool roof solutions in new and existing buildings. • Use low-cost cooling solutions in existing village settlements to quickly reduce heat stress among the most exposed populations. • Promote high solar reflective index (SRI) roofing and ventilated attic spaces in public and private buildings to reduce indoor heat gain and cooling loads.
Potential locations: Public buildings, schools, hospitals, existing residential areas and village settlements, new residential apartments, commercial and industrial roofs
Implementing entities **Lead:** APCRDA **Supporting:** AP DTCP, architects, contractors, real estate developers, NGOs, community organisations
Indicative cost: Cool roof tiles can cost between Rs. 120-150 including product, labour and installation. Cool roof paint can cost around Rs. 1300 for 4 liters.

Type of action: Climate Adaptation; Climate Mitigation
Climate resilience benefits: Medium
Timeline: Short to Medium term
Monitoring Indicators: • Publication of city-wide cool roof implementation plan • Area (sq. m) of cool roofs installed annually (new and retrofitted) • Percentage of new buildings with high SRI/cool roofs • No./percentage of existing homes with cooling solutions implemented • Reduction in average indoor and surface temperatures at cool roof implementation sites • No. of policy and incentive beneficiaries
Good Practice: In **Hyderabad**, cool roofs in households were able to reduce cooling energy demand by 10-19% in the top floor of buildings, lowering indoor air temperature by 2^0C. High-density polyethylene (HDPE) cool roof membranes were piloted in a low-income neighborhood in the city. Similarly cool roof coating demonstrated in two office buildings in Hyderabad reduced roof surface temperatures by 5°C and cooling energy use by 15-20% during summer.

Action 4: Enhance green cover and vertical greening
Action details Expanding urban greenery on roofs and façades directly lowers surface and ambient temperatures, reduces cooling loads and improves thermal comfort. This intervention delivers multiple benefits for a hot-humid greenfield city like Amaravati. Amaravati's Master Plan emphasizes extensive green–blue networks and pollution prevention. The EC/NGT conditions call for plantations using native, multi-use species to protect ecological diversity. Embedding rooftop/vertical greening into zoning approvals and tying compliance to building occupancy permission process helps to operationalize these requirements and supports city-wide green cover. **Sub Actions** • Mandate at least 20% of rooftop area in public buildings and large private developments with plot area > 4000 sq. m. plot area to be green roofs **(ongoing/planned)** • Promote rooftop gardens and façade greening for all buildings with adequate structural load bearing capacity **(ongoing/planned)** • Implement vertical gardening through the use of native species to keep structures cooler • Undertake periodic monitoring of green space provision in properties/buildings as per zoning/byelaws before issue of occupancy certificate.
Potential locations: AGC- office buildings, public buildings; large private developments across C1–C6 commercial, I1–I3 non-polluting industry, and R3–R4 higher-density residential zones; priority corridors and areas susceptible to heat
Implementing entities **Lead:** APCRDA

Supporting: AP DTCP, architects, contractors, real estate developers, NGOs, community organisations
Indicative cost: Rooftop garden installation costs approximately Rs. 800 per sq.ft.[13] including the cost of the rooftop garden layer and installation.
Type of action: Climate Adaptation
Climate resilience benefits: Medium
Timeline: Short to Medium term
Monitoring Indicators: • Percentage of new public buildings with rooftop/vertical greening installed and maintained • Percentage of large private developments (by built-up area threshold per zoning/building rules) implementing mandated rooftop/façade greening • Total green roof/façade area implemented (sq. m.) and annual native species survival rate (%) • Estimated impact (such as annual cooling energy reduction or indoor/surface temperatures) from green roofs/façades • No. and percentage of buildings/properties complying to green area provision norms and total sq. m. of green area/spaces provided

Action 5: Integrate flood-resilient design in building constructions
Action details Given Amaravati's location along the banks of the River Krishna and anticipated flooding risks due to its low-lying topography and climate impacts, integrating flood proof designs and measures into buildings constructed is important. **Sub Actions** • Mandate elevated plinth height and floor level elevation standards in all buildings located in low-lying or flood-prone areas as identified in flood mapping by APCRDA **(ongoing/planned)** • Elevate the critical electrical and power infrastructure above expected flood levels to prevent water damage and service disruption. • Mandate on-site stormwater management measures such as recharge pits, rainwater harvesting systems and permeable paving to minimize runoff and waterlogging at the plot level. • Ensure flood resilient features are included in building approvals and tender documents, and link occupancy certificates to verified compliance.
Potential locations: All buildings in low-lying/urban flooding-prone zones within Amaravati as identified by flood mitigation and hydrological studies. New development areas in expansion zones adjacent to riverbanks, drainage channels, and stormwater catchments
Implementing entities **Lead:** APCRDA **Supporting:** Planning department, Engineering and Public Works Department, Geotechnical consultants
Type of action: Climate Adaptation

[13] R Dhivya Barathi and R Vidjeapriya, 2022, IOP Conf. Ser.: Earth Environ. Sci. 1086 012006

Climate resilience benefits: Medium
Timeline: Short term
Monitoring Indicators: • Percentage of new buildings in flood-prone areas complying with minimum plinth height and floor elevation standards • Percentage of building proposals including on-site stormwater management measures • Percentage of occupancy certificates issued only after verified compliance with flood resiliency features • No. of awareness/training workshops held for developers and residents on flood resilient construction
Good Practice: Rebuild Kerala Development Programme mandated elevated plinths, stilt construction in flood zones, corrosion-resistant materials, onsite rainwater management in reconstruction projects after the 2018 floods, reducing vulnerability in low-lying areas.

Strategy 3 - Financing Modes/Sources
APCRDA budget, AMRUT scheme, APSECM funds, EESL's Building Energy Efficiency Programme (BEEP), PPP/building developer and owner/occupant contributions, bulk procurement for lower costs, affordable/green home loans from banks, multilateral grants/assistance, climate adaptation funds, CSR contributions

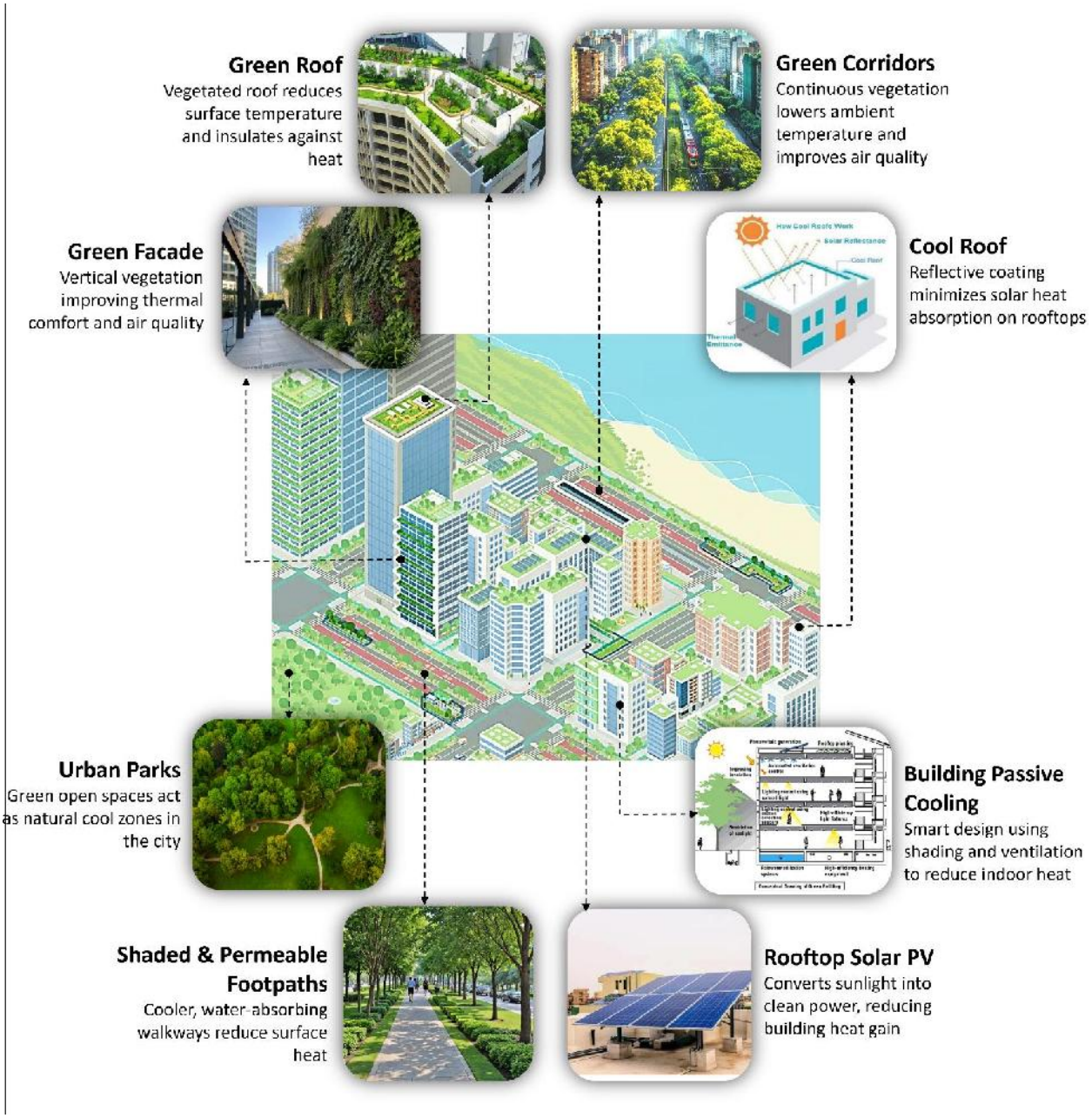


Figure 2-1: Interventions to mitigate Urban Heat Stress

Integrating Interventions for Thermal Comfort and Reduced Heat Stress

Amaravati's rapid development as a greenfield capital presents both opportunities and challenges in addressing urban heat, water scarcity, and livability concerns. As construction activity expands, increasing impervious surfaces, limited vegetation, and reduced airflow heighten urban heat island effects, aggravating heat stress and energy demand. These issues are further compounded by climate projections indicating a rise of 1 to 2.4°C in maximum temperatures by 2078 and more frequent heatwaves[14]. To mitigate these risks, it is important that Amaravati's urban design adopts an integrated, multi-layered cooling approach that links built form, landscape, and renewable energy systems.

City and Neighbourhood Scale Interventions

At the city level, Amaravati promotes a blue-green network that integrates green corridors, urban parks, and shaded, permeable footpaths to regulate microclimate and manage stormwater. These interconnected systems form ecological spines that link open spaces, water channels, and vegetation belts across the city.

- Green corridors—tree-lined streets and vegetated links—facilitate air circulation, lower surface and ambient temperatures, and act as wind channels that disperse trapped heat and pollutants.
- Urban parks and open spaces serve as thermal sinks that absorb carbon dioxide and provide shade, while also functioning as community recreation zones that improve well-being.
- Permeable and shaded footpaths use high albedo materials and vegetation to reduce heat storage, allow groundwater recharge, and offer pedestrian comfort even during peak heat hours.

Building-Level Interventions

At the building scale, Amaravati's planning and design guidelines promote energy-efficient and climate-responsive buildings through a mix of green infrastructure and passive cooling techniques:

- Green roofs add a vegetative layer that insulates buildings, reduces rooftop temperature, and minimizes heat absorption while providing stormwater retention benefits.
- Cool roofs coated with reflective, high-SRI materials deflect solar radiation, lowering indoor temperatures and air-conditioning loads.
- Green facades improve air quality, reduce wall heat gain, and enhance aesthetics while acting as noise and dust barriers.
- Passive design measures - optimized orientation, cross-ventilation, shading devices, and insulated envelopes - reduce reliance on mechanical cooling systems and create thermally comfortable indoor environments.
- Rooftop solar PV systems generate renewable energy while shading roofs, further reducing heat absorption and emissions from grid-based power use.

These measures not only improve building energy performance but also contribute to urban-scale heat mitigation, demonstrating how design decisions at the micro level influence macro-level climate resilience. By embedding these measures into master planning, development control regulations, and building codes, Amaravati can ensure that every layer of its urban fabric—streets, buildings, and open spaces—contributes to climate adaptation and mitigation. This approach not only reduces urban heat and enhances livability.

[14] Climate projections as per Hydrological and Climate Modelling of Solapur and Vijayawada cities by IIT Madras, 2019 under RCP 4.5 and RCP 8.5. Representative Concentration Pathway (RCP) scenarios describe different trajectories for greenhouse gas concentrations and the resulting radiative forcing (energy added to the climate system) by 2100.

Strategy 4: Integrate clean energy and renewables to meet energy requirements

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Renewable energy adoption in buildings	Electricity consumption in residential buildings to be met by renewables	40%	75%	100%
	Electricity consumption in commercial and institutional buildings and industries to be met by renewables	40%	75%	100%
	Solar Water Heaters to meet at least 20% of hot water requirements in multi-story residential apartments and complexes, hospitals, government buildings, residential schools, educational institutions, hostels and industries (with plot area > 500 sq. m)	100%	100%	100%
Adoption of electric cooking	Residential buildings using electric cooking (powered by renewables)	0%	5%	10%
	Commercial and institutional buildings using electric cooking (powered by renewables)	0%	10%	15%

Proposed Actions

Action 1: Develop Sustainable Energy Transition (SET) Roadmap for Amaravati

Action details

A SET Roadmap will provide a city-wide blueprint to decision-makers, planners, and utilities to phased adoption of high level of renewables. It will target round-the-clock RE supply through both on-site decentralised sources (within the city) and off-site large megawatt scale RE sources (from outside of Amaravati and the capital region). The roadmap will a unified strategy and specific actions to support large-scale RE procurement and integration and identify innovative business models to significantly reduce costs, create local employment, and ensure that power demand for buildings, infrastructure and electric vehicles is powered by green energy.

Sub Actions

- Assess technologies including solar, wind, waste to energy, bio-CNG, bio-methanation, combined heat and power systems, battery energy storage, pumped hydro storage.
- Identify phase-wise targets for renewables including solar PV, solar water heating, wind, waste to energy and biomass until 2058.
- Allocate buildings across residential, commercial, industrial, education and healthcare zones demarcated for solar rooftop and solar water heater installation.
- Solar PV targets for new warehouses, IT parks, and non-polluting industries

• Identify targets and sites for solar and wind-powered public infrastructure such as water supply facilities, sewage treatment plants, streetlights, waste facilities, bus stops and depots, and for EV charging infrastructure in line with EV targets. • Business models for end-use related to bio-CNG. Identify locations if decentralized bio-methanation plants (e.g. near proposed vegetable markets) • Develop a dashboard to monitor RE installation, electricity generation and emissions savings • Identify financing options including private investment, public funds, low-interest or concessional loans, climate finance along with mechanisms to support small and large-scale RE projects.
Implementing entities **Lead:** APCRDA **Supporting:** ADCL, NREDCAP, APCPDCL, APIIC, technical consultants and renewable energy developers.
Estimated targeted scale Renewable energy in residential buildings: 2028 – 58 million kWh 2043 – 1,151 million kWh 2058 – 3,426 million kWh Renewable energy in commercial buildings: 2028 – 47 million kWh 2043 – 928 million kWh 2058 – 4,249 million kWh Renewable energy in industrial buildings: 2028 – 17 million kWh 2043 – 335 million kWh 2058 – 1,535 million kWh
Indicative cost: Renewable energy in residential buildings: 2028 – 16,734 lakh INR 2043 – 333,194 lakh INR 2058 – 991,584 lakh INR Renewable energy in commercial buildings: 2028 – 13,487 lakh INR 2043 – 268,547 lakh INR 2058 – 1,229,677 lakh INR Renewable energy in industrial buildings: 2028 – 4,874 lakh INR 2043 – 97,051 lakh INR 2058 – 444,399 lakh INR
Type of action: Climate Mitigation
Climate resilience benefits: High
Timeline: Short term
Monitoring Indicators: • Phase wise renewable capacity installed (MW)

- Percentage of total city electricity consumption met by renewables
- No. of buildings/zones with rooftop solar and solar water heating
- Renewable energy generation and GHG emission savings tracked via dashboard
- Capacity of decentralized renewable installations

Good Practice:

Vancouver has committed to a target of 100% renewable energy use by 2050. Its Renewable City Strategy sets out interventions focusing energy demand reduction, zero-emission new buildings, deep retrofits, increasing renewable energy use, and expanding renewable energy supply – primarily in buildings, transport and city infrastructure**.** It integrates detailed land use planning, energy-efficient building standards, renewable neighborhood energy systems, and electrification of transport. Vancouver's approach includes partnerships, public engagement, and innovation support, aligning with regional, provincial, and federal policies.

Action 2: Promote at-scale adoption of green renewable power

Action details

To meet Amaravati's goal of becoming fully renewable powered, enabling interventions on policy, regulation, facilitated and aggregated deployment, business models, investments and awareness will be crucial. These actions will result in wide-scale adoption of on-site and off-site renewable energy solutions across commercial, institutional, industrial, public, residential buildings and complexes, helping significantly reduce the city's carbon emissions and energy costs.

Sub Actions

- Ensure solar-ready rooftops though requirements in zoning regulations and guidance on rooftop structural design, strength, utility placement, and shadow avoidance. In line with AGC Regulations, city-wide buildings can have 50-70% of roof area dedicated to solar PV or solar water heating depending on building needs. **(ongoing/planned partly)**
- Enforce requirements to adopt RE in:
    - Commercial and institutional properties (plot area> 1,000 sq. m or built-up area> 2,000 sq. m.), multiplexes, hospitals, hotels, convention centres as per AP ECBC, 2019/ECSBC 2024.
    - Group apartments of 100+ units, nursing homes, hospitals and hotels to deploy solar water heating and solar lighting systems, with 15% of external lighting in residential complexes and 5% in commercial/institutional buildings to be powered by RE.
- Encourage major private sector, commercial, institutional and industrial consumers with high consumption to integrate high level of RE-based electricity from an early-stage, through both on-site RE and off-site green power purchase.
- Facilitate aggregated procurement and deployment of solar PV for a group of commercial, institutional, residential and industrial consumers, through group captive models and community pooling of small-scale RE projects.
- Implement awareness campaigns to promote RE adoption among consumers and community.
- Publish a regional list of empaneled solar PV and solar water heating vendors aligned with lists of APCPDCL and NREDCAP. Facilitate partnerships with local/regional solar companies for discounted bulk procurement and coordinated group-scale installations.

- Support innovative space-efficient solar PV deployment through elevated structures (e.g. 'Ojas') and solar carports.
- Expand the district cooling network beyond the AGC area to serve high cooling demand of large commercial and institutional buildings, shopping malls, hotels and hospitals in the CBD and high-density commercial zones in the mid-term.
- Pilot emerging solutions in the short to mid-term including:
    - building integrated PV solutions (solar roof tiles, solar facades, BIPV skylights, curtain walls, shading devices, solar windows in glass facades of CBD and commercial zones)
    - battery energy storage systems (for applications such as maximising RE utilisation, energy management, maintaining grid operations, optimizing power distribution at substation)
    - floating solar deployment (while evaluating ecosystem, biodiversity and environmental impacts) reuse of EV batteries as second life battery energy solutions for stationary applications (EV charging, renewable energy storage, energy management)
    - hydrogen fuel cells for buildings
    - use of EV-charging facility to provide grid support

Potential locations: AGC, commercial & institutional buildings, large residential townships, group apartments, hotels, hospitals, multiplexes, IT parks, warehouses.

Implementing entities

Lead: APCRDA

Supporting: APCPDCL, NREDCAP, APSECM, RESCO companies, renewable technology and service providers, academic & research institutions involved in clean energy and building innovations.

Indicative cost:

Rooftop solar PVs approximately cost INR 75,000 for a 1 kW system

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Short to Medium term

Monitoring Indicators:

- Total installed RE capacity (on-site/off-site) and increase in RE adoption year-on-year
- Percentage of total city-wide electricity consumption met through renewables and sector/consumer-category-wise breakup (residential, commercial, industrial)
- Installed rooftop solar PV capacity (MWp) annually
- Percentage of new buildings/properties complying to RE adoption requirements, including solar-ready rooftops
- No. and installed capacity of large-scale aggregated RE adoption projects completed
- Capacity of district cooling network and floor area (sq. m.) served
- No. of RE vendors and solution providers empaneled and actively participating in RE deployment
- No. and outreach of awareness and promotional campaigns completed
- No. of pilot installations and operational status of advanced and innovative renewable and grid support technologies.
- Cumulative GHG emissions avoided from RE adoption annually

Good Practice:

The **City of Melbourne** led the creation of the Melbourne Renewable Energy Project in 2017 - a collective effort by 14 public and private institutions, including universities, banks and local councils to purchase large-scale renewable energy – which supported development of a new wind farm of 80 MW. The buying group committed to purchase 88 GWh annually (over 1/3rd of the wind farm's capacity) under a long-term power purchase agreement. This pioneering initiative subsequently led to Melbourne switching to 100% renewable-based municipal operations from the same wind farm in 2019. It also brought additional RE into the market with long-term price certainty. Building on this success, the city of Melbourne facilitated a second round of aggregated RE procurement in 2020 – with seven large energy users including universities, property companies and manufacturers to procure 110 GWh annually from a wind farm.

The DISCOM, **BSES Rajdhani Power,** facilitates rooftop solar adoption by consumers in **Delhi** through a one-stop-shop portal. The portal serves as a single point source of information, with detailed guidance and step-by-step facilitation for submission of applications and installation of rooftop solar PV by empanelled installers.

Action 3: Use scalable implementation mechanisms and financing models

Action details

Testing and adopting innovative mechanisms and financing models is pivotal to help realize ambitious RE adoption across Amaravati city. By leveraging a mix of on-site, off-site, physical, and virtual RE solutions with the best-fit financing and implementation models, Amaravati can maximize integration of green energy across diverse consumer categories from households and apartments to commercial and institutional establishment, while optimizing financial returns for consumers.

Sub Actions

- Utilise on-site, off-site, physical, and virtual renewable energy mechanisms (e.g., net metering, open access, renewable energy certificates, feed-in tariffs, carbon offsetting) to optimize financial returns and enhance integration of renewables.
- Test and adopt innovative investment and business models such as CAPEX, RESCO, captive, group captive, rent-a-roof, subscription, demand aggregation (DISCOM-led/city-led) for different consumers to tap into private investments as per the building typology, size and energy demand. Such models ensure consumers obtain quality products at competitive prices.
- Encourage innovative service solutions such as the integrated utility services model for mid to large-size commercial and institutional consumers, wherein an energy service provider delivers a bundled package of energy services to consumers — including electricity supply, rooftop solar installation, energy efficiency upgrades, and maintenance.

Potential locations: City-wide across residential (including affordable housing), commercial, institutional, and government zones targeting public buildings, hospitals, hotels, large residential and commercial complexes, business and industrial parks, universities, schools and institutional buildings.

Implementing entities

Lead: APCRDA

Supporting: ADCL, NREDCAP, APCPDCL, private RESCOs, technology and service providers, EPC contractors, RWAs, building owners/operators

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Medium term

Monitoring Indicators:

- No. of buildings/consumers adopting innovative and market-based RE implementation models
- Installed RE capacity and generation by implementation/business models deployed

Good Practice:

The Boston Community Choice Electricity (BCCE) is a municipal aggregation program facilitated by the City of **Boston**, that allows community members to opt for using renewable powered electricity. Consumers, including residents and businesses, can choose to enroll in the Optional Green 100 rate, with 100% of electricity coming from RE sources, thereby supporting Boston in reducing carbon emissions.

In **Hyderabad,** the Telangana State Renewable Development Corporation (TSREDCO) undertook aggregated rooftop solar installations across government and residential buildings. Over 27 MW of rooftop solar PV capacity was deployed between 2017-2019, with an investment of USD 24 million through RESCO and CAPEX modes.

Action 4: Pilot community-scale solar in existing settlement zones (such as R1)

Action details

By piloting community-scale shared solar solutions in existing settlement zones, Amaravati can leverage its greenfield status to effectively introduce renewable energy access and resilience in its community. A decentralised approach empowers communities with locally managed clean energy, reducing dependence on the grid while promoting social inclusion through livelihood opportunities for community groups, including women and youth.

Identify areas within existing settlement-based zones such as the R1 zone, having clustered housing and shared infrastructure such as schools, community centers or Anganwadis to pilot shared solar PV solutions such as:

- Rooftop solar PV on community buildings or schools, with power supplied to nearby households by net-metering. Employment opportunities can be created for cleaning and maintenance of solar panels.
- Solar streetlights in neighborhood streets and community spaces.
- Solar-powered livelihood units such as solar food dryers, sewing units, cold press oil units or food processing units, where women from self-help groups can be trained on O&M.

Potential locations: Existing settlement zones such as R1 (Village Planning Zone), community infrastructure sites including schools, community centers, and anganwadi's, public spaces within clustered housing areas

Implementing entities

Lead: APCRDA

Supporting: ADCL, APSECM, NGOs, self-help groups, residential welfare associations (RWAs), technical partners for O&M training

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Short to Medium term

Monitoring Indicators:

- No. of rooftop solar PV systems installed across community buildings, schools, anganwadis along with installed capacity and RE generation
- Installed capacity and functionality of solar-powered livelihood units
- No. and capacity of solar streetlights installed and operational in neighborhood areas
- No. of persons from community trained, particularly women and youth, in solar O&M

Good Practice:

SELCO foundation installed a solar food dryer in Udupi, Karnataka where women were trained to process jackfruit, chillies, and kokum to enable preservation and off-season sales. These hybrid solar dryers generated an income of Rs. 5,000-10,000 per month for each SHG member. Similar community-based solutions powered by sustainable energy solutions can also be explored for community in existing settlement zones.

Action 5: Integrate solar rooftop in new EWS/LIG housing

Action details

Integrate rooftop solar PV systems into the building plans of EWS/LIG housing (reserved in residential projects with a site area > 4000 sq. m as per Zoning Regulations) to power common loads such as common area lighting, shared amenities, and water pumps. Solar electricity can also partly power household loads such as lighting and fans.

Potential locations: New EWS and LIG housing developments in Amaravati as per zoning regulations

Implementing entities

Lead: APCRDA

Supporting: ADCL, AP Housing Board, NREDCAP, APCPDCL, APTIDCO, NGOs involved in affordable housing.

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Medium term

Monitoring Indicators:

- No., capacity and RE generation of solar rooftop systems installed in affordable/EWS/LIG housing
- Percentage of common area and utility loads met by solar
- Estimated energy savings and emissions reduction

Good Practice:

A 31.5 kWp **rooftop** solar PV installed at the Krantiveer Khudiram Bose affordable housing complex at **Rajkot** generates around 2,500 kWh of electricity per month and reduces 25 tCO_2e GHG emissions per year.

Action 6: Implement solar water heaters (SWHs) in targeted buildings

Action details

Installation of solar water heaters (SWHs) in Amaravati's large residential, commercial, institutional, and government buildings is a crucial sustainability measure that directly aligns with environmental mandates and NGT directives for the greenfield capital. Mandating SWHs in buildings with significant hot water demand will promote renewable energy adoption and mitigate GHG emissions.

Sub Actions:

- Establish and enforce mandates to install SWHs in multi-storey apartments/complexes (>100 units or with plot area > 500 sq. m), hotels, banquet halls, hospitals, educational institutions, and government buildings, depending on hot water demand **(ongoing/planned)**
- Select SWH or solar PV with heat pump/solar thermal based on site-specific analysis and hot water demand.
- Include SWH installation confirmation (layout and equipment specs) at building permission and occupancy certificate stages.
- Provide incentives such as increased FSI/FAR, property tax rebates, capital cost discounts to developers and owners for installing SWHs.
- Conduct periodic compliance audits and use digital records for monitoring.

Potential locations: New developments across Amaravati (e.g., zones designated for mid to large institutional, hospital buildings, hotels), government offices (existing and new constructions), major educational institutions and universities, planned affordable housing and large residential housing and townships with hot water requirements

Implementing entities

Lead: APCRDA

Supporting: ADCL, NREDCAP, AP DTCP, building developers and architects associations

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Medium term

Monitoring Indicators:

- No. and total capacity (liters/day) of SWHs installed in buildings (apartments, hotels, hospitals) and year-on-year increase
- Percentage of new buildings granted occupancy certificate with SWH installation
- No./percentage of buildings availing incentives for SWH installations

Action 7: Streamline procedures and facilitate financing support for renewable adoption

Action details

A streamlined approval system and a dedicated digital platform will support RE adoption and speed up Amaravati's transition to clean energy while reducing approval process related delays.

Sub Actions

- Streamline solar PV installations through a single-window clearance and digital platform supported by APCPDCL, APCRDA and other relevant departments

- Establish a single-window clearance system for the provision of approvals/permits to RE project developers from different regulatory entities.
- Offer a single 'one-stop shop' digital platform for end-to-end management of RE project applications including application submission, feasibility assessments, technical approvals, subsidy facilitation and on-ground implementation, monitoring and tracking.

- Offer incentives such as faster building approvals, tax rebates, FAR/FSI incentives to promote RE adoption. Collaborate with financing institutions to facilitate access to low-interest loans.

Implementing entities

Lead: APCRDA

Supporting: APCPDCL, NREDCAP

Type of action: Mitigation

Climate resilience benefits: Medium

Timeline: Short term

Monitoring Indicators:

- No. of RE applications processed via the digital platform
- Installed solar PV capacity (MW) annually
- Amount of incentives and financing disbursement supported/facilitated
- Average turnaround time for RE project approvals

Action 8: Encourage adoption of electric cooking

Action details

Supply of PNG through a city-wide network is planned in Amaravati to adopt a relatively cleaner energy source from LPG. Electrification of cooking can be promoted, particularly for a portion of domestic, commercial and institutional consumers as PNG is not a completely zero emission source.

Sub Actions

- Develop awareness campaigns on the health and environmental benefits of electric cooking, targeting women and primary cooks in households, hotels, canteens and cafeterias.
- Encourage mid to large-scale government and institutional canteens and cafeterias to shift to electric cooking (powered by renewables) through incentives and financial support
- Incentivize electric cookstoves (through discounts) and undertake distribution supported by NREDCAP, EESL and private CSR funding. Offer electric cook-stoves at low-cost, especially to low-income households as an alternative to PNG.
- Incorporate infrastructure to support electric cooking in new residential buildings including provision of electrical connections and ventilation

Potential locations: Government offices, institutions, mid to large-sized hotels, restaurants, and commercial kitchens, large residential apartments and select lower-income housing

Implementing entities

Lead: APCRDA

Supporting: NREDCAP, EESL, private sector, RWAs

Type of action: Mitigation

Climate resilience benefits: Medium

Timeline: Medium term

Monitoring Indicators:

- No. and percentage of households, commercial and government canteens adopting electric cooking
- Percentage reduction in LPG/PNG consumption in households and commercial units
- No. and outreach of awareness events/campaigns conducted

Action 9: Build local skills to boost job creation and support RE and EE integration

Action details

Training local community members including youth as installers, technicians, and maintenance personnel for RE and EE solutions directly supports Amaravati's climate vision and employment opportunities.

Sub Actions

- Provide technical training to youth in existing settlements to serve as installers and O&M technicians for solar PV, solar water heaters, LED lighting, energy efficient equipment and as energy maintenance personnel in Amaravati's upcoming properties and facilities. Collaborate with technical universities and skill-development training institutes.
- Link the training to existing programs such as Suryamitra technician, Andhra Pradesh State Skill Development Corporation, Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) to enable formal certification and further job opportunities.

Potential locations: Technical and vocational training centers within Amaravati and existing settlements. Collaborating technical universities, colleges, and ITIs.

Implementing entities

Lead: Andhra Pradesh State Skill Development Corporation (APSSDC)

Supporting: APCRDA, technical universities and skill-development training institutes, national programs such as Suryamitra and MGNREGS, private sector partners engaged in RE for internships/apprenticeships, NGOs focused on youth employment, green jobs, and technical training.

Type of action: Climate Mitigation

Climate resilience benefits: Medium

Timeline: Short term

Monitoring Indicators:

- No. of community members and youth trained and certified in RE and energy efficiency skills.
- No. of new jobs created locally in renewable energy and energy-efficiency sectors
- Percentage of RE and EE projects staffed with locally trained technicians
- No. of installations (solar PV, LED, efficient equipment) supported by local technicians.
- Contribution to overall city RE/EE targets

Good Practice:

Capetown partnered with a local NGO and industry association to develop a training programme for solar PV installers. The programme offers subsidies for male electricians (75% subsidy) and female electricians (100% subsidy). Over 100 candidates have received the solar PV training and it has helped to address the challenge of limited capacity of trained installation technicians.

Strategy 4- Financing Modes/Sources

APCRDA budget, PM Surya Ghar Muft Bijli Yojana, NREDCAP funds, RESCO models, bulk procurement/demand aggregation of multiple projects, group captive, rent-a-roof models, power purchase agreements, MNRE's grid connected rooftop solar programme, multilateral grants/assistance, CSR funds for pilots, National Efficient Cooking Programme; PM Awas Yojana, Suryamitra, MGNREGS and Skill India for vocational training and skill development

Enabling financing and implementation models for renewable energy deployment:

- On-site and off-site CAPEX (Capital Expenditure) models: Direct investment by building or property owners, supported by applicable government incentives.
- RESCO model: Third-party investors/RESCOs bear capital cost of deployment and own, operate, and maintain the system; users or building owners can forego upfront capital investment and pay for green power generated via power purchase agreements (PPAs).
- Group Captive and Open Access: Pooled investments from multiple consumers for jointly owned renewable generation assets
- Demand aggregation: DISCOMs or relevant nodal institutions facilitate aggregation of demand/procurement to negotiate better rates and attract private investments.
- Subscription based or rent-a-roof models: Residents/owners receive rental income or discounted energy by allowing third parties to install and operate solar PV on their rooftops.
- Renewable Energy Certificates or carbon offsetting: Sale of green credits for additional revenues.

Strategy 5: Undertake integrated spatial and energy planning at the city-scale with energy sector institutions

Proposed Actions

Action 1: Advocate for faster integration of renewables in Amaravati's grid power supply

Action details

Achieving Amaravati's vision of being fully renewable powered capital city will require significant support and coordination from state-level agencies and power sector institutions:

- Need to engage with state-level power sector entities, decision-makers, and electricity suppliers (e.g., APTRANSCO, APCPDCL, Andhra Pradesh Energy Department, State Load Dispatch Centre) in order to help increase ambition and accelerate the integration of renewables into Amaravati's electricity supply.
- Promote the adoption of aggressive renewable energy deployment for Amaravati's demand in addition to state-level RPO (Renewable Purchase Obligation) targets, support utility-scale, off-site, and distributed on-site renewables, and ensure grid readiness for 100% RE integration.

• Regularly participate in state-level policy dialogues, working groups, and sector planning to align city and state objectives, and to enable necessary technical and regulatory support to meet Amaravati's ambitious RE targets
Implementing entities **Lead:** APCRDA **Supporting:** APTRANSCO, APCPDCL, NREDCAP, APSECM
Type of action: Climate Mitigation
Climate resilience benefits: Medium
Timeline: Short term
Monitoring Indicators: • Percentage increase in RE share in Amaravati's grid mix and electricity consumption • No. of formal engagements with power sector and electricity supply institutions • No. of grid-connected on-site and off-site renewable projects commissioned • Availability of RE integration roadmap aligned with Amaravati's climate change action plan targets

Action 2: Involve officials from APCPDCL, APTRANSCO, NREDCAP and APSECM in committees for master planning and urban infrastructure development.
Action details Involve key officials from APCPDCL, APTRANSCO, NREDCAP and APSECM in Amaravati's master planning and urban infrastructure committees. This will systematically help to coordinate and integrate renewable energy and energy efficiency into spatial planning and infrastructure design at an early stage and on regular basis. Participation can be sought in relevant committees such as city-level master planning, infrastructure, zoning, and project review committees, sub-committees tasked with energy, utilities, building codes, and sustainability integration. Such involvement will help better embed RE and energy efficiency solutions into Amaravati's urban infrastructure and spatial development while also helping inform and synchronize planning of power infrastructure to meet city-wide targets.
Implementing entities **Lead:** APCRDA **Supporting:** APCPDCL, APTRANSCO, NREDCAP, APSECM
Type of action: Climate Mitigation
Climate resilience benefits: Medium
Timeline: Short term
Monitoring Indicators: • No. of official committee meetings/working groups involving APCPDCL, APTRANSCO, APGENCO, NREDCAP, APSECM annually • No. of cross-agency policy and infrastructure alignment meetings • Evidence of renewable and energy efficiency integration of renewable into city development and infrastructure planning, projects and regulations

Action 3: Coordinate with APCPDCL and APTRANSCO for effective integration of urban development and electricity planning

Action details

Establish a coordination mechanism between the APCRDA, ADCL, APCPDCL and APTRANSCO to synchronise urban development with electricity planning. Such an integration will enable sustainable energy management at the city-scale and support the integration of renewables, energy efficiency solutions, and E-mobility at an early stage in Amaravati's built infrastructure and electricity networks.

Sub Actions:

- Undertake periodic consultations, information-sharing, and joint reviews to align planning, decision making, and facilitate policy and regulatory implementation.
- Promote renewable solutions through policy measures to avoid future network congestion, transformer overloading, and meet future demands from EV infrastructure and increased cooling requirements due to rising heat.
- Conduct periodic demand and load assessment over Amaravati's development timeline to understand patterns, power requirements, and identify opportunities for RE solutions, energy management, and grid infrastructure upgrades or expansion requirements.
- APCPDCL and APTRANSCO will be informed at an early-stage of upcoming developments, densification, high energy consumers, and plans for RE adoption. This will help estimate power demand against existing grid capacity, manage peak loads, and undertake distribution grid planning measures.
- APCPDCL and APTRANSCO can suggest suitable energy management options at the planning stage for large commercial complexes, institutional buildings, industries to support high RE integration and ensure stable grid operation.
- Given Amaravati's ambitious RE targets, ensuring smooth integration of intermittent renewable electricity generation into the city's local power system. APCPDCL and APTRANSCO can advise at an early-stage on spatial distribution of large-scale RE projects considering their grid capacity, while providing suggestions on rooftop solar PV and large-scale RE deployment across different consumers.
- APCPDCL and APTRANSCO can coordinate and provide inputs to locate EV charging infrastructure, considering existing electricity grid infrastructure and future load expansion.
- Coordinate with state-level institutions and private sector to facilitate participation and partnerships with RE generators and EPC players to support large-scale RE deployment for Amaravati's power demand.

Potential locations: High-density/commercial zones, infrastructure corridors in Amaravati, all public and large private buildings, utility facilities and major mobility nodes (EV charging, transit hubs)

Implementing entities

Lead: APCRDA

Supporting: APCPDCL, APTRANSCO, ADCL, NREDCAP, APSECM

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Short term

Monitoring Indicators:

- No. and frequency of formal coordination meetings and joint planning sessions per year

- Annual increase/adoption of renewable and energy efficiency solutions in city through joint planning
- No. of joint studies/load demand assessments completed and followed by local power grid and distribution system deployment/improvement measures
- No. of new developments at zonal/neighbourhood/project-scale integrating RE and EE measures based on committee/coordination input
- No. of RE and EV infrastructure locations sited through joint coordination

Strategy 6: Adopt smart and reliable power distribution systems for high renewable integration

Proposed Actions

Action 1: Plan and upgrade grid infrastructure to accommodate high levels of renewables and meet future requirements

Action details

As a greenfield capital city, Amaravati has a unique opportunity to design its power system to accommodate advanced technologies and significant levels of green power from the ground up. Proactively installing and upgrading grid infrastructure, including substations, smart distribution lines, and grid-scale energy storage, will enable Amaravati to absorb high shares of renewable energy, reliably support EV adoption, and handle rapidly growing energy demand.

Sub Actions

- Install or upgrade substations, transformers, and distribution lines to handle high RE penetration and ensure reliable supply.
- Ensure grid stability and power quality by managing the inherent variable generation from RE by using energy storage solutions, especially in distribution infrastructure including substations.
- Conduct regular performance and safety audits of the power infrastructure and distribution network. Undertake resource adequacy assessments to identify improvement areas.
- Plan and implement measures to meet high energy demand from end-uses such as fast charging EV infrastructure expected to be deployed across Amaravati.

Potential locations: All urban and peri-urban zones under APCRDA jurisdiction, new and existing substations throughout Amaravati catering to business zones, commercial centers, and residential townships, EV charging clusters, public transport terminals/depots and AGC

Implementing entities

Lead: APCPDCL, APTRANSCO, APCRDA

Supporting: ADCL, NREDCAP, private EPCs, technology vendors, service providers and expert consultants

Type of action: Climate Mitigation

Climate resilience benefits: Very High

Timeline: Short term

Monitoring Indicators:

- Total additional substation/transformer capacity installed/upgraded (MVA)

- Percentage of grid-connected renewable energy share (annual reporting)
- Annual grid resource adequacy/stability assessments completed
- Annual no. of grid safety and performance audits completed
- No. and capacity (MW/MWh) of battery energy storage solutions deployed and operational
- No. of EV fast-charging hubs/grid nodes supported by new upgrades
- User/customer satisfaction rates for power quality/reliability in growth zones

Good Practice:

In **New Delhi**, BSES Rajdhani Power Limited (BRPL) with partners has commissioned a 20 MW/40 MWh battery energy storage system (BESS) project located at the Kilokari substation. The battery energy storage deployed will help improve power quality and reliable power supply in the area for over 12,000 low-income consumers. It is designed to deliver up to four hours of reliable daily power everyday, two hours each during the day and night. The BESS can provide multiple benefits such as improved power supply, enhanced grid stability, peak demand shaving, reduced overloading of network and renewable power integration.

Action 2: Deploy smart systems, data management and advanced power management techniques

Action details

Amaravati can incorporate digital intelligence, SCADA/ICT integration, and advanced analytics into its power infrastructure from an early-stage. This will help to ensure the power grid operates with real-time precision and future-ready flexibility. By incorporating AI-based demand-supply modelling, real-time monitoring and analytics-driven maintenance, the city could proactively manage outages, grid congestion and integration of distributed energy resources.

Sub Actions

- Integrate SCADA and ICT to enhance operational planning, real-time grid management, efficient data acquisition and processing, peak power demand management, complaint handling, electricity outage response, and proactive maintenance **(ongoing/planned partly)**
- Manage diverse energy resources and storage technologies to ensure a reliable power supply management, enhance grid resilience, and maintain high distribution network uptime.
- Leverage artificial intelligence and machine learning for power demand-supply modeling based on city development trend, tracking RE integration at zonal-level, and identifying new investment and maintenance requirements.

Potential locations: City-wide at major city substations and feeders, growth corridors, business districts, large public buildings (government, institutional, hospitals) and commercial centers, EV charging infrastructure, RE generation sites, and major transmission/distribution nodes. Solutions can be deployed for AGC area and imminent mid-to-large size upcoming developments in the near-term.

Implementing entities

Lead: APCPDCL, APCRDA

Supporting: APTRANSCO, ADCL, NREDCAP, grid technology vendors (SCADA/ICT/AI), service providers and expert consultants

Type of action: Climate Mitigation

Climate resilience benefits: Medium
Timeline: Medium term
Monitoring Indicators: • Extent of local power distribution network and infrastructure integrated with SCADA/ICT • Extent of city power grid network with real-time monitoring, management, analytics-enabled outage/complaint response • Performance metrics for distribution network uptime and reduction in average outage duration • No. of grid anomalies, outages, or distribution asset failures resolved proactively with smart system alerts

Action 3: Adopt urban microgrids and demand management to enable renewable adoption and energy resilience

Action details
By adopting urban microgrids and advanced demand management, Amaravati can efficiently incorporate high levels of renewables, maximise local RE use and maintain reliable power supply to critical services during outages or climate extremes. Microgrids and innovative demand-side solutions will help Amaravati create distributed, flexible, and adaptive energy system .
 	
Sub Actions
• Deploy modular local microgrids in office complexes, hospitals, schools, educational campuses and neighbourhoods to help locally manage RE generation, storage and consumption.
  ○ Modular urban microgrids, equipped with smart controls and battery storage, help to utilise higher amounts of RE, optimise energy demand, maintain power quality and reduce grid dependency.
  ○ Microgrids can ensure energy resilience by isolating from the power grid during outages and climate hazards, while powering critical infrastructure and essential services.
• Use smart meters, time-of-day pricing, and demand-response programs to shift power consumption to off-peak hours, when RE generation is abundant and ensure its higher use.

Potential locations: Initial deployment and pilots can target AGC area (offices, control centers, hospitals), institutional/educational and public campuses, large residential townships, commercial hubs and business parks, planned new neighborhoods, large EV charging sites
Implementing entities **Lead:** APCPDCL, APCRDA **Supporting:** APTRANSCO, NREDCAP, ADCL, technology vendors, service providers and expert consultants, technical and research institutes
Type of action: Climate Mitigation and Adaptation
Climate resilience benefits: Very High
Timeline: Medium term
Monitoring Indicators: • No. and capacity of urban microgrids deployed (by type/use, MW/MWh) • Percentage of critical infrastructure connected to microgrids

- Percentage of energy consumption in pilot zones met by locally generated RE
- Percentage of city covered with smart meters and Time of day tariff/demand response programs
- Relative reduction in grid peak load and improved power quality metrics
- Instances and no. of hours of critical services powered during grid outages/climate events

Good Practice:

New York launched RISE : NYC program in response to vulnerabilities exposed by hurricanes such as Sandy. Under the program, NYC Economic Development Corporation, HUD and private partners deployed eight neighbourhood microgrids in flood-prone zones. The microgrids combine rooftop solar, battery storage, and backup generators to allow these communities to island from the main grid outages and maintain power for critical loads.

Strategy 6 - Financing Modes/Sources

State funding for power grid expansion and upgradation, support/incentives under AP Integrated Clean Energy Policy, MNRE's Revamped Distribution Sector scheme and Green Energy Corridor scheme, National Smart Grid Mission, NREDCAP support, 15th Finance Commission, PPP and private sector investment (EPC, ESCO, RESCO modes), FAME (for storage/EV grid integration), multilateral grants/assistance for grid upgradation, smart grid technology and storage pilots.

2.2 Water Supply

Baseline Status (2024-25)	**Key Statistics:** • The Krishna River serves as the primary source of surface water for Amaravati, supplying the significant share of piped water. • As of 2024, the Rural Water Supply and Sanitation (RWSS) department supplies about 13 million liters per day (MLD) of treated water to 25 villages and the Mangalagiri-Tadepalli Municipal Corporation (MTMC) areas within Amaravati. • The NTR Sujala initiative provides access to safe drinking water to over 50,000 people across 100 villages in Andhra Pradesh, including the Amaravati city. • Village settlements rely on groundwater extraction through borewells, to supplement domestic and non-potable water needs.
Existing Policy, Plans and Initiatives	**National Policy/Programme/Targets:** • GoI's AMRUT 2.0 and 15th FC supporting water infrastructure • CPHEEO Guidelines for planning, design and implementation of 24x7 water supply systems • Guidelines to Regulate and Control Groundwater Extraction in India, MOJS lists down extraction charges for various categories and volume of usage • National Framework on Safe Reuse of Treated Water has set year wise targets for reuse of treated wastewater. **StateLevel Policy/Programme/Targets:** • Andhra Pradesh Building Rules, 2017. • Action Plan for Rejuvenation of River Krishna of Krishna District • APWALTA Act 2002 **City Policy/Programme/Targets:** • Planned to meet a projected water demand of 925 MLD by 2058 • Setting up advanced water treatment plants in modular basis and expanding network coverage in phased manner • Implementation of smart meters, SCADA and 24/7 water supply system throughout the city • Long-term plans aim to use water from the River Godavari through the Polavaram project to help meet water demand during peak season or during other conditions of exigency • Zoning regulations mandate the construction of rain water harvesting structures for all the properties and promote the use of rainwater storage and water-saving plumbing fixtures • Urban design and architectural guidelines promote a blue-green network that connects canals, green corridors, flood control systems, and bio-retention features to improve water quality and enhance resilience
Opportunities and Gaps	• High dependence on ground water and partially on single surface water sources • Untreated ground water in several village settlements is not fit for direct drinking purposes[15] due to high concentration of total dissolved solids, nitrates and fluorides. • Flood events may pose risks to disrupt the functioning of headworks and transmission network[16]

[15] Dynamic Ground Water Resources of Andhra Pradesh State, 2024.
[16] World Bank, Amaravati Flood Mitigation Works: Environmental Impact Assessment–Environmental Management Plan Report, 2018.

	• Future water demand can be met by strengthening infrastructure, recharging ground water, implement rain water harvest structures, and adopting sustainable water use practices.
Climate Risk	**Climate Risk Status**: High Increased flooding during periods of high intensity rainfall increases chances for disruption in water supply. Groundwater is at higher risk of pollution in places with shallow water tables, as sewer leaks during floods can worsen contamination and increase health risks for people dependent on groundwater. • Increase in temperature will increase demand of water, particularly in summers and and heatwave periods. Projected drought event and increased evapotranspiration rate may adversely impact available water quantity and quality. This may lead to people shifting to bore wells for water supply from surface supply, lowering groundwater table, or in the worst-case, low-income groups might have to use untreated groundwater, raising public health concerns.
Potential Climate Resilience Impact and Wider Co-benefits of Climate Actions	**Strengthened Resilience to Climate Hazards:** Heat stress, urban flood, cyclones **Climate Resilience Impact and Co-benefits**: • Address future water demand sustainably, mitigate heat stress, drought, and urban flooding impact and improve groundwater table by integrating blue-green networks, conserving water resources, and protecting related ecosystems. • Equitable and safe access to 24/7 water supply for all residents • Strengthen water security by mandating rainwater harvesting in all properties and promoting reservoir based storage for groundwater recharge. • Reduce public health risk due to contamination of groundwater • Lower operational and maintenance costs through the adoption of clean energy in water supply infrastructure. • Develop standard operating procedures for NRW management and implementing SCADA systems with data-driven decision-making will help reduce NRW.
SDGs	GOAL 3: Good Health and Well-being, GOAL 6: Clean Water and Sanitation, GOAL 7: Affordable and Clean Energy, GOAL 9: Industry, Innovation and Infrastructure, GOAL 10: Reduced Inequality, GOAL 11: Sustainable Cities and Communities, GOAL 12: Responsible Consumption and Production, GOAL 13: Climate Action, GOAL 14: Life under Water, GOAL 15: Life on Land

Climate Strategies, Actions and Targets

Strategy 1: Sustainable water resource management for ensuring long term water security

Proposed Targets

Action area	Target Parameter	2028	2043	2058
Installation of RWH system in the properties.	Percentage of existing residential properties with rainwater harvesting	10%	100%	100%
	Percentage of new residential properties with rainwater harvesting	100%	100%	100%
	Percentage of existing commercial properties with rainwater harvesting	10%	100%	100%
	Percentage of new commercial properties with rainwater harvesting	100%	100%	100%

Proposed Actions

Action 1: Ensure protection of surface water sources

Action details

To protect surface water sources, Amaravati city should explore the potential use of multiple water sources to increase resilience and flexibility in meeting rising water demand. Enforcing strict regulations on the discharge of treated wastewater and conducting regular water quality monitoring will help maintain healthy aquatic ecosystems and prevent contamination.

Currently, the Krishna River is the primary source of water for meeting the water demand in Amaravati. The city is also planning to construct five reservoirs, which will act as multiple water sources.

Sub Actions

- Identify multiple water sources to support flexibility in meeting water demand **(Ongoing/Planned)**
- Maintain natural river bank ecology through the creation of a riparian buffer and embankment construction for promoting recharge **(Ongoing/Planned)**
- Ensure discharge of treated wastewater into water bodies only in compliance with national standards. **(Ongoing/Planned)**
- Conduct periodic water quality monitoring and remedial actions to protect the natural ecosystem. **(Ongoing/Planned)**

Potential locations: Krishna River, Water bodies and Vagus

Implementing entities

Lead: APCRDA, Water Resource Department

Supporting: APPCB, PH&MED, Forest Department

Indicative cost:

~Rs. 1.5 crore to build 1 km of concrete embankment depending on soil type, design (conventional earth, reinforced, or concrete), and protection works such as stone pitching or geo-tube systems[17]
Type of action: Climate Adaptation
Climate resilience benefits: High
Timeline: Short term
Monitoring Indicators: • Percentage of riverbank protected with riparian buffers or embankments • Number of treated wastewater discharge samples meeting national water quality standards • Area of riverbank and ecological buffer zones maintained or restored • Number of water quality monitoring cycles conducted per year for major surface water bodies
Good Practice: **Patna's** riverfront tackles soil erosion along the banks by restoring the riparian edge between ghats. This involves creating promenades, implementing proper waste disposal systems, and planting native shrubs, boulders, and gabions to prevent erosion. The project maintains and promotes the growth of local flora and fauna. Any construction uses locally sourced, eco-friendly materials and natural stone for both durability and aesthetic appeal. **Shimla** city sources its municipal water supply from seven different locations, with water treated at four different treatment plants to ensure resilience and flexibility. This multi-source approach has helped the city to meet growing water demand amid increasing tourism and urban expansion. In rural **West Bengal**, Vetiver grass was used to create low-cost, effective riparian buffers and protect riverbanks from erosion. This natural intervention has helped to stabilize channels and promote groundwater recharge while supporting local livelihoods. By diversifying water sources and investing in both centralized and decentralized water infrastructure, **Port Vila** city achieved greater resilience, reduced water demand by 35%, and improved water quality standards through stakeholder engagement and regular monitoring.

Action 2: Conservation & management of groundwater resources by limiting extraction, promoting recharge, and continuous monitoring.
Action details Regulating groundwater extraction particularly for bulk water users like high-rise apartments and large commercial buildings along with promoting groundwater recharge, will help secure the Amaravati city's water supply for the long term. These measures are important as the city continues to urbanize and will support both sustainable growth and ecological balance in the future. **Existing Initiatives**

[17] Water resources department building 1,000 km of concrete embankment, Economic Times, 2022.

Amaravati has proactively conducted a hydrogeomorphological study to map local geological features, including the identification of shear zones—fractured rock formations known for facilitating groundwater movement, as well as regions with low groundwater levels. This mapping enables the city to target these zones for strategic aquifer recharge interventions and to establish continuous monitoring systems for sustainable groundwater management.

Sub Actions

- Monitor groundwater levels through piezometers in all existing settlements **(Ongoing/Planned partly)**
- Formulate and levy volume-based charges on groundwater extraction post connection to city water supply network
- Redesign and restore ponds to maximize recharge capacity
- Mandate the construction of groundwater recharge pits for buildings with plot size >300 sq. m through issuing regulatory measures. An occupancy certificate to be provided upon inspection of the presence of appropriate recharge pits. **(Ongoing/Planned)**
- Deploy city-wide piezometer network with real-time monitoring of groundwater
- Construction of large-scale recharge pits in open spaces and public buildings as per groundwater recharge potential in different areas.
- Constitute a dedicated team to maintain and monitor the recharge pits in all public areas/buildings and to conduct annual inspections on private properties especially before monsoon
- Geotag piezometers and both public and private recharge pits and set up a portal for groundwater quality and quantity monitoring to be managed by the dedicated team.
- Disseminate technical specifications for groundwater recharge pits from hydrogeomorphology study to architects, contractors, real estate agencies, and others.

Potential locations: City-wide with focus on lower Groundwater levels for recharging in village settlements from the Hydrogeomorphology study - Nidamarru, Kuragallu, Yerrabalem, Nowluru, Penumaka, Nekkallu, Ananthavaram

Implementing entities

Lead: APCRDA, Groundwater & Water Audit Department

Supporting: PH&MED, DTCP, APPCB, Builders, Technology providers

Indicative cost:

1 piezometer cost ~INR 35,000 to 50,000 per unit[18]

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Medium term

Monitoring Indicators:

- Number of piezometers installed and functional
- Annual percentage change in average groundwater level
- Public and private recharge pits geotagged and monitored through CCC

Good Practice:

[18] Tradeindia, 2025

Sixty village ponds were adopted within a 10 km radius of Gajraula town in Uttar Pradesh for the construction of a recharge structure, enabling the recharge of over 21 Lakh Cubic meters of rainwater into the saturated groundwater aquifer.

Chennai city has made the installation of rainwater harvesting (RWH) structures mandatory in all buildings, resulting in widespread adoption. The Chennai Metropolitan Water Supply and Sewerage Board monitors groundwater levels using citywide piezometers and enforces compliance with occupancy certificates linked to RWH inspection. These actions increased groundwater tables significantly.

The Rainwater Harvesting in Schools project in Jerusalem, Israel equipped 24 schools with rooftop rainwater collection systems that store harvested water for non-potable uses, including toilet flushing, cleaning, garden irrigation, and watering indoor plants.

Action 3: Reduce fresh water demand by replacing non-potable needs with alternative sources

Action details

Reducing freshwater demand by mandating rainwater harvesting, dual plumbing, and the adoption of water-saving fixtures will enable the greenfield Amaravati city to sustainably meet its water requirements for non-potable uses, such as cleaning, flushing, and irrigation.

Existing Initiatives

Amaravati has recently amended its zoning regulations to mandate the construction of rainwater harvesting structures in all new developments, ensuring that buildings contribute to local groundwater recharge. The regulations also require the adoption of dual plumbing systems, with separate pipelines and storage tanks for supplying both fresh water and treated wastewater, thus enabling safe and efficient reuse. Furthermore, the installation of low-flow plumbing fixtures, sensor-based taps, and pressure-reducing valves in wash basins, baths, and other faucets is now mandatory, significantly reducing water consumption and promoting long-term water conservation.

Sub Actions

- Mandate the construction of rainwater harvesting in buildings[19] with plot size >300 sq.m and utilisation of the collected water for meeting non-potable demands. Additional water needs to be channelled to recharge pits in applicable structures. **(Ongoing/Planned)**
- Promote the adoption of water-saving fixtures such as aerators/ sensors, to reduce water consumption. **(Ongoing/Planned)**
- Mandate dual plumbing for properties with plot area > 300 sq m, with separate storage tanks in place to ensure potable and non-potable water is not mixed. **(Ongoing/Planned)**
- Promote installation of RWH structures in existing settlements and buildings through incentives.
- Link installation of RWH systems to building permission and occupancy certificates.
- Conduct awareness and skill-building workshops for local masons and contractors.

Potential locations: City-wide

[19] Government of Andhra Pradesh G.O. Ms. No. 350A dated 9th June 2000.

Implementing entities **Lead:** APCRDA, DTCP **Supporting:** Developers, Architects, Contractors
Indicative cost: Cost for construction of RWH structure system ranges from INR 25-60 per sq ft[20]
Type of action: Climate Adaptation
Climate resilience benefits: High
Timeline: Short term
Monitoring Indicators: • Number of new buildings with RWH systems installed • Percentage of harvested rainwater reused for non-potable applications at the household level • Number of recharge pits maintained and operational • Number of contractors and masons underwent training for RWH installation
Good Practice: 100 Government Schools of Udham Singh Nagar in **Uttarakhand** were equipped with Rooftop Rain water harvesting structures and recharge pits. The structure has filters to remove debris and impurities. Stored water is used for non-potable needs like sanitation and gardening, and the rest of the water goes for groundwater recharge. An estimated 23 lakh litres of water is saved per year through this system. GuruJal Society in **Gurugram** supported the installation of 8500 aerators in 15 RWAs of Gurugram, which approximately saves 230 kilolitres per day. The city of **Austin** developed ordinances requiring new large commercial and multi-family buildings to incorporate dual plumbing systems for non-potable reuse water. These systems are being integrated into building codes for properties above specified sizes (e.g., >250,000 sq ft). The **Tucson** city offers financial rebates of up to $2,000 for the installation of rainwater harvesting systems (cisterns and tanks). Rebates are contingent on residents completing a city-run training program, ensuring best practices in implementation. Similarly, greywater-harvesting rebates of up to $1,000 are available for systems that use recycled water within homes.

Strategy 1 - Financing Modes/Sources
APCRDA budget, State budget, AMRUT 2.0, 15th Finance Commission

[20] Guide for Rainwater Harvesting System Cost in India. Houseyog. 2025.

Strategy 2: Provision of year-round supply of clean and adequate drinking water to all

Proposed Targets

Action area	Target Parameter	2028	2043	2058
Continuous supply of drinking water	Extent of 24x7 water supply system in the city	100%	100%	100%
Quality of drinking water	Provision of safe water supply at all times	100%	100%	100%
Metering of service connections	Installation of meters in existing properties	10%	100%	100%
	Installation of meters in new connections	100%	100%	100%

Proposed Actions

Action 1: Commission a 24/7 water supply system of optimum quality and quantity

Action details

Implementing a 24/7 water supply system of high quality and required quantity in greenfield Amaravati city will significantly enhance the availability of safe drinking water for every resident and businesses. By constructing a robust, city-wide water distribution network with smart-metered service connections, the city can track real-time water usage and reduce both physical and commercial losses.

Existing Initiatives

Amaravati has planned a 24/7 water supply system that will be supplied through a direct-pumping transmission and distribution network. The system is engineered to minimize energy losses and maintain a consistent residual pressure at consumer endpoints. The city will divide its water supply network into District Metered Areas (DMAs), each serving about 4,000 people with clearly defined boundaries and equipped with advanced controls. The system will enable real-time non-revenue water (NRW) monitoring, facilitate easy maintenance, support water quality monitoring, and automatically shut down if security issues arise; regular leak detection surveys and controls will be conducted within each DMA through SCADA for optimal performance.

Sub Actions

- Construction of a city-wide water distribution network **(Ongoing/Planned)**
- Ensure a 24/7 supply of drinking water with a demarcated district metering area (DMA) and sufficient balancing storage in place. **(Ongoing/Planned)**
- Continuous monitoring of water quality parameters as per applicable standards, such as IS 10500:2012, at all storage reservoirs and integrated with SCADA and monitored at CCC in real-time. **(Ongoing/Planned)**
- Construction of water treatment plants with future capacity expansion potential. **(Ongoing/Planned)**

Potential locations: City-wide

Implementing entities

Lead: APCRDA, ADCL

Supporting: APPCB, Technology/ Service Provider

Indicative cost: At a per capita cost of INR 1,840 for the formation of the District Metering Area[21]
Type of action: Climate Adaptation
Climate resilience benefits: High
Timeline: Medium term
Monitoring Indicators: • Number of functional District Metering Areas (DMAs) established • Number of water samples meeting quality standards
Good Practice: **Puri** launched the "Drink from Tap" mission and became the first city to offer 24/7 high-quality drinking water directly from taps, removing the need for boiling and filtering. The initiative depended on active community involvement, with women-led Jalsathis from SHGs managing billing, handling complaints, and raising awareness. **Seosan** city created nine sub district metered area systems within two district metered areas integrated with smart water metering, reducing NRW from 32% to 10%. According to Singapore's National Water Agency, all buildings in **Singapore** with annual water usage of 60,000 m^3 or higher must install dedicated water meters at critical usage points within their premises to accurately track and monitor water use.

Action 2: Ensure efficient management of bulk water users

Action details

To ensure responsible and sustainable water usage in Amaravati city, it is essential to identify all bulk water users (BWUs) that have high daily water consumption. These BWUs should be prioritized for targeted water supply monitoring and management. By monitoring water consumption among large-scale consumers, the city can implement targeted, data-driven interventions.

Existing Initiatives

As mentioned in the Water Supply DPR, the installation of bulk flow meters at points supplying water to bulk consumers will facilitate regular monitoring of the water supply and the overall gap between water produced and water billed each month. Over time, these meters support systematic leak detection and control efforts, aiding in the reduction of Non-Revenue Water (NRW) and improving the efficiency and financial sustainability of Amaravati's water supply system.

Sub Actions

- Identify BWUs with high consumption (eg. >5,000 liters/day) including residential societies, public buildings, hotels, hospitals, malls, stadiums

[21] Installation of flow control valves, bulk flow meters, pressure reducing valves, and the replacement of house service connections (HSC) with mechanical water meters. https://mohua.gov.in/pdf/620235209 28a0advisory-on-water%20supply-final-new.pdf

- Establish a dedicated BWU monitoring team, incorporate periodic updation of new BWUs into the list
- Facilitate centralized reporting of water consumption and Extended User Responsibility certification for environmentally sound management of water by BWUs

Potential locations: City-wide

Implementing entities
Lead: APCRDA

Type of action: Climate Adaptation

Climate resilience benefits: Medium

Timeline: Short to Medium term

Monitoring Indicators:

- Percentage of total city water demand consumed by BWUs
- Number and percentage of BWUs certified under the Extended User Responsibility (EUR)

Good Practice:
Puri launched the "Drink from Tap" mission and became the first city to offer 24/7 high-quality drinking water directly from taps, removing the need for boiling and filtering. The initiative depended on active community involvement, with women-led Jalsathis from SHGs managing billing, handling complaints, and raising awareness.

Water utilities such as Thames Water in **Greater London**, maintain registers of large household and non-household customers and implement targeted water metering, real-time data dashboard monitoring, and conduct audits.

Action 3: Ensure minimal extent of Non-Revenue Water (NRW)

Action details
Minimizing NRW is critical for sustaining Amaravati's water supply by reducing losses, improving operational efficiency, and ensuring financial viability. Setting up an NRW team, deploying smart meters, and implementing real-time SCADA monitoring will help quickly identify and address leaks.

Existing Initiatives
Amaravati's water supply DPR sets an ambitious target to restrict Non-Revenue Water (NRW) to less than 10%. To achieve this, NRW will be tracked continuously using a SCADA system and smart meters, ensuring accurate and real-time monitoring of water use and losses throughout the network. The city also plans to establish a dedicated NRW team to undertake an NRW reduction program that includes forming District Metered Areas (DMAs) for leak assessment, detection, and control. Additionally, Amaravati proposes 100% metering of all water supply connections to reduce unbilled losses.

Sub Actions

- Establish NRW cell & Quick Response Team to undertake planning and actions for NRW minimization, and early redressal of grievances on physical losses
- Develop SOP for the NRW management

- Conduct regular training of department officials on advanced NRW management techniques and solutions
- Implement SCADA across the water supply system (from water extraction to entire transmission and distribution network) for real-time monitoring, fault identification and efficient operation
- Install smart meters to monitor usage and levy volume-based water tariffs, with surcharges for excess consumption beyond service level
- Integrate water connection requests into building permission process for 100% coverage and metering

Potential locations: City-wide

Implementing entities

Lead: APCRDA

Supporting: Water Resource Department, Technology/ service Providers, Research organizations

Indicative cost:

Agra's smart city project allocated around INR 3.44 crore for citywide installation of water supply SCADA system (excluding O&M and hardware renewals)[22]

The average installation cost for a smart water meter ranges from INR 10,000 to 15,000 per connection.[23]

Type of action: Climate Adaptation

Climate resilience benefits: Medium

Timeline: Short term

Monitoring Indicators:

- Number of water department officials trained in NRW techniques
- Percentage of the water supply system covered by SCADA monitoring
- Percentage of total consumer/service connections equipped with smart meters

Good Practice:

Surat established a dedicated Non-Revenue Water (NRW) cell to maintain NRW levels at 20%. The NRW cell focused on improving water supply efficiency, raising awareness about water conservation, and conducting regular water audits, leading to a decrease in pipeline leakage and the quick redressal of customer complaints.

Seosan city installed smart water meters and sub-district metered areas in Chari Village to address a high non-revenue water rate of 32%. Smart metering facilitated accurate leak detection, daily monitoring, and a quicker response to complaints. As a result, NRW decreased to 10% in just three months.

Strategy 2 - Financing Modes/Sources

State budget, APCRDA budget, AMRUT, 15th FC, Public Private Partnership (PPP), loan from multilateral development bank, grant from donor agency

[22] Providing 24 x 7 water supply to ABD area with water meters and SCADA system, Agra Smart City Limited, 2020
[23] NDMC to spend INR 31 crores on smart water meter plan, Times of India, 2025

Strategy 3: Adopt high-efficiency water supply system powered by renewables

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Adoption of high-efficiency equipment for water pumping	Energy-efficient equipment and pumps in water supply facilities	100%	100%	100%
Renewable energy in water supply facilities	Electricity consumption in water supply facilities to be met by renewables	50%	100%	100%
Non-Revenue Water (NRW) reduction in water supply	Percentage of NRW	10%	10%	10%

Proposed Actions

Action 1: Implement energy efficiency in water pumping

Action details

Implementing energy efficiency in water pumping will significantly help Amaravati advance toward its 100% energy efficiency target by reducing the overall electricity demand from water and wastewater infrastructure, which is one of the major energy-intensive sectors in urban systems.

Existing Initiatives

The Amaravati water supply DPR emphasizes the preparation of an Action Plan to conduct an energy audit and reduce energy consumption. Accounting for monthly energy consumption and performing an annual energy audit are essential performance indicators that enable necessary remedial action to control consumption within approved and guaranteed energy parameters. All pumping motors in the water supply system are specifically selected for their energy efficiency and are equipped with a Variable Frequency Drive (VFD), which helps save electricity and reduce operational costs. The efficiency of the entire VFD system also considers supporting components such as drive isolation transformers, cooling systems, output sine filters, power factor correction units, and harmonic filters, ensuring the water pumping remains energy-efficient.

Sub Actions

- Enable the use of energy-efficient equipment including pumping motors (atleast IE4 or above), variable frequency drives, automatic power factor correction panels, advanced transformers in all facilities by including requirements in public tenders for procurement and deployment. **(Ongoing/Planned partly)**
- Conduct regular energy audits to monitor the energy performance of electromechanical equipment
- Optimize energy use by reducing NRW & leakages.

Potential locations: City-wide with focus on water treatment plants and pumping stations

Implementing entities
Lead: APCRDA, ADCL
Supporting: APCPDCL, NREDCAP, Technology and service providers

Indicative cost:
Energy Audit: INR 10 – 15 lakhs

Type of action: Climate Mitigation

Climate resilience benefits: Very High

Timeline: Short

Monitoring Indicators:

- Number of pumps and motors meeting high-efficiency classes (IE4 or above)
- Percentage reduction in energy consumption achieved through leakage control
- Number and frequency of energy audits conducted

Good Practice:

In **Brazil**, the water utility implemented measures to optimize water distribution operations and reduce electricity consumption costs by utilizing automation and high-efficiency equipment. These measures reduced electricity consumption by 88 GWh over a four-year period, resulting in annual savings of $2.5 million.

The **Pune** Water Supply Energy Efficiency project aimed to reduce electricity consumption costs and boost the efficiency of the city's aging distribution system along with implementing energy audits, training engineers, and adopting both capital and low-cost improvements at water pumping stations. The initiative resulted in annual electricity savings of 38 lakhs kWh, the avoidance of 38,000 tonnes of CO_2, and a yearly savings of INR 146 lakh, along with a 10% increase in water supplied to the community without expanding infrastructure, primarily achieved by reducing energy intensity and system losses.

Action 2: Utilise renewable energy in water supply facilities.

Action details
Using renewable energy in water supply facilities will help Amaravati reach its 100% renewable energy target. Major operations, such as water pumping and treatment, will utilize solar and wind power, supplemented by batteries to ensure a 24/7 renewable electricity supply.

Sub Actions

- Integrate provision for renewable energy integration (on-site and off-site) in the design of pump houses, treatment plants, and site planning from an early stage.
- Include requirements for relevant electrical infrastructure and space considerations in tender documents for the construction of water supply facilities.

• Adopt a combination of on-site and off-site RE resources, including solar and wind energy, which can help deliver 24/7 renewable electricity for day and night-time water supply operations when deployed with battery energy storage solutions.
Potential locations: City-wide with focus on water treatment plants and pumping stations
Implementing entities **Lead:** APCRDA, ADCL **Supporting:** APCPDCL, NREDCAP, Technology and service providers
Type of action: Climate Mitigation
Climate resilience benefits: High
Timeline: Short to Medium term
Monitoring Indicators: • Percentage of use of renewable energy in water supply operations • Number of water supply facilities with RE Integration
Good Practice: SA Water deploys the world's largest moveable solar site in **Adelaide** as part of an ambitious renewable energy initiative. Over 30,000 solar panels are positioned at happy valley reservoir to generate more than 17,000 megawatt hours of renewable energy yearly, supplying power to key water facilities and reducing fossil fuel-based electricity use, and reducing emissions by more than 7,600 tonnes.

Strategy 3 - Financing Modes/Sources
State budget, APCRDA budget, ESCO model with private sector investment, AMRUT 2.0, 15th FC

2.3 Wastewater Management

Baseline Status (2024-25)	**Key Statistics:** • Existing settlements with 46,224 households generate 10.3MLD of wastewater, with no centralized sewerage network or treatment facilities. • Households rely on septic tanks, with faecal sludge collected by private desludging operators and disposed of in the open fields and natural drains. • **GHG Emissions:** 3,837 tCO_2e (1.8% of total GHG emissions)

Existing Policy, Plans and Initiatives	**National Policy/Programme/Targets:**
	• GoI's AMRUT 2.0 supporting sewage infrastructure
	• National Policy on Faecal Sludge and Septage Management
	• Energy Efficient Wastewater Management System
	• National Framework on Safe Reuse of Treated Water has set year-wise state-level targets for the reuse of treated wastewater
	• Toolkit For Preparing City Action Plans for Reuse of Treated Used Water by National Institute of Urban Affairs (NIUA), National Mission for Clean Ganga (NMCG) and Council on Energy, Environment and Water (CEEW)
	State/Local Policy/Programme/Targets:
	• AP State Sanitation Policy 2016
	• Andhra Pradesh Building Rules, 2017 specifies requirement for on-site sewage treatment plants and dual plumbing system for wastewater recycle and reuse in new building and construction for 50,000 to 150,000 sq. m. plot area
	• Faecal Sludge and Septage Management Policy and Operative Guidelines for Urban Local Bodies
	• Wastewater Reuse and Recycle Policy 2017
	• Standard Operating Procedure (SOP) For Cleaning of Sewers and Septic Tanks
	City Policy and Initiatives
	• Decentralized sewerage system divided into 13 zones – 12 STPs for domestic sewage and 1 CETP for industrial effluents.
	• Planned infrastructure:
	  ○ Phase-1 (upto 2043): 284MLD capacity (12STPs + 35 MLD CETP)
	  ○ Phase-2 (2043-2058): Expansion to 586MLD STP capacity and 53MLD CETP capacity for projected 723MLD wastewater.
	• 1035km of trunk sewer network with 58 intermediate lifting stations and main pumping stations in each zone.
	• 193MLD of treated wastewater is planned to reuse for urban greening, district cooling and irrigation.
	• Modular treatment plants with SBT, A2O and MBBR technologies recommended.

Opportunities and Gaps	• 100% wastewater collection and treatment planned through a decentralized, modular STP network with SCADA-enabled real-time monitoring for efficient operations. • Treated water reuse in urban greening, district cooling, waterbodies recharge, firefighting, construction activities, flushing, and industries can reduce freshwater demand and create revenue opportunities for the city.

<table>
<tr><td></td><td>

- Current untreated sludge discharge into vagus poses a serious water quality risk to Prakasam Barrage until full network implementation.

</td></tr>
<tr><td>Climate Risk and GHG Emissions Scenario</td><td>

GHG Emissions:

<table>
<tr><th colspan="4">GHG Emissions in BAU scenario (tCO_2e)</th></tr>
<tr><th>2024</th><th>2028</th><th>2043</th><th>2058</th></tr>
<tr><td>7,613</td><td>46,076</td><td>145,609</td><td>329,241</td></tr>
</table>

Climate Risk Status: Medium

- During heavy rainfall and flooding situations, there is a risk of STP, pumping station, and sewer network inundation, leading to untreated sewage overflow and water contamination.
- Higher temperatures can reduce biological treatment efficiency and increase energy demand for aeration in STPs
- Mixing of floodwater and untreated sewage can spread waterborne diseases and create vector-breeding hotspots.

</td></tr>
<tr><td>Potential Climate Resilience Impact and Wider Co-benefits of Climate Actions</td><td>

GHG Mitigation Potential and Indicative Cost of Interventions:

<table>
<tr><th rowspan="2">Parameters</th><th colspan="3">Climate Action Scenario</th></tr>
<tr><th>2028</th><th>2043</th><th>2028</th></tr>
<tr><td>GHG Emissions in Climate Action Scenario (tCO2e)</td><td>5,111</td><td>16,318</td><td>35,786</td></tr>
<tr><td>GHG emissions reduction from BAU</td><td>89%</td><td>89%</td><td>89%</td></tr>
<tr><td>Total cost of mitigation actions by 2058 (Million INR)</td><td colspan="3">9,056</td></tr>
</table>

Climate Resilience Impacts and Co-benefits:

- Improved quality of water resources, reduces water contamination and related health issues.
- Improves city sanitation standards and mitigates urban flooding risks
- Promotes circular economy by reusing treated wastewater, lowering freshwater demand
- Decreases methane emissions by capturing and utilising gas from Anaerobic Treatment Plant

Strengthened Resilience to Hazards:
Urban flood, cyclones

</td></tr>
<tr><td>SDGs</td><td>GOAL 3: Good Health and Well-being, GOAL 6: Clean Water and Sanitation, GOAL 7: Affordable and Clean Energy, GOAL 9: Industry, Innovation and Infrastructure, GOAL 11: Sustainable Cities and Communities, GOAL 12: Responsible Consumption and Production, GOAL 13: Climate Action, GOAL 15: Life on Land</td></tr>
</table>

Climate Strategies, Actions and Targets

Strategy 1: Commission efficient and adequate wastewater collection network

Proposed Actions

Action 1: Deploy city-wide sewer network to prevent cross-contamination of water supply and stormwater during heavy rain and floods.
Action details Implement a city-wide underground sewerage network covering all properties, with gravity-based designs prioritized to reduce pumping needs. Ensure resilience against floods and high groundwater, link building permissions for mandatory sewer connections, phase out septic tanks, and prevent stormwater-sewage cross-contamination through integrated planning and enforcement mechanisms. **Existing Initiatives** A 1,035 km underground sewer network was planned across 13 zones, with 58 lifting stations and modular STPs. Phase I (up to 2043) work includes trunk sewers, pumping stations, and initial STP capacity of 284 MLD, ensuring 100% network coverage for all new developments and gradual conversion of septic tank systems in existing settlements. **Sub Actions** • Conduct a comprehensive geo-hydrological feasibility assessment of the citywide underground sewer network. **(Ongoing/Planned)** • Prioritize gravity-based sewer designs, wherever possible, to minimize mechanical pumping and enhance cost and energy efficiency.**(Ongoing/Planned)** • Assess feasibility of using solutions such as automated vacuum sewer systems to ensure network connectivity in areas with high groundwater levels and narrow streets. • Ensure network connection to all new buildings by linking to building permission system and conducting inspections prior to building occupancy. • Connect all existing buildings having septic tank systems to the sewer network through service connections. Integrate connection status into property tax system to promote compliance
Potential locations: Citywide
Implementing entities **Lead:** APCRDA, ADCL **Supporting:** PH&MED, DTCP, Technology/service providers
Type of action: Climate Mitigation
Climate resilience benefits: Medium
Timeline: Short term
Monitoring Indicators:

- Percentage of properties connected to sewer network
- Percentage of existing properties connected to sewer network

Action 2: Ensure optimum management and maintenance of sewer network

Action details

SCADA-enabled real-time monitoring and integrated grievance redressal systems are planned for O&M under the Central Command Centre. DPR provisions include sensor-based block detection, periodic cleaning using robotic systems, and integration of stormwater and sewer inspections into building permissions for long-term network sustainability.

Sub Actions

- Establish systematic maintenance plan to ensure optimal performance, prevent sewer blockages and overflows.
- Formulate an immediate response team to address maintenance-related grievances.
- Implement SCADA for efficient, real-time sewer network monitoring and operation. **(Ongoing/Planned)**
- Integrate robotic cleaning solutions such as HomoSEP in the manhole to reduce manual intervention.
- Install intelligent sensors in manholes to detect blockages, stop stormwater inflow and trigger response actions.
- Ensure provision of dedicated stormwater and wastewater systems at property-level through site inspections in the building occupancy permission process.
- Continuous and coordinated planning with Urban Greening for tree placement near sewer lines to minimize root intrusion risks.

Potential locations: Citywide

Implementing entities

Lead: APCRDA

Supporting: ADCL, PH&MED, DTCP, Technology service providers

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Short to Medium term

Monitoring Indicators:

- No. of SCADA sensors & manhole monitoring devices installed & functional.
- No. of issues identified through SCADA, and percentage of thems correlated with the grievances.
- Response time to blockage/overflow complaints (average hours/days).
- Percentage of sewer network covered under maintenance schedule
- Percentage of properties inspected for separate stormwater & sewerage systems

Good Practice:

The HomoSEP robotic cleaning system, developed by IIT Madras–incubated startup Solinas Integrity, was deployed by **Madurai Municipal Corporation** across 16 sites in five residential areas. The system

mechanizes septic and manhole cleaning, using high-speed cutters and suction units, eliminating manual entry and improving sewer maintenance efficiency.

Action 3: Provision of facilities for safe containment, collection and treatment of wastewater during the first phase of construction.

Action details

As full sewer connectivity will be completed in phases, bio-digester-based mobile toilets and dual plumbing systems have been proposed for construction sites and public facilities in Phase I areas, ensuring interim sanitation solutions before central STPs become fully operational.

Sub Actions

- Prioritize construction of public toilets early on, equipped with dual plumbing to use treated wastewater for flushing.
- Establish size-based sanitation requirements at construction sites. Smaller projects to provide access to public toilets for workers and larger projects (over 3,000 sq.m) to install mobile toilets supported by appropriate enforcement/penalty mechanisms.
- Adopt sustainable in-situ solutions such as bio-digester technology (a self-sufficient containment and treatment unit that requires no further processing) in mobile and public toilets to be constructed.

Potential locations: Construction Sites

Implementing entities

Lead: APCRDA

Supporting: ADCL, PH&MED, DTCP, private contractors, NGOs

Type of action: Climate Mitigation

Climate resilience benefits: Medium

Timeline: Short term

Monitoring Indicators:

- Percentage of public toilets with dual plumbing for reuse of treated wastewater.
- Percentage of construction sites with mobile toilets provision.

Good Practice:

In **Banka, Bihar,** the BioLoo bio-digester toilets treat human waste onsite using anaerobic bacteria, converting it into pathogen-free water for gardening and biogas for energy, requiring no sewer linkages.

Strategy 1 - Financing Modes/Sources

APCRDA fund, State government grants and schemes, AMRUT, loan from multilateral development bank (World Bank, ADB, GEF)

Strategy 2: Ensure sustainable and scientific wastewater treatment and reuse

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Efficiency of treatment process	Percentage of quality compliance of treated water	100%	100%	100%
Adoption of decentralised wastewater treatment system	Percentage of wastewater collected and treated safely through decentralised wastewater treatment system (DeWATS)	100%	100%	100%
Adoption of treated wastewater for reuse.	Percentage of safe reuse of treated water	30%	50%	50%

Proposed Actions

Action 1: Adopt well-managed, efficient treatment system & infrastructure able to sustain extreme climate events

Action details

Amaravati needs to develop modular, flood-resilient STPs and CETPs equipped with SCADA-based monitoring, buffer storage, and interlinked systems to ensure continuous, compliant treatment under extreme weather. Regular assessments, operator training, and capacity expansion will enhance efficiency, resilience, and adaptability to future growth.

Existing Initiative

Phase I includes 12 modular STPs (284 MLD) and 1 CETP (35 MLD) with provision for flood-resilient designs, buffer storage tanks, and SCADA-based monitoring. Phase II will expand capacities to 586 MLD STPs and 53 MLD CETP by 2058, ensuring safe treatment under extreme weather events.

Sub Actions

- Commission innovative treatment infrastructure such as multi-storey STP configurations to optimise land use and address high groundwater table conditions.
- Conduct periodic assessments to enhance treatment infrastructure, accounting for population and city growth.
- Implement SCADA-based real-time monitoring to optimise STP performance and support reporting to SPCB and CPCB. Monitoring to cover all STP modules (e.g. clogging in the grit removal chamber, level of aeration, tracking flow hydraulic) and inflow and outflow quality. **(Ongoing/Planned)**
- Validate SCADA results through periodic external labaratory-based quality tests and to support system calibration.
- Ensure treated water discharged from STP meets the required norms as laid out by the concerned regulatory authorities. **(Ongoing/Planned)**
- Establish water quality monitoring stations at strategic locations across the city's natural drainage network including STP discharge points, upstream city boundaries, and outfall locations

- Study the feasibility of interlinking STPs for diversion of wastewater during failures or climate events such as floods.
- Provide adequate buffer storage capacity to accommodate additional inflows during system failures, scheduled maintenance, and to support retreatment of wastewater effluent (in cases when prescribed treatment norms are not met)
- Train plant operators regularly on efficient, low-carbon STP operations and new technologies.

Potential locations: Citywide

Implementing entities

Lead: APCRDA, ADCL

Supporting: APPCB, STP operator, Technology/ Service providers, academic Institutes, research organisations

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Short term

Monitoring Indicators:

- % STP & CETP capacity commissioned vs demand.
- % wastewater treated vs total generation (MLD).
- % treated wastewater complying with CPCB/APPCB discharge norms.
- % of STPs installed with SCADA real-time monitoring

Good Practice:

A 20 MLD double-storey STP built in 2018 in Pune Cantonment, Maharashtra, uses SBR technology and spans 1.40 acres (5,665 m^2) at a cost of ₹32 crore. The multi-storey design offers a cost-effective solution for both capital and operational expenses.[24]

Action 2: Adopt decentralised wastewater management approaches

Action details:

Amaravati will promote decentralized wastewater management systems to complement centralized infrastructure and ensure efficient treatment at the source. Large developments and individual plots will be mandated to install on-site treatment units such as DEWATS or prefabricated STPs.

Sub Actions

- Mandate on-site wastewater treatment for projects with 50,000–150,000 sq.m built-up area or plots over 1,000 sq.m.[25] Link compliance to building occupancy permit process. **(Ongoing/Planned)**
- Use of DEWATS or prefabricated STPs for on-site treatment based on feasibility studies.
- Establish request-based, fee-for-service facility for maintenance of on-site decentralized systems. Delivery of such service by centralized STP operators functioning within the same service area can be facilitated

[24] Multi-storey STP in Pune Cantonment, Pune, Maharashtra, sbmurban, e-library
[25] Andhra Pradesh Building Rules 2017.

Potential locations: Citywide with focus on public buildings, institutions, large-scale commercial and residential projects.
Implementing entities **Lead:** APCRDA **Supporting:** PH&MED, DTCP, Technology/ service providers, DEWATS operators
Type of action: Climate Adaptation
Climate resilience benefits: Very High
Timeline: Short to Medium term
Monitoring Indicators: • No. of properties installed with on-site STPs. • % compliance of on-site systems with O&M standards. • Volume of wastewater treated by decentralized systems (MLD).
Good Practice: 15 kLD capacity DEWATS was set up at Pristine Temple Tree Apartment**, Bengaluru,** in 2019, catering to 40 flats. The treated water is re-used for gardening/landscaping, with safe disposal of the remaining wastewater into the nearby municipal sewer line.

Action 3: Enable high level of safe reuse of tertiary treated wastewater

Action details

Amaravati will promote safe and sustainable reuse of treated wastewater by enforcing reuse regulations, optimizing tertiary treatment, and integrating reclaimed water use across sectors such as construction, landscaping, and cooling, thereby reducing freshwater demand and enhancing water security.

Existing Initiative

Treated water reuse for landscaping, district cooling, and construction has been integrated into Phase I DPR plans. About 193 MLD of treated water is earmarked for reuse, with dual plumbing.

Sub Actions

- Assess potential for safe reuse of treated wastewater by bulk consumers and select suitable tertiary treatment based on end use.
- Enforce regulations to mandate safe reuse of treated wastewater, limit groundwater extraction, and raise awareness of its benefits.
- Mandate treated wastewater reuse with dual plumbing and separate storage in properties using DEWATS (plots over 1,000 sq.m) to prevent potable water contamination **(Ongoing/Planned)**
- Mandate the use of recycled water for construction activity through building approval process, once planned centralised STPs become operational **(Ongoing/Planned)**
- Ensure 100% treated wastewater reuse for urban green areas through coordination with relevant stakeholders **(Ongoing/Planned)**
- Adopt optimal treated wastewater use in district cooling systems while meeting necessary technical and quality standards **(Ongoing/Planned)**

• Pilot provision of reusing treated wastewater for flushing and gardening at property level.
Potential locations: Citywide with focus on AGC area in the initial development phase.
Implementing entities **Lead:** APCRDA, ADCL **Supporting:** PH&MED, APPCB, DTCP, Research organisations, Consultants, APIIC
Indicative cost: INR 13 million/km of pipeline for conveying treated used water. Tanker for conveying - INR 0.2-0.8 million/ vehicle[26]
Type of action: Climate Adaptation
Climate resilience benefits: Very High
Timeline: Short to Medium term
Monitoring Indicators: • Volume of treated water reused for urban greening, construction, district cooling (in MLD). • % buildings with dual plumbing for recycled water. • % treated water reuse mandated & enforced in bulk user sectors.
Good Practice: **Singapore's** NEWater initiative treats municipal wastewater using microfiltration, reverse osmosis, and UV disinfection to produce ultra-pure reclaimed water. NEWater currently meets around 40% of national demand, projected to reach 55% by 2060. It's used for industries, power generation, cooling systems, and indirect potable reuse via reservoir augmentation. **Surat** Municipal Corporation (SMC) has converted the wastewater generated in the city into the resource by establishing 4 Tertiary Treatment Plants with installed capacity of 116 MLD thereby reducing dependency on fresh water resources & creating treated wastewater as an economic resource, to promote Sustainability and circular economy, Surat has started reuse of treated waste water in various non potable purposes like Industrial use, rejuvenation of lakes, Agriculture – mass plantation, sewer cleaning, Gardening, etc. through direct service line as well as Tanker Filling Station.

Strategy 2 - Financing Modes/Sources
APCRDA fund, State government grants and schemes, AMRUT, loan from multilateral development bank (World Bank, ADB, GEF)

[26] NIUA, NMCG, CEEW, Toolkit for Preparing City Action Plans for Reuse of Treated Used Water, 2024.

Strategy 3: Adopt low-carbon technologies, enhance energy and performance efficiency of treatment

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Adoption of high-efficiency equipment for water pumping	Energy-efficient equipment and pumps in water supply facilities	100%	100%	100%
Renewable energy in water supply facilities	Electricity consumption in water supply facilities to be met by renewables	50%	100%	100%
Low-carbon and efficient performance management of wastewater treatment plants	Percentage of wastewater treatment capacity using anaerobic treatment system with methane gas capture and recovery	33%	33%	33%
	Percentage of wastewater treatment capacity using aerobic treatment system operated with optimum and efficient performance management measures	67%	67%	67%

Proposed Actions

Action 1: Adopt anaerobic treatment technology with efficient methane gas capture and utilisation

Action details

Anaerobic sludge digestion for energy recovery at STPs and co-treatment of faecal sludge from existing settlements until sewerage coverage is complete. GIS tracking for desludging vehicles is planned for operational monitoring.

Sub Actions

- Ensure anaerobic STPs are installed with an efficient methane gas capture mechanism and utilisation for energy generation **(Ongoing/Planned Partly)**
- Adopt scientific treatment of sewage sludge generated from STPs through anaerobic digestion process to curb GHG emissions
- Conduct an assessment to identify suitable pre-treatment technology to optimise biogas yield from anaerobic digestion of sewage sludge

Potential locations: Citywide

Implementing entities

Lead: APCRDA

Supporting: ADCL, PHMED, APPCB, STP operators, Academic institutions, Research Organisations

Indicative cost:

Anaerobic Wastewater Treatment Plants

2028: 4,612 lakh INR

2043: 12,976 lakh INR

2058: 29,452 lakh INR

Type of action: Climate Mitigation
Climate resilience benefits: Very High
Timeline: Short term
Monitoring Indicators: • Quantity of sludge generated vs treated. • Volume of biogas generated and utilized for energy (m^3/year).
Good Practice: **Chennai** Metropolitan Water Supply & Sewerage Board in Chennai anaerobically digests sludge in 7 STPs of 498 MLD cumulative capacity to produce biogas. Around 523.92 m3 per hour (12,574 m3 per day) of gas is produced and utilized for the production of power through a biogas engine. The average electrical energy production from biogas is 2 kWh / m3 of biogas.

Action 2: Enhance performance efficiency of wastewater treatment plants
Action details Automated controls, energy audits, and operator training programs for STPs under SCADA integration to optimize treatment processes and energy use **Sub Actions** • Optimise aerobic treatment processes by upgrading to high-efficiency aeration, motor and pumping systems. **(Ongoing/Planned)** • Organise regular trainings for operational staff to enhance treatment efficiency and operational performance of STPs.
Potential locations: All proposed STPs in the city
Implementing entities **Lead:** APCRDA **Supporting:** ADCL, PH&MED, APSECM, monitoring agencies and training institutes
Indicative cost: Aerobic Wastewater Treatment Plants 2028: 9,569 lakh INR 2043: 26,924 lakh INR 2058: 61,111 lakh INR
Type of action: Climate Mitigation
Climate resilience benefits: Very High
Timeline: Medium term
Monitoring Indicators: • Energy consumption per MLD of wastewater pumping and treatment (kWh/MLD). • % operators trained in low-carbon/energy-efficient STP operations. • No. of energy audits & performance reviews completed annually
Good Practice:

The **City of Riverbank** in California, Wastewater Treatment Plant integrated SCADA-based automation with upgraded fine-bubble diffusers, blowers, and high-efficiency motors to optimize dissolved oxygen control and reduce energy use. The plant achieved ~75% energy savings and 65% cost reduction, saving over USD 240,000 annually. Regular operator training on SCADA systems and maintenance ensured sustained efficiency gains and performance optimization.

Action 3: Reduce energy demand and integrate renewable energy sources

Action details

STPs to include solar PV systems and biogas-to-energy conversion at treatment plants to reduce operational costs and carbon footprint

Sub Actions

- Use high-efficiency equipment such as pumping motors (atleast IE4 or above), variable frequency drives, automatic power factor correction panels to minimize energy use in all wastewater treatment facilities. Facilitate deployment by including requirements for energy efficient equipment in public tenders for construction and commissioning of STPs. **(Ongoing/Planned Partly)**
- Include requirements for energy efficient operation and performance of STPs in contracts of third-party facility operators
- Undertake periodic energy audits to monitor the performance and undertake improvement measures.
- Adopt a mix of on-site and off-site RE resources including solar and wind energy for meeting energy demand of wastewater treatment facilities. Use of solar and wind energy along with battery energy storage solutions can be assessed to provide round-the-clock renewable power for day and night-time operation of wastewater management facilities.
- Build facilities to be ready for RE integration (on-site and off-site) from an early-stage, considering infrastructure inclusions (electrical, metering, sanctioned load) and space provision. Relevant requirements can be reflected in tender documents for STP construction.

Potential locations: All proposed STPs in the city

Implementing entities

Lead: APCRDA, ADCL

Supporting: APCPDCL, APSECM, NREDCAP, STP facility operators, Technology/service providers

Type of action: Climate Mitigation

Climate resilience benefits: Very High

Timeline: Short to Medium term

Monitoring Indicators:

- % STPs powered by onsite solar PV or hybrid renewable systems.
- % reduction in grid electricity use compared to baseline year.
- GHG emissions avoided through biogas & renewable energy use (tCO_2e/year)

Strategy 3 - Financing Modes/Sources

APCRDA funds, State government grants and schemes, AMRUT, funding from multilateral development bank (World Bank, ADB, GEF), ESCO/RESCO models through PPP

Strategy 4: Adopt safe and sustainable faecal sludge treatment system

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Scientific treatment of fecal sludge	Percentage of faecal sludge treated	100%	100%	100%

Proposed Actions

Action 1: Ensure scientific management of faecal sludge from the existing village settlements for the near-term

Action details

Until full sewer network coverage is achieved, Faecal Sludge Treatment Plants (FSTPs) and co-treatment in central STPs are proposed. Private desludging operators will be empaneled and GIS-monitored to ensure safe sludge disposal.

Sub Actions

- Treatment of faecal sludge from existing settlements can be carried out by establishing an FSTP or co-treatment STP until the integration with city-level sewer network.
- Empanel private desludging operators, thereby scientifically enabling the emptying process as per GO 134.[27] **(Ongoing/Planned Partly)**
- Mandating the use of GIS-enabled tracking for all desludging vehicles and monitoring at the command control centre to ensure waste reaches the processing facility. **(Ongoing/Planned)**

Potential locations: Existing Settlements, STPs in the city

Implementing entities

Lead: APCRDA, ADCL

Supporting: Technology/service providers, academic/research institutes

Indicative cost:

Establishing a FSTP is approximately INR 7 million per kLD of treatment capacity

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Short term

Monitoring Indicators:

- % faecal sludge safely collected & treated vs total generation.
- % desludging operators empaneled & tracked through CCC.
- No. of unauthorized sludge disposal incidents & enforcement actions taken.

Good Practice:

Maharashtra has implemented co-treatment of faecal sludge in existing STPs, enabling nearby towns to discharge septage into larger treatment facilities, ensuring efficient use of infrastructure. Sludge volumes

[27] Faecal Sludge and Septage Management Policy and Operative Guidelines for Urban Local

and quality are monitored to avoid overloading. This approach optimizes resources, reduces operational costs, and promotes sustainable sanitation.

Strategy 4 - Financing Modes/Sources

APCRDA funds, State government grants and schemes, AMRUT, Smart City funds, funding from multilateral development bank (World Bank, ADB, GEF)

2.4 Stormwater Management

Baseline Status (2025)	**Key Statistics:** Amaravati is located downstream of the Kondaveeti Vagu catchment. Kondaveeti Vagu and Pala Vagu form a network of 31.15 km in the catchment, with approximately 11 km lying within Amaravati, where it eventually joins the Krishna River at Undavalli. Plans are in place to widen Kondaveeti and Pala Vagu to accommodate the anticipated increase in runoff. Three reservoirs are planned within the city and two more in the Kondaveeti Vagu catchment. The capacity of the existing Undavalli pumping station will be enhanced, and a new pumping station at Vykuntapuram will be constructed.
Existing Policy, Plans and Initiatives	**National Policy/Programme/Targets:** • GoI's AMRUT 2.0 • River Centric Urban Planning Guidelines (2021), MoHUA • Manual on Storm Water Drainage Systems (2019), CPHEEO • SMART City Mission. **State/Local Policy/Programme/Targets:** • AP Building Rules 2017. • AP ECBC guidelines. • Blue Master Plan • Completion of the first phase of flood mitigation works by 2028. • Completion of construction of underground stormwater drainage network by 2028.
Opportunities and Gaps	• The bund wall to block backwater of the Prakasam barrage entering the city necessitates mechanical engineering interventions for reaching the runoff into the River Krishna. • Preserving and integrating existing water bodies with the vagu network. • Demarcating the FTLs of existing water bodies. • Rainfall events taking place in the upstream catchment will impact the city. • Sedimentation carried by runoff can impact the operation of the pumping stations.

	• The effectiveness of mitigation strategies heavily relies on centralised pumping stations. • Responsibilities for protecting and maintaining water bodies are divided among multiple departments, resulting in a lack of coordination, compromising the maintenance operations and protection of the water bodies.
Climate Risk Scenario	**Climate Risk Status**: Extreme Due to the prevailing flat terrain of the Amaravati and black cotton soil permeability of the stormwater into the ground is very limited which converts the major extent of rainfall into runoff. Effective management of the runoff through interventions is required to avoid any instances of pluvial flooding and with anticipated high intense rainfall events the vulnerability of public infrastructure is high and disruption of day-to-day activities of the citizens.
Potential Climate Resilience Impact and Wider Co-benefits of Climate Actions	**Climate Resilience Impact and Co-benefits:** • Understanding the hydrological dynamics of stormwater is essential for identifying flood-prone areas. • Implementing strategies to mitigate urban flooding and its consequential impacts, including public health risks. • Constructing engineered retention basins and adopting nature-based solutions effectively reduces surface runoff and enhances groundwater recharge. • Rainwater harvesting and groundwater replenishment initiatives at the property level will significantly decrease pressure on limited freshwater resources.
SDGs	GOAL 3: Good Health and Well-being, GOAL 6: Clean Water and Sanitation, GOAL 11: Sustainable Cities and Communities, GOAL 12: Responsible Consumption and Production, GOAL 13: Climate Action, GOAL 14: Life under Water

Climate Strategies, Actions and Targets

Strategy 1: Adopt principles of Integrated Urban Water Management for effective stormwater management

Proposed Targets:

Action area	Target Parameter	2028	2043	2058
City network of stormwater	Stormwater network coverage	100%	100%	100%

Proposed Actions:

Action 1: Conserve and optimise utilization of natural water bodies and drainage network for runoff management and flood control

Action details

Amaravati's green field capital is planned on areas where the majority of land use is agriculture. This region contains a network of natural stormwater systems formed through vagus and water bodies. Preserving and expanding the use of this natural system for runoff management is crucial, as stormwater flow at a micro level will remain the same regardless of city-scale infrastructure. Any retention and detention measures can be planned along this natural network.

Existing Initiatives

APCRDA is working to identify the FTLs of existing water bodies nad conserving the natural drainage system. Additionally, widening works for the Kondaveeti vagu and Pala vagu to discharge runoff generated for a 1 in 100-year return period rainfall are underway. These enhancements are supported by increasing the pumping capacity at Undavalli and constructing another pumping station at Vykuntapuram, as planned in the Blue master plan.

Sub Actions:

- Demarcate and notify the Full Tank Levels of existing and proposed water bodies and drains (vagus).
- Map and communicate boundaries of natural stormwater system to government departments. Establish shared responsibilities for ecosystem protection.
- Notify and enforce legal actions against the encroachments of water bodies and vagus.
- Implement the identified measures to reduce runoff from each sub-catchment as identified in the flood mitigation study.
- Ensure the widening of the natural drainage network as per the flood mitigation plans to accommodate the increased runoff due to anticipated urbanisation and enforce protection measures supported with city-wide coverage of the storm water drain network.

- Ensure all water bodies are integrated with the flood mitigation network through the identification and protection of inlet and outlet channels for all existing and planned water bodies in the city.
- Define SOPs for year-round desilting and cleaning of water channels and water bodies to sustain the design capacities.
- Increase the capacity of the existing bund road to protect the surrounding areas from the backwaters of Prakasam barrage and accommodate higher traffic volumes.
- Protect the existing irrigation canals to handle expected excess runoff by converting them into stormwater channels and ensuring their durability.
- Assess sedimentation risk in the network of waterbodies and vagus and implement necessary measures.

Implementation agency

Lead: APCRDA, Water Resource Dept.

Supporting: ADCL, MA&UD

Type of action: Climate Adaptation

Timeline: Short to medium

Climate resilience benefits: High

Potential locations: Citywide

Monitoring indicators:

- Percentage of existing and planned waterbodies FTL notified.
- Percentage of existing waterbodies linked with the stormwater network.
- Percentage of waterbodies and length of stormwater network that conducted maintenance /desilting works in a maintenance cycle period.

Good practice:

Canal rehabilitation in Johannesburg, South Africa:
Canal rehabilitation aims to achieve a 100-year return period flood relief through a combination of reed removal, planting biodiverse vegetation, geo-matting to prevent soil erosion, and minimising reed growth.

Lake redevelopment in Ahmedabad:
The Ahmedabad Lake redevelopment links lakes to address waterlogging, insecurity, and groundwater depletion by integrating sustainable urban water management. It involves creating lake clusters with natural slopes, sluice gates, and valves for flow control, redeveloping waterfronts for recreation, installing sewage and stormwater drains, and desilting to increase storage.

Canal network rejuvenation in Kochi:

In 2019, Kochi faced extreme rainfall, and reduced canal water capacity was a key cause of flooding. Rejuvenating the canal system was vital for flood management. The Kochi Canal network rejuvenation involves implementing resilience actions identified by the technical committee. The Government of Kerala allocated around USD 3.2 million for structural measures. These included desilting, widening, clearing vegetation, removing debris, demolishing and reconstructing culverts, and widening canals to increase capacity.

Action 2: Establish a unified real-time monitoring system for all urban water systems to enable comprehensive water management.

Action details

A monitoring system providing real-time information on all water systems, including drinking water supply, groundwater, wastewater, and stormwater, enables better urban water circularity management. This reduces the need for external water intake and minimises the pumping of wastewater and stormwater runoff from the city to outside. The potable water demand can be met through drinking water supply, non-potable demands can be met with treated wastewater and stormwater, and the availability of these can reduce the raw water pumping demand and meet the future needs. The shortage of water supply is reflected in the extraction of groundwater. The stress on one system is reflected in the pressure building up on other system.

Implementation agency

Lead: APCRDA, Water Resource Dept.

Supporting: IMD, Research institutions, and Technology service providers.

Type of action: Climate Adaptation

Timeline: Medium

Climate resilience benefits: Medium

Potential locations: Citywide

Good practice:

Waternet, Amsterdam

Waternet, a public organization responsible for the entire water cycle, manages drinking water, wastewater, surface water, and flood control efficiently, sustainably, and with a focus on customer needs.

Strategy 1 - Financing Modes/Sources

AMRUT and APCRDA funds, CSR funds, Water Resource Department funds, multilateral development bank loan, and grants from donor agencies.

Strategy 2: Integrate green spaces with blue infrastructure and adopt decentralised flood resilience measures.

Proposed Targets:

Action area	Target Parameter	2028	2043	2058
Runoff management	Permeable/semi-permeable surface in footpaths	100%	100%	100%
Installation of the RWH system in the properties	Percentage of new properties with RWH system	100%	100%	100%
	Percentage of existing properties retrofitted with RWH system	10%	100%	100%

Proposed Actions:

Action 1: Mainstream nature-based solutions in land use planning and building regulations

Action details

Increasing flood resilience through the adoption of decentralised, nature-based solutions is cost-effective as it requires limited external materials and is mostly made of natural resources available locally. Integrating nature-based solutions into infrastructure offers greater benefits compared to standalone engineering solutions or solely nature-based ones. Allocating dedicated space for developing NBS solutions makes them unfeasible in urban settings where land costs are high and availability is limited. Incorporating these solutions into micro-level land use planning and mandating them at the property level enhances implementation and yields larger results.

APCRDA is adopting semi-permeable materials for the development of pathways/paving and parking areas and suggesting the same for individual developers as well.

Sub Actions:

- Conduct a city-scale study to assess the detention potential of green areas, prioritising high runoff sub-catchments that can be integrated with the stormwater network.
- Create rain gardens connected to conveyance channels for redirection.
- Mandate the utilisation of semi-permeable materials for pavements/pathways and parking.
- Promote the installation of percolation pits in all commercial and industrial premises.
- Adopt climate resilient street design by including solutions such as bioswales, innovative inlet design and weir walls to slow down run off and support effective rainwater retention and infiltration.

Implementation agency

Lead: APCRDA

Supporting: ADCL, Architects, Civil Engineers, Subject experts.
Indicative cost: Permeable pavers can vary from Rs. 40-100 per square feet depending on material[28]
Type of action: Climate Adaptation
Timeline: Short term
Climate resilience benefits: High
Potential locations: Citywide
Monitoring indicators: • Percentage of runoff absorbed through Nbs solutions. • Percentage of length of footpaths/pavements made with semi-permeable materials. • Percentage of commercial and industrial premises installed with percolation pits. • Percentage of installed NBS solutions for which maintenance works are completed in a maintenance cycle.
Good practice: **Sponge Park, Chennai:** In Chennai, parks feature pond-like formations and channels that capture and infiltrate rainwater in urban areas. These channels divert water from nearby roads into the pond through storm drains. The pond is surrounded by a stone barrier topped with a protective layer of railing. **Raincity, Vancouver, Canada:** The Raincity Strategy of Vancouver is a 30-year plan to manage rainwater as a resource, using green rainwater infrastructure like rain gardens, permeable pavements and green roofs, and the target is to capture 90% of annual rainfall and manage 40% of runoff from impervious areas by 2050.

Action 2: Ensure city-wide adoption of rainwater harvesting and its sustained operation

Action details

Introducing a decentralised runoff management system, with RWH systems installed at a plot level, helps capture runoff at its source. The systems can be emptied ahead of time when high-intensity rainfall is predicted, or the amount of runoff that can be captured can be used to reduce system surcharge time.

As mentioned in the AP building rules, APCRDA is mandating the construction of RWHs in all properties above 300 sq. m, and execution of the same will be verified during the building permission approval and issuance of the occupancy certificate.

[28] India Mart

Sub Actions:

- Mandate the construction of RWH systems in all properties with a plot area of >300 sq. m
- Include specifications on RWH design in building bye-laws stating that the minimum storage capacity should be able to accommodate peak-month rainfall runoff.
- Pilot AI and IoT-enabled monitoring and decision-making system.
- Establish a system to monitor the operation of RWHs periodically, link this analysis of runoff volume from each catchment to the censors' recordings. (Target properties with excess water utilisation).

Implementation agency

Lead: APCRDA, DTCP

Supporting: Architects, Civil Engineers, Real estate developers, Contractors, Technology/service providers

Type of action: Climate Adaptation

Timeline: Short to medium term

Climate resilience benefits: High

Potential locations: City-wide, with a focus on sub catchments 9, 10, and 12 for the pilot study.

Monitoring indicators:

- Percentage of properties installed with RWH systems.
- Percentage of properties installed with real-time monitoring sensors.
- Percentage of properties with real-time monitoring sensors receiving instructions on emptying or capturing the runoff.
- Percentage of installed RWH systems monitored in a cycle.

Good practice:

Residential Stormwater Smartgrid Utility Technology in Canada:
RainGrid's Residential Stormwater Smartgrid Utility Technology (RSSUT) manages rain runoff from rooftops, aiming to disconnect roofs from storm sewers and supply harvested water for recharge or use. It provides real-time rainfall data and micro-climate analytics for individual properties and networks. The system reduces stormwater runoff by 90% in cisterns serving roof areas.

Action 3: Incorporate a river-centric approach in land use planning

Action details

As the Amaravati is situated on the banks of the river Krishna, it is crucial to safeguard the existing ecosystem and biodiversity, avoiding disruption from changes in land use within the city limits. Preserving

the river ecosystem and maintaining flood plains as buffer zones minimises the risk by reducing exposure to hazards.

APCRDA will maintain a buffer of 100 meters from the Krishna River line, and the riverfront development plans are being carried out with minimal interventions to preserve the natural ecosystem.

Sub Actions:

- Prevent concretization of river bank and adopt ecological and people-centric development following natural hydrogeology.
- Designate and notify no-construction areas based on comprehensive flood risk assessments (both extreme and most probable flooding scenarios).

Implementation agency

Lead: APCRDA, Water Resource Dept.

Supporting: DTCP, AP Urban greening and beautification Corporation Ltd.

Type of action: Climate Adaptation

Timeline: Short to medium term

Climate resilience benefits: Medium

Potential locations: Along the Krishna riverbank

Good practice:

Urban River Management Plan, Kanpur:
The Urban River Management Plan of Kanpur aims to sustainably integrate the Ganga and Pandu rivers into the urban landscape. It designates a 100-meter no-development zone for Ganga and a 30-meter zone for Pandu to protect their riverfronts. This plan is intended as a living document for future updates, detailed project reports, and adaptive management. It encourages community ownership, coordinated governance, and long-term river health.

Strategy 2 - Financing Modes/Sources

AMRUT and APCRDA funds, CSR funds, multilateral development bank loan, and grants from donor agencies.

Strategy 3: Effective monitoring, forecasting and readiness to respond to extreme climate events.

Action 1: Implement Early Flood Warning System.

Action details

Based on the rainfall forecasting information for Amaravati and the overall Kondaveeti Vagu catchment, runoff generated upstream of the Kondaveeti catchment flows through Amaravati before reaching the Krishna River. This could cause a flood-like situation in Amaravati even without any rainfall if not prepared. The planned network within the city can be developed to manage the anticipated runoff based on forecasting data, including the expected volume and velocity of runoff, supported by an early warning system. In extreme events, flood-prone areas can be identified, and communities within those areas can be informed and prepared.

APCRDA is planning to install a network of AWS stations that will be integrated into a central monitoring system. Also, warning dissemination is in place in a few existing villages, which can be implemented throughout the city.

Sub Actions:

- Deploy a network of automated weather stations with a lower recording interval (preferably 15 minutes) across all city sub-catchments and upstream vagu/drainage areas and integrate data with the Command and Control Centre (CCC).
- Install sensors to monitor water level and flow rates in all water bodies, vagus, and the underground stormwater network.
- Implement upstream flow monitoring systems to pre-emptively regulate water levels in water bodies and prevent urban flooding.
- Integration of all the existing rain gauges in the Kondaveeti vagu catchment with CCC and replace them with automatic weather stations over time.
- Develop a robust warning dissemination mechanism. Form community groups trained in interpreting public alerts and in emergency response coordination. Establish evacuation routes using hydrological and spatial information and local community knowledge.

Implementation agency

Lead: APCRDA, IMD, Water resource department (Go. A.P)

Supporting: SDMA, Krishna River Management Board, Health Department, NGOs, Police Department, RWAs, and Community associations.

Indicative cost: INR 1 million for 1 AWS[29]

Type of action: Climate Adaptation

Timeline: Short to medium term

Climate resilience benefits: High

Potential locations: Kondaveeti catchment and city wide

Monitoring indicators:

- Percentage of sub catchments installed with AWS systems.

[29] The Hindu, 39-more-automatic-weather-stations-installed-in-kerala-ahead-of-monsoon, 2022

- Percentage of sub catchments for which runoff is measured.
- Percentage of waterbodies installed with monitoring sensors.
- Percentage of rainfall events monitored based on forecasting information.

Good practice:

Community-based flood forecasting and early warning system in Semarang, Indonesia:
Early flood warning system in Semarang, involve local communities in regular risk mapping exercises by documenting their knowledge and identifying potential communication and coordination features, including but not limited to evacuation routes and flood protection shelter management. These preparedness efforts help communities become better equipped to respond in case of floods.

Action 2: Develop a comprehensive flood analysis system and mechanism to minimise urban flood risk.

Action details

Flood risk of an urban area depends on the rate of urbanisation, which includes changes in land use, infrastructure development, and modifications of the natural storm drainage network. The analysis to forecast the risk should be updated promptly with these modifications. Forecasting analysis helps in taking necessary measures before an event occurs, and infrastructure can be planned to mitigate the risk. As flood risk analysis is a continuous process, in-house capacity building reduces dependency on external resources and utilises the crucial minimum time available for emergency response activities. Integrating infrastructure proposals can help identify the probability of expected outcomes and provide final verification before proceeding with execution.

Sub Actions:

- Develop a predictive flood modelling system to map catchment-wise exposed areas and flood extents. Periodically update model parameters to support accurate runoff modelling.
- Build institutional capacities for flood data analysis and effective information dissemination to government departments and the public.
- Install a network of real-time monitoring sensors in the near-term to validate and calibrate flood modelling analysis, while improving forecasting accuracy.
- Maintain comprehensive rainfall and flood event records including rainfall data (hourly intensity, duration), exposure levels (spatial extent, duration and maximum depth of water logging specific to locations), and damage assessments to enhance future flood risk studies and planning.

Implementation agency
Lead: APCRDA, SDMA
Supporting: Andhra Pradesh Space Applications Centre, Andhra Pradesh State Planning and Development Society, Academic institutions, and Research organisations.

Type of action: Climate Adaptation

Timeline: Short to Medium

Climate resilience benefits: High

Potential locations: City-wide and Kondaveeti vagu catchment
Monitoring indicators: • Annual updation of runoff influencing variable parameters with reference to on-ground changes. • Percentage of flood events recorded and data records available for future reference. • Percentage of error in estimated results (spatial extent, runoff quantity, failure points) with actual results.

Strategy 3 - Financing Modes/Sources
APCRDA funds, Water resource department funds, SDMA funds, multilateral development bank loan, and grants from donor agencies.

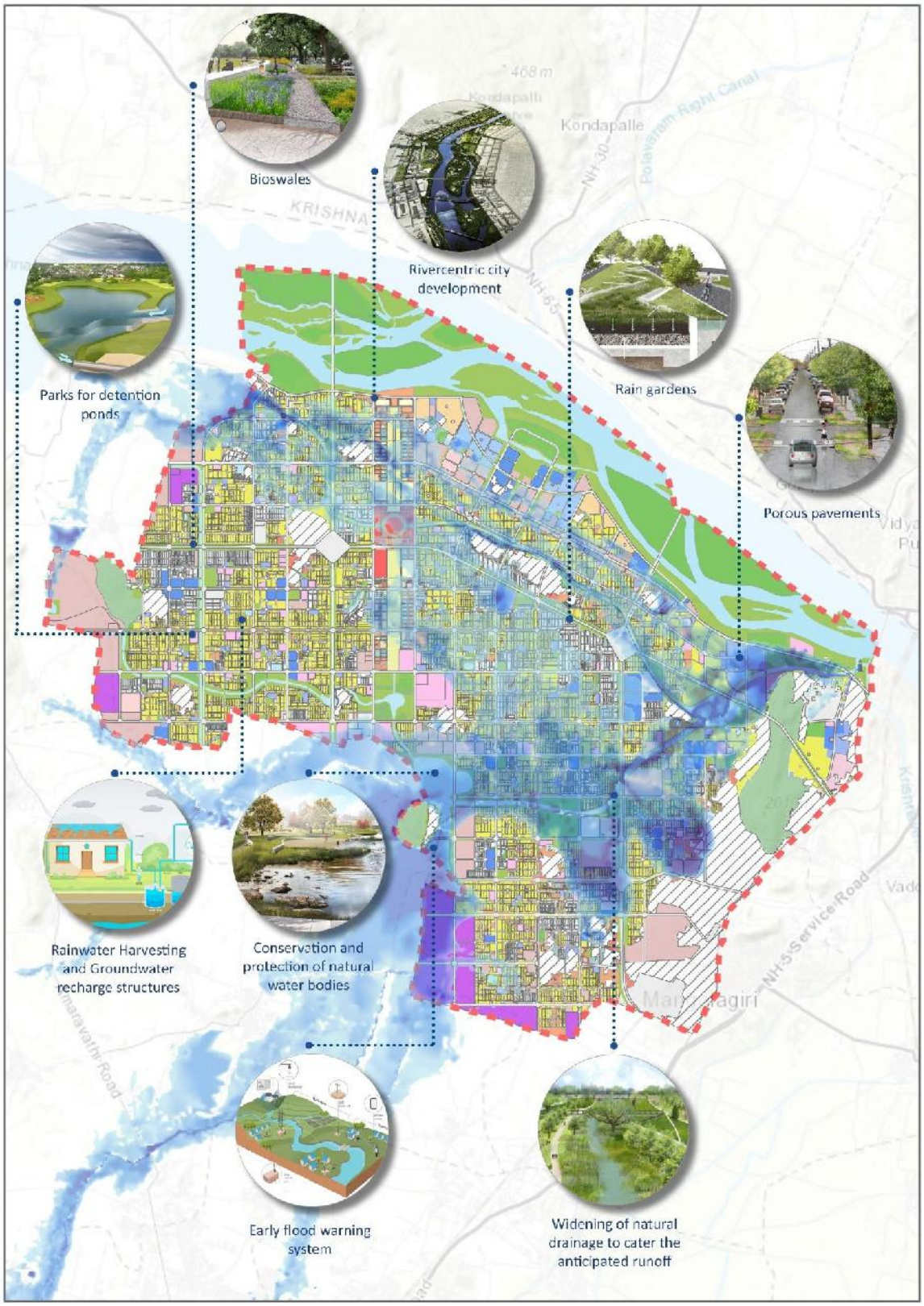


Figure 2-2: Interventions for Urban Flooding

Integrating Interventions to Improve Resilience to Urban Flooding in Amaravati

Addressing rainwater runoff surcharging the Vagu network is essential to reducing flood risk vulnerability. It is important to implement actions that focus on minimizing runoff generation and effectively managing runoff through engineering and nature-based solutions. Stormwater management planning starts with conserving and protecting natural water bodies and drainage systems.

Amaravati is situated on the banks of the River Krishna and upstream of the Prakasam barrage. A river-centric design that protects the river's ecology and encourages interaction between citizens and nature needs to be planned, with the capacity of its existing bund road running along the River Krishna to be enhanced to accommodate higher traffic movement and enhance protection of surrounding areas against backwater of the Prakasam barrage. Identifying and notifying the boundaries of lakes and vagus in the city is crucial for protection and legal enforcement against encroachments over time. Since Amaravati lies in the lower reaches of the Kondaveeti Vagu catchment, most runoff passes through the city before reaching the River Krishna. The design measures for widening of Kondaveeti Vagu should accommodate upstream runoff and the anticipated runoff from developed spaces and infrastructure in Amaravati. Additionally, the existing irrigation canals that previously served the irrigation needs should be preserved, even though the irrigation demand is expected to significantly reduce once urbanization increases. However, the canals will still assist in channeling rainwater runoff out of the city.

Reducing runoff generation is fundamental to effective stormwater management. Using nature-based solutions is both effective and cost-efficient. Incorporating bio-swales and rain gardens in green buffer zones along the roads E5, E10, N6, N7, N9, and N13 can help. Maintaining land cover porosity through porous pavements and parking areas aids in groundwater recharge and aquifer replenishment, which will be crucial during events of erratic and low rainfall. Decentralized solutions such as rainwater harvesting structures and recharge pits should be mandated across properties through building guidelines and codes. Additionally, strict enforcement through monitoring cells once properties are occupied is essential to ensure compliance and continued utility of such solutions.

Detention ponds in parks can serve as temporary storage basins that capture and slowly release stormwater, reducing peak runoff and mitigating urban flood risks. Planning a detention pond network that spans across parks in different zones and neighbourhoods is important. This intervention requires a detailed study, identification of relevant priority parks, and designing runoff diversion systems. An early flood warning system provides additional preparation time and enables communication with vulnerable groups to increase proofing measures and coordination with authorities. Automatic rain gauges and sensors should be installed throughout the Kondaveeti Vagu catchment to monitor rainfall, water levels, velocity, and rainfall on a real-time basis, especially as high-intensity rainfall events are anticipated to become more common. The data specific to each rainfall event, including information on the spatial extent of waterlogging, depth, and duration, must be collated and made available for effective mitigation measures in the future. This meticulously recorded long-term historical data helps validate models and in turn supports flood protection.

2.5 Solid Waste Management

Baseline Status (2024-25)	**GHG Emissions:** 15,983 tCO_2e (7.7% of total GHG emissions) **Key Statistics:** • Total waste generation: 70 MT, 100% door-to-door collection • Waste composition: Wet waste (51%), Dry waste Recyclables (11%), Dry waste RDF (26%) and Inert (12%) • Waste to Energy: 56 TPD, Landfill disposal: 14 TPD • 2.25 lakh metric tonnes of legacy waste were bioremediated at Kolanukonda in 2023-24
Existing Policy, Plans and Initiatives	**National Policy/Programme/Targets:** • GoI's Swachh Bharat Mission[30] 2.0 supporting solid waste management infrastructure • National Policy on Biofuels, 2018[31] • Sustainable Alternatives for Affordable Transportation (SATAT)[32] • 15th FC and National Clean Air Programme (NCAP) • Waste to Energy Programme, 2022 **State/Local Policy/Programme/Targets:** • Clean Andhra Pradesh (CLAP) programme supporting source segregation and door-to-door collection • Formulation of Andhra Pradesh Integrated Municipal Solid Waste Management Strategy 2014, which aims for 100% door-to-door collection, 100% segregation and 100% treatment and scientific disposal in all ULBs • Andhra Pradesh State Sanitation Strategy, 2016 promotes recycling of wastewater and proper collection, conveyance, treatment and disposal system and treatment of sludge from on-site installations.
Opportunities and Gaps	• Limited segregation at source, collection, and transport of mixed waste leads to inefficient processing. • Littered solid waste blocks sewerage and stormwater drains during extreme rainfall. • Awareness campaigns for source segregation and promoting reduce, reuse and recycling to boost the circular economy
Climate Risk and GHG Emissions Scenario	**GHG Emissions:** **GHG Emissions in BAU scenario (tCO_2e)** **2024** | **2028** | **2043** | **2058** 8,370 | 36,042 | 64,239 | 152,996 **Climate Risk Status: Medium** | Medium risk during high temperature and high intensity rainfall • High intensity rainfall events increase the moisture content and weight of the solid waste, making it difficult to collect, transport and process subsequently.

[30] Swachh Bharat Mission (Urban), Ministry of Housing and Urban Affairs (MoHUA), Accessed 7 January 2025.
[31] Ministry of Petroleum and Natural Gas, National Policy on Biofuels, 2018.
[32] Targets Under SATAT Scheme, Press Information Bureau, 2022.

<table>
<tr><td></td><td>

During high-intensity rainfall, littered solid waste is likely to get washed into drains, blocking outflow and resulting in water stagnation. This aggravates the flood situation, leading to a public health menace.
Higher temperatures may cause fires at open dumpsites, causing toxic gas emissions and creating health risks to the neighbourhood.

</td></tr>
<tr><td>Potential Climate Resilience Impact and Wider Co-benefits of Climate Actions</td><td>
GHG Mitigation Potential and Indicative Cost of Interventions:
<table>
<tr><th rowspan="2">Parameters</th><th colspan="3">Climate Action Scenario</th></tr>
<tr><th>2028</th><th>2043</th><th>2058</th></tr>
<tr><td>GHG Emissions in Climate Action Scenario (tCO2e)</td><td>36,042</td><td>52,904</td><td>123,245</td></tr>
<tr><td>GHG emissions reduction from BAU</td><td>-</td><td>18%</td><td>19%</td></tr>
<tr><td>Total cost of mitigation actions by 2058 (Million INR)</td><td colspan="3">11,297</td></tr>
</table>
Climate Resilience Impacts and Co-benefits:

Achieving higher resource efficiency and promoting a circular economy
Enhancing public health outcomes
Reduced GHG emissions from effective waste treatment

Strengthened Resilience to Hazards:
Urban flood, cyclones
</td></tr>
<tr><td>SDGs</td><td>GOAL 3: Good Health and Well-being, GOAL 6: Clean Water and Sanitation, GOAL 7: Affordable and Clean Energy, GOAL 9: Industry, Innovation and Infrastructure, GOAL 11: Sustainable Cities and Communities, GOAL 12: Responsible Consumption and Production, GOAL 13: Climate Action, GOAL 15: Life on Land</td></tr>
</table>

Climate Strategies, Actions and Targets

Strategy 1: Adopt 3R principles and decentralised processing at source

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Enforcement of Source segregation	Percentage of source segregation	100%	100%	100%

Proposed Actions

Action 1: Promote decentralised processing of wet waste at households through home-composting

Action details

Promoting the decentralised processing of wet waste at households through home composting to manage biodegradable waste at the source. Home-composting reduces the burden on municipal solid waste

management infrastructure, decreases landfill usage, and mitigates greenhouse gas emissions from unprocessed organic waste.

Sub Actions

- IEC campaigns to raise awareness on practices and solutions for home composting
- Encourage early practitioners by providing composting kits at discounted rates.
- Develop a system to record the households/non-bulk waste generators (BWGs) practicing composting.
- D2D collection staff to verify adherence to on-site composting practices by households and properties and report non-compliance.

Potential locations: City-wide with focus on Residential colonies, High-rise apartments, Gated communities, zones with rooftop gardening initiatives

Implementing entities

Lead: APCRDA

Supporting: SAC, RWAs, NGOs

Indicative cost:

City level awareness Campaign - INR 2-2.5 crores for a city with 10 lakh population[33]

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Short term

Monitoring Indicators:

- Number of households practising home-composting
- Amount of wet waste processed in home composting per month (tonnes)
- Number of IEC campaigns conducted
- Reduction in organic waste sent to transfer stations and centralized processing/landfill

Good Practice:

Indore has achieved 100% door-to-door collection and citywide source segregation through sustained IEC campaigns, GPS-tracked collection vehicles, decentralized processing facilities, and strict enforcement. This integrated system has enabled Indore to maintain the top rank in Swachh Survekshan for multiple years.

The Sunya model, implemented in select wards of **Udaipur**, Coimbatore and Siliguri, focuses on decentralized waste segregation and processing at ward level. It uses trained collection staff, community participation, and localized composting or recycling units, reducing transportation cost and landfill dependency.

San Francisco's Mandatory Recycling & Composting Ordinance, enacted in 2009, makes it compulsory for all residents and businesses to separate their waste into recyclables, compostables and landfill using a three-bin collection system. By 2010, the city's compost rate increased by 45%, growing from 400 to 600 tons per day.

[33] Estimates based on previous assessments of ICLEI South Asia.

The **European Union's** comprehensive waste framework directive establishes a five-step waste hierarchy (prevention, preparation for reuse, recycling, recovery and disposal). The directive targets to achieve 55% of municipal waste for reuse and recycling by 2025, increasing to 65% by 2035.

Action 2: Establish compost pits in parks for on-site treatment of garden waste and implement flower waste processing into incense sticks and cones.

Action details

By treating garden and flower waste on-site in Amaravati's proposed parks and supporting innovative reuse of flower waste, the city could reduce the amount of waste transported to treatment sites.

Sub Action

- Promote management of flower waste by supporting engagement of religious places with service providers.
- Engage flower waste recyclers with event organisers, community halls.

Potential locations: Community parks and urban gardens, Major religious temples and prayer halls, Community halls

Implementing entities

Lead: APCRDA

Supporting: ADCL, Organisations/ startups, Event and function organisers, Religious place administrators, NGOs

Indicative cost:

CAPEX: INR 12 lakhs for a 0.9 TPD capacity flower waste plant[34]

INR 35,000–40,000 per garden for basic twin-pit composting systems[35]

INR 3.5–4 lakh for engineered aerobic pits with a civil structure in gardens[36]

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Short term

Monitoring Indicators:

- Number of compost pits established and operational
- Tonnes of garden/flower waste processed per park/month
- Number of events/organisations linked to recycling initiatives
- Number of religious places/events adopting the circular waste approach

Good Practice:

At Mahakaleshwar temple in **Ujjain**, daily 5-6 tons of floral and religious waste is recycled into incense sticks, cones and compost by local SHGs and startups, reducing river pollution and creating livelihoods.[37]

[34] Solid Waste Management Initiatives in Urban India: A Compendium, NIUA, 2019
[35] MC to construct compost pits in 100 Chandigarh parks, Times of India, 2018
[36] Waste to manure: Chandigarh civic body refloats tender for compost pits in parks, Times of India, 2020
[37] Flower Power: India's Temple Waste Transformation, PIB, 20th September 2024

Tirupati city processes over 6 tons of daily floral waste from temples, converting it into valuable products and employing around 150 self-help group women. Recycling takes place at the Tirumala Tirupati Devasthanam agarbatti plant, with products packaged in recycled and plantable Tulsi seed paper to ensure a zero-carbon footprint.[38]

Action 3: Conduct IEC and Behavior Change Communication (BCC) campaigns

Action details

As Amaravati is a new city, training people to manage waste properly from the inception will be beneficial in the long run. By doing so, the city will be able to follow NGT directives on waste management and encourage people to segregate their waste at the source for better processing and recycling.

Sub Actions

- Conduct IEC activities to improve the segregation, recycling and waste reduction.
- Establish annual public recognition and certification programs to recognize best-performing citizens, sanitation workers, and D2D in source segregation and innovative waste reduction practices.
- Conduct public exhibitions on 3R themes with a focus on reuse and waste minimization practices.

Potential locations: City-wide

Implementing entities

Lead: APCRDA, SAC

Supporting: Bulk waste generators, NGOs, RWAs

Indicative cost:

City level awareness Campaign - INR 2-2.5 crore for a city with 10 lakh population[39]

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Short term

Monitoring Indicators:

- Number of IEC/BCC events conducted monthly
- Number of households reached through campaigns
- Number of schools/institutions that participated
- Number of D2D collection staff trained
- Percentage of total households practising segregation
- Number of public recognitions/certifications awarded

Good Practice:

Trichy city boosted source segregation by launching the Students@Clean Trichy contest in June–August 2018 across 350–365 schools, distributing Green Report Cards to 1.5–1.7 lakh students whose parents and sanitary workers countersigned to verify daily segregation at home; 1,100 students won prizes (e.g., bicycles). As a result, waste segregation is increased from 70% to 100%, reducing waste quantity reaching

[38] Floral Waste is boosting circularity in economy — Press Information Bureau, Government of India
[39] Estimates based on previous assessments of ICLEI South Asia.

landfill, enabling full use of micro-composting centres, generating jobs for 677 SHG women, and reducing the secondary collection vehicles for waste transportation from 28 to 18.

Indore city conducted a wide range of IEC activities, including traditional, audio-visual, print, electronic, and social/digital media, which played a pivotal role in driving behavioural change. Innovations such as street plays, wall paintings, and FM radio were constantly updated by incorporating new thematic awareness messages to be communicated. Major cultural events, such as the Ganesh festival and Gandhi Jayanti, were utilized as platforms to disseminate the awareness message of cleanliness.

Action 4: Notify and implement green protocol guidelines for eco-friendly material use and waste management at community gatherings.

Action details

Implementing green protocol guidelines enables Amaravati to address waste reduction at its source, reduce plastic pollution, increase waste recycling, and minimise extra waste from mass gathering events, thereby supporting a circular economy.

Sub Actions:

- Promote use of alternate, eco-friendly, reusable materials (bio-degradable packaging, cloth banner, steel) for mass gathering events.
- Mandate prior approval of community celebrations with specifications of key materials and waste-generating items to be used.
- Mandate requirements for proper waste storage with appropriate segregation protocols during all mass gathering events.

Potential locations: Citywide with focus on all major event venues, large open spaces designated for festivals or celebrations, and frequent or large gatherings.

Implementing entities

Lead: APCRDA

Supporting: SAC, Event organizers, NGOs

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Short term

Monitoring Indicators:

- Number of large events with prior approval as per green protocol guidelines
- Number of events with 100% source segregation and waste collection
- Share of biodegradable/recyclable material use in total event-generated waste

Good Practice:

Kerala's Suchitwa mission promotes zero-waste events by banning single-use plastics, mandating the use of reusable or biodegradable materials, and enforcing strict waste segregation.[40]

[40] Suchitwa Mission (The State Nodal Agency for Sanitation) Local Self Government Department Government of Kerala

Gurugram city has established two steel utensil banks in sectors 10 and 48, which have approximately 2,000 sets of utensils each. These utensil banks provide residents with utensils free of charge, discouraging them from using disposable plastics.[41]

Action 5: Efficient collection and recycling of E-Waste.

Action details

Amaravati is projected to generate around 198 tonnes of e-waste per day by 2058, which demonstrates the need for effective recycling and environmentally sound methods of disposal.

As per EC directives, Amaravati city must facilitate the establishment of E-waste Collection Centers by producers and ensure e-waste is sent to authorized recyclers or dismantlers.

Sub Actions:

- Notify and enforce CPCB guidelines for handling E-waste with clearly defined responsibilities for manufacturer, producer, refurbisher or recycler, consumers, recyclers, concessionaires.
- Map and engage all key stakeholders for integrated e-waste management.
- Establish a collection system for collecting e-waste from MRFs and bulk consumers such as the proposed Quantum Valley and IT parks.
- Equip MRFs with E-waste dismantling facilities and mandate to segregate and dismantle e-waste fractions coming in the MSW stream.
- Integrate the e-waste management value chain-specific information into the command control centre by adding a separate module for e-waste.
- Ensure the collection and processing of solar photovoltaic modules.
- IEC activities to raise awareness on e-waste management.

Potential locations: City-wide with focus on IT Parks (such as proposed Quantum Valley, IT offices), residential, commercial and institutional zones.

Implementing entities

Lead: APCRDA

Supporting: APPCB, SAC, E-Waste Recyclers, NGOs and RWAs.

Indicative cost:

INR 48 lakh for plant and machinery with a capacity of 1,500 tonnes per annum for an e-waste recycling plant[42]

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Short term

Monitoring Indicators:

- Quantity of e-waste collected from bulk generators
- Number of MRFs equipped with e-waste dismantling

[41] Documentation of Best Practices on 3R's (Reduce, Reuse, Recycle) — MoHUA and GIZ, 2023.
[42] Electrical and Electronic Equipment Waste Recycling — Council on Energy, Environment and Water, accessed 28th September 2025.

- Quantity of e-waste safely recycled/disposed (Tonnes/year)
- Number of IEC activities conducted on e-waste management
- Quantity of solar PV waste separately collected and recycled

Good Practice:

Namo E-waste operates collection centres across 12 states and union territories, arranging pickups and transporting electronic waste to its recycling plant in Faridabad to extract reusable parts and sustainably dispose of the rest in an environmentally friendly manner.

Switzerland operates one of the most robust national e-waste systems globally through EPR. It is financed by an advanced recycling fee paid by consumers at the time of purchasing electronic equipment. Recycling companies such as SWICO and SENS coordinate the collection and recycling of waste electrical and electronic equipment.

Strategy 1 - Financing Modes/Sources

State and APCRDA budget, SBM 2.0, AMRUT, 15th FC, CSR, PPP, Development banks, CSR contributions

Strategy 2: Ensure efficient waste collection and transportation

Proposed Target

Action Area	Target Parameter	2028	2043	2058
City-wide coverage of MSW collection And transportation	Percentage of waste collected and transported	100%	100%	100%

Proposed Actions

Action 1: Ensure 100% collection across solid waste management operations (for both in-house and third-party services).

Action details

To ensure 100% coverage of waste collection in Amaravati's greenfield city, it is essential to adopt real-time information technology across all SWM operations to prevent the formation of garbage vulnerable points.

Existing Initiative

As outlined in the SWM Master Plan 2016, Amaravati city has already planned to equip waste collection vehicles with GPS tracking systems, enabling waste managers to monitor and track the vehicles.

Sub Action

- Ensure 100% daily waste collection with real-time monitoring through QR codes and GPS-enabled vehicles integrated with centralized command control systems. **(ongoing/planned)**

• Commission transfer stations and secondary transportation system to accommodate unloading and dispatch of segregated waste stream to designated processing facilities • Implement performance-based contractor payments linked to daily coverage of designated areas by waste collection vehicles. • Equip transfer stations with weighbridge systems that have real-time integration for automated waste quantum monitoring and streamlined contractor payments
Potential locations: City-wide, transfer stations, waste processing sites
Implementing entities **Lead:** APCRDA **Supporting:** SAC, technology service providers
Indicative cost: Costing for transfer stations: INR 10 crores for 100 TPD transfer station including pre-sorting line[43] INR 8 crores for 10 lakh population size ULB (only for SWM module integration in CCC)
Type of action: Climate Adaptation
Climate resilience benefits: Medium
Timeline: Short term
Monitoring Indicators: • Number of properties mapped on GIS for monitoring of waste collection • Integration of D2D vehicles with QR & GPS tracking • Quantity of segregated vs mixed waste reaching transfer stations
Good Practice: **Vijayawada** city has implemented QR code-enabled RFID tags to monitor waste collection, installed smart bins and equipped collection vehicles with GPS for effective route monitoring, resulting in effective door-to-door waste collection. **Kakinada** city has adopted the Facial Recognition System (FRS) technology to register sanitation worker attendance and ensure that all sanitation staff reach their assigned reporting locations on time, thereby delivering effective waste management collection.

Action 2: Establish specialized waste collection mechanisms for non-routine and oversized residential waste.
Action details A demand-based collection system should be established, where residents can request on-demand pickup of bulky waste (e.g., furniture, mattresses, appliances) and small quantities of construction & demolition (C&D) debris from household repairs. These items should be collected separately and taken to proper facilities for safe recycling or disposal to prevent illegal dumping and recover valuable materials.

[43] Estimates based on previous assessments of ICLEI South Asia.

Sub Actions • Establish on-demand collection & dismantling services for bulky household items and small-scale C&D waste from residential repairs • Develop SOPs for residential ceremonial/event waste collection (outside standard BWG protocols)
Potential locations: City-wide with focus on Residential and commercial zones
Implementing entities **Lead:** APCRDA **Supporting:** SAC, RWA, event organisers
Type of action: Climate Adaptation
Climate resilience benefits: High
Timeline: Short term
Monitoring Indicators: • Number of demand-based pickups requested and fulfilled • Quantity of bulky waste collected and recycled
Good Practice: In **Indore** city, the households are covered by the door to door collection system while the semi bulk and bulk generators are covered by the on-demand bulk collection system.

Strategy 2 - Financing Modes/Sources
APCRDA and State budget, PPP, SBM 2.0, 15th FC, grant from donor agencies and multilateral development bank loan, CSR

Strategy 3: Enforcing extended bulk waste generators' responsibility (EBWGR)[44] practices for waste minimization and on-site processing

Proposed Actions

BWGs (Resident Welfare Associations, Gated Communities, Restaurants, Commercial complexes, Institutions) are identified based on the criteria indicated below,

- Buildings with a floor area of 20,000 sq. m. or above
- Water consumption of 5000 litres per day
- Solid waste generation of 100 kg per day

[44] Draft Solid Waste Management Rules 2024

Action 1: Establish a dedicated team to monitor and facilitate EBWGR implementation.
Action details A dedicated team should be deployed to monitor the BWGs process their organic waste on-site. This approach will reduce the amount of waste sent to treatment plants and generate local value through the production of compost or biogas at the source. In accordance with NGT and EC directives, all bulk waste generators must segregate waste at the source and ensure all wet waste is processed by composting or biomethanation within their premises. **Sub Actions** • Ensure on-site processing of complete wet waste generated by the BWGs through inspection and suitable incentive and recognition measures. • Maintain an updated list of BWGs through coordination between multiple departments (town planning, water supply, solid waste management). • Create public awareness on the implementation of activities and regulatory requirements as per EBWGR guidelines. • Conduct regular inspections to monitor the performance and efficiency of onsite waste treatment facilities. • Identify and engage with organizations, service providers to support BWGs with on-site waste treatment.
Potential locations: City-wide
Implementing entities **Lead:** APCRDA **Supporting:** SAC, RWA, BWGs
Indicative cost: INR 40 Lakh for Organic Waste Composting Machine for processing 1.5 tonnes per day; INR 2.3 lakh for Large Scale Composting Pits for processing 130 kg per day[45]
Type of action: Climate Adaptation
Climate resilience benefits: Medium
Timeline: Short term
Monitoring Indicators: • Number of BWGs with functioning on-site wet waste treatment • Quantum of organic waste processed at source • Number of workshops/awareness programs conducted on wet waste treatment at on-site • Number of BWG incentives/recognitions awarded
Good Practice: **Ranchi** city deployed nine dedicated teams to oversee compliance by BWGs. These teams include sanitary supervisors, food inspectors and enforcement officers. They conduct daily inspections, monitor source

[45] Advisory on On-Site and Decentralized Composting of Municipal Organic Waste. Ministry of Housing and Urban Affairs, 2018

segregation, issue notices to violators and ensure the continuous supply of wet waste to compressed biogas plants at Jhiri.

Action 2: Implement quantum-based fees for services to collect and transport dry waste from BWGs.

Action details

BWGs that do not have their own on-site composting facilities should be charged a service fee based on the quantity of waste. The implementation of this action will encourage BWGs to reduce, segregate, and manage their waste more sustainably.

Sub Actions

- Equip waste collection vehicles with portable weighing equipment for on-site quantification at generation points.
- Establish daily logging systems for efficient user charge calculation and billing.

Potential locations: City-wide with focus on Commercial and Institutional zones, Hotels, Hospitals, and High-rise Residential zones, Start-Up Areas

Implementing entities

Lead: APCRDA

Supporting: SAC, RWA, BWGs

Type of action: Climate Adaptation

Climate resilience benefits: Medium

Timeline: Short to Medium term

Monitoring Indicators:

- Number of BWGs identified and enrolled in quantum-based fee program
- Quarterly reduction trends in total waste generated per BWG
- Increase in segregation rate at source among BWGs

Good Practice:

Bengaluru city enforces a quantum-based fee system for BWGs. Those BWGs without in-situ composting or dry waste processing must pay a service fee of INR 12 per kg for collection and processing; those with on-site processing pay INR 3 per kg. These service fees are regularly reviewed and are intended to recover the costs associated with dedicated dry waste collection and transportation services.

Many **European states** have adopted the Pay As You Throw (PAYT) model, which discourages individuals from producing excess waste by directly linking the waste fee to the actual quantity of waste generated.

Strategy 3 - Financing Modes/Sources

State and APCRDA Budget, SBM 2.0, 15th FC, PPP, CSR fund

Strategy 4: Maintain cleanliness in public places and water courses.

Proposed Actions

Action 1: Impose a spot fine against littering and open dumping.
Action details Deploy special teams throughout Amaravati to impose strict fines for littering and open dumping, with a special focus on high-footfall areas such as AGC, commercial stretches, bus stops, terminals, depots, and railway stations, as well as river or canal promenades. By implementing spot fines for littering and open dumping, Amaravati will reduce such incidents and ensure compliance with environmental regulations and directives issued by the NGT. **Sub Action** Install AI-enabled smart bins[46] at suitable intervals in public places
Potential locations: City-wide
Implementing entities **Lead:** APCRDA **Supporting:** SAC, technology service providers
Indicative cost: INR 1.9 lakh for one solar-powered bin with a capacity of 120 litres[47]
Type of action: Climate Adaptation
Climate resilience benefits: Medium
Timeline: Short term
Monitoring Indicators: • Number of AI-enabled smart bins installed and operational • Number and frequency of spot fines issued
Good Practice: **Vijayawada** city has installed 45 smart bins and 32 smart semi-underground garbage collection bins at various locations. All these bins are equipped to send real-time alerts to authorities after they are filled.[48] **Singapore** has installed solar-powered "BigBelly" smart bins that include compactor units, fill-level sensors and Wi-Fi hotspots. These smart bins use sensors to track the amount of waste deposited and automatically send alerts via email or text message to cleaners when they are nearly complete. The built-in compactor allows each bin to hold up to eight times as much rubbish as a standard bin, enhancing waste collection efficiency.[49]

[46] AI-based device, designed for public places, enabling them to simplify recycling. It sorts and compresses the waste automatically, controls the fill level and processes data for convenient waste management.
[47] Smart Dustbin With Solar Panel, Indiamart, 2025.
[48] Waste-Wise Cities Best Practices in Municipal Solid Waste Management, NITI Aayog, 2021
[49] Solar-powered smart bins that act as Wi-Fi hot spots launched at Orchard Road, The Straits Times. 2016.

Action 2: Enforce strict regulation on the disposal of festival waste and ensure regular cleaning of watercourses.
Action details Adopting strict regulations and standard operating procedures for the disposal of festival waste in Amaravati's greenfield city is essential to protect local water resources, maintain ecological balance and public health. Improper disposal of festival waste, particularly during idol immersion and associated rituals, frequently results in substantial pollution of watercourses, introducing harmful chemicals, microplastics, and non-biodegradable debris that degrade water quality and harm aquatic life. **Sub Actions** • Provision of artificial ponds with suitable post-treatment for environmentally safe idol immersion. • Use synthetic liners in specific river stretches to capture idol debris and enable efficient cleanup. • Install floating screens/mesh systems at regular intervals along water channels to capture and contain debris.
Potential locations: City-wide with focus on the Krishna River Banks, Kondaveeti vagu, temple sites near water bodies, water bodies in neighborhoods
Implementing entities **Lead:** APCRDA **Supporting:** APPCB, Water Resources Department
Indicative cost: INR 12,000–20,000 per meter of floating screen[50]
Type of action: Climate Adaptation
Climate resilience benefits: Medium
Timeline: Short
Monitoring Indicators: • Number of water quality tests performed in waterbodies (before/after major festivals) • Number of artificial ponds constructed • Quantity of waste captured from floating screens/mesh (in tonnes)
Good Practice: The **Greater Hyderabad Municipal Corporation** has installed floating trash barriers across key nalas and lakes to intercept solid waste before it enters major water bodies, such as Hussain Sagar, thereby improving cleanup efficiency and reducing downstream pollution. Introduced drone-based monitoring and surveillance integrated with a command control centre for monitoring littering, especially around waterfront areas, areas with more floating population and after festival and mass gathering events. During the Ganesh Chaturthi festival, the **Brihanmumbai Municipal Corporation (BMC)** deployed drones to monitor immersion sites, track idol processions, and crowd movements in real-time, ensuring

[50] Heavy Duty Safety Floating Barrier and Trash Boom, Adart Publicity, Indiamart,

compliance with waste disposal norms. The BMC has established 288 artificial ponds across Mumbai, designating 68 natural water bodies for immersing idols taller than six feet. According to the SOP, public organisations are responsible for managing the artificial ponds, where idol remnants will be retained in the tanks for a minimum of 15 days before being collected for subsequent processing.

Strategy 4 - Financing Modes/Sources
State and APCRDA funds, SBM 2.0, Donor grants, CSR funds, PPP

Strategy 5: Efficient handling of Construction and Demolition Waste

Proposed Actions

Action 1: Implement 100% C&D waste collection to achieve zero open dumping.
Action details Setting up the city-wide C&D waste collection centres will cater to the massive construction waste that is going to come up in the greenfield city of Amaravati, will facilitate organised disposal and prevent illegal dumping on vacant plots. In accordance with NGT and EC directives, C&D waste must be collected separately and sent to dedicated recycling facilities. According to the SWM Master Plan 2016, Amaravati city is expected to generate about 105.7 lakh tonnes of C&D waste by 2058. **Sub Actions** • Adopt a demand-based collection system dedicatedly to larger as well as smaller C&D waste volumes from minor repairs of buildings to ensure timely collection in lieu of pre-defined charges on the basis of quantity and distance • Ensure timely collection of C&D waste to prevent illegal dumping in nearby vacant lands. • Establish a wider network of temporary C&D collection centres during the initial construction phase with improved collection frequency. • Imposition of fines on property owners, real estate developers, and contractors for the open dumping of C&D waste. • Identify the producer of C&D waste as per the Environment (Construction and Demolition) Waste Management Rules, 2025 and ensure EPR compliance[51]
Potential locations: City-wide with focus on construction sites
Implementing entities **Lead:** APCRDA **Supporting:** APPCB, C&D waste generator, contractors and real estate developers
Type of action: Climate Adaptation
Climate resilience benefits: High

[51] "producer" means a waste generator, who is occupier or in charge of a building or building complex project having a built-up area of 20000 square meters and above;

Timeline: Short term
Monitoring Indicators: • Quantity of C&D waste collected vs. estimated generation • Number of illegal C&D waste dumping cases detected and fined • Number and location of C&D drop-off centers operational • Quantity of C&D waste collected, processed and recycled
Good Practice: **Pimpri Chinchwad** addressed illegal C&D waste dumping through a third-party engagement contract by implementing GPS tracking on collection vehicles and applying strict penalties. Authorised private agencies are responsible for the collection and transportation of C&D waste exclusively to designated C&D waste transfer stations. As a result, illegal dumping of C&D waste has decreased.[52]

Action 2: Deploy processing infrastructure with flexibility to handle initial peak C&D generation volumes and meet long-term needs.
Action details Planning and designing C&D waste storage and processing plants will help Amaravati meet both its ongoing and future construction needs. In line with NGT and EC directives, C&D waste should be collected separately and sent to dedicated processing facilities. To enable this, Amaravati city should involve private contractors to strategically plan and set up a dedicated C&D waste transfer station and processing facility. **Sub Actions** • Set up an intermediate waste storage facility at the city level to cater to ongoing construction until the C&D processing plant is operational. • Ensure that the establishment of the processing facility does not degrade air quality by adopting water sprinklers, covering debris during transport, and storing it in collection and processing centers. • Establish a C&D processing facility with the potential to enhance capacity as needed.
Potential locations: City-wide with focus on active construction sites
Implementing entities **Lead:** APCRDA **Supporting:** APPCB
Indicative cost: INR 17 – 20 Crores for a 1000 TPD capacity C&D plant[53]
Type of action: Climate Adaptation
Climate resilience benefits: Medium
Timeline: Short to Medium term

[52] Factsheet: C&D Waste Management in Pimpri-Chinchwad, Centre for Science and Environment.
[53] Guide on Business Models and Economic Assistance for Municipal Solid Waste Projects, Ministry of Housing and Urban Affairs, 2025

Monitoring Indicators:

- Quantity of C&D waste stored, processed and recycled
- Air quality readings near active construction facilities (PM2.5, PM10 and dust levels)

Good Practice:

Gurugram city has a C&D waste processing plant with a 1,500 TPD capacity and has collected nearly 1.2 million tonnes of C&D waste from unclaimed dumpsites, processing around 3.5 lakh tonnes. The city has made significant progress in primary waste collection, on-call removal, grievance redress, and the implementation of penalties for non-compliance with C&D waste management rules.

Action 3: Ensure the maximum reuse of C&D-treated waste.

Action details

Mandating the reuse of recycled C&D materials will boost the circular economy in Amaravati's construction sector.

The ready reckoner developed by the Building Materials and Technology Promotion Council provides comprehensive guidance to policymakers, urban planners, contractors, and civic bodies for the management, processing, and utilization of recycled C&D waste.[54]

Sub Actions

• Establish requirements through the building approval process for submission of C&D waste utilization plan for large sites (> 20,000 sq. m. built-up area) .

• Develop a digital portal that provides real-time material availability and facilitates early material requests.

• Facilitate partnerships between C&D waste processors and product manufacturers.

Potential locations: City-wide (all large construction sites)

Implementing entities

Lead: APCRDA

Supporting: DTCP, contractors, real estate developers

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Short term

Monitoring Indicators:

- Quantity of recycled C&D materials used
- Number of construction projects using the products of recycling of C&D waste, especially in affordable housing, government buildings and public places.

Good Practice:

[54] Utilisation of Recycled Produce of Construction & Demolition Waste, Building Materials & Technology Promotion Council, Ministry of Housing & Urban Affairs, 2018.

In **North Delhi**, the Burari C&D processing plant scientifically processes 2,000 TPD of mixed C&D waste into recycled aggregates that are converted to make ready-mix concrete, cement and hollow bricks, paver blocks, kerbstones and concrete blocks, thereby reducing demand for construction raw material. Notably, more than 16 lakh recycled concrete blocks have been utilized in the construction of the new Supreme Court building.[55]

Strategy 5 - Financing Modes/Sources

State and APCRDA budget, SBM 2.0, NCAP, AMRUT and PPP mode

Strategy 6: Decarbonise the MSW value chain by integrating sustainable technologies appropriate to waste fractions

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Sustainable waste processing and disposal infrastructure	Percentage of waste sent to composting facilities	0%	13%	13%
	Percentage of waste sent to bio-methanation/bio-CNG facilities	0%	10%	10%
	Percentage of waste recovered for recycling at material recycling facilities (MRF)	0%	5%	5%
	Percentage of waste sent to waste-to-energy facilities	88%	60%	60%
	Percentage of waste sent to sanitary landfill	12%	12%	12%
	Extent of landfill gas capture	80%	80%	80%
Electrification of waste collection vehicles and services	Use of electric vehicles in waste collection and management	100%	100%	100%

Proposed Actions

Action 1: Conduct scientific techno-financial viability of various types of processing technologies.

Action details

To conduct a comprehensive techno-financial assessment of municipal solid waste management (MSWM) processing technologies planned for Amaravati. The Business Models & Economic Assistance for MSW Projects Reference Guide offers practical guidance for cities on technology selection, financial planning and environmental management to establish sustainable, economically viable waste processing infrastructure.

Sub Actions

- Assess physico-chemical composition and properties of generated waste periodically

[55] Waste-Wise Cities Best Practices in Municipal Solid Waste Management, NITI Aayog, 2021

- Conduct market assessment to identify the potential revenue generation from recycled and processed waste products.
- MSWM processing facilities to comply with environmental norms.

Potential locations: City-wide with focus on waste processing and transfer station facilities

Implementing entities
Lead: APCRDA
Supporting: APPCB, consultants, research and academic institutions, technology service providers

Indicative cost:
Composting Plant: Rs. 2 Crores per 100 TPD of waste, **Biomethanation Plant:** Rs. 30 – 35 Crores per 100 TPD of waste, **Mechanized MRF Plant:** ~12 lakhs per TPD, **Waste to Energy Plant**: Rs. 23 – 29 Crores per 100 TPD capacity excluding cost of land, **Construction and Demolition Plant:** Rs. 17 – 20 Crores for a 1000 TPD capacity plant[56]

Type of action: Climate Mitigation

Climate resilience benefits: Medium

Timeline: Short term

Monitoring Indicators:

- Number of viable processing technologies identified and evaluated
- Total revenue generated from recycled and processed products
- Number of waste processing facilities compliant with pollution norms

Good Practice:

Pune city has established a 300 TPD PPP-based compressed biogas (CBG) facility that uses anaerobic digestion to process organic food waste into CBG and organic manure. The city pays a tipping fee of INR 570 per tonne to partially offset processing costs, given market-linked CBG pricing, with CBG sales routed through oil marketing companies retail networks under the SATAT scheme. The plant is estimated to operate at a roughly 20% margin, with approximately INR 12 crore in annual revenue, implying a payback period of 5 to 7 years.

Stockholm city achieved a 30% increase in recycling efficiency through the use of optical sorting technology, with 55% of municipal solid waste being recycled and 40% converted into energy, resulting in a reduction in landfill dependency to 5%.

Action 2: Explore the adoption of Bio-CNG facilities for wet waste processing

Action details

Prioritising modular bio-CNG facilities that process pure wet waste ensures the efficient utilisation of organic waste streams, maximising renewable energy recovery while minimising methane emissions from landfills. These facilities promote a circular economy by converting waste into clean energy and valuable organic fertilisers, reducing dependency on fossil fuels, and mitigating climate change.

[56] Guide on Business Models and Economic Assistance for Municipal Solid Waste Projects, Ministry of Housing and Urban Affairs, 2025

As per EC directives, Amaravati shall ensure daily collection of waste from markets and the installation of decentralized composting or biomethanation plants within these markets.

Sub Actions

- Identify establishments that generate pure wet waste (vegetable markets)/neighbourhoods/ wards that practice 100% segregation.
- Determine appropriate technology by evaluating feedstock type, plant location, capital cost, output gas yield, and O&M expenses.
- Adopt modular plant design to initiate wet waste processing in targeted areas and scale-up progressively
- Enable bio-CNG off-take by city gas distribution entities or gas marketing companies.

Potential locations: City-wide with focus on vegetable, fruit and flower markets, areas with established 100% source segregation and Bulk wet waste generators

Implementing entities
Lead: APCRDA
Supporting: NREDCAP, APPCB, SAC

Indicative cost:
Bio-CNG Plant: Rs. 25 Crores for a 100 TPD capacity plant

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Short term

Monitoring Indicators:

- Bio-CNG generated per tonne of processed wet waste
- Revenue generated through bio-CNG and related by-products.

Good Practice:

Indore Municipal Corporation (IMC), the cleanest city in India, has set up a 550 TPD centralised CBG plant on a PPP mode. At full capacity, the plant produces 17 TPD of CBG. Thus, by replacing fossil fuel with CBG generated from this plant to run waste trucks, the facility contributes to 1,30,000 tCO_2e GHG emissions reduced per year.[57]

France implements a progressive roll-out of separate food waste collection, processing organic waste through a network of biomethane injection and anaerobic digestion facilities, which inject into the GRDF gas network. The target is to increase capacity from 1,320 GWh in 2019 to 12 TWh by 2023.[58]

Action 3: Implement effective dry waste recycling and adopt market-driven secondary segregation for higher market value.

[57] Advisory on CBG Plants Based on Municipal Solid Waste, SBM 2.0, 2025
[58] Biomethane: the future of natural gas. GRDF. Accessed on 30th September 2025.

Action details

Design and implement scientifically optimized dry waste recovery infrastructure. Commissioning MRFs with automation and segregation lines ensures efficient and high-quality recovery of recyclables and RDF, diverting significant waste from landfills and abatement of methane emissions.

Sub Actions

- Select automation levels appropriate to technology and feedstock type.
- Explore setting up small scale semi-automated MRFs at transfer stations for enhanced waste stream processing and recovery
- Equip the centralised MRF with segregation lines for waste categories as identified in characterization studies to recover high quality recyclables
- Establish a prior agreement with the off-takers (recyclers for recyclables, cement plants such as Nagarjuna Cement or Penna Cement for RDF co-processing) on the guaranteed quantity, pricing, and frequency of off-take.
- Implement Extended Producer Responsibility (EPR) enforcement through collaboration between Producers, Importers and Brand Owners (PIBOs) and MRF operators
- Promote plastic reuse as construction material with robust quality control. Ensure shredded plastic availability for road construction, implement mandatory utilization policies, and support R&D.
- Study the feasibility of implementing a small-scale plastic waste to fuel refinery plant. The plant can convert plastic to crude oil which can then be refined to automotive grade diesel or petrol.

Potential locations: City-wide

Implementing entities

Lead: APCRDA

Supporting: APPCB, SAC, recyclers, cement plants, PIBOs for EPR enforcement

Indicative cost:

Mechanized MRF Plant: ~12 lakhs per TPD

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Short to Medium term

Monitoring Indicators:

- Quantity and quality of recovered recyclables and RDF delivered to off-takers
- Quantity of shredded plastic supplied for road construction and adherence to quality standards

Good Practice:

To move towards the 'zero waste to landfill' city, **Indore** Municipal Corporation, in PPP mode with Nepra Resource Management Private Ltd. has set up 300 TPD fully automated MRF to scientifically manage and maximise economic return from the dry waste generated in the city. About 10% of the MRF input is recovered as high-quality recyclable, while 90% is shredded and sent to a cement plant as RDF for co-

processing. [59] By recycling the single-use plastic items, this plant has supported Indore to become the first ULB in India to earn EPR credit.

The first "PlasticRoad" in **Zwolle**, Netherlands was a pioneering project where a 30 metre cycle path entirely built from prefab, modular and hollow blocks manufactured from recycled plastic in place of traditional materials.

Action 4: Commission sanitary landfill for scientific waste disposal and equipped with integrated methane capture system.

Action details

Establish a scientifically designed sanitary landfill (SLF) facility[60] in Amaravati for the environmentally compliant disposal of inert materials and process rejects generated from waste processing activities.

Amaravati has significant potential to reduce greenhouse gas emissions, by maximizing methane capture from its sanitary landfill and converting it into valuable renewable energy to power its waste processing facilities or feed into the local energy market. Exploring excess methane supply agreements with gas marketing companies to supply methane gas to consumers by integrating circular economy principles.

Sub Actions

- Develop environmentally compliant sanitary landfill with long-term capacity design (20-25 year)
- Deploy integrated leachate management for environmental protection and landfill gas (LFG) capture system to maximise methane utilisation as alternative energy source
- Minimize landfill dumping through reduced process rejects and inerts and performance monitoring of processing facilities
- Explore partnerships with gas marketing companies for off-take of any excess methane generation

Potential locations: The landfill site is proposed in Zone III as per the solid waste management master plan

Implementing entities

Lead: APCRDA

Supporting: APPCB, SAC, landfill operators, gas marketing companies

Indicative cost:

Sanitary Landfill cost: INR 15 crores for 20 TPD inert and reject disposal at a 6.25-acre area[61]

Type of action: Climate Mitigation

Climate resilience benefits: Very High

Timeline: Short term

Monitoring Indicators:

- Annual quantity of inert and process reject waste disposed of in the landfill

[59] Discussion with Nepra Resource Management Private Ltd.
[60] A Ready Reckoner for Selection of Technologies for Management of Municipal Waste, Ministry of Housing and Urban Affairs, 2017.
[61] Solid Waste Management Practices In Urban India: A Compendium, NIUA, 2019.

- Efficiency and functionality of leachate treatment and LFG capture and utilization systems
- Conduct performance audits of the landfill

Good Practice:

As part of the integrated municipal solid waste management facility in **Hyderabad**, ReSustainability Limited has started capturing gas from the capped landfill through strategically placed wells. The landfill gas is being purified, converted to automotive fuel and marketed through Bhagyanagar Gas Limited (BGL).

Texas city has deployed methane gas detectors to monitor methane levels in the landfill. These detectors connect to a centralized data system, enabling landfill operators to track and analyze methane emission trends continuously. This data will help the operator increase efficiency in methane capture and ensure compliance with regulations.

Action 5: Deploy integrated digital monitoring systems in all MSW operations for real-time tracking of quality, quantity & environmental compliance.

Action details

By integrating monitoring processes for the quality and quantity of all MSW inputs (waste collected) and outputs (processed/recycled/landfilled), as well as critical environmental compliance parameters, directly with the city's Command & Control Centre (CCC), Amaravati will maintain a high standard of transparency, accountability, and responsiveness. As a result, the city can better enforce regulations, optimize resource use and proactively address environmental concerns, significantly improving overall waste management performance.

Potential locations: City-wide with focus on all MSW collection zones at source, waste processing plants, transfer stations and sanitary landfills.

Implementing entities

Lead: APCRDA

Supporting: APPCB, SAC, Treatment Facility Operators (MRF, composting, WtE, landfill contractors), technology service providers

Indicative cost:

INR 8 crores for 10 lakh population Size ULB (only for SWM module integration in CCC)

Type of action: Climate Mitigation

Climate resilience benefits: High

Timeline: Short to Medium

Monitoring Indicators:

- Percentage of MSW collection and processing sites integrated with CCC data reporting.
- Number of staff trained on digital monitoring technologies and protocols.

Good Practice:

Bengaluru city has introduced ICT tools, such as RFID attendance system and geotagging of collection routes, to monitor its waste management services. The Ezetap mobile app facilitates real-time monitoring

of areas prone to garbage and imposes penalties on offenders. Together, these measures achieved 100% door-to-door garbage collection and eliminated garbage-vulnerable points across the city.[62]

Action 6: Electrify solid waste vehicle fleet and integrate renewable energy into SWM operations.

Action details

This action focuses on transforming Amaravati's solid waste management services by adopting electric vehicles (EVs) for the collection and transportation fleet, installing EV charging stations at key operational sites, and integrating on-site renewable energy generation, primarily solar, into day-to-day facility operations and by shifting from diesel or petrol vehicles to electric and powering these vehicles with locally produced renewable energy.

Sub Actions

- Adopt EVs for the solid waste collection and transportation fleet
- Deploy EV charging stations at transfer stations and parking lots of the waste management fleet
- Integrate renewable energy into the operations of facilities such as transfer stations, processing facilities and fleet EV charging stations

Potential locations: City-wide with a focus on transfer stations and waste processing facilities

Implementing entities

Lead: APCRDA

Supporting: SAC, NREDCAP, EV charging service providers

Indicative cost:

15 lakhs per one waste electric vehicle

Financing Modes/ Sources:

State and APCRDA budget, SBM 2.0, 15th FC, PPP mode, CSR funds, grant from donor agencies, multilateral development bank loan

Type of action: Climate Mitigation

Climate resilience benefits: Very High

Timeline: Short

Monitoring Indicators:

- Number of EV Waste Management fleet
- Number of EV Charging Points Installed
- Percentage of EV Fleet Powered by On-Site Renewable Energy

Good Practice:

Guntur city has introduced over 200 electric autos for door-to-door garbage collection replacing diesel trucks with electric vehicles equipped with GPS for real-time tracking. The EV shift has eliminated the need for 71,000 litres of diesel each year, mitigating GHG emissions by around 21,000 tonnes over ten years and improving air quality.

[62] Waste-Wise Cities Best Practices in Municipal Solid Waste Management, NITI Aayog, 2021

Belgrade city has implemented an innovative waste management system integrating renewable energy within SWM. The city combines a waste-to-energy plant and a biogas engine plant for landfill gas utilization, both of which feed electricity and thermal energy not only to the waste management facility but also to the city grid and district heating system. The facility generates about 216 GWh of electricity and 174 GWh of heat yearly, all from MSW and landfill gas.

Strategy 6 - Financing Modes/Sources
State and APCRDA budget, SBM 2.0, 15th FC, PPP mode, CSR funds, grant from donor agencies, Ministry of New and Renewable Energy grants, Urban Challenge Fund , Climate finance and concessional loans from multilateral development banks (e.g., World Bank, ADB, GEF), PPP mode

2.6 Transportation

<table>
<tr><td>Baseline Status (2024-25)</td><td>GHG Emissions: 31,405tCO₂e (11.3% of total GHG emissions)
Centrally located in Amaravati Capital Region, well-connected regionally via Vijayawada/Guntur rail hubs, two NH corridors, and Vijayawada International Airport.
Daily mobility dominated by private two-wheelers and autos/IPT, no formal intra-city public transport operating in Amaravati.
APSRTC services halted during COVID-19, some village routes not resumed as of 2024, reducing inter-settlement accessibility.
Existing population commute to Vijayawada and Guntur for work and education</td></tr>
<tr><td>Existing Policy, Plans and Initiatives</td><td>National Policy/Programme/Targets:
Voluntary Vehicle-Fleet Modernisation Program (V-VMP)
Scheme to promote manufacturing of electric passenger cars
National Clean Air Action Plan 2019
National Urban Transport Policy
State/Local Policy/Programme/Targets:
New Andhra Pradesh Sustainable Electric Mobility Policy (4.0), 2024-29
AP Logistics Policy, 2022-27
Transit Oriented Development (TOD) Policy, 2022
City Policy/Programme/Targets:
1,693 km total roads, including 593 km major and 1,100 km internal roads with dedicated NMT paths.
168 km of mass transit corridors (BRT/MRT) planned within the city by 2050
100% of roads designed with dedicated pedestrian and cycling infrastructure.
City plans to achieve 80% passenger trips through non-motorized, mass transport and electrically powered vehicles by 2050</td></tr>
<tr><td>Opportunities and Gaps</td><td>Greenfield context enables early deployment of integrated BRT/MRT, grid bus feeders, and NMT-first street design.
Persuading citizens to shift from private modes requires strong policy incentives, fare structures, awareness, and reliability in service.
Scope to align high density, mixed use and transit corridors early on, which can support ridership and reduce private vehicle dependence
Strong regional anchors (Vijayawada/Guntur) can seed high-ridership intercity corridors and seamless multimodal hubs.
Electrified IPT can bridge last-mile gaps during transition phases
Need clearer phasing, funding, and governance capacity (depots, terminals, O&M, EV charging) to operationalize plans.</td></tr>
<tr><td>Climate Risk and GHG Emissions Scenario</td><td>GHG Emissions:<table><tr><th colspan="4">GHG Emissions in BAU scenario(tCO₂e)</th></tr><tr><th>2024</th><th>2028</th><th>2043</th><th>2058</th></tr><tr><td>31,405</td><td>29,656</td><td>287,726</td><td>710,347</td></tr></table>Climate Risk Status: Medium | Medium risk during high temperature and high intensity rainfall</td></tr>
</table>

<table>
<tr><td></td><td>

During high-intensity rainfall and urban flooding, the water overflows onto the roads, leading to restricted mobility and hindering connectivity with other areas and hampering productivity.
Increased temperature leads to preference of air-conditioned private transport modes and hinders non-motorised mobility such as walking and cycling.

</td></tr>
<tr><td>Potential Climate Resilience Impact and Wider Co-benefits of Climate Actions</td><td>
GHG Mitigation Potential and Indicative Cost of Interventions:
<table>
<tr><th rowspan="2">Parameters</th><th colspan="3">Climate Action Scenario</th></tr>
<tr><th>2028</th><th>2043</th><th>2058</th></tr>
<tr><td>GHG Emissions in Climate Action Scenario (tCO2e)</td><td>77,821</td><td>162,665</td><td>233,094</td></tr>
<tr><td>GHG emissions reduction from BAU</td><td>2%</td><td>43%</td><td>67%</td></tr>
<tr><td>Total cost of mitigation actions by 2058 (Million INR)</td><td colspan="3">31,022</td></tr>
</table>
Climate Resilience Impacts and Co-benefits:

Shift to public, electric, and non-motorized transport lowers GHG emissions and improves air quality.
Resilient transport networks minimise disruptions from climate-related events, ensuring more reliable service.
Active mobility modes and cleaner transport systems promote healthier, safer, and more liveable communities.

Strengthened Resilience to Hazards:
Urban flood, Heat and cyclones
</td></tr>
<tr><td>SDGs</td><td>GOAL 3: Good Health and Well-being, GOAL 7: Affordable and Clean Energy, GOAL 8: Decent Work and Economic Growth, GOAL 11: Sustainable Cities and Communities, GOAL 12: Responsible Consumption and Production, GOAL 13: Climate Action; GOAL 15: Life on Land</td></tr>
</table>

Climate Strategies, Actions and Targets

Strategy 1: Develop an integrated public transit system

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Establish a reliable, city-wide public transportation system	Mode share of Public Transport	24%	46%	46%

Proposed Actions

Action 1: Deploy a city-wide electric public bus system in near to mid-term

Action details

Establish a clean, reliable electric bus system with charging depots, solar shelters, and centralized fleet management to provide immediate, sustainable mobility options during Amaravati's early development phase

50 e-buses have been allocated under the Government of India's PM e-Bus Sewa scheme

Sub Actions:

- Conduct an early-stage demand survey among current residents, government employees, and workers to estimate demand, identify priority bus routes, optimal bus stop locations and frequency. **(ongoing/planned)**
- Develop a phased implementation roadmap of electric buses, aligned with projected population, key institutional and commercial destinations and early stage ridership potential.
- Deploy an electric bus fleet to serve the city's mobility requirements during the initial 3 to 5 years of infrastructure development. 50 E-buses have already been allocated to Amaravati under the Government of India's 'PM e-Bus Sewa' scheme **(ongoing/planned)**
- Install prefabricated solar powered bus shelters for interim use, with the ability to relocate them as the city develops.
- Develop electric bus depots with required civil works, electric transformers, fast/slow chargers, vehicle washing systems and driver rest zones.
- Integrate public bus system with a centralised Command Control Centre for performance monitoring, route optimization and fleet management.

Implementation agency

Lead: APCRDA

Supporting: ADCL, Transport Department, APSRTC, Research Organizations, Technology service providers

Estimated targeted scale

Number of Electric buses required[63]:

2028: 135

[63] Number of buses estimated based on projected mode share and considering 30 buses per 1lakh population as per the Service level benchmarks

2043: 537
2058: 1133

Indicative cost:

Cost for bus procurement:
2028 – 2025 million INR
2043 – 8055 million INR
2058 – 16,995 million INR

Type of action: Climate Mitigation

Timeline: Short to Medium term

Climate resilience benefits: High

Potential locations: Citywide

Monitoring indicators:

- Number of e-buses deployed and operational
- Average km travelled per bus per day and dead km travelled per bus per day
- Annual average passenger ridership

Good practice:

Pune has pioneered the procurement and operation of electric buses, integrating two exclusive depots and solar-powered infrastructure. In parallel, it has retrofitted and expanded pedestrian and cycling infrastructure under a "complete streets" model, improving multimodal access.

Action 2: Expand to develop an integrated, high-capacity and scalable public transit system

Action details

Plan and expand public transit system such as Bus Rapid Transit (BRT), Metro, and LRT corridors with multimodal hubs, ensuring scalable, future-ready mass transit that integrates with land-use and provides seamless connectivity across Amaravati.

APCRDA is conducting a study for phased development of the public transit system. BRT will serve as the core system, with upgrades to MRT as demand increases.

Sub Actions:

- Use travel demand modelling to plan BRT, Metro and LRT systems as the city population increase.
- Develop multimodal hubs, terminals and depots to ensure seamless transfers between public transit, IPT and NMT. **(ongoing/planned)**
- Integrate route planning, ticketing, fare capping and service scheduling across all public transport systems. **(ongoing/planned)**
- Establish threshold or triggers to guide upgrades in the transit system.
- Design transit infrastructure with universal design principles, sustainable and climate-responsive features.

Implementation agency

Lead: APCRDA

Supporting: Andhra Pradesh Metro Rail Corporation Ltd. (APMRC), Transport Department, APSRTC, Research Organizations

Type of action: Climate Mitigation

Timeline: Medium to Long term

Climate resilience benefits: Very High

Potential locations: Citywide

Monitoring indicators:

- Km of BRT, Metro, LRT proposed as per demand vs operational
- Daily ridership for each transit system
- Percentage of multimodal hubs functional among the transit hubs
- Percentage increase in public transport mode share annually
- Average trip time saving due to PT

Good practice:

Pune adopted a comprehensive, data-driven mobility planning approach under its Comprehensive Mobility Plan (CMP) and Pune Metro and BRT expansion programs. The city used travel demand modelling and GIS-based simulations to plan future transit corridors for BRT, Metro, and suburban rail, aligned with projected population and land-use growth

Action 3: Strengthen first and last mile connectivity

Action details

Develop feeder services, shaded walkways, cycling routes, and micro-mobility hubs to ensure seamless, safe, and affordable last-mile connectivity between residential areas, commercial areas, workplaces, and public transport nodes.

The city network features cycle tracks and shaded walkways according to the proposed street designs, and construction of this infrastructure is currently underway.

Sub Actions:

- Integrate first and last mile solutions such as e-autos, feeder vans, and shuttle services linked to public transport terminals and stations.
- Ensure cycle tracks, shaded walkways, and secure parking at terminals. **(ongoing/planned)**
- Prioritize development of shared mobility hubs and micro-mobility zones around key intersections, employment hubs, government offices, commercial, institutional and recreational spaces.
- Enable real-time integration between last-mile providers and public transport systems for seamless integration.
- Develop land use and building regulations, Urban design and architectural guidelines to promote mixed-use and transit-oriented development around transit corridors.

Implementation agency

Lead: APCRDA

Supporting: ADCL, Auto unions, Taxi unions, APMRC, Technology Service Providers

Type of action: Climate Mitigation

Timeline: Short term

Climate resilience benefits: High

Potential locations: Citywide

Monitoring indicators:

- Percentage of transit nodes with feeder services and
- Percentage of transit nodes having access to footpath and cycle tracks
- Regular passenger satisfaction surveys on comfort, accessibility and safety

Good practice:

Bengaluru's Metro partnered with WRI India and private operators like Yulu and MetroRide to launch app-based e-auto and e-bike feeder services. The initiative integrates real-time metro schedules, shaded walkways, and secure cycle parking at stations, improving accessibility, reducing congestion, and promoting clean last-mile mobility.

Singapore's Land Transport Authority developed the Walk-Cycle-Ride strategy integrating cycling paths, pedestrian zones, and shared mobility around MRT stations. Through the SimplyGo multimodal app, over 1,300 km of cycling paths ensure seamless, low-carbon connectivity, boosting public transport ridership and reducing car dependency.

Action 4: Implement an integrated fare and ticketing system

Action details

Implement a unified QR/NFC-based fare collection system across modes, enabling seamless transfers, fare capping, and accessible multilingual platforms that enhance passenger convenience and improve operational efficiency

Sub Actions:

- Deploy QR-based, near field communication (NFC)-enabled ticketing across modes
- Offer fare capping, transfer discounts, and integrated tourism passes to promote public transit use
- Ensure multilingual, accessible, user-friendly ticketing interfaces compatible with diverse payment systems.

Implementation agency

Lead: APCRDA

Supporting: APSRTC, APMRC, Payment and Technology Service Providers
Type of action: Climate Mitigation
Timeline: Short to Medium term
Climate resilience benefits: Medium
Potential locations: Citywide
Monitoring indicators: • Percentage of PT modes under single ticketing platform • Share of digital ticketing transactions • Average transfer time saved for passengers
Good practice: **Kochi** introduced the Kochi1 smart card usable across metro, buses, and other modes. City rolled out electronic ticketing machines (ETMs), vehicle location tracking, and passenger information systems under a PPP model, structuring revenue sharing with private operators.

Action 5: Promote low-carbon public transit technologies
Action details Adopt advanced technologies such as regenerative braking, lightweight materials, and smart HVAC systems in buses and metros to improve energy efficiency, reduce operating costs, and minimize emissions. **Sub Actions:** • Mandate adoption of energy-efficient design features such as regenerative braking, smart HVAC systems and lightweight composite materials in transit vehicles. • Install onboard driver advisory systems to optimize acceleration, braking and energy consumption patterns.
Implementation agency **Lead:** APCRDA **Supporting:** APSRTC, APMRC, Technology Service Providers
Type of action: Climate Mitigation
Timeline: Short to Medium term
Climate resilience benefits: Medium
Potential locations: Citywide
Monitoring indicators:

- Percentage of fleet with energy-efficient technologies
- Energy saved (in kWh) per year from regenerative systems
- GHG emissions avoided annually.

Strategy 1 - Financing Modes/Sources

APCRDA budget, PPP models such as Gross Cost Contracting (GCC), Central government funding under 'Transport Planning and Capacity Building in Urban Transport for metro and non-metro projects' for research studies, National Clean Air Action Plan funds, loans/grants from multilateral development banks and donor agencies

Strategy 2: Enable and prioritize Non-Motorized Transport (NMT)

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Promote non-motorized mobility	Percentage modal share for Non-Motorized Transport (walking and cycling)	20%	24%	25%

Proposed Actions

Action 1: Establish citywide NMT infrastructure

Action details

Design and implement shaded sidewalks, cycle tracks, and PBS systems with wayfinding, secure parking, and PT integration to encourage safe, accessible, and continuous non-motorized transport across Amaravati

100% city network features cycle tracks and shaded walkways according to the proposed street designs, and construction of this infrastructure is currently underway.

Sub Actions:

- Design a continuous network of dedicated cycle tracks, shaded sidewalks and pedestrian priority streets.
- Install dedicated NMT signage, wayfinding maps and digital boards at key public spaces and transit hubs.
- Deploy a technology-enabled Public Bicycle Sharing (PBS) system integrated with app-based booking, docking and payment features.
- Ensure all PT terminals and major bus stops include NMT access routes, bicycle racks and shaded walking corridors.
- Establish interim pedestrian safety infrastructure using quick-build footpaths, signage, and lighting in existing village settlement areas during early-stage construction.

Implementation agency

Lead: APCRDA, ADCL

Supporting: PBS Operators, Contractors
Type of action: Climate Mitigation
Timeline: Short term
Climate resilience benefits: Medium
Potential locations: Citywide
Monitoring indicators: • Percentage of road network with cycle tracks and footpath • Percentage of transit stations with public bike sharing system
Good practice: **Bhopal** launched India's first fully automated Public Bicycle Sharing (PBS) system with 500 bikes and over 50 stations, integrated with its MyBus BRTS and a unified smart-card/digital app for seamless first- and last-mile connectivity.

Action 2: Improve NMT safety and accessibility
Action details Introduce pedestrian crossings, traffic calming measures, and universal design features like ramps, tactile paving, and audible alerts to ensure safe, inclusive, and accessible walking and cycling for all. **Sub Actions:** • Implement traffic calming measures such as raised table-top pedestrian crossing, speed bumps, and modal filters in residential, institutional, and commercial zones. • Install pelican crossings at high footfall and high-risk junctions to allow safe pedestrian movement, particularly for children, elderly and differently abled persons. • Equip pedestrian infrastructure with accessible features including audible alerts, step free ramps, tactile paving, and shaded rest points.
Implementation agency **Lead:** APCRDA, ADCL **Supporting:** Traffic Police
Type of action: Climate Mitigation
Timeline: Short term
Climate resilience benefits: Average
Potential locations: Citywide
Monitoring indicators:

- Percentage of streets with accessibility features such as ramps, tactile paving
- Number of safe crossings installed
- User satisfaction scores on safety and comfort

Good practice:

In **Chennai** Street Design Project, more than 100 km of streets were redesigned following the Complete Streets and Universal Design principles. The project introduced raised pedestrian crossings, tactile paving, shaded walkways, and traffic calming elements, ensuring safety and accessibility for all, including elderly and differently abled citizens.

Action 3: Promote behavioral shift to active mobility

Action details

Encourage walking and cycling through public campaigns, institutional policies, subsidized PBS rides, and community partnerships, creating cultural acceptance of NMT as a preferred daily commuting choice.

Sub Actions:

- Organize recurring public campaigns such as walk to work or cycle to school weeks, and provide app-based rewards for using NMT modes
- Encourage offices and educational institutions to support walking and cycling by implementing parking disincentives for two-wheelers and cars, and limiting private vehicle use
- Partner with public bike sharing service providers to offer subsidized ride vouchers, especially for short-distance commutes and metro/bus station access
- Partner with universities and colleges to promote cycling through student clubs, group rides, and subsidized access to public bicycle sharing schemes

Implementation agency

Lead: APCRDA

Supporting: Traffic Police, Educational Institutions, NGOs, PBS Operators, Private Companies

Type of action: Climate Mitigation

Timeline: Short to Medium term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Modal shift to walking/ cycling compared to baseline year
- Percentage reduction in short-distance motorized trips

Good practice:

Surat, Gurugram, Delhi and other Indian cities host Raahgiri Day — weekly car-free mornings where main streets are closed to motor vehicles, promoting walking, cycling, play and public life, raising awareness of active mobility.

Strategy 2- Financing Modes/Sources

APCRDA budget, Central government funding under 'Transport Planning and Capacity Building in Urban Transport for metro and non-metro projects' for research studies, National Clean Air Action Plan funds, Nirbhaya fund for women's safety, loans/grants from multilateral development banks and donor agencies

Strategy 3: Promote Clean, Electric Mobility for Public and Private Transport

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Electrification of public and private transport	Percentage of electric public bus fleet	100%	100%	100%
	Percentage of electric 2-wheelers registered within Amaravati	100%	100%	100%
	Percentage of electric cars registered within Amaravati	100%	100%	100%
	Percentage of electric light freight vehicles in Amaravati	100%	100%	100%
Renewable integration in public electric charging infrastructure	Percentage of EV electricity consumption to be met by renewables	20%	40%	60%

Proposed Actions

Action 1: Mandate electrification of government and institutional fleet

Action details

Transition all government and institutional fleets to EVs, provide shared electric commuting options, and train staff in EV operations to showcase leadership and accelerate e-mobility adoption.

Sub Actions:

- Transition 100% of government and institutional fleets to EVs in a phased manner.
- Promote shared electric transport solutions such as e-buses, e-autos and pooled cabs for daily commuting of government staff and workers
- Encourage infrastructure contractors and large institutions e.g., educational institutions and hospitals to provide electric shared mobility options for staff and site workers
- Train municipal staff in EV operations, maintenance, and safety protocols to ensure compliance.
- Involve EV manufacturers, service providers, and fleet operators to co-develop use cases, support pilot projects, and build the institutional EV ecosystem

Implementation agency

Lead: APCRDA

Supporting: ADCL, Transport Department, EV Manufacturers
Type of action: Climate Mitigation
Timeline: Short to Medium
Climate resilience benefits:
Potential locations: Citywide
Monitoring indicators: • Percentage of ICE fleet converted to EVs

Action 2: Develop city-wide charging infrastructure

Action details

Plan and implement charging stations, depots, and battery-swapping facilities across PT, freight, and private vehicle segments, supported by grid upgrades and renewable energy integration for long-term sustainability.

Sub Actions:

Develop citywide EV charging and battery-swapping infrastructure.

- Identify and classify EV charging needs for private vehicles, public buses, IPT and freight fleet.
- Integrate EV infrastructure into spatial plans, LPS layouts and public buildings.
- Designate land for charging stations at public transport depots, IPT stands, parking facilities, logistics hubs and trip attraction zones.
- Enforce regulations requiring all government buildings, commercial, institutional and residential developments to include EV charging infrastructure.
- Include provisions for battery-swapping stations.
- Involve EV manufacturers, service providers, and fleet operators to co-develop use cases, support pilot projects, and build the institutional EV ecosystem
- Include planning for EV charging infrastructure at an early-stage during fleet procurement in PT terminals and depots for both overnight charging and on-route fast charging.
- Identify locations for deployment of on-route charging fast charging of public bus fleets to facilitate charging without disruption of service, minimize dead or non-operational kms and time, optimize operational efficiency and revenue.
- Coordinate with APCDPCL for grid infrastructure upgrades and smart metering to cater to city-wide EV-charging requirements. Conduct annual assessments of electricity demand from transport electrification and help inform grid capacity upgrades, charging infrastructure, and distribution planning accordingly.

Ensure sustainable EV battery lifecycle and circularity.

- Promote EV battery circularity through collection, recycling and reuse.
- Establish partnerships with authorized recyclers and EV manufacturers end of life battery management, ensuring compliance with the Battery Waste Management Rules, 2025
- Encourage adoption of second life applications for used EV batteries in stationary storage or renewable energy integration.

Implementation agency

Lead: APCRDA

Supporting: ADCL, APCPDCL, APSRTC, Private Charging Companies

Type of action: Climate Mitigation

Timeline: Short to Medium term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Number of community EV charging stations (privately owned and operated)
- Number of community EV charging stations (publicly owned and operated)
- Number of community EV charging stations (PPP / FDI)
- Area (sq. km) served per EV charging station
- Total number of freight-specific EV charging stations installed
- Percentage of PT depots with overnight/ on-route charging

Good practice:

Ahmedabad's on-route solar-powered charging pilot resulted in the elimination of 120 hours of non-productive time and saved Rs.15 million by reducing non-revenue generating dead kilometres travelled by the city's electric buses. About 40-45 buses are able to use this on-route charging station of 500 kW size. A 120 kWp solar PV system is installed on-site, that generates about 170,000 kWh of renewable energy per year, helping mitigate around 140 tCO2e of GHG emissions.

Action 3: Integrate renewable energy in EV charging infrastructure

Action details

Deploy solar PV and renewable-powered charging infrastructure in bus depots, parking hubs, and logistics centres to reduce emissions, enhance energy resilience, and promote zero-emission e-mobility.

Sub Actions:

- Adopt renewable energy powered EV charging for emission-free mobility. Prioritise its early adoption in charging facilities at bus terminals and logistics hubs.
- Implement pilot projects for integration of renewable energy in EV charging infrastructure

Implementation agency

Lead: APCRDA

Supporting: ADCL, APCPDCL, Private Charging Companies, NREDCAP

Indicative Cost:

RE for EV Charging

2028 – 2,313 million INR 2043 – 40,409 million INR 2058 – 140,270 million INR
Type of action: Climate Mitigation
Timeline: Short to Medium term
Climate resilience benefits: High
Potential locations: Citywide
Monitoring indicators: • Percentage of EV charging stations powered with renewable energy • Percentage of energy demand met through renewable energy
Good practice: **Amsterdam Smart Charging Program, Netherlands**: Amsterdam developed 3,000 smart charging points integrated with renewable energy grids and real-time demand management. The city uses open data platforms to optimize grid load balancing and prioritizes solar-powered chargers for taxis, logistics, and buses.

Action 4: Incentivize electric vehicle uptake and phase out ICE vehicles
Action details Introduce financial incentives, scrappage policies, congestion pricing, and green zones to accelerate EV adoption, discourage ICE vehicles, and shift Amaravati towards a cleaner, low-carbon mobility future. **Sub Actions:** • Provide financial incentives, including registration waivers, scrapping bonuses, parking discounts, and low-interest financing for EV buyers. • Designate green zones and low-emission corridors allowing only zero-emission vehicles. • Pilot congestion pricing and time-based access restrictions for ICE vehicles based on traffic congestion and air quality levels.
Implementation agency **Lead:** APCRDA **Supporting:** ADCL, APPCB, Vehicle Manufacturers
Type of action: Climate Mitigation
Timeline: Short to Medium term
Climate resilience benefits: Medium
Potential locations: Citywide

Monitoring indicators:

- Percentage of annual vehicle registrations that are EVs
- Number of ICE vehicles scrapped annually
- Annual EV adoption rate in 2W, 3W, 4W and freight categories

Action 5: Mandate EV-ready development regulations

Action details

Mandate EV-ready parking slots and charging infrastructure in all new residential, commercial, and institutional developments to future-proof Amaravati's transport systems and support rapid EV growth.

Ongoing

Sub Actions:

- Amend building byelaws to mandate EV-ready parking slots in residential, commercial and institutional projects. **(ongoing/planned)**
- Ensure that the building occupancy or completion certificate are issued only after compliance with EV-readiness in parking infrastructure.

Implementation agency

Lead: APCRDA

Supporting: DTCP, RWAs, Developers, Builders and Contractors

Type of action: Climate Mitigation

Timeline: Short term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Percentage of new development projects with EV charging infrastructure in parking
- Percentage of building occupancy certificates linked to EV readiness

Good practice:

Delhi's Charging/Swapping Infrastructure Action Plan 2022-25, under Delhi EV policy mandates the setting up charging and battery swapping stations across Delhi in multiple phases by porting and providing concessional locations for charging stations at bare minimum lease rentals. It mandates 20% of parking spaces in new buildings and 5% of all existing parking spaces under the purview of different agencies must be EV ready with at least 3.3 kW output charging points. Five swap points will be considered equivalent to one charging point.

Strategy 3- Financing Modes/Sources

APCRDA budget, National Clean Air Action Plan funds, Non-banking financial companies (NBFCs) and Fin-tech firms,[64] banks & private financial services companies offering loans and credit schemes for EVs (Mahindra Finance, TVS credit), Electric Mobility Promotion Scheme by Ministry of Heavy Industries for two and three-wheelers, Incentives under AP's Electric Mobility Policy, Green Climate Fund's India E-Mobility Financing Programme, FAME scheme (Phase III), PM E-Bus Sewa Scheme

Strategy 4: Enable Sustainable, Low-Carbon Freight

Action 1: Implement immediate controls on construction-related freight movement
Action details Enforce restricted access for heavy vehicles during peak hours, establish holding yards, and mandate compliance with emission norms to minimize congestion, dust, and pollution during Amaravati's construction phase. **Sub Actions:** • Restrict the entry of ICE-based heavy freight vehicles into the core urban areas during peak congestion hours • Designate freight corridors, entry/exit points and enforce time window-based access. • Mandate BS-VI compliance, GPS tracking, emission certificate and dust suppression mechanisms for freight vehicles. • Create a freight holding yards at city periphery with batch dispatch during construction phase. • Encourage adoption, provide incentives and priority access for electric freight vehicles.
Implementation agency **Lead:** APCRDA **Supporting:** Traffic Police, Freight Operators, APPCB
Type of action: Climate Mitigation
Timeline: Short term
Climate resilience benefits: High
Potential locations: Citywide
Monitoring indicators: • Percentage of freight vehicles BS-VI compliant • Number of peripheral holding yards operational • Number of permit violations detected monthly
Good practice: **Beijing's** Low-Emission Zone launched in 2017, bans heavy-duty freight vehicles below National IV emission standards to curb air pollution. Supported by WRI China, the initiative improved air quality,

[64]5 FinTechs fueling Electric Vehicle Loans in India

prevented about 43 premature deaths annually, and achieved $37 million in yearly social cost savings, influencing similar actions across other Chinese cities.

Action 2: Electrify last-mile freight and introduce e-logistics mandates

Action details

Mandate electrification of two/three-wheeler delivery fleets and develop digital aggregation platforms to ensure low-emission, efficient, and cost-effective last-mile logistics in the city.

Sub Actions:

- Mandate phased electrification of light freight and delivery fleets.
- Promote battery swapping models for two and three-wheeler fleets.
- Enable logistics fleet aggregation and digital platforms.
- Develop freight decarbonization guidelines and promote data-backed emission tracking.

Implementation agency

Lead: APCRDA

Supporting: Logistics Companies, EV Manufacturers, Freight Operators

Type of action: Climate Mitigation

Timeline: Short to Medium term

Climate resilience benefits: High

Potential locations: Citywide

Monitoring indicators:

- Percentage of light freight vehicle electrified
- Percentage of last-mile deliveries done by EVs

Action 3: Establish integrated urban freight and logistics management zones and implement freight routing

Action details

Establish logistics hubs at Amaravati's periphery with shared warehousing, EV charging, and multimodal connectivity, supported by dedicated freight corridors and smart routing systems to reduce core-area congestion.

Sub Actions:

- Identify and operationalize logistics hubs near the city periphery and regional corridors
- Identify and reserve land for shared warehousing, EV charging, and logistics handling infrastructure
- Promote multimodal connectivity for bulk movement into the city
- Restrict ICE-based heavy freight vehicles in inner city zones in the mid-term
- Enable dedicated freight corridors with real-time route advisory

Implementation agency **Lead:** APCRDA **Supporting:** Warehouse companies, Freight associations, Transport Department
Type of action: Climate Mitigation
Timeline: Short to Medium term
Climate resilience benefits: Medium
Potential locations: Logistics hub proposed as per Master Plan
Monitoring indicators: • Number of operational freight or logistics hubs in the city • Km of dedicated freight corridor active within city • Percentage reduction in freight vehicles travelled in core city

Strategy 4- Financing Modes/Sources

APCRDA budget, Incentives under AP's Electric Mobility Policy, OEMs like Tata, iXEnergy and Kalyani Powertrain who offer retrofitting kits,[65] Non-Banking Financial Companies (NBFCs) and FinTech firms,[66] International funding sources such as the German government's International Climate Initiative (IKI) supporting a sustainable freight project in India, Green Climate Fund's India E-Mobility Financing Programme, Multilateral development banks

Strategy 5: Develop Climate-Resilient and Low-Emission Transport Infrastructure

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Incorporate nature-based and water-sensitive design elements	Permeable/semi-permeable and high-albedo paving surfaces in NMT lanes	100%	100%	100%

[65] JMK Research & Analytics, White Paper, E truck Market in India, March 2024.
[66]5 FinTechs fueling Electric Vehicle Loans in India.

Proposed Actions

Action 1: Adopt climate-resilient transport infrastructure design

Action details

Adopt climate resilient construction materials, elevate roads in flood-prone areas, and integrate stormwater drains into road cross-sections to ensure Amaravati's transport infrastructure withstands climate risks and extreme weather.

Sub Actions:

- Mandate the use of climate resilient construction material such as fly ash concrete, ground granulated blast furnace slag (GGBS), fibre-reinforced concrete, and geo-grid stabilization in bridges, bus terminals, bus depots and transit stations.
- Elevate critical road infrastructure such as major roads, PT terminals, depots in low-lying areas and flood-prone zones based on the flood risk maps developed by APCRDA and ADCL's flood management studies.
- Integrate stormwater drains, recharge pits, slit traps and percolation chambers in the road cross sections to minimize surface logging.
- Use heat-resistant asphalts and concrete mixture with high solar reflectance index for transport infrastructure exposed to prolonged sun.

Implementation agency

Lead: APCRDA, ADCL

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: High

Potential locations: Citywide with focus on inundation areas identified in Kondaveti Vagu Flood Management Plan

Monitoring indicators:

- Km of roads elevated or flood proofed
- Percentage of roads with laid with heat and flood resilient specification

Action 2: Incorporate nature-based and water-sensitive design elements

Action details

Introduce bioswales, rain gardens, permeable pavements, and tree-lined boulevards to reduce surface heat, manage runoff, and create cooler, greener, and climate-adapted transport corridors across Amaravati.

Sub Actions:

- Include bio-swales, rain gardens and vegetated detention basins along pedestrian and NMT corridors to manage run-off, improve groundwater recharge and reduce temperature.

- Use permeable paving and high-albedo materials for pavements to reduce surface temperature.
- Provide tree-lined boulevards using native species along major NMT corridors, with wide plantation strips and tree guards.
- Install cool roofs or solar PV-integrated shading in NMT shelters, bike parking zones, and intersections
- Incorporating green buffers into sidewalk landscaping and around public transport zones to reduce noise, dust and surface temperature.

Implementation agency

Lead: APCRDA, ADCL

Supporting: R&B Department, APG&BC

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Percentage of pavement with permeable and high albedo surfaces
- Tree canopy cover increase (in hectares)
- Reduction in average surface temperature

Good practice:

Street design and urban form features for improved wind flow in Singapore

Wind corridors are carefully planned urban design features that channel natural wind flows through cityscapes to enhance ventilation, reduce ambient temperatures, and improve pedestrian comfort. These corridors are typically aligned with prevailing wind directions, and their effectiveness depends on the placement, orientation, and height of buildings and streets.

Marina South locality in Singapore integrates wind corridors by aligning streets with prevailing winds, spacing buildings, and using varied heights to channel airflow. This design lowers ambient temperatures by up to 2°C and enhances pedestrian comfort and climate resilience.

Action 3: Implement the Adaptive Traffic and Smart Parking Management System

Action details

Implement AI-enabled adaptive traffic signals, smart pedestrian crossings, and sensor-based parking systems to optimize traffic flow, improve safety, and reduce congestion-related emissions across the city.

Sub Actions:

- Deploy an AI-enabled adaptive traffic signal system that responds to the real-time congestion, pedestrian volumes and vehicle types, ensuring optimal signal phasing and reduced idling emissions.

• Integrate real-time weather data into traffic control systems to proactively manage disruptions caused by extreme climate events. • Prioritize signal clearance and corridor access for public transport vehicles, ambulances and emergency services. • Enable smart pedestrian crossing with pelican or HAWK signals in high footfall zones, ensuring safety. • Set up solar-power traffic kiosks at major junctions with battery backup, surveillance connectivity and emergency communication tools to ensure uninterrupted operations. • Implement a citywide smart parking system using sensors, cameras and a digital interface to track space availability and regulate curbside usage. • Introduce demand-based parking pricing and restrictions in high traffic zones.
Implementation agency **Lead:** APCRDA, Traffic Police **Supporting:** ADCL, Technology service providers
Type of action: Climate Adaptation
Timeline: Short to Medium term
Climate resilience benefits: Medium
Potential locations: Citywide
Monitoring indicators: • Number of AI-enabled adaptive traffic signal system • Reduction in average delays and idle time at junctions
Good practice: **Nagpur Municipal Corporation** piloted an AI-driven Intelligent and Integrated Traffic Management System (IITMS) at three major junctions, featuring adaptive signals, ANPR violation detection, speed radars, LED messaging, all monitored from a command centre**.**

Strategy 5- Financing Modes/Sources
APCRDA budget, Central/state govt. grants

Strategy 6: Integrated transport governance and smart mobility planning

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Deploy Smart mobility platforms and real-time passenger tools	Major PT stops and terminals with real-time tracking and passenger information systems	50%	100%	100%

Proposed Actions

Action 1: Establish Unified Metropolitan Transport Authority (UMTA) and build institutional capacity

Action details

Amaravati has a Unified Metropolitan Transport Authority (UMTA) formed under APCRDA. It needs to be strengthened to effectively implement and oversee infrastructure development and emerging needs in the city.

Sub Actions:

- Strengthen UMTA for multimodal planning, fare regulations, EV oversight, ITS management and other mobility projects.
- Prepare and update the Amaravati Mobility Master Plan every five years based on evolving land-use and transport demand.
- Establish a Mobility Innovation Cell within UMTA to pilot new solutions.
- Build internal capacity through regular training for city officials on NMT, EVs, ITS, Gender Equity and Social Inclusion (GESI), and mobility innovations.

Implementation agency

Lead: APCRDA, UMTA

Supporting: ADCL, APMRC, Transport Department, APSRTC, Traffic Police, APPCB, South Central Railway, Research Institutes

Type of action: Climate Adaptation

Timeline: Short

Climate resilience benefits:

Potential locations: Citywide

Monitoring indicators:

- No. of training sessions conducted annually

Action 2: Deploy smart mobility platforms and real-time passenger tools

Action details

Develop a unified mobility platform with feeds from PT, IPT, NMT, freight and parking systems for real-time PT tracking, multimodal journey planning, safety monitoring, and dynamic fleet deployment, ensuring efficient, resilient, and passenger-friendly transport services across Amaravati.

Sub Actions:

- Integrate feeds from PT, IPT, NMT, freight and parking systems with a central command control centre for real time monitoring and decision making.
- Use real-time monitoring to track crash data, identify black spots and coordinate with traffic police for enforcement and response.

• Enable dynamic service adjustments and predictive fleet deployment during congestion or climate disruptions. • Launch a multilingual journey planner app with live PT vehicle tracking, multimodal routing and tourist support • Install digital displays at all major terminals and stops for real time information and route guidance
Implementation agency **Lead:** APCRDA, UMTA **Supporting:** ADCL, APMRC, Transport Department, APSRTC, Traffic Police, Research Institutes
Type of action: Climate Adaptation
Timeline: Short to Medium term
Climate resilience benefits: Medium
Potential locations: Citywide
Monitoring indicators: • Percentage of PT routes live-tracked on the smart mobility platform • Monthly active users of the real-time passenger tools/ app • Number of PT stops with real-time information displays • Percentage reduction in response time to crashes/ incidents
Good practice: **Seoul** operates a centralised real-time command platform that aggregates data from transit cards, vehicle sensors, and operations systems. This enables live analysis for route planning, interval management, and immediate response to disruptions via dynamic traffic signalling and coordination with emergency services.

Strategy 6- Financing Modes/Sources
APCRDA budget, Central/state govt. grants

2.7 Biodiversity and Urban Greening

Baseline Status (2024-25)	**Key Statistics:** • Amaravati has a number of scenic natural features providing abundant water and greenery within the city. • Several scenic natural islands exist within the river Krishna. • Amaravati supports diverse resident and migratory birds and contains ecologically sensitive habitats along the Krishna River floodplains. • Amaravati has about 251 acres of forest land, which acts as the green lungs of the city. • Amaravati has 3 major hills: Undavalli, Neerukonda, and Ananthavaram. The Undavalli Hill area is categorized as a Reserved Forest Area, and no interventions are proposed.
Existing Policy, Plans and Initiatives	**National Policy/Programme/Targets:** • Nager Van Yojana[67], National Clean Air Program[68] supports increasing green cover in the city • Biological Diversity Act, 2002 • National Biodiversity Strategy and Action Plan[69] **State/City Policy/Programme/Targets:** • Swarna Andhra@2047 Vision Plan targets to achieve more than 50% green cover in the state of Andhra Pradesh.[70] • Draft Urban Design and Architectural Guidelines 2025 recommends "Blue and Green Network" is a planning strategy that seeks to protect the ecological and hydrological assets of Amaravati.[71] • Green Policy is being formulated by the Urban Greening Committee of Amaravati city
Opportunities and Gaps	• All existing hills and the river Krishna must be protected as they provide the Amaravati city with critical natural open spaces and green cover. • The 25 km long river Krishna waterfront can be developed as a vibrant centre for active and passive recreational uses. • A seamless network of green and blue networks can be created by interweaving the existing water tanks and canals together. This network can be supported with reservoirs to mitigate flood-related issues within the city. • The cluster of islands on the river Krishna should be protected and developed as eco-tourism attractions within the city.
Climate Risk	**Climate Risk Status**: High | High risk from elevated temperatures and extreme rainfall events

[67] Implementation Guidelines: Nagar Van Yojana, Ministry of Environment, Forest and Climate Change, Government of India, 2017.
[68] Portal for Regulation of Air-pollution in Non-Attainment cities, Ministry of Environment, Forest and Climate Change, Government of India.
[69] India launches updated National Biodiversity Strategy and Action Plan (NBSAP) at COP 16 to the Convention on Biological Diversity (CBD), in Colombia, Ministry of Environment, Forest and Climate Change, Government of India.
[70] Swarna Andhra @ 2047 Vision Plan. Andhra Pradesh State Development Planning Society (APSDPS). 2025.
[71] Draft Urban Design and Architectural Guidelines 2025

	• Extreme heat conditions intensify the urban heat island effect. • Intense rainfall events lead to urban flooding due to stormwater runoff.
Potential Climate Resilience Impact and Wider Co-benefits of Climate Actions	**Climate Resilience Impact and Co-benefits:** • Reduces urban heat island effect and surface temperatures • Improved health of existing natural ecosystems • Nature-based solutions help absorb storm surges and reduce the risk of flooding. • Increased carbon sequestration • Improved air and water quality through natural filtration **Strengthened Resilience to Hazards:** Heat stress, urban flood, cyclones
SDGs	GOAL 3: Good Health and Well-being, GOAL 6: Clean Water and Sanitation, GOAL 11: Sustainable Cities and Communities, GOAL 13: Climate Action, GOAL 15: Life on Land

Climate Strategies, Actions and Targets

Strategy 1: Conserve and restore ecosystems to enhance climate and ecological resilience

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Restore degraded and ecologically sensitive areas using nature-based solutions	Restoring a degraded ecosystem during the construction phase	50%	100%	100%

Proposed Actions

Action 1: Protect and conserve natural water bodies, hills and eco-sensitive zones

Action details

Existing natural water bodies, including lakes, ponds, and wells, must be protected against pollution, encroachment, dumping, and any activities that may threaten their ecological integrity and health.. Restoration of existing water bodies should be carried out by shaping their contours and maintaining the natural flow of water. Water bodies should be protected with buffer zones to prevent development from encroaching too closely to the water's edge.

Existing Initiatives

The Amaravati city master plan has addressed the demarcation of protected areas under P3 zoning to conserve and protect environmentally sensitive areas, such as steep slopes and rivers, which are rich in natural biodiversity.

Sub Actions

- Conduct a citywide survey to map natural assets like wetlands, ridges, streams, and hills.[72] **(Ongoing/Planned)**
- The Advanced Locality Management[73] committee of each area should be tasked with overseeing the protection and management of local water bodies.
- Enforce buffer zones: 30m for streams/canals, 50m for ponds/tanks, 100m for the Krishna River **(Ongoing/Planned)**
- Remove invasive species and replant native, climate-resilient vegetation.
- Ban cement lining of water bodies; use vegetation for edge stabilization.
- Install eco-friendly fencing and vegetated buffers around lakes and ponds.
- Use coir log barriers and native grass bunds to prevent erosion on banks and slopes.
- Restrict construction on hills/ridges and promote afforestation and erosion control with native plants. **(Ongoing/Planned)**

Potential locations: City-wide with focus on water bodies, Parks and Open Spaces (P1, P2, P3)

Implementing entities

[72] Toolkit for management of wetlands and water bodies in urban areas, National Mission for Clean Ganga

[73] Advanced Locality Management represents a designated locality or neighborhood where residents collaborate closely with the government department to collectively enhance the "Quality of Life" within their community.

Lead: APCRDA **Supporting:** ADCL, APG&BC, DTCP, AP Biodiversity Board, Water Resources Department, Forest Department
Type of action: Climate Adaptation
Climate resilience benefits: Medium
Timeline: Short term
Monitoring Indicators: • Percent of total city area surveyed and digitized for natural assets • Area of riparian buffers restored with native species • Number of shoreline stabilization works using nature-based solutions • Mapped water bodies conforming to minimum buffers and physical demarcation
Good Practice: The SOUL (Saving Open Space and Urban Lakes) project in **Hubli-Dharwad**, Karnataka, was launched in 2008 to revive urban lakes, protect open spaces, and strengthen the city's cultural heritage. Through inter-departmental coordination, the project restored lake boundaries, diverted sewerage, planted 5,000 saplings, and enhanced water storage by over 1 lakh cubic meters. It also promoted cultural activities, attracting over 1 lakh tourists per month and generating a sustainable revenue of more than INR 10 Lakh per month. The initiative successfully combined environmental restoration with cultural rejuvenation, earning the Prime Minister's Award for Excellence in Public Administration.[74] The Neknampur Lake Restoration by Dhruvansh Organization in **Hyderabad** focused on reviving a severely polluted lake by restoring biodiversity, enhancing water retention, and creating a community space for recreation. Key interventions included phytoremediation, floating treatment wetlands, desilting, and garbage removal. The project achieved a 90% reduction in Biological Oxygen Demand, improved water quality, and transformed the lake into a vibrant ecological and recreational place for the community.[75]

Action 2: Restore degraded and ecologically sensitive areas using nature-based solutions
Action details Restoring degraded and ecologically sensitive urban areas with nature-based solutions helps Amaravati reduce flood risk, decrease heat islands, and improve water quality by integrating wetlands, bioswales, riparian buffers, and urban forests into streetscapes and waterways. Amaravati city has plans to plant vegetation on slopes to help minimize soil erosion. **Sub Actions** • Identify and survey degraded areas like eroded slopes and dry stream beds. • Undertake ecological restoration of the degraded landscapes. • Use geo-jute matting and brush layering for slope stabilization in high erosion risk zones.

[74] NIUA. (2021). Rejuvenation and conservation of water bodies and open areas: Training manual. Climate Centre for Cities.
[75] NITI Aayog (2023). COMPENDIUM OF BEST PRACTICES IN WATER MANAGEMENT - 3.0.

- Rejuvenate streams and wetlands via desilting, buffer planting, and restoring drainage.
- Designate restored sites as protected zones to prevent encroachment.
- Develop an invasive species control protocol and establish a native plant nursery for the Krishna basin.

Potential locations: City-wide with focus on Hill slopes, Krishna river and Kondaveeti vagu

Implementing entities

Lead: APCRDA

Supporting: APG&BC, APSBB, Water Resource Department, NGOs/ CSOs

Indicative cost:

INR 1.2 lakh per hectare hill slope renaturation (Construction and the first two years of maintenance, including preparation of the plants in the nursery and transplantation and manual harvesting)[76]

Type of action: Climate Adaptation

Climate resilience benefits: Medium

Timeline: Short to Medium term

Monitoring Indicators:

- Length of slopes treated with geo-jute and brush layering
- Number of restored sites notified as protected zones
- Increase in native plant species per plot

Good Practice:

In Jaipur, Rao Jodha Desert Rock Park was restored by the removal of Prosopis juliflora and the reintroduction of native xeric vegetation, which restored the degraded rocky terrain.

A stretch of the French Broad River bank in **Tennessee** state, experienced severe erosion during flooding that occurred while a new bridge was under construction. The erosion posed risks to both the newly installed bridge infrastructure and the nearby railroad line. To stabilize the slope, a vegetative riprap system was applied at the toe, combining rock with dormant cuttings to reinforce the stream bank. The estimated cost of this slope stabilization is approximately INR 65 lakh per kilometer.

Action 3: Safeguard culturally and ecologically sensitive zones

Action details

Special zones can be designated to safeguard the existing heritage structures and cultural assets, as heritage zones are currently not specified within the planning regulations and P3 consists of only hills and existing water bodies. Preserving heritage and integrating local art and culture will help create a unique image and identity for the city.

Existing Initiatives

Amaravati city has amended its zoning regulations to take appropriate measures for the protection of Undavalli caves and ensure that no development activity is permitted within a Zone of 100 to 300 meters around Undavalli caves, as per ASI regulations.

[76] Sustainable Cities - Integrated Approach Pilot (SCIAP), The United Nations Human Settlements Programme (UN-Habitat), 2022, Accessed September 2023

Sub Actions

- Notify and demarcate no-development zones around heritage sites and sensitive areas as per ASI and environmental rules. **(Ongoing/Planned)**
- Introduce guided eco-trails with bilingual signs and controlled access.
- Digitally map and monitor heritage zones with drones to spot encroachments.
- Protect reserve forest, allow diversion only with ecological justification and mitigation plans. **(Ongoing/Planned)**

Potential locations: City-wide

Implementing entities

Lead: APCRDA, Tourism Department

Supporting: ASI, DTCP, Forest Department

Type of action: Climate Adaptation

Climate resilience benefits: Medium

Timeline: Short term

Monitoring Indicators:

- Number of heritage/sensitive sites with physical boundary demarcation
- Periodic drone monitoring of heritage sites and sensitive areas to spot encroachments

Strategy 1 - Financing Modes/Sources

APCRDA and State budget, AMRUT 2.0, 15th FC, CSR funds

Strategy 2: Expand and diversify green spaces for ecological, recreational and climate co-benefits

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Develop a citywide green space network	Total green cover area	4 sq.km	16 sq.km	64 sq.km

Proposed Actions

Action 1: Develop a city-wide green space network

Action details

The introduction of a green space protection and management policy proposed in the urban design guidelines will protect and manage green spaces planned as primary greens, secondary green links, and recreational landscapes to maintain their productivity in stormwater retention. Planting large canopy trees along streets improves the microclimate by providing shade and promoting evapotranspiration, creating a comfortable environment that encourages people to walk.

Sub Actions

- Create green spaces across Amaravati, including primary and secondary green areas at walkable distances of 300-500m for all residents. **(Ongoing/Planned)**
- Connect parks, water bodies and forest patches using greenways, NMT corridors and shaded paths. **(Ongoing/Planned)**
- Establish "Urban forest micro hubs" using native dry deciduous species.
- Use geotagged tree canopy monitoring tools and satellite imageries to assess green cover expansion.

Potential locations: City-wide with focus on landuse zones (P1&P2)

Implementing entities

Lead: APCRDA, ADCL

Supporting: APG&BC

Estimated targeted scale

Total green cover area required:

2028 – 4 sq.km

2043 – 16 sq.km

2058 – 64 sq.km

Indicative cost:

Cost for increasing green cover:[77]

2028: INR 360 crore
2043: INR 1,440 crore
2058: INR 5,760 crore

Type of action: Climate Adaptation

Climate resilience benefits: Very High

Timeline: Short to Medium term

Monitoring Indicators:

- Availability of green space area per person (m^2/person)
- Total length of kilometers of continuous, shaded greenways and NMT corridors
- Number of micro forests established
- Number of trees planted and mapped on GIS

Good Practice:

The City of **Baltimore** utilizes GIS monitoring tools and satellite imagery to manage its urban forest. Between 2017 and 2018, the city conducted a detailed inventory of over 1.2 lakh trees, stumps, and planting sites, integrating geospatial data into TreeKeeper software for ongoing analysis and maintenance

[77] Consider INR 900 per sq. m. for increasing green cover (ICLEI South Asia).

planning. Satellite imagery complements this by providing updated canopy coverage maps, helping prioritize planting and maintenance efforts. Using i-Tree Streets software, Baltimore quantifies the environmental and economic benefits of its trees, estimating an annual savings of $9.3 million through energy conservation, stormwater management, and improved air quality. This monitoring tool has supported targeting canopy expansion and sustained urban forest health across neighborhoods.

Action 2: Develop biodiversity parks

Action details

Biodiversity parks protect natural areas that store carbon, keep places cooler through shade and evapotranspiration, and reduce the risk of floods through stormwater retention.

Existing Initiatives

Amaravati city plans to develop approximately 500 parks throughout the city, which will feature amenities for both commercial and recreational use, while enhancing the city's natural landscape. Incorporation of bio-retention swales is prioritized in areas at high risk of inundation due to their high water retention capacity.

Sub Actions

- Develop biodiversity parks with wetlands, grasslands, woodlands, pollinator gardens, and educational spaces using native plants. **(Ongoing/Planned)**
- Incorporate passive water harvesting features like recharge pits and bio-retention swales to enhance groundwater recharge. **(Ongoing/Planned)**
- Provide shaded rest areas, accessible trails, tactile and interpretive signage for inclusive, educational access.
- Design parks to be walkable and connected to public transport and pedestrian networks.

Potential locations: Parks and Open Spaces Zones (P1, P2, P3)

Implementing entities

Lead: APCRDA, ADCL

Supporting: APG&BC, APSBB

Indicative cost:

INR 3-22 lakhs per hectare to develop biodiversity park[78]

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Medium term

Monitoring Indicators:

- Number of biodiversity parks developed
- Number of bio-retention swales installed
- Total capacity of recharge pits constructed

Good Practice:

[78] List of Biodiversity Park Projects. National Mission for Clean Ganga.

Adyar Eco-park, Chennai, covering 358 acres along the Adyar estuary, this restored wetland park reintroduced mangroves, mudflats, marshes and tropical dry evergreen forest using 172 native species. Features include boardwalks, interpretation centres, birdwatching points, and eco-trails, making it both a biodiversity hotspot and an environmental education hub.[79]

Action 3: Scale urban afforestation and native forest clusters

Action details

Scaling urban afforestation and native forest clusters in Amaravati can reduce the heat island effect in dense neighborhoods through shade and evapotranspiration, lower energy demand for cooling, mitigate runoff and flooding and enhance soil infiltration along streets, canals and open spaces.

Existing Initiatives

Amaravati city has mandated that no trees be cut down during the development phase. Instead, existing trees are being carefully relocated using modern techniques. The city maintains a comprehensive inventory of existing trees and has recently prepared a list of native species well-suited to the local environment. The greening initiatives also include the adoption of Miyawaki plantations and nutrition gardens to enhance carbon sequestration rates, thereby accelerating the capture of carbon from the atmosphere.

Sub Actions

- Afforest institutional lands, medians, and buffers using Miyawaki[80] or dry deciduous native planting. **(Ongoing/Planned)**
- Select native plant species native to the Krishna basin and Eastern Ghats, as recommended by APCRDA. **(Ongoing/Planned)**
- Use only locally adapted, non-exotic species suited to the semi-arid climate.
- Reserve urban forest, green corridors, and floodplain zones for endemic species.
- Install perforated tree guards and aerated pits to improve survival and root growth in urban settings.
- Organize annual tree planting drives with schools, colleges, and residents, led by city and state agencies.

Potential locations: City-wide

Implementing entities

Lead: APCRDA, ADCL

Supporting: APG&BC, Horticulture Department, APSBB, Educational Institutions, RWAs, NGOs

Indicative cost:

Miyawaki gardening cost is INR 2,000 per sq.m[81]

Type of action: Climate Adaptation

Climate resilience benefits: Very High

Timeline: Medium term

[79] Adyar Eco Park Phase 1, Chennai Rivers restoration trust.
[80] ICLEI South Asia. Guidelines for Development of Miyawaki Forests in India. Prepared under SDC Supported CapaCITIES II project. 2022.
[81] Miyawaki gardening, Indiamart

Monitoring Indicators:

- Number of plantations of native species
- Number of Miyawaki forests developed

Good Practice:

The **Prayagraj Municipal Corporation** has developed dense forests at various locations within the city to prepare for the Mahakumbh 2025. The corporation has planted trees using the Miyawaki technique covering an area of 55,800 square meters. Over 1.2 lakh trees of 63 species were planted in the Naini industrial area, and 27,000 trees of 27 species at Baswar after cleaning a major dumping yard. These fast-growing forests can reduce temperatures by 4–7°C, enhance biodiversity, and promote environmental restoration more effectively than traditional forests.

Strategy 2 - Financing Modes/Sources

APCRDA and State budget, AMRUT 2.0, 15th FC, CSR funds

Strategy 3: Integrate blue-green infrastructure into urban planning and infrastructure development

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Develop shaded and green mobility corridors	Green Corridors	100%	100%	100%
Promote Green roofs and living facades in urban buildings	At least 20% rooftop area in public buildings and large private developments with more than 4000sq.m plot area should be green roofs	100%	100%	100%

Proposed Actions

Action 1: Embed blue-green infrastructure in city planning and development regulations

Action details

The Blue and Green Infrastructure (BGI) network is a planning approach designed to protect the ecological and hydrological resources while shaping a city that is liveable and resilient. The BGI network plays a crucial role in enhancing flood resilience by integrating flood management functions into urban open spaces. To effectively incorporate the BGI network into city planning and development regulations, Amaravati should institutionalize the integration of draft Urban Design and Architectural Guidelines in existing zoning regulations.

As per the directives of the NGT and EC, Amaravati should develop a green and blue network that interconnects all reservoirs, water bodies, green areas and open spaces.

Sub Actions

- Incorporate bioswales, rain gardens, permeable pavements, tree pits in all townships and road designs. **(Ongoing/Planned)**
- Develop a belt of 2-3 km of broad running parallel to the Krishna River with mixed native plantations and urban flood belts.
- Design dual-use landscapes such as water plazas and floodable parks in low-lying areas.
- Integrate BGI requirements into zoning laws and building codes.

Potential locations: City-wide with focus on blue and green infrastructure

Implementing entities

Lead: APCRDA, ADCL

Supporting: APG&BC, DTCP, landscape designers and architects

Indicative cost:

INR 500–1,000 per sq. m. for the construction of permeable pavement[82]

INR 830-1,245 per sq. m. for setting up a Rain garden

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Medium term

Monitoring Indicators:

- Development of at least one BGI element in designing all roads
- Length of roads retrofitted with permeable pavement per year (km)
- Plantation of native trees and shrubs per hectare

Good Practice:

The City of **St. Paul** developed permeable pavements along sections of Jackson Street, Kellogg Boulevard, St. Peter Street, 9th Street, and 10th Street, using porous asphalt for construction. A rain garden has been developed at Riverfront Park in **Middlebury**, adjacent to Otter Creek Falls. Designed to manage urban runoff, the garden captures and filters stormwater from surrounding impervious surfaces such as roads, sidewalks, and parking areas, preventing direct discharge into the creek. By naturally treating this runoff, it helps improve water quality and reduce flooding risks.[83]

Action 2: Develop shaded and green mobility corridors

Action details

In addition to ensuring smooth vehicular circulation along the city's mobility corridors, Amaravati should promote a comprehensive multi-modal transit system that integrates Non-Motorized Transport (NMT) and enhanced pedestrian walkability. A well-designed street and public space network should encourage walking and create enjoyable urban experiences through shared streets, shaded sidewalks, and accessible

[82] Nature-Based Solutions to Ecosystem Management, Aga Khan Agency for Habitat India, 2021.
[83] Nature-Based Solutions to Ecosystem Management, Aga Khan Agency for Habitat India, 2021.

transit options that strengthen last-mile connectivity while ensuring comfortable microclimatic conditions.

As per the directives of the NGT and EC, Amaravati's road infrastructure must prioritize pedestrian pathways, dedicated cycle tracks, and the development of robust public mass transit systems such as BRT, LRT and MRT.

Sub Actions

- Construct shaded pedestrian and cycling corridors using high-canopy native trees. **(Ongoing/Planned)**
- Integrate bioswales, rain gardens and tree pits along roadways to reduce surface runoff. **(Ongoing/Planned)**
- Install sensors for real-time monitoring of temperature and air quality.

Potential locations: City-wide with focus on pedestrian, walking and cycling corridors

Implementing entities

Lead: APCRDA, ADCL

Supporting: APG&BC

Indicative cost:

INR 2-4 lakhs cost for the plantation of one tree using the tree trench system[84]

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Medium term

Monitoring Indicators:

- Number of planted trees that are high-canopy native species
- Number and length of roadways retrofitted with tree pits and bioswales

Good Practice:

As part of the Central Corridor Light Rail Transit project, the city of St. Paul installed an integrated tree trench system along more than five miles of the corridor. These 10-foot-wide systems consist of layered components including trees, porous pavers, CU Structural Soil, drainage rock, and perforated PVC pipes that channel street runoff into the trench. Around 1,250 new trees have been planted within these systems, which help filter sediments and pollutants from stormwater, reduce runoff volume and flow rates into the Mississippi River, and increase pervious surfaces within the right-of-way.

Action 3: Promote urban agriculture

[84] Case studies for tree trenches and tree boxes. Minnesota Stormwater Manual. Accessed 30th September 2025.

Action details

Given Amaravati's agricultural heritage, urban agriculture and community farms should be promoted as an interim use. Urban agriculture provides a number of key benefits such as environmental enhancement and economic resilience. Open spaces should incorporate urban agriculture zones, such as patches along the waterfront, and community farms near existing villages. During the interim phase, vacant plots should be put to use for urban agriculture and community farming as appropriate. The advantages of urban agriculture include generating additional income and employment opportunities, improved food security, and the ability to produce food locally.

According to EC directives, Amaravati should actively promote urban agriculture to help meet the city's food demands and reserve high-value agricultural land.

Sub Actions

- Develop urban agro zones and public orchards on peri-urban land using traditional and climate-resilient crops.
- Promote rooftop farming and composting in residential and public buildings with city-supported toolkits
- Establish agro-biodiversity parks showcasing traditional millet and native varieties.
- Use treated wastewater from STPs for urban greening **(Ongoing/Planned)**

Potential locations: City-wide

Implementing entities

Lead: APCRDA

Supporting: APG&BC, APSBB, Horticulture Department

Type of action: Climate Adaptation

Climate resilience benefits: Average

Timeline: Medium

Monitoring Indicators:

- Number of urban agro zones and public orchards established
- Percentage of residential and public buildings practicing rooftop farming and composting
- Establishment of agro-biodiversity parks
- Conduct workshop and training for the members engaged in urban agriculture

Good Practice:

To address the economic and climate crises in 2001, **Rosario** city launched an Urban Agriculture Program that transformed abandoned land into productive farms, training and equipping residents to create local markets. The initiative expanded to 75 hectares, cutting food-related emissions by 95% and enhancing flood resilience. In 2015, the Green Belt Project permanently protected 800 hectares of peri-urban land for agroecological farming, strengthening the city's climate adaptation and earning international recognition for combining food security with sustainable urban planning.

Action 4: Promote green roofs and facades in buildings

Action details

Green roofs are widely recognized as an effective measure for environmental protection. Amaravati could promote the adoption of green roofs by incorporating them into zoning regulations. Green roofs help reduce stormwater runoff generated at the plot level and can also limit the spread of dust and particulate matter, while lowering smog formation.

Sub Actions

- Mandate at least 20% rooftop area as green roofs on public buildings and large (4000+ sq.m) private developments to lower temperatures. **(Ongoing/Planned)**
- Encourage private adoption through tax rebates and green building incentives.
- Develop climate-specific rooftop garden guidelines, ensuring accessibility for all users.
- Build demo green roofs and vertical gardens in government and educational buildings.
- Promote shade-giving creepers on building peripheries and parking areas to reduce reflected heat and improve aesthetics.

Potential locations: City-wide

Implementing entities

Lead: APCRDA

Supporting: APG&BC, APSBB, Horticulture Department

Type of action: Climate Adaptation

Climate resilience benefits: Medium

Timeline: Short to Medium term

Monitoring Indicators:

- Number of public buildings and large private developments with at least 20% rooftop area converted to green roof
- Number of awareness and training programs conducted on green roofs, vertical gardens and creeper

Good Practice:

In **Tokyo**, green roofs are mandated for private buildings with a built-up area exceeding 1,000 m^2 and for public buildings larger than 250 m^2. Additionally, integrated green roofs are required to cover at least 20% of the total rooftop area.

Strategy 3 - Financing Modes/Sources

APCRDA and State budget, AMRUT 2.0, 15th FC, CSR funds

Strategy 4: Strengthen governance and community stewardship

Proposed Actions

Action 1: Institutionalize biodiversity planning and legal frameworks
Action details Establishing a robust governance and planning framework for biodiversity is essential to protect Amaravati's threatened species and habitats, mitigate flood and heat hazards, and facilitate the integration of blue–green infrastructure for a resilient and livable city. **Existing situation** Currently, Amaravati is conducting a comprehensive baseline assessment of the Krishna River's productivity and water quality. This baseline data is essential for identifying existing biodiversity patterns, detecting potential ecological impacts of urbanization, and formulating targeted interventions to protect aquatic ecosystems amid rapid planned urbanization. **Sub Actions** • Establish Biodiversity Management Committee and hold regular meetings for development, operations and management. • Prepare a Local Biodiversity Strategy and Action Plan (LBSAP) with zone-level targets and a revision of the plan every 5 years. • Update zoning and development control regulations to include minimum green cover as per URDPFI and WHO standards. **(Ongoing/Planned)**
Potential locations: City-wide
Implementing entities **Lead:** APCRDA **Supporting:** APSBB
Indicative cost: **Cost for Preparing LBSAP:** INR 25 lakhs
Type of action: Climate Adaptation
Climate resilience benefits: High
Timeline: Short term
Monitoring Indicators: • Number of Biodiversity Management Committee meetings held per year • Number of zone-specific biodiversity targets and actions formulated in the LBSAP completed within the plan period • Percentage of development projects complying with minimum green cover requirements
Good Practice: **Kochi** city became the first city in India to develop a scientifically informed and participatory Local Biodiversity Strategy and Action Plan (LBSAP). Kochi's LBSAP was designed to mainstream biodiversity conservation into urban planning by setting 29 specific goals that fall under nine focus areas across critical areas, including islands, lakes, green spaces, and wetlands. The plan incorporated extensive stakeholder

consultations at the zonal and city levels, mapped key ecosystems, and established targeted interventions, including the desilting of all inland water bodies, the establishment of decentralized sewage treatment plants, and shoreline conservation to enhance ecosystem services and climate resilience. LBSAP has guided the Kochi local government to safeguard biodiversity while supporting sustainable urban growth and resilience.[85]

Action 2: Establish monitoring systems using the City Biodiversity Index (CBI) and technology

Action details

The CBI, or Singapore Index on Cities' Biodiversity, is a self-assessment tool for cities that helps a greenfield city like Amaravati measure and monitor its biodiversity efforts over time. The data collected through the CBI, particularly during the construction phase, provides baseline data for tracking ecosystem health, species diversity, and habitat quality. Conducting the CBI assessment is essential for developing an LBSAP, as it allows for the necessary data to inform and guide the LBSAP.

Sub Actions

- Use the CBI to track progress on ecological indicators every 5 years.
- Implement tree-tagging with QR codes, GPS enabled plantation monitoring and AI-based tree health tracking.
- Develop, maintain and periodically update the People's Biodiversity Register
- Publish an open-data dashboard for public tracking of tree plantations, wetlands restored, and carbon sinks created.

Potential locations: City-wide

Implementing entities

Lead: APCRDA

Supporting: APSBB, Technology Service Provider, NGOs/ CSOs, Research Organizations

Indicative cost:

Cost for Developing CBI: INR 15 lakhs

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Short term

Monitoring Indicators:

- Number of newly planted and existing trees tagged
- Number of PBR updates per year
- Analysis of the overall CBI score compared to the previous assessment

Good Practice:

Hyderabad City Biodiversity Index tracks 23 ecological indicators and guides green space planning.

[85] ICLEI South Asia. (2020). Local Biodiversity Strategy and Action Plan for Kochi Municipal Corporation. Prepared under the BMU supported INTERACT-Bio project.

In 2020, **Kochi** became one of the first cities in India to develop a baseline CBI report, scoring a total of 45 out of 72 for the 18 indicators. The CBI revealed that the city's significant backwater area highly contributed to its native biodiversity score. The assessment identified that despite Kochi's rich biodiversity, it faces mounting challenges from urbanization and population growth that are threatening its green spaces and ecosystems. The findings highlighted the need for interventions to protect biodiversity, increase green cover and strengthen its governance mechanisms. Using the CBI monitoring tool, Kochi has aligned its projects and budgets with the biodiversity priorities outlined in the LBSAP.

Action 3: Promote public participation, education and stewardship

Action details

The suggested action to promote public participation and education in nurturing a biodiversity-friendly culture is essential for Amaravati to become climate-resilient.

Sub Actions

- Build the capacity of city planners, engineers, horticulture teams, and RWAs on biodiversity-friendly practices.
- Launch city-wide "My Tree" campaign with citizen tree adoption and rewards.
- Establish eco-volunteer networks in each township to maintain parks, report encroachments and support greening.
- Organize monthly biodiversity walks, plantation drives, etc
- Introduce a "Green Scorecard" system to rate layouts, RWAs and institutions.

Potential locations: City-wide

Implementing entities

Lead: APCRDA

Supporting: APG&BC, APSBB, Horticulture Dept, Educational Institutions, RWAs, NGOs/ CSOs, SHGs, Residents

Type of action: Climate Adaptation

Climate resilience benefits: High

Timeline: Short to Medium term

Monitoring Indicators:

- Identify and monitor the number of projects required for biodiversity practices
- Number of trees adopted by citizens

Good Practice:

Toronto's Local Enhancement and Appreciation of Forests (LEAF) organization has established an Adopt-A-Street-Tree program for promoting urban forestry by engaging community members directly in tree stewardship. The program successfully addresses the post-planting survival and health of street trees by mobilizing residents and businesses to help with monitoring and maintenance. LEAF provides the initial

tree planting and necessary educational resources, while community adopters commit to tasks such as watering, weeding, litter removal, and monitoring the tree's health.[86]

Strategy 4 - Financing Modes/Sources
APCRDA and State budget, 15th FC, CSR funds

[86] Thacker, M. (2018). LEAF's Adopt-A-Street-Tree program: Impacts on urban tree health and the driving social factors of community-based urban forest stewardship. University of Toronto.

2.8 Health

Baseline Status (2025)	**Key Statistics:** Amaravati's capital city area lacks primary health centres (PHCs) within its administrative boundary. Residents currently depend on nearby urban centres such as Mangalagiri, Guntur, and Vijayawada for medical services.[87]
Existing Policy, Plans and Initiatives	**National Policy/Programme/Targets:** • National Health Policy 2017 • National Urban Health Mission (NUHM) • Ayushman Bharat **State/Local Policy/Programme/Targets:** • Andhra Pradesh Health Systems Strengthening Project. **City Policy/Programme/Targets:** • >40 hospital beds per 10,000 population, supported by three multi-specialty hospitals in the initial 10 years. • 5–10 minute emergency response time through township-level health centres. • 300 acres of reserved public health land supporting primary and secondary care. • A 24×7 Health Command and Control Centre with telemedicine and digital monitoring for real-time response and disease surveillance.
Opportunities and Gaps	• Potential to establish model PHCs that leverage telemedicine and digital health platforms to serve both urban and peri-urban populations. • Dependence on neighbouring cities like Mangalagiri, Guntur, and Vijayawada for medical services leads to delayed treatment and overburdening of regional hospitals. • Regulatory and digital infrastructure gaps may hinder private sector participation and telemedicine scale-up.
Climate Risk	**Climate Risk Status**: Medium • High-intensity rainfall can lead to flooding and water stagnation, increasing water-borne and vector-borne diseases through contaminated water and mosquito breeding.

[87] Based on Focused Group Discussion conducted with existing settlements.

	• Rising temperatures elevate the risk of heat-related illnesses, such as heat strokes, particularly affecting vulnerable populations in slums and outdoor workers.
SDGs	GOAL 3: Good Health and Well-being, GOAL 6: Clean Water and Sanitation, GOAL 7: Affordable and Clean Energy, GOAL 11: Sustainable Cities and Communities, GOAL 12: Responsible Consumption and Production, GOAL 13: Climate Action

Climate Strategies, Actions and Targets

Strategy 1: Dust and emissions control during construction and infrastructure development.

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Accessibility of health services for all communities	All health care facilities should be within 1km	100%	100%	100%
Monitor climate-sensitive diseases and pandemics	Readiness to deal with extreme climate events, vector and water borne diseases	100%	100%	100%

Proposed Actions

Action 1: Accessibility of health services for all communities

Action details

Ensuring equitable access to health services across Amaravati by planning PHCs and health centres within 1km of residential zones, prioritized underserved and vulnerable areas. Emphasizes climate-resilient, barrier free, and transit accessible facilities to serve vulnerable populations effectively.

Sub Actions:

- Plan health centers within 1km of all residential zones **(Ongoing/Planned partly)**
- Prioritize underserved areas, including heat and flood-prone areas and informal settlements.
- Establishing regulations and guidelines to ensure the development of healthcare facilities that are well-prepared to withstand and effectively respond to the impacts of climate change on public health.

- Healthcare facilities should be set up in areas that are easily accessible by the urban poor, that is, within the range of public transport facilities and should not be inaccessible due to flooding or other hazards.
- Provide barrier free access for persons with disabilities, elderly and pregnant women.

Implementation agency

Lead: APCRDA

Supporting: Medical and Family Welfare Department, Private Hospitals

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: High

Potential locations: Citywide with focus on flood-prone and heat-impacted areas. Especially near to Pichukalapalem, Dondapadu, Ananthavaram, Velagapudi, Venkatapalem, Krishnayapalem, Sakamuru, Nowluru, Yerrabalem and Neerukonda

Monitoring indicators:

- Percentage of population within 1km of a primary health centres
- Number of PHCs/ health centres established in underserved/ climate risk prone areas.

Good practice:

Bhubaneswar, under smart health Initiative, developed accessible urban health centres within 1 km radius in all wards, integrating GIS-based planning to serve slum and vulnerable communities. This model ensured universal health coverage under the Smart City Mission

Action 2: Develop and implement a citywide Heat Action Plan (HAP)

Action details

The HAP aims to safeguard residents from extreme heat by mapping heat-prone areas, issuing early warnings, and conducting outreach for vulnerable groups. It integrates urban cooling interventions such as cool roofs and shaded public spaces

Sub Actions:

- Map heat-prone areas using land surface temperature data from satellite imagery combined with perspective surveys with the residents.
- Establish early warning systems for extreme heat events, integrated with emergency response protocols.

- Design targeted outreach for high-risk groups such as elderly, outdoor workers, pregnant women, children and people in informal settlements.
- Promote cool roofs, green roofs, shaded public spaces as suggested in Built Environment sector **(Ongoing/Planned)**

Implementation agency

Lead: APCRDA

Supporting: APSDMA, Research Organizations

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: High

Potential locations: Citywide with focus on high temperature villages - Pichukalapalem, Dondapadu, Ananthavaram, Velagapudi, Venkatapalem

Monitoring indicators:

- Existence and periodic update of city Heat Action Plan
- Number of early warnings issued before heatwave events
- Percentage of high-risk areas mapped and targeted with awareness campaigns
- Number of citizens reached through awareness campaigns

Good practice:

Ahmedabad Heat Action Plan is the first city-level HAP in South Asia, successfully reducing heat-related mortality through early warnings, public awareness and targeted interventions in vulnerable areas

Action 3: Enhance heat, air quality and flood resilience of public health infrastructure

Action details

Retrofitting and designing healthcare facilities for climate resilience with cool roofs, passive ventilation, renewable energy backup, and flood-proofing measures.

Sub Actions:

- Retrofit all health facilities with cool roofs, passive ventilation, and climate appropriate shading.
- Ensure uninterrupted water supply, renewable-powered backup system, accessible toilets and safe waste management system
- Install vegetative barriers and shaded waiting areas in healthcare premises located in degraded air quality zones or near traffic corridors.

- Elevate new facilities above design flood levels and integrate waterproofing, raised electrical systems, and resilient drainage in flood-prone sites. **(Ongoing/Planned)**
- Create safe access routes to health facilities during floods, with priority to serving heat and flood-prone settlements or areas.
- Establish mobile medical units and telemedicine kiosks as backup service delivery modes during periods of disrupted physical access.
- Maintain pre-positioned emergency medical and sanitation supplies at facility and ward/ village levels before the start of heatwave or flood season.

Implementation agency

Lead: APCRDA, Medical and Family Welfare Department

Supporting: APG&BC

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: High

Potential locations: Citywide with focus on flood-prone and heat-impacted areas. Especially near to Pichukalapalem, Dondapadu, Ananthavaram, Velagapudi, Venkatapalem, Krishnayapalem, Sakamuru, Nowluru, Yerrabalem and Neerukonda

Monitoring indicators:

- Percentage of health facilities retrofitted with cool roofs, solar backup and passive ventilation
- Number of mobile health units operational during climate emergencies
- Number of service disruption days during flood events.

Good practice:

In Kerala, primary health centres were rebuilt with elevated plinths, solar backup, and improved sanitation systems after 2018 floods, ensuring uninterrupted services during monsoon emergencies

Action 4: Ensure sanitation and disease prevention in climate-sensitive areas.

Action details

Promotes climate-resilient sanitation, vector control, and hygiene measures to reduce disease outbreaks post heat and flood events.

Sub Actions:

- Install climate-resilient sanitation facilities in all public health centres and community shelters.

- Conduct seasonal vector control drives in heat and flood-prone areas.
- Promote safe water storage and community hygiene campaigns before and after flood season

Implementation agency

Lead: APCRDA, Medical and Family Welfare Department

Supporting: SHGs, NGOs

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: High

Potential locations: Citywide with focus on flood-prone and heat-impacted areas. Especially near to Pichukalapalem, Dondapadu, Ananthavaram, Velagapudi, Venkatapalem, Krishnayapalem, Sakamuru, Nowluru, Yerrabalem and Neerukonda

Monitoring indicators:

- Percentage of health facilities with climate-resilient sanitation systems
- Number of seasonal vector-control and water-quality campaigns conducted
- Percentage of households reached with hygiene and safe water awareness drives
- Incidence rate of water- and vector-borne diseases (yearly trend)
- Percentage of flood shelters equipped with sanitation facilities

Good practice:

Odisha's Community-Led Total Sanitation (CLTS) Model empowered SHGs and local communities to maintain hygiene and safe sanitation in flood-prone areas, reducing diarrheal and vector-borne diseases significantly during monsoon seasons.

Action 5: Monitor climate-sensitive diseases and pandemics

Action details

Establishes an integrated disease surveillance system to monitor vector-borne, water-borne, and climate-linked illnesses in real time, enabling early detection and rapid response.

Sub Actions:

- Establish a disease surveillance system integrating local clinics, hospitals and public health labs.
- Track water-borne, vector-borne, health-related illnesses in real time in the city, including village settlements.

- Develop rapid response protocols for outbreaks and pandemics with a dedicated health emergency team.

Implementation agency

Lead: APCRDA, Medical and Family Welfare Department

Supporting: Private Hospitals & Clinics, NGOs

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: High

Potential locations: Citywide with focus on flood-prone and heat-impacted areas. Especially near to Pichukalapalem, Dondapadu, Ananthavaram, Velagapudi, Venkatapalem, Krishnayapalem, Sakamuru, Nowluru, Yerrabalem and Neerukonda

Monitoring indicators:

- Percentage of clinics and hospitals integrated into the reporting network
- Number of alerts issued and response actions activated per year
- Response time between outbreak detection and intervention

Strategy 1 - Financing Modes/Sources

State budget, CSR funds

Strategy 2: Strengthen health governance and capacity for climate adaptation

Proposed Actions

Action 1: Integrate climate risk into health sector planning and regulation

Action details

Ensuring all new healthcare facilities meet climate-resilient design standards, including flood safety, renewable energy, and sanitation provisions

Sub Actions:

- Enforce regulations requiring all new healthcare facilities to meet climate-resilient design standards.
- Prioritise facility location in accessible areas served by public transport and safe from flooding.
- Include provisions for renewable backup power and sanitation.

Implementation agency

Lead: Medical and Family Welfare Department

Supporting: APCRDA

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Percentage of new health facilities meeting climate-resilient design standards

Action 2: Capacity building for health professionals

Action details

Focuses on training doctors, nurses, and sanitation workers on managing climate-induced health risks and emergency response for heatwaves, floods, and disease outbreaks.

Sub Actions:

- Train healthcare professionals to identify and manage climate-related health risks.
- Provide refresher courses on emergency response for heatwaves, floods, air pollution and disease outbreaks.
- Build capacity among sanitation workers for disease prevention and safe waste handling during climate emergencies.

Implementation agency

Lead: APCRDA

Supporting: APCRDA, NGOs/ CSOs, Academic Institutions

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Number of health professionals trained on climate-health linkages
- Frequency of emergency response refresher courses conducted annually
- Percentage of sanitation workers trained in safe waste management
- Percentage of hospitals conducting mock drills for heat/flood response

Action 3: Community engagement and awareness

Action details

Encourages citizen participation through awareness campaigns, evacuation drills, and volunteer networks for early reporting of disease outbreaks in high-risk areas.

Sub Actions:

- Establish climate health awareness programs in schools, urban villages and market areas.
- Conduct drills for emergency evacuation and medical response in high-risk zones.
- Encourage community-based volunteers to report early signs of disease outbreaks.

Implementation agency

Lead: Medical and Family Welfare Department

Supporting: APCRDA, NGOs/CSOs, RWAs, Fire Department, APSDMA

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Number of community awareness programs and school outreach sessions held annually
- Percentage of high-risk wards conducting emergency evacuation drills
- Number of active community health volunteers per 1,000 population.

Action 4: Monitoring, evaluation and reporting

Action details

Establish a Climate Health Dashboard to integrate disease data, air quality monitoring, and climate alerts, facilitating evidence-based health advisories and periodic reviews.

Sub Actions:

- Set up a centralised Climate Health Dashboard to track heat, flood and air pollution-related illnesses.
- Link continuous air quality monitoring stations with the command control centre and the health database.
- Issue health advisories during poor air quality episodes, focusing on sensitive groups.
- Release seasonal climate health bulletins for public and policy use.
- Review and update health and sanitation policies every 5 years

Implementation agency

Lead: APCRDA, Medical and Family Welfare Department

Supporting: NGOs/CSOs

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: High

Potential locations: Citywide

Monitoring indicators:

- Frequency of published climate-health bulletins (quarterly/seasonal)
- Number of health advisories issued for poor air quality or heat eventIncidence rate of water- and vector-borne diseases (yearly trend)

Good practice:

In **Tamil Nadu,** A state-of-the-art One Health and Climate Change centre is being set up at the State level, and this system will ensure real-time data collection, analysis, and reporting to track the incidents of diseases exacerbated by climate change, such as zoonotic diseases, vector-borne diseases, heat stress, and respiratory illnesses,etc. The integration of this data will inform resource allocation, healthcare infrastructure, and policymaking, enabling proactive interventions. Additionally, this data will support the development of predictive models and enhance district-level capacity for responding to climate-induced health risks.

Strategy 2 - Financing Modes/Sources

State budget, CSR funds

2.9 Air Quality Management

Baseline Status (2025)	**Key Statistics:** Annual concentration of PM 10 is 65.22 µg/m^3. Annual concentration of PM 2.5 is 32.15µg/m^3. AQI levels in Amaravati fall under satisfactory and good for about 82% of the days from 2020 to 2024.
Existing Policy, Plans and Initiatives	**National Policy/Programme/Targets:** • National Clean Air Programme. • Construction and Demolition Waste Management Rules, 2016. **State/Local Policy/Programme/Targets:** • NGT and EC guidelines for dust and emissions control during the construction phase
Opportunities and Gaps	• Only one AQQMS is installed at the AP secretariat for AQI monitoring. • Planned infrastructure construction activities in the city can increase the concentration of particulate matter. • The health of the existing villagers and construction labourers needs to be taken care of during the immediate construction phase.
SDGs	GOAL 3: Good Health and Well-being, GOAL 11: Sustainable Cities and Communities, GOAL 12: Responsible Consumption and Production, GOAL 13: Climate Action, GOAL 15: Life on land.

Climate Strategies, Actions and Targets

Strategy 1: Dust and emissions control during construction and infrastructure development.

Proposed Targets

Action Area	Target Parameter	2028	2043	2058
Real-time air quality monitoring	Large construction sites (>20,000 sq.m) with live air quality monitoring.	100%	100%	100%

Action Area	Target Parameter	2028	2043	2058
Dust and emission control	Large sites using dust and emission control measures as per protocol.	100%	100%	100%

Proposed Actions

Action 1: Enforce robust dust suppression and containment protocols

Action details

Implement multiple measures to minimise the spread of particulate matter from source locations to adjacent areas and during material transportation. Precautionary and suppression measures are to be enforced to keep PM concentration within safe limits.

Sub Actions:

- Use of windshield of adequate height (minimum 3m height or 1/3rd of building height, maximum up to 10m) in all construction sites.
- Use green netting or dust-proof sheets on all scaffolding to control dust emissions during construction and demolition. **(Ongoing/Planned)**
- Deploy anti-smog guns/mist cannons at least three times daily, with continuous operation during periods of high wind. **(Ongoing/Planned)**
- Reuse treated wastewater from sewage treatment plants to operate anti-smog guns/mist cannons and minimize freshwater use.
- Cover excavated material using tarpaulin or green mesh, store fine materials indoors or under non-permeable covers.
- Enclose cutting, grinding, drilling and sawing in covered, ventilated enclosures.

Implementation agency

Lead: APCRDA

Supporting: APPCB

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Percentage of construction sites installed with windshields.
- Percentage of construction sites using treated wastewater for dust suppression.

Good practice:

The Commission for Air Quality Management in NCR Delhi has mandated sprinklers, anti-smog guns, and scaffolding netting for all registered C&D sites. Continuous mist cannons during windy periods reduced airborne dust, supporting the Graded Response Action Plan (GRAP) compliance.

Action 2: Deploy real-time air quality monitoring and site surveillance systems

Action details

Real-time monitoring of air quality through a continuous decentralised network of monitors helps collect localised data and identify when the air quality deteriorates, enabling alerts for immediate safety measures.

Sub Actions:

- Install real-time pollutants monitoring sensors (for PM1, PM2.5, PM10, PM100) for large sites (such as size >20,000 sq. m) and connect to Command & Control Centre dashboard.
- Maintain calibration logs and ensure uninterrupted data transmission at sub-hourly intervals (every 15 minutes)
- Reflect real-time air quality data on display boards at construction sites for transparency.

Implementation agency

Lead: APCRDA

Supporting: APPCB

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Percentage of construction sites installed with real-time pollutants monitoring sensors.
- Percentage of installed pollutants monitoring sensors integrated with CCC.
- Percentage of construction sites installed with display boards.

Good practice:

Swati 18, an under-construction business centre in Ahmedabad, has installed PM1-PM10 sensors connected to a live dashboard with a public display. Triggered misting and rescheduled high-dust activities based on the sensors' data, maintaining compliance with Ahmedabad Municipal Corporation's construction dust control guidelines.

Action 3: Strengthen material handling, storage and transport regulations

Action details

Transporting C&D waste from the source to collection and treatment facilities must follow specific measures to suppress the spread of particulate matter. Once the material reaches the processing facility, it should be stored properly, with coverings or suppression measures in place to help maintain a better AQI around the facilities.

Sub Actions:

- Pave all internal haul roads, maintain dust-free surfaces.
- Cover all material transport vehicles with tarpaulin and enforce restrictions on overloading.
- Install wheel wash or tire wash systems at large sites, with use of treated wastewater where feasible.
- Dispose C&D waste at designated collection or processing facilities promptly (such as within 48 hours of generation).

Implementation agency

Lead: APCRDA

Supporting: APPCB

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Percentage of large construction sites installed with tire wash systems.

Good Practice

In **Chandigarh**, the municipal corporation established a Construction & Demolition Waste Recycling Plant at the Industrial Area to ensure regulated collection, covered transport, and scientific storage of debris. Internal haul roads were paved, vehicle washing was mandated, and processed material was reused in city works.

Action 4: Adopt low-emission construction machinery and power solutions.
Action details Adoption of the latest technology in construction activities, especially in non-preventive tasks that reduce fossil fuel consumption, can help improve air quality. Additionally, preventing increased vehicle pollution due to outdated technology and poor maintenance is a necessary step to avoid deterioration of air quality. **Sub Actions:** • Only allow Bharat stage complaint construction equipment on-site. • Fit all DG sets with particulate filters, acoustic enclosures and comply with noise and emissions norms prescribed by MoEF&CC in Environment (Protection) Rules. • Prioritise grid-based power supply for construction sites, incentivize battery or hybrid generator sets. • Maintain a preventive maintenance schedule for all machinery.
Implementation agency **Lead:** APCRDA **Supporting:** APPCB
Type of action: Climate Adaptation
Timeline: Short term
Climate resilience benefits: Medium
Potential locations: Citywide
Monitoring indicators: • Percentage of DG sets complies with noise and emissions norms.
Good Practice: In **Delhi**, for large scale projects, only Bharat Stage–VI compliant excavators, cranes and loaders were permitted on site. All DG sets were retrofitted with diesel particulate filters and acoustic enclosures per MoEF&CC norms, and the contractor employed hybrid gensets with priority to grid power.

Action 5: Implement specific measures for ready-mix concrete plants.
Action details The expected increase in both the number and scale of constructions will lead to the growth of ready-mix concrete plants. These plants, where construction materials will be stored and used in larger quantities,

need to implement measures to reduce particulate matter spread and maintain buffer zones from other public areas.

Sub Actions:

- Barricade or cover batching areas.
- Install dust collectors/ bag filters for silos, cover conveyor belts.
- Use sprinklers and windbreak walls around stockpiles.
- Pave all vehicle movement paths within the plants.

Implementation agency

Lead: APCRDA

Supporting: APPCB

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Percentage of plants that maintain barricades.
- Percentage of plants maintaining a green buffer on their boundaries.
- Percentage of plants where AQI falls below the acceptable levels in a month.

Good practice:

Nyati Group, a real estate developer based in Pune, has installed bag filters, covered conveyors, paved plant roads, and automated sprinklers for stockpiles. Additionally, the deployed advanced, weatherproof air quality monitors for real-time data monitoring. Fugitive dust fell by 28%, meeting MPCB standards.[88]

Action 6: Mandate comprehensive construction environmental management plans.

Action details

Construction sites are potential sources of particulate matter, air quality management plans should be included in building permission approval requirements, focusing on reducing pollutant levels and ensuring site owners and contractors take responsibility for effective enforcement.

[88] Transforming Air Quality at construction sites

Sub Actions:

- Mandate CEMP submission and approval as a precondition for all building permits of large sites (such as area >5,000 sq. m).
- CEMP shall include site-specific dust suppression measures, waste management and vehicle cleaning protocols, air quality monitoring, and contingency plans for high AQI days.
- Nominate a Site Air Quality Officer for each large construction project to oversee compliance and maintain daily logs.
- Submit monthly compliance reports to the concerned authority or department at APCRDA.

Implementation agency

Lead: APCRDA

Supporting: APPCB

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Percentage of construction sites implementing dust suppression measures.
- Percentage of construction sites submitting monthly compliance reports to APCRDA.

Good Practice:

Ahmedabad Municipal Corporation (AMC) has prepared the 'Policy on Good Construction Practices' to reduce the dust pollution from the construction sector. Policy developed based on information from RERA, around 450 sites were under construction during FY 2021-22, with more than 70% sites having built up area more than 5,000 m2. This policy includes good practices for construction sector, which needs to be followed for construction sites having more than 5,000 m2 built up area to reduce the air pollution from construction sector. This policy includes measures/ interventions including air quality monitoring, construction site surveillance and mitigation measures for dust generating sources (including demolition; cutting; crushing; drilling; excavation; operation of RMC plant; material handling, storage and transfer; use of mist machine etc.)

Strategy 1 - Financing Modes/Sources
State and APCRDA budget, NCAP funds

Strategy 2: Integrate air quality resilience into urban and building design

Proposed Actions

Action 1: Establish air filtration and ventilation standards for public buildings, schools and hospitals.

Action details

Adoption of air filters in public and other buildings where vulnerable groups are present during the daytime to reduce the impact, as air quality is often beyond permissible levels, especially during winter months, and with anticipated construction projects.

Sub Actions:

- Mandate Minimum Efficiency Reporting Value (MERV)-13/ High Efficiency Particulate Air (HEPA) filtration in all new public buildings, schools and hospitals.
- For naturally ventilated public buildings, install filtered fresh air inlets.

Implementation agency

Lead: APCRDA

Supporting: APPCB

Type of action: Climate Adaptation

Timeline: Short term

Climate resilience benefits: Medium

Potential locations: Citywide

Monitoring indicators:

- Percentage of public buildings, schools and hospitals installed with air filters.

Action 2: Implement worker and community protection measures.

Action details

On days with poor AQI, altogether avoiding activities can disrupt the livelihoods of daily wage workers. Implementing safety measures can help reduce the impact on health, and the APCRDA should monitor periodically on these days and property owners should be involved in enforcing safety precautions.

Sub Actions:

• Supply N95/ P2 masks to all outdoor municipal or construction workers on poor AQI days. **(Ongoing/Planned)** • Schedule work shifts to avoid peak dust hours, install shaded, ventilated rest shelters. • Ban biomass burning in worker camps, ensure LPG/PNG/ electric cooking facilities as feasible.
Implementation agency **Lead:** APCRDA **Supporting:** APPCB
Type of action: Climate Adaptation
Timeline: Short term
Climate resilience benefits: Medium
Potential locations: Citywide

Action 3: Design and maintain vegetative buffers and include provision for pollution-suppression infrastructure.
Action details Using the greenery as buffer space along the road network and special development zones helps in minimising the spread of particulate matter to the adjacent areas. **Sub Actions:** • Develop multi-row native tree buffers along highways, construction corridors and logistics hubs. • Use vegetated verges and permeable paving to reduce dust re-suspension and improve air quality.
Implementation agency **Lead:** APCRDA **Supporting:** APPCB
Type of action: Climate Adaptation
Timeline: Short term
Climate resilience benefits: High
Potential locations: Citywide

Monitoring indicators:

- Percentage of high traffic volume roads and logistic corridors with vegetative buffers.

Good practice:

Delhi - In the Delhi Metro Rail Corporation (DMRC) projects, vegetative buffers (grass verges, shrubs) were planted along excavated edges and combined with periodic water spraying / dust-cannon systems to suppress fugitive dust. This combined "green + mechanical" buffer reduced downwind PM_{10} exposures by 20–25 %.

Strategy 2 - Financing Modes/Sources

State and APCRDA budget, NCAP funds

Strategy 3: Establish strong governance, enforcement and adaptive management for air quality

Proposed Actions

Action 1: Setup and operationalize a Construction Air Quality Management Cell or Unit

Action details

Continuous monitoring of various activities and on-site inspections are crucial because enforcement failures often happen when construction workers are unaware of the long-term health effects of air quality. The efficacy of sensors installed at construction sites must be regularly verified through inspections.

Sub Actions:

- Establish a dedicated construction Air Quality Management Team/Cell under APCRDA.
- Deploy a trained inspection team with jurisdiction over all active construction zones, capable of issuing on-spot fines and blacklisting non-complaint contractors.
- Undertake periodic source apportionment studies using advanced receptor modelling techniques to identify and quantify key contributors to air pollution (e.g., transport, road dust, industry, construction, biomass burning)
- Integrate air quality data with command control centre for 24/7 data feed from dust sensors, CCTV, metrological station and air quality monitoring sensors.
- Maintain a dashboard showing live air quality data, inspection results, and enforcement actions, accessible to decision makers and the public.

Implementation agency

Lead: APCRDA

Supporting: APPCB
Financing Sources/ Modes APCRDA funds, NCAP funds.
Type of action: Climate Adaptation
Timeline: Short term
Climate resilience benefits: High
Potential locations: Citywide
Monitoring indicators: • Number of inspections carried out by the team/cell in a month. • Percentage of non-compliant construction sites identified out of total inspections in a month.

Action 2: Implement a city-wide AQI linked adaptive construction response protocol

Action details

Dissemination of information when the air quality is identified as moderate or lower, to prevent impacts on health. Depending on the information communicated to on-site personnel, they can immediately instruct the working groups to use safety precautions or schedule modifications.

Sub Actions:

- Maintain a graded AQI response system tailored to construction phase conditions.
    - **Moderate**: Maintain standard dust suppression, ensure covered storage and transport, and restrict biomass burning.
    - **Poor**: Increase misting frequency, limit material transfer during windy hours, and inspect all active sites for compliance
    - **Very Poor**: Halt earthworks and concrete batching in open areas, restrict truck movement to night hours and require all sites to operate only enclosed cutting/ drilling stations
    - **Severe**: Temporarily stop all non-essential construction, relocate school activities indoor, activate community clean air shelters.
- Deploy automated AQI-triggered alerts to contractors, site managers, APCRDA field teams, schools and health facilities via SMS/ social media.
- Integrate AQI response protocols into all public works tenders and private project environmental management plans.

• Maintain a multi-year compliance archive to track trends, inform mid-course policy adjustments and ensure accountability across construction project timelines.
Implementation agency **Lead:** APCRDA **Supporting:** APPCB
Type of action: Climate Adaptation
Timeline: Short term
Climate resilience benefits: High
Potential locations: Citywide
Monitoring indicators: • Percentage of days in a month that air quality records are monitored and recorded. • Percentage of moderate or below air quality days communicated to contractors and site managers. • Percentage of construction sites communicated for a poor air quality alert.
Good practice: Delhi, under the GRAP protocol, enforces graded AQI-based restrictions ranging from increasing the misting frequency to halting earthworks and activating clean-air shelters with automated alerts to contractors and schools.

Strategy 3 - Financing Modes/Sources
State and APCRDA budget, NCAP funds

3 Governance and Implementation of Climate Change Action Plan

Amaravati has set an ambitious vision to become a climate-resilient city and achieve low-emission development. To achieve this target, APCRDA needs to enhance collaboration among key stakeholders and develop a robust governance, monitoring, and verification framework to achieve the sectoral targets set in the CCAP, and sustain the benefits for the long term. This chapter outlines the key steps that APCRDA and stakeholders must take to enhance governance, monitoring, and verification, thereby facilitating the effective and timely implementation of proposed climate mitigation and adaptation actions.

3.1 Effective Governance for CCAP Implementation

Having enabling governance structures and coordination mechanisms in place to ensure effective implementation and monitoring of the climate actions of Amaravati's CCAP is important. APCRDA can establish an institutional structure such as a dedicated Climate Core Team[89] to oversee and ensure the strategic execution and implementation of its CCAP. It can be supported by a Stakeholder Committee that brings together multi-stakeholders to ensure inter-agency coordination, partnerships, and help incorporate local expertise to operationalise joint efforts on climate action and achieve intended objectives and targets of the CCAP.

The key responsibilities of the proposed Climate Core Team or Climate Cell include:

1. **Establish a Climate Core Team or Cell within APCRDA:**

A Climate Core Team or Cell can be established within APCRDA, with it being chaired and headed by the Commissioner and Additional Commissioner. It can include key departments handling Urban Services Infrastructure, Planning, Urban Greening and Environment, Economic Development, and Housing and infrastructure planning and development in the LPS zones from APCRDA and ADCL. The proposed Team or Cell shall be responsible for CCAP implementation, monitoring, and reporting, with strategic guidance from the Principal Secretary of MA&UD, the Commissioner & Director of Municipal Administration, to ensure the successful implementation of the CCAP and align with the state's target of net-zero emissions by 2047.

Based on evolving urban governance institutional arrangements in Amaravati, the composition of the Climate Core Team or Climate Cell can be revisited to have representation of all relevant departments involved in day-to-day urban service delivery and governance in the city.

- **Strategic Alignment and Planning**
    - Oversee, guide, and coordinate the planning and implementation of the CCAP.
    - Periodically review state-level initiatives such as Swarna Andhra 2047 Vision and Master Plan for the larger capital region to identify strategic climate and sustainability interventions and projects.
    - Ensure alignment of CCAP actions with key national and state policies[90], programs, and schemes such as National Clean Air program (NCAP), Urban Challenge Fund, AMRUT, SBM, and EV policies.

[89] The Climate Core Team is responsible for overseeing the preparation, execution and implementation of the city's climate action plan
[90] Swarna Andhra@2047, AP Integrated Clean Energy Policy, AP Industrial Development Policy, AP Tourism Policy , AP Sustainable Electric Mobility Policy, AP Private Industrial Parks Policy, AP Electronics Manufacturing Policy, AP Data Center Policy

- Facilitate integration of climate initiatives into the city's development plans[91], policies and budgetary frameworks.
- Promote inclusive and gender-balanced approaches to climate planning and project design.

- **Institutional Coordination and Governance**
  - Ensure inter-departmental engagement, communication, and collaboration with the departments and stakeholders involved in the Climate Core Team and Stakeholder Committee for cross-sectoral coordination on climate action implementation.
  - Facilitate regular inter-departmental and stakeholder meetings on CCAP implementation
  - Coordinate with the State Climate Change Centre for Cities[92] to ensure alignment with state-wide climate initiatives and access to technical support.
  - Support relevant APCRDA and ADCL departments in preparing short-term departmental action plans under the CCAP and integrating them into regular planning and operations.
  - Conduct regular consultations with external experts, agencies, and institutions to gain insight on sectoral priorities and best practices.
  - Ensure representation of vulnerable & marginalized groups in planning and decision-making

- **Implementation and Action Delivery**
  - Develop and implement targeted strategies, programs, and projects to address climate risks and promote sustainability across sectors.
  - Conceptualize climate resilience projects, prepare feasibility analyses, and establish implementation frameworks to attract national, private sector and international funding.
  - Facilitate adoption of innovative and climate-sensitive financing mechanisms, including mobilization of local resources, i.e., CSR/CER funds.
  - Ensure timely and effective implementation of climate actions identified under the CCAP.

- **Monitoring, Evaluation, and Reporting**
  - Monitor and evaluate the progress of climate actions using relevant Key Performance Indicators (KPIs) as identified.
  - Compile periodic reports tracking KPIs for GHG reduction and resilience. Maintain a dashboard for CCAP progress transparency.
  - Review and update Amaravati's GHG emissions inventory and Climate Risk and Vulnerability Assessment once every three to five years.
  - Report on progress of CCAP implementation in adherence to national and state-level climate change frameworks and reporting mechanisms.
  - Participate in global climate action reporting platforms such as Global Covenant of Mayors (GCOM) and engage in peer-to-peer learning to adopt international best practices.
  - Apprise departments and stakeholders on CCAP progress and achievements.
  - Conduct periodic stakeholder perception surveys on CCAP effectiveness and inclusive governance
  - Review and update the CCAP, at least once every 5 years through engagement with departments and stakeholders.

[91] Capital City Master Plan, Zoning Regulations, Sectoral Master Plan, Urban greening policy, Streetscape guidelines, Disaster Management Plan, Mobility Plan, Flood mitigation plan

[92] Andhra Pradesh through the Municipal Administration & Urban Development (MA&UD) Department has established a 'State Climate Centre for Cities' under MoHUA's CITIIS 2.0 program (State Component 2)

- **Data and Knowledge Management**
    - Establish and maintain a centralized climate data portal to support decision-making and performance tracking.
    - Analyze city-wide data to identify trends, risks, and opportunities for course correction.
    - Conduct climate research and promote knowledge-sharing within and across departments and partner institutions.
    - The city may strengthen some additional socio-economic indicators including income distribution/levels across different sections, local migration and inequality aspects as possible.
- **Awareness, Capacity Building, and Partnerships**
    - Promote environmental education and awareness through sensitization programs and IEC (information, education, and communication) campaigns.
    - Identify capacity gaps among the implementation entities across sectors and partner with knowledge partners for training and building capacity among APCRDA staff and stakeholders for designing and implementing appropriate climate action projects.
    - Build strategic partnerships and mobilize support and funding from multiple sources to enable climate action.
    - Provide tools, resources, and guidance to internal departments and external stakeholders on sustainable and climate-resilient practices.
    - Set up recognition and reward mechanisms for CCAP champions and successful initiatives by APCRDA, public departments, and stakeholders.

2. Mainstream the 'Climate Resilient Infrastructure'[93] framework into Amaravati infrastructure planning processes.

Incorporate the 'Climate Resilient Infrastructure' framework into Amaravati's planning processes by embedding climate risk and GHG footprint considerations into project identification, design approval, tendering, and operations and maintenance (O&M) phases. This framework is essential to safeguard Amaravati from the anticipated impacts of climate change. The Climate Core Team can prioritize CCAP-listed actions in annual and project budgets, using climate-oriented benefits to rank investments for scale-up. The CCAP identifies sector-specific projects that align well with Amaravati's urban planning goals, offering significant potential for emission reduction. For example, in the context of civil works and infrastructure development, APCRDA can leverage enabling programs and capital subsidy schemes to ensure a portion of the budget is dedicated to supporting the installation of rooftop solar PV in upcoming residential buildings.

As a greenfield capital, Amaravati anticipates increases in built-up area and space cooling demand due to prevalent weather conditions. The planning department must strictly adhere to zoning regulations and promote all capital complexes, commercial, institutional, and large residential developments to be designed as green buildings that requires less energy and promote energy efficiency, optimal resource utilization, and the adoption of renewable energy, passive design measures, heat-resistant building materials, and high efficiency appliances. The CCAP outlines these targeted actions, while noting

[93] Infrastructure is considered climate-resilient when it is planned, designed, constructed, and operated to anticipate, respond to, and adapt to changing climatic conditions.

resulting climate resilience benefits and GHG emission reductions, thereby enabling decision-makers to prioritize effective climate actions in alignment with the Net-zero Swarna Andhra target.

3. **Empower the Stakeholder Committee to ensure inclusive and systematic implementation of the CCAP.**

   The successful implementation of the CCAP requires robust collaboration across several public institutions and parastatal agencies and local stakeholders. This includes the CDMA, AP TRANSCO, NREDCAP, APCPDCL, APSECM, APSRTC, APMRC, AP Water Resources, APG&BC, Swacch Andhra, APPCB, PH&MED, DTCP, academic institutions such as SRM University, SPA Vijayawada, Acharya Nagarjuna University, and residential welfare associations, among others. These stakeholders are already mapped and participated in one-to-one and joint consultations during the CCAP development, and thereby can be readily enrolled in the Stakeholder Committee.

   The Stakeholder Committee shall act as a central platform for inclusive, participatory, and coordinated action. The Committee will play a key role in: reviewing and analyzing CCAP strategies and sector-specific interventions; prioritizing projects and actions through consensus-based decision-making; and ensuring that the implementation of climate initiatives delivers reliable, affordable, and sustainable urban services while supporting the greenfield city's economic growth.

   The Climate Core Team shall promote active partnerships with think tanks, academic institutions, technical agencies, state nodal bodies, and city network organizations to explore emerging technologies, solution trends, and best practices that can be localized for Amaravati's context. A strong emphasis should be placed on community engagement, especially the involvement of vulnerable and climate-impacted communities. Enhancing the engagement of existing village communities will foster a sense of ownership and empower community members to implement climate-resilience solutions. Including vulnerable communities in the planning and execution stages ensures their insights and needs shape the outcomes, leading to more effective and sustainable resilience strategies. Moving forward, community engagement and participatory processes should be institutionalized as key components in the update and revision phases of Amaravati's CCAP.

4. **Mainstreaming Climate action into Policy and Zoning Regulations and creating an implementation framework**

   Amaravati should embed the climate-responsive strategies outlined in the CCAP into its Zoning Regulations and Urban Design and Architectural Guidelines. This integration will guide macro and micro level planning to be climate-resilient, with climate-adaptive neighborhood designs and sustainable buildings, through working towards maintaining blue and green cover of 30% in the city by increasing the green cover through avenue plantation and network of parks which help in reducing the solar radiation absorption, reducing UHI effect, and promoting NMT, enhancing better last mile connectivity. Additionally, promoting the installation of rainwater harvesting structures and groundwater recharge pits can make buildings more sustainable, and cool roofs help in reducing the dependency on mechanical cooling systems. Further measures include working on options to achieve 100% renewable target for Amaravati energy demands such as promoting rooftop solar PV at buildings, identifying potential off-site solar and wind energy systems at an early-stage for large developments, supporting collective aggregated procurement of renewable power.

3.2 Enable Data Collection and Management

The success of every city-wide project and policy is highly dependent on a robust institutional framework and governance practices. However, for designing such projects and policies, the availability of data and information that is grounded in science, validated by subject matter experts, and informed by local communities is crucial. In the Indian context, gaps exist in standardised processes and systems for city governments to collate up-to-date and accurate datasets of their infrastructure and operations.

Establishing an Integrated Command Control Centre (ICCC)[94] for Amaravati: The ICCC should be designed as a system-of-systems that integrates data from multiple sources (such as IoT sensors, GIS data, and city databases).

Amaravati should develop and implement a robust data governance policy that defines data management protocols, data sharing mechanisms, privacy controls, and ownership responsibilities for all stakeholders. The system should maintain geo-referenced data for all city assets, ensuring that building permissions and zoning regulations are spatially mapped and continuously monitored through GIS-enabled platforms. Various cells proposed under different sectors like SCADA system for monitoring water supply and wastewater networks, early flood warning system, real-time monitoring of Solid waste processing facilities, air quality monitoring, building permission approvals should be linked with ICCC for maintaining a centralized database and conduct analysis to identify cross-sectoral implications in early stages.

The ICCC should integrate platforms such as Building Permission Management Systems with real-time monitoring capabilities to ensure adherence to zoning regulations. The system should implement Standard Operating Procedures (SOPs) for building approval processes, incorporating business rules engines that automatically flag violations or non-compliance issues. Real-time integration with drone-based monitoring systems can provide surveillance of construction activities, ensuring that approved building plans are followed and unauthorized constructions are immediately identified. The installation and integration of environmental sensors at construction sites will enable the real-time monitoring of air quality, noise levels, temperature, and humidity. Predictive analytics capabilities of ICCC will help in forecasting energy demand patterns, optimizing renewable energy distribution, and identifying opportunities for energy efficiency improvements.

ICCC should be linked with Intelligent Traffic Management Systems (ITMS) with adaptive traffic control, public transport monitoring, and parking management systems. Real-time traffic flow analysis, congestion prediction, and dynamic route optimization should be core functionalities in coordination with traffic police department. The platform should integrate with Automatic Vehicle Location Systems (AVLS) for public transport monitoring and implement dynamic messaging systems for citizen communication during traffic disruptions.

For flood, heat, and disaster risk simulation, the ICCC should receive information from environmental sensors, automatic weather monitoring systems installed and maintained by stakeholders, and should have in-house expertise to perform predictive modeling analysis. Disaster Risk Simulation and Prediction functionalities should include flood modeling based on forecasting information, topographical

[94] The ICCC Maturity Assessment Framework (IMAF) will help Amaravati city to develop standardized, scalable, and resilient ICCC systems that can effectively monitor the utilities, manage crises, support smart infrastructure, and foster real time urban governance.

data, real-time water level monitoring, and emergency response coordination systems. The platform should maintain emergency response protocols with automated alert systems, evacuation route optimization, and coordination with emergency services including fire, police, and medical response teams.

Establishing the ICCC requires recruiting subject matter experts including ICCC managers, data officers, technology experts, GIS specialists, cybersecurity experts, and domain specialists. Training and capacity-building programs should be implemented with dedicated annual budgets for continuous skill development.

To address the high operational costs of ICCC operations, Amaravati should explore public-private partnership models for ICCC operations, potentially generating revenue through data insights for urban planning and traffic optimization services.

Chandigarh city has developed an ICCC platform to support environmental and urban sustainability through technology-driven governance. The core infrastructure integrates over 25 urban services through 2,000 IP-based CCTV cameras across 285 locations, IoT sensors for air and water quality monitoring, AI-powered traffic management at 45 junctions, GPS-enabled waste collection for 489 vehicles, and SCADA systems for utility monitoring. Key outcomes include improved air quality despite rapid urbanization, 70% waste segregation rate with 40% reduction in landfill overflow, 20% reduction in non-revenue water losses, 30% reduction in groundwater use, 875,000 public bike rides reducing CO_2 emissions by 875 tonnes, 15-minute reduction in peak hour travel times, and successful management of 2023 monsoon floods through real-time monitoring and coordinated emergency response. The ICCC project demonstrates how integrated command systems can transform urban environmental management by combining real-time data analytics with community engagement, serving as a replicable model for sustainable city development across India and beyond.[95]

3.3 Monitoring and Tracking Progress

Although Amaravati CCAP is aligned with the city's ongoing infrastructure plans and projects, specific strategies and actions require a robust institutional framework and capacity to design, implement, operate, and maintain the implemented climate actions for optimal performance. This section covers aspects for effective monitoring and reporting of climate actions to be implemented in Amaravati.

a. **Institutional Set-up:** APCRDA needs to monitor and maintain the implemented climate actions with appropriate monitoring and tracking measures through the concerned departments. For instance, developing a real-time SCADA system for the water supply and energy project to monitor supply and demand patterns and enhance service quality. Such initiatives would enhance revenue generation and reduce GHG emissions.

   The proposed Climate Core Team, comprising of Amaravati's decision makers and departments, shall plan, steer, and oversee the CCAP's implementation in Amaravati, monitor overall progress, and strive to achieve the set milestones and identify gaps in achieving the targets and resolve the same. The designated Nodal Officer, appointed by Climate Core Team, can supervise and monitor routine activities by collating progress reports from concerned departments. Individual departments must analyze reports from various monitoring systems and verify them against on-the-ground

[95] Asian Development Bank Institute. (2025). Integrated Command and Control Centre: A Holistic Approach to Tackling Environmental Challenges in Chandigarh.

information to improve system performance. The Core Team should conduct periodic meetings as needed with these departments to resolve inter-departmental and on-ground operational challenges, and apprise its members within the stipulated timeline. The Core Team can then review periodic progress (at least quarterly) and take any necessary actions. The Team should periodically apprise MA&UD and CDMA of the ongoing and planned climate actions for Amaravati and seek their inputs for better alignment and impact.

b. **Sectoral Key Performance Indicators (KPIs):** For the timely and successful implementation of the CCAP, it is crucial to adopt and utilise KPIs. APCRDA and the proposed Climate Core Team shall establish such qualitative and quantitative indicators to track performance progress and nominate the relevant committee members/departments for performance evaluation. The identified KPIs shall be dynamic, robust, and forward-looking in nature to ensure maximum positive impact on the ground. Suggested KPIs for all sectoral climate actions have been provided in section 2 of this report.

   Amaravati shall review progress through the KPIs at least annually and may opt for more regular monitoring and reporting, as necessary. The tracking of KPIs shall be aligned with national and state-level city performance monitoring cycles set by authorities such as MoHUA and MA&UD for integrating and highlighting climate-focused initiatives and success stories, thus establishing the need for climate-centric development.

   Amaravati can develop a monitoring, evaluation and reporting matrix based on the KPIs, aligned with international and national reporting platforms, such as GCoM and CSCAF. It can also consider establishing a reporting system or platform linked to its Integrated Command and Control Centre.

c. **Accountability and Transparency:** The proposed Climate Core Team can continue to update the city's baseline information and emissions inventories, monitor the benefits, and proactively report the analysis on public climate data platforms such as the Urban Outcomes Framework and the GCoM through the CDP-ICLEI Reporting Platform and other similar international climate platforms. This will help Amaravati gauge its performance compared to similar cities being reported on the platforms and explore potential partnership opportunities with the best-performing cities.

d. **Update and revise CCAP:** The CCAP is a dynamic document to be reviewed and updated regularly by APCRDA and relevant governing institutions, especially given Amaravati's greenfield context. To ensure alignment with evolving priorities, policies, technology and context, APCRDA can review and update its CCAP, at least every 5 years, with the aim to achieve net-zero emissions ahead of 2058.

Globally, leading cities have adopted pioneering approaches for monitoring and tracking climate action. For instance, with a vision to achieve carbon neutrality by 2050, the city of **Buenos Aires** launched its Climate Action platform in 2020. This digital portal provides real-time, open access to over 30 environmental datasets such as GHG emissions, air quality, waste management, and sustainable mobility statistics. The platform supports transparent reporting, citizen engagement, and open collaboration with experts and other cities. Open-source datasets, hackathons, and digital tools empower both officials and citizens to track the city's progress towards carbon neutrality, enhancing accountability and promoting data-informed governance frameworks.[96]

[96] Urban Agenda Platform. (2020). The Buenos Aires Climate Action platform: enabling citizen-driven urban climate action.

3.4 Strengthen Institutional Readiness for Fast-Tracking Climate Action

Amaravati's institutional readiness will be strengthened by embedding multidisciplinary capacity building and sustainable procurement reforms into core governance processes, enabling faster and higher-quality implementation of the CCAP and measurable GHG reductions.

Objectives:

- Build cross-functional skills, coordination, and incentives across technical, administrative, and political wings to implement climate projects at speed and scale.
- Institutionalize low-carbon, climate-resilient procurement to reduce lifecycle emissions in infrastructure works and city operations.

Capacity Building: APCRDA can partner with national and international academic institutions, professional training bodies, and industry experts to deliver targeted capability development across departments.

- Focus domains: NRW management, renewable energy with battery energy storage systems, energy saving operational performance of STP operations, EV and non-motorized transport systems, blue–green infrastructure, climate-resilient neighbourhood planning, climate risk mapping, climate finance structuring, and sustainable urban mobility planning, etc.
- Modalities: short and mid-term trainings, thematic workshops, field demonstrations, and exposure visits including study tours for hands-on learning of best practices.
- Integration: Trainings embedded in annual departmental action plans with KPIs, pre and post-training assessments, and application targets linked to project milestones and budget releases.
- Knowledge management: Create a climate action knowledge hub, standard operating procedures (SOPs), and a repository of case studies, toolkits, and model bid documents to ensure continuity despite staff transfers.
- Governance: Designate climate action contact points in each department, with quarterly cross-department meetings to resolve bottlenecks and accelerate decision-making.

Sustainable Procurement: Amaravati can achieve significant reductions in GHG emissions through the procurement and supply chain of products and services, particularly in infrastructure projects of various scales and typologies. For instance, procuring energy-efficient data servers and their cooling equipment for the city's Command and Control Centre, and powering them through clean energy sources, such as solar PV systems. Another example is procuring regionally manufactured certified green materials for external and internal building elements to reduce embodied energy and lifecycle emissions.

The APCRDA Commissioner and Additional Commissioner can authorise the dedicated nodal officer from concerned departments, in consultation with stakeholder committee members, to undertake market research for commercially available green certified products and materials in the region as well as assess newer technologies and construction techniques that are energy efficient with passive design specifications, to reduce space cooling demand of the buildings. APCRDA can maintain an approved list of green products with performance benchmarks.

Similarly, Amaravati can explore RE procurement options and other demand-side management practices, like green energy open access for energy-intensive facilities, such as water supply systems, for reducing peak demand charges and overall GHGs. The state has laid out guidelines and schemes for such RE procurement that APCRDA's concerned departments can examine and incorporate, as relevant. The Climate Core Team may propose amendments to public procurement bye-laws and standard bid documents to include minimum energy performance, lifecycle carbon assessment, and recyclability criteria and integrate these into evaluation bidding scoring with verifiable certifications in the market.

The Climate Core Team can oversee annual capacity plans, green procurement roadmaps, and performance targets, and conduct quarterly reviews to monitor implementation and resolve bottlenecks. Nodal point of the departments can translate CCAP targets into their departmental project-level specifications and tender documents, and report progress to the Core Team. Nodal officer designated for green procurement can maintain an approved products list and lead supplier engagement to ensure compliance and report progress to Core Team.

Through such an assessment, Amaravati can modify the public procurement bye-laws by apprising the state government agency. Such practices will enhance Amaravati's capacity and enable it to showcase best practices to other developing cities and private stakeholders, while also helping to achieve the state's net-zero targets.

Financing Climate Action:

Amaravati will require external financing to implement, scale (CAPEX), and sustain (OPEX) the climate-led projects identified under the CCAP. Amaravati should identify avenues and mechanisms to secure the necessary financial resources for the successful implementation of ongoing and planned climate actions of CCAP. APCRDA and the Climate Core Team can seek available grants or financing instruments through ongoing state-level missions such as the 'Integrated Clean Energy Policy 4.0' with a capital subsidy of 25% to a maximum of INR 3 lakhs per public charging station for the first 5,000 EV public charging stations in the state over five years and with a capital subsidy of 20% will be provided on the fixed capital investment for battery manufacturing units over 5 years until the state reaches 5,000 MWh of cumulative capacity. Other co-funding opportunities to realize deployment of climate projects should be explored.

The Climate Core Team can initiate frequent engagements with national as well as global networks and donor organisations that can assist Amaravati in securing grants and assistance for various climate-based projects through different financial instruments and models such as PPP, Green Bonds, and RESCO/ESCO, among others. Similarly, avenues such as ICLEI's Transformative Actions Program (TAP) and the World Bank's City Climate Gap Fund can be explored to access private sector investment. Amaravati should also assess Indian national government initiatives through apex agencies, such as the Ministry of New & Renewable Energy, the Ministry of Housing and Urban Affairs, and dedicated state nodal agencies that provide grants and incentives through various schemes, as well as recent CSR amendments to access funding for specific climate actions.

3.5 Way forward - Realizing Climate Ambitions

Amaravati, as the capital city of Andhra Pradesh, serves as a lighthouse for other cities in implementing model projects and policies, and the way forward for realizing its climate ambitions requires a systematic, phased approach that transforms the CCAP from strategic vision into tangible outcomes through robust institutional frameworks, supported with innovative financing mechanisms, and adaptive management systems.

Amaravati's unique advantage as a greenfield development presents an unprecedented opportunity to embed climate resilience and net-zero principles into every aspect of urban planning and infrastructure development, requiring the establishment of a dedicated Climate Core Team/Cell that coordinates across sectors, while ensuring seamless integration with existing governance structures, including APCRDA and state line departments. CCAP implementation requires sector-specific working groups comprising technical experts, policy makers, private sector representatives, academic institutions, and community representatives who can translate the CCAP's strategic interventions into detailed project designs, procurement specifications, and performance monitoring frameworks that track progress against the 2058 net-zero target through measurable indicators such as GHG emissions reductions, green building certifications, integration of RE with BESS, green cover expansion, EV readiness and climate vulnerability assessments etc.

The success of Amaravati's climate journey depends on mobilizing diverse funding streams, including green bonds, climate funds, public-private partnerships, and international development finance, while building local capacity through training programs, knowledge-sharing platforms, and community engagement initiatives. These initiatives embed climate action within the city's institutional framework, positioning Amaravati not merely as a planned capital but as a replicable model for climate-resilient, net-zero, and inclusive development that can inspire and guide cities across India and abroad.

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Annexure A. Feasibility Assessment of the Climate Resilient Interventions

The feasibility exercise also shows the period to realise the impact of the intervention.

- **Period to Realise Impact:** Actions that are based on readily available technology, that meet development/political priorities and are easily financed (readily available funds), can be implemented quickly with a short lead time for impact realisation. Based on these characteristics, the time required for implementing projects is categorised as short, medium, and long term.

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention			Period to Realize Impact
		Technical	Political	Financial	
		High/ Medium/ Low	High/ Medium/ Low	High/ Medium/ Low	Short/ Medium/ Long
Energy and Building					
Prioritise energy efficiency and renewables in public buildings and city utilities	Build and operate certified green, energy-efficient public buildings	High	High	Medium	Short to Medium
	Establish enabling policies for government buildings and public procurement	High	Medium	High	Short
	Integrate energy efficiency & renewables into utility service infrastructure	High	High	Medium	Short to Medium
	Test innovative solutions & implementation models for further scale-up	Medium	High	Medium	Medium
	Notify enabling guidelines & conduct training of public officials	High	High	High	Short
	Central energy management system	High	High	Medium	Short to Medium
Reduce energy use by green, climate-responsive & energy-efficient buildings in all zones	Integrate green building norms into zoning regulations	High	Medium	Medium	Short
	Incentivise green building certification for private buildings	Medium	Medium	Low	Short to Medium
	Use passive cooling measures and sustainable building materials	Medium	Low	Low	Short to Medium
	Partner with green building agencies and implement pilot projects	Medium	Medium	Low	Short to Medium

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention			Period to Realize Impact
		Technical	Political	Financial	
		High/ Medium/ Low	High/ Medium/ Low	High/ Medium/ Low	Short/ Medium/ Long
	Promote enhanced building energy performance and reporting	High	Medium	Medium	Short to Medium
	Expand AGC Urban Design Committee & team into city-wide Green Building Promotion Department	High	High	Medium	Short
Integrate climate-resilient building design and thermal comfort	Deploy localized cooling interventions for vulnerable zones and public spaces	High	Medium	Low	Short to Medium
	Promote cool/green roofs and green facades in new and existing buildings	High	Medium	Low	Short to Medium
	Mandate passive cooling and thermal comfort standards in all new buildings	High	Medium	Low	Short to Medium
	Integrate flood-resilient design in building constructions	High	Medium	Low	Short
Integrate high level of clean energy and renewables to meet energy requirements	Develop Sustainable Energy Transition Roadmap for Amaravati	High	Medium	Medium	Short
	Wide-scale adoption of green renewable power using scalable mechanisms and financing models	High	Medium	Low	Medium
	Promote at-scale adoption of green renewable power	High	Low	Low	Short to Medium
	Pilot community-scale solar in existing settlement zones (such as R1)	High	Medium	Low	Short to Medium
	Solar rooftop in new EWS/LIG housing	High	Low	Low	Medium
	Solar water heaters in buildings with high hot water demand	High	Low	Medium	Medium
	Streamline procedures & facilitate financing support	High	Low	Medium	Short
	Encourage adoption of electric cooking	Medium	Low	Low	Medium
	Build local skills to boost job creation & support RE & EE deployment	High	Medium	Medium	Short
Adopt smart and reliable power	Plan & upgrade grid infrastructure to accommodate high levels of RE & meet future requirements	High	Medium	Low	Short

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention			Period to Realize Impact
		Technical	Political	Financial	
		High/ Medium/ Low	High/ Medium/ Low	High/ Medium/ Low	Short/ Medium/ Long
distribution systems for high renewable integration	Deploy smart systems, data management and advanced power management techniques	High	Medium	Low	Medium
	Adopt urban microgrids and demand management to support RE adoption and energy resilience	High	Medium	Medium	Medium
Undertake integrated spatial and energy planning with energy sector institutions	Advocate for faster integration of renewables in Amaravati's grid power supply	High	Medium	High	Short
	Involve APCPDCL, APTRANSCO, NREDCAP, APSECM in structures/ committees for master planning and urban infrastructure development	High	Medium	High	Short
	Coordinate with APCPDCL and APTRANSCO for effective integration of urban development and electricity planning	High	Medium	High	Short
Water Supply					
Sustainable water resource management for ensuring long term water security	Ensure protection of surface water sources	High	Medium	Medium	Short
	Conservation & management of groundwater resources by limiting extraction, promoting recharge, and continuous monitoring	High	Medium	Medium	Medium
	Reduce fresh water demand by replacing non-potable needs with alternative sources	High	Low	Low	Short
Provision of year-round supply of clean and adequate drinking water to all	Commission 24x7 water supply system of optimum quality and quantity	High	Medium	Low	Medium
	Ensure efficient management of bulk water users	High	Low	Medium	Short to Medium
	Ensure minimal extent of non-revenue water (NRW)	High	Medium	Medium	Short
Adopt high-efficiency water supply system powered by renewables	Implement energy efficiency in water pumping	High	Medium	Low	Short
	Utilise renewable energy in water supply facilities	High	Medium	Low	Short to Medium
Wastewater Management					

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention			Period to Realize Impact
		Technical	Political	Financial	
		High/ Medium/ Low	High/ Medium/ Low	High/ Medium/ Low	Short/ Medium/ Long
Commission efficient and adequate wastewater collection network	Deploy city-wide sewer network to prevent cross-contamination of water supply and stormwater during heavy rain and floods	High	Medium	Medium	Short
	Ensure optimum management and maintenance of sewer network	Medium	Medium	Medium	Short to Medium
	Provide facilities for safe containment, collection and treatment of wastewater during the first phase of construction	Low	Low	Medium	Short
Ensure sustainable and scientific wastewater treatment and reuse	Adopt well-managed, efficient treatment system & infrastructure able to sustain extreme climate events	Medium	Medium	Medium	Short
	Adopt decentralised wastewater management approaches	High	Medium	Low	Short to Medium
	Enable high level of safe reuse of tertiary treated wastewater	High	Low	Low	Short to Medium
Adopt low-carbon technologies, enhance energy and performance efficiency of treatment	Adopt anaerobic treatment technology with efficient methane gas capture and utilisation	Medium	Medium	Low	Short
	Enhance performance efficiency of wastewater treatment plants	High	Medium	Medium	Medium
	Reduce energy demand and integrate renewable energy sources	High	Medium	Low	Short to Medium
Adopt safe and sustainable faecal sludge treatment system	Ensure scientific management of faecal sludge from existing settlements in the near-term	Medium	Low	Medium	Short
Stormwater Management					
Adopt principles of Integrated Urban Water Management for	Conserve and optimise utilization of natural water bodies and drainage network for runoff management and flood control	High	Low	High	Medium

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention			Period to Realize Impact
		Technical	Political	Financial	
		High/ Medium/ Low	High/ Medium/ Low	High/ Medium/ Low	Short/ Medium/ Long
effective stormwater management	Establish unified real-time monitoring system for all urban water systems to enable comprehensive water management	High	Low	Medium	Medium
Integrate green spaces with blue infrastructure and adopt decentralised flood resilience measures	Mainstream nature-based solutions in land use planning and building regulations	High	Low	Low	Short
	Ensure city-wide adoption of rainwater harvesting and its sustained operation	Medium	Low	Medium	Medium
	Incorporate a river-centric approach in land use planning	Medium	Low	Medium	Short
Effective monitoring, forecasting and readiness to respond to extreme climate events	Implement Early Flood Warning System	High	Medium	High	Short to Medium
	Develop a comprehensive flood analysis system and mechanism to minimise urban flood risk	High	Low	Medium	Short to Medium
Solid Waste Management					
Adopt 3R principles and decentralised processing at source	Promote decentralised processing of wet waste through promotion of home-composting	High	Low	Medium	Short
	Establish compost pits in parks for on-site treatment of garden waste and implement processing of flower waste processing into incense sticks and cones	High	Medium	Medium	Short
	Conduct IEC and Behavior Change Communication (BCC) campaigns	High	Medium	Medium	Short
	Notify and implement green protocol guidelines for eco-friendly material use and waste management at community gatherings	High	Low	Medium	Short
	Efficient collection and recycling of E-Waste	High	High	Medium	Short
Ensure efficient waste collection and transportation	Ensure 100% collection across for in-house and third-party solid waste management operation (for both in-house and third-party services)	High	High	Low	Short
	Establish specialized waste collection mechanisms for non-routine and oversized residential waste	medium	Medium	Low	Short

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention			Period to Realize Impact
		Technical	Political	Financial	
		High/ Medium/ Low	High/ Medium/ Low	High/ Medium/ Low	Short/ Medium/ Long
Enforce extended bulk waste generators' responsibility practices for waste minimization and on-site processing	Establish a dedicated team to monitor and facilitate EBWGR implementation	High	Medium	Medium	Short
	Implement quantum-based fees for services to collect and transport dry waste from BWGs	High	Low	Medium	Short to Medium
Maintain cleanliness in public places and water courses	Impose spot-fine against littering and open dumping	High	Low	High	Short
	Enforce strict regulation on disposal of festival waste and ensure regular cleaning of watercourses	High	Low	Medium	Short
Efficient handling of Construction and Demolition Waste	Implement 100% C&D waste collection to achieve zero open dumping	High	Medium	Medium	Short
	Deploy processing infrastructure with flexibility to handle initial peak C&D generation volumes and meet long-term needs	High	Medium	Low	Short to Medium
	Ensure maximum reuse of treated C&D waste	High	Medium	Medium	Short
Decarbonise MSW value chain by integrating sustainable technologies appropriate to waste fractions	Conduct scientific techno-financial viability of various types of processing technologies	High	Medium	Medium	Short
	Explore the adoption of Bio-CNG facilities for wet waste processing	High	Medium	Low	Short
	Implement effective dry waste recycling and adopt market-driven secondary segregation for higher market value.	High	Medium	Medium	Short to Medium
	Commission sanitary landfill for scientific waste disposal and equipped with integrated methane capture system	High	Low	Medium	Short
	Deploy integrated digital monitoring systems in all MSW operations for real-time tracking of quality, quantity & environmental compliance	High	Medium	Medium	Short to Medium
	Electrify solid waste vehicle fleet and integrate renewable energy into SWM operations	High	Medium	Low	Short
Transportation					

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention			Period to Realize Impact
		Technical	Political	Financial	
		High/ Medium/ Low	High/ Medium/ Low	High/ Medium/ Low	Short/ Medium/ Long
Develop an integrated public transit system	Deploy a city-wide electric public bus system in near to mid-term	High	Medium	Low	Short to Medium
	Expand to develop an integrated, high-capacity and scalable public transit system	High	Medium	Low	Medium to Long
	Strengthen first and last mile connectivity	High	Medium	Medium	Short
	Implement an integrated fare and ticketing system	Medium	Medium	Medium	Short to Medium
	Promote low-carbon public transit technologies	Medium	Medium	Low	Short to Medium
Enable and prioritize Non-Motorized Transport (NMT)	Establish city-wide NMT infrastructure	High	High	Low	Short
	Improve NMT safety and accessibility	High	High	Medium	Short
	Promote behavioral shift to active mobility	High	Medium	Low	Short to Medium
Promote Clean, Electric Mobility for Public and Private Transport	Mandate electrification of government and institutional fleet	High	Low	Low	Short
	Develop city-wide charging infrastructure	High	Low	Low	Short to Medium
	Integrate renewable energy in EV charging infrastructure	High	Medium	Low	Short to Medium
	Incentivize electric vehicle uptake and phase out ICE vehicles	Low	Medium	Medium	Short to Medium
	Mandate EV-ready development regulations	High	Low	Low	Short
Enable Sustainable, Low-Carbon Freight	Implement immediate controls on construction-related freight movement	High	Low	Medium	Short
	Electrify last-mile freight and introduce e-logistics mandates	Medium	Low	Medium	Short to Medium
	Establish integrated urban freight and logistics management zones and implement freight routing	High	Low	Low	Short to Medium
Develop Climate-Resilient and Low-Emission Transport Infrastructure	Adopt climate-resilient transport infrastructure design	High	Medium	Medium	Short
	Incorporate nature-based and water-sensitive design elements	High	High	Medium	Short
	Implement adaptive traffic and smart parking management system	Medium	Medium	Low	Short

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention			Period to Realize Impact
		Technical	Political	Financial	
		High/ Medium/ Low	High/ Medium/ Low	High/ Medium/ Low	Short/ Medium/ Long
Integrated transport governance and smart mobility planning	Operationalize Unified Metropolitan Transport Authority (UMTA) and build institutional capacity	High	Medium	Medium	Short
	Deploy smart mobility platforms and real-time passenger tools	High	Medium	Medium	Short to Medium
Biodiversity and Urban Greening					
Conserve and restore ecosystems to enhance climate and ecological resilience	Protect and conserve natural water bodies, hills and eco-sensitive zones	Medium	Medium	Medium	Short
	Restore degraded and ecologically sensitive areas using nature-based solutions	Medium	High	Medium	Stort to Medium
	Safeguard culturally and ecologically sensitive zones	High	High	Medium	Short
Expand and diversify green spaces for ecological, recreational and climate co-benefits	Develop a city-wide green space network	High	High	Medium	Short to Medium
	Develop biodiversity parks	Medium	Medium	Medium	Medium
	Scale urban afforestation and native forest clusters	Medium	Medium	Medium	Medium
Integrate blue-green infrastructure into urban planning and infrastructure development	Embed blue-green infrastructure in city planning and development regulations	High	Medium	Medium	Medium
	Develop shaded and green mobility corridors	High	High	Medium	Medium
	Promote urban agriculture	Medium	Medium	Low	Medium
	Promote green roofs and facades in buildings	Medium	Low	Low	Short to Medium
Strengthen governance and community stewardship	Institutionalize biodiversity planning and legal frameworks	High	Medium	Medium	Short
	Establish monitoring systems using City Biodiversity Index (CBI) and technology	High	Medium	Medium	Short
	Promote public participation, education and stewardship	High	Medium	Medium	Short to Medium
Health					
Strengthen health sector to withstand climate hazards	Accessibility of health services for all communities	High	High	Medium	Short
	Develop and implement a citywide Heat Action Plan (HAP)	Medium	High	Medium	Short

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention			Period to Realize Impact
		Technical	Political	Financial	
		High/ Medium/ Low	High/ Medium/ Low	High/ Medium/ Low	Short/ Medium/ Long
	Integrate climate risk into health sector planning and regulation	Medium	Medium	Medium	Short
	Enhance heat, air quality and flood resilience of public health infrastructure	Medium	Medium	Medium	Short
	Ensure sanitation and disease prevention in climate-sensitive areas	Medium	High	Medium	Short
	Monitor climate-sensitive diseases and pandemics	Medium	Medium	Medium	Short
Strengthen health governance and capacity for climate adaptation.	Capacity building for health professionals	Medium	Medium	Medium	Short
	Community engagement and awareness	High	Medium	Medium	Short
	Monitoring, evaluation and reporting	High	High	Low	Short
Air Quality Management					
Dust and emissions control during construction and infrastructure development	Enforce robust dust suppression and containment protocols	Medium	Low	Low	Short
	Deploy real-time air quality monitoring and site surveillance systems	High	Low	Medium	Short
	Strengthen material handling, storage and transport regulations	Low	Low	Low	Short
	Adopt low-emission construction machinery and power solutions	Low	Low	Low	Short
	Implement specific measures for ready-mix concrete plants	Medium	Low	Medium	Short
	Mandate comprehensive construction environmental management plans	High	Low	Medium	Short
Integrate air quality resilience into urban and building design	Establish air filtration and ventilation standards for public buildings, schools and hospitals	High	Low	Medium	Short to Medium
	Implement worker and community protection measures	Low	Medium	Low	Short
	Design and maintain vegetative buffers and include provision for pollution-suppression infrastructure.	Low	Medium	High	short

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention			Period to Realize Impact
		Technical	Political	Financial	
		High/ Medium/ Low	High/ Medium/ Low	High/ Medium/ Low	Short/ Medium/ Long
Establish strong governance, enforcement and adaptive management for air quality	Setup and operationalize a Construction Air Quality Management Cell or Unit	High	Medium	Medium	Short
	Implement a city-wide AQI linked adaptive construction response protocol	High	Medium	Medium	Short

Annexure B. Prioritisation of Resilience Actions

The prioritisation exercise uses five key criteria/characteristics:

- Redundancy: A resilient system can function and achieve results through multiple paths or nodes when one fails and when performance is critical. In contrast, a "single best solution" is not resilient because if it fails, the system collapses. Back-up systems, or decentralised nodes for service delivery in a linked network, are preferable.
- Flexibility and diversity: Essential systems should be able to work under a variety of conditions; they should not be rigid or designed only for a specific situation. Any system will fail if overloaded beyond its capacity, but it should be designed to fail under stress in a safe and predictable way, rather than suddenly and catastrophically.
- Re-organisation and responsiveness: Under extreme conditions, systems should be able to respond and change to meet unexpected shocks. This requires flexible organisations and access to different kinds of resources (information, skills, equipment, knowledge and experience). It also requires a high level of coordination and flexible organisational structures capable of adjusting to new conditions.
- Access to information: Resilient systems have mechanisms to learn from and build on experience, so that past mistakes are not repeated and lessons from other cities can be integrated into planning. This requires procedures for monitoring and evaluating performance under stress, and multiple sources of knowledge and documentation (strengthening "institutional memory").
- Energy saving and GHG emissions mitigation potential: Resilient systems have potential to reduce energy consumption and mitigate GHG emissions, which may be integrated into their regular planning. This requires procedures for periodic monitoring and evaluating performance, which requires multiple sources of knowledge and documentation.

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
Energy and Building							
Prioritise energy efficiency and renewables in public buildings and city utilities	Build and operate certified green, energy-efficient public buildings	Yes	Yes	Yes	Yes	Yes	Very High
	Establish enabling policies for government buildings and public procurement	No	Yes	Yes	Yes	Yes	High
	Integrate energy efficiency & renewables into utility service infrastructure	Yes	Yes	Yes	Yes	Yes	Very High
	Test innovative solutions & implementation models for further scale-up	Yes	Yes	Yes	Yes	Yes	Very High
	Notify enabling guidelines & conduct training of public officials	Yes	Yes	No	Yes	No	Medium
	Central energy management system	Yes	Yes	No	Yes	No	Medium
Reduce energy use by green, climate-responsive & energy-efficient buildings in all zones	Integrate green building norms into zoning regulations	Yes	Yes	No	Yes	Yes	High
	Incentivise green building certification for private buildings	Yes	Yes	No	No	Yes	Medium
	Use passive cooling measures and sustainable building materials	Yes	Yes	No	Yes	Yes	High
	Partner with green building agencies and implement pilot projects	Yes	Yes	No	No	Yes	Medium
	Promote enhanced building energy performance and reporting	Yes	Yes	No	No	Yes	Medium
	Expand AGC Urban Design Committee & team into city-wide Green Building Promotion Department	Yes	Yes	Yes	Yes	No	High

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
Integrate climate-resilient building design and thermal comfort	Deploy localized cooling interventions for vulnerable zones and public spaces	Yes	Yes	No	Yes	Yes	High
	Promote cool/green roofs and green facades in new and existing buildings	Yes	Yes	No	No	Yes	Medium
	Mandate passive cooling and thermal comfort standards in all new buildings	Yes	Yes	No	Yes	Yes	High
	Integrate flood-resilient design in building constructions	Yes	Yes	No	Yes	No	Medium
Integrate high level of clean energy and renewables to meet energy requirements	Develop Sustainable Energy Transition Roadmap for Amaravati	Yes	Yes	Yes	Yes	No	High
	Wide-scale adoption of green renewable power using scalable mechanisms and financing models	Yes	Yes	Yes	No	Yes	High
	Promote at-scale adoption of green renewable power	Yes	Yes	No	Yes	Yes	High
	Pilot community-scale solar in existing settlement zones (such as R1)	Yes	Yes	No	Yes	Yes	High
	Solar rooftop in new EWS/LIG housing	Yes	Yes	No	Yes	Yes	High
	Solar water heaters in buildings with high hot water demand	Yes	Yes	No	Yes	Yes	High
	Streamline procedures & facilitate financing support	Yes	Yes	No	Yes	No	Medium
	Encourage adoption of electric cooking	Yes	Yes	No	No	Yes	Medium
	Build local skills to boost job creation & support RE & EE deployment	Yes	Yes	Yes	Yes	No	High
Adopt smart and reliable power	Plan & upgrade grid infrastructure to accommodate high levels of RE & meet future requirements	Yes	Yes	Yes	Yes	Yes	Very High

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
distribution systems for high renewable integration	Deploy smart systems, data management and advanced power management techniques	No	Yes	Yes	Yes	No	Medium
	Adopt urban microgrids and demand management to support RE adoption and energy resilience	Yes	Yes	Yes	Yes	Yes	Very High
Undertake integrated spatial and energy planning with energy sector institutions	Advocate for faster integration of renewables in Amaravati's grid power supply	No	Yes	Yes	Yes	No	Medium
	Involve APCPDCL, APTRANSCO, NREDCAP, APSECM in structures/ committees for master planning and urban infrastructure development	No	Yes	Yes	Yes	No	Medium
	Coordinate with APCPDCL and APTRANSCO for effective integration of urban development and electricity planning	Yes	Yes	Yes	Yes	No	High
Water Supply							
Sustainable water resource management for ensuring long term water security	Ensure protection of surface water sources	Yes	Yes	Yes	Yes	No	High
	Conservation & management of groundwater resources by limiting extraction, promoting recharge, and continuous monitoring	Yes	Yes	Yes	Yes	No	High
	Reduce fresh water demand by replacing non-potable needs with alternative sources	Yes	Yes	Yes	Yes	No	High

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
Provision of year-round supply of clean and adequate drinking water to all	Commission 24x7 water supply system of optimum quality and quantity	Yes	Yes	Yes	Yes	No	High
	Ensure efficient management of bulk water users	Yes	Yes	No	Yes	No	Medium
	Ensure minimal extent of non-revenue water (NRW)	Yes	Yes	No	Yes	No	Medium
Adopt high-efficiency water supply system powered by renewables	Implement energy efficiency in water pumping	Yes	Yes	Yes	Yes	Yes	Very High
	Utilise renewable energy in water supply facilities	Yes	Yes	No	Yes	Yes	High
Wastewater Management							
Commission efficient and adequate wastewater collection network	Deploy city-wide sewer network to prevent cross-contamination of water supply and stormwater during heavy rain and floods	Yes	No	Yes	Yes	No	Medium
	Ensure optimum management and maintenance of sewer network	Yes	Yes	Yes	Yes	No	High
	Provide facilities for safe containment, collection and treatment of wastewater during the first phase of construction	Yes	No	Yes	Yes	No	Medium
Ensure sustainable and scientific wastewater	Adopt well-managed, efficient treatment system & infrastructure able to sustain extreme climate events	Yes	Yes	Yes	Yes	No	High
	Adopt decentralised wastewater management approaches	Yes	Yes	Yes	Yes	Yes	Very High

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
treatment and reuse	Enable high level of safe reuse of tertiary treated wastewater	Yes	Yes	Yes	Yes	Yes	Very High
Adopt low-carbon technologies, enhance energy and performance efficiency of treatment	Adopt anaerobic treatment technology with efficient methane gas capture and utilisation	Yes	Yes	Yes	Yes	Yes	Very High
	Enhance performance efficiency of wastewater treatment plants	Yes	Yes	Yes	Yes	Yes	Very High
	Reduce energy demand and integrate renewable energy sources	Yes	Yes	Yes	Yes	Yes	Very High
Adopt safe and sustainable faecal sludge treatment system	Ensure scientific management of faecal sludge from existing settlements in the near-term	Yes	No	Yes	Yes	Yes	High
Stormwater Management							
Adopt principles of Integrated Urban Water Management for effective stormwater management	Conserve and optimise utilization of natural water bodies and drainage network for runoff management and flood control	Yes	Yes	Yes	Yes	No	High
	Establish unified real-time monitoring system for all urban water systems to enable comprehensive water management	Yes	Yes	No	yes	No	Medium
Integrate green spaces with blue	Mainstream nature-based solutions in land use planning and building regulations	Yes	Yes	Yes	Yes	No	High

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
infrastructure and adopt decentralised flood resilience measures	Ensure city-wide adoption of rainwater harvesting and its sustained operation	Yes	Yes	Yes	Yes	No	High
	Incorporate a river-centric approach in land use planning	Yes	Yes	Yes	Yes	No	High
Effective monitoring, forecasting and readiness to respond to extreme climate events	Implement Early Flood Warning System	Yes	Yes	No	Yes	No	Medium
	Develop a comprehensive flood analysis system and mechanism to minimise urban flood risk	Yes	Yes	No	Yes	No	Medium
Solid Waste Management							
Adopt 3R principles and decentralised processing at source	Promote decentralised processing of wet waste through promotion of home-composting	Yes	No	Yes	Yes	Yes	High
	Establish compost pits in parks for on-site treatment of garden waste and implement processing of flower waste processing into incense sticks and cones	Yes	No	Yes	Yes	Yes	High
	Conduct IEC and Behavior Change Communication (BCC) campaigns	Yes	Yes	Yes	Yes	No	High
	Notify and implement green protocol guidelines for eco-friendly material use and waste management at community gatherings	Yes	Yes	Yes	Yes	No	High

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
	Efficient collection and recycling of E-Waste	Yes	Yes	Yes	Yes	No	High
Ensure efficient waste collection and transportation	Ensure 100% collection across for in-house and third-party solid waste management operation (for both in-house and third-party services)	Yes	No	Yes	Yes	No	Medium
	Establish specialized waste collection mechanisms for non-routine and oversized residential waste	Yes	Yes	Yes	Yes	No	High
Enforce extended bulk waste generators' responsibility practices for waste minimization and on-site processing	Establish a dedicated team to monitor and facilitate EBWGR implementation	Yes	No	Yes	Yes	No	Medium
	Implement quantum-based fees for services to collect and transport dry waste from BWGs	Yes	No	Yes	Yes	No	Medium
Maintain cleanliness in public places and water courses	Impose spot-fine against littering and open dumping	Yes	No	Yes	Yes	No	Medium
	Enforce strict regulation on disposal of festival waste and ensure regular cleaning of watercourses	Yes	No	Yes	Yes	No	Medium
Efficient handling of Construction and	Implement 100% C&D waste collection to achieve zero open dumping	Yes	No	Yes	Yes	Yes	High
	Deploy processing infrastructure with flexibility to handle initial peak C&D	Yes	No	Yes	Yes	No	Medium

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
Demolition Waste	generation volumes and meet long-term needs						
	Ensure maximum reuse of treated C&D waste	Yes	Yes	Yes	Yes	No	High
Decarbonise MSW value chain by integrating sustainable technologies appropriate to waste fractions	Conduct scientific techno-financial viability of various types of processing technologies	Yes	Yes	No	Yes	No	Medium
	Explore the adoption of Bio-CNG facilities for wet waste processing	Yes	Yes	No	Yes	Yes	High
	Implement effective dry waste recycling and adopt market-driven secondary segregation for higher market value.	Yes	No	Yes	Yes	Yes	High
	Commission sanitary landfill for scientific waste disposal and equipped with integrated methane capture system	Yes	Yes	Yes	Yes	Yes	Very High
	Deploy integrated digital monitoring systems in all MSW operations for real-time tracking of quality, quantity & environmental compliance	Yes	Yes	Yes	Yes	No	High
	Electrify solid waste vehicle fleet and integrate renewable energy into SWM operations	Yes	Yes	Yes	Yes	Yes	Very High
Transportation							
Develop an integrated public transit system	Deploy a city-wide electric public bus system in near to mid-term	Yes	Yes	No	Yes	Yes	High
	Expand to develop an integrated, high-capacity and scalable public transit system	Yes	Yes	Yes	Yes	Yes	Very High

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
	Strengthen first and last mile connectivity	Yes	Yes	No	Yes	Yes	High
	Implement an integrated fare and ticketing system	Yes	Yes	No	Yes	No	Medium
	Promote low-carbon public transit technologies	Yes	Yes	No	No	Yes	Medium
Enable and prioritize Non-Motorized Transport (NMT)	Establish city-wide NMT infrastructure	Yes	No	No	Yes	Yes	Medium
	Improve NMT safety and accessibility	Yes	No	No	Yes	No	Average
	Promote behavioral shift to active mobility	Yes	Yes	No	Yes	No	Medium
Promote Clean, Electric Mobility for Public and Private Transport	Mandate electrification of government and institutional fleet	Yes	Yes	No	Yes	Yes	High
	Develop city-wide charging infrastructure	Yes	Yes	No	Yes	No	Medium
	Integrate renewable energy in EV charging infrastructure	Yes	Yes	Yes	No	Yes	High
	Incentivize electric vehicle uptake and phase out ICE vehicles	Yes	Yes	Yes	No	No	Medium
	Mandate EV-ready development regulations	Yes	No	Yes	Yes	No	Medium
Enable Sustainable, Low-Carbon Freight	Implement immediate controls on construction-related freight movement	Yes	No	Yes	Yes	Yes	High
	Electrify last-mile freight and introduce e-logistics mandates	Yes	Yes	No	Yes	Yes	High

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
	Establish integrated urban freight and logistics management zones and implement freight routing	Yes	No	Yes	Yes	No	Medium
Develop Climate-Resilient and Low-Emission Transport Infrastructure	Adopt climate-resilient transport infrastructure design	Yes	Yes	Yes	Yes	No	High
	Incorporate nature-based and water-sensitive design elements	Yes	Yes	Yes	Yes	No	High
	Implement adaptive traffic and smart parking management system	Yes	Yes	No	Yes	No	Medium
Integrated transport governance and smart mobility planning	Operationalize Unified Metropolitan Transport Authority (UMTA) and build institutional capacity	Yes	No	Yes	Yes	No	Medium
	Deploy smart mobility platforms and real-time passenger tools	Yes	No	Yes	Yes	No	Medium
Biodiversity and Urban Greening							
Conserve and restore ecosystems to enhance climate and ecological resilience	Protect and conserve natural water bodies, hills and eco-sensitive zones	Yes	Yes	No	Yes	No	Medium
	Restore degraded and ecologically sensitive areas using nature-based solutions	Yes	Yes	No	Yes	No	Medium
	Safeguard culturally and ecologically sensitive zones	Yes	Yes	Yes	No	No	Medium
Expand and diversify green spaces for ecological, recreational	Develop a city-wide green space network	Yes	Yes	Yes	Yes	Yes	Very High
	Develop biodiversity parks	Yes	Yes	Yes	Yes	No	High
	Scale urban afforestation and native forest clusters	Yes	Yes	Yes	Yes	Yes	Very High

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
and climate co-benefits							
Integrate blue-green infrastructure into urban planning and infrastructure development	Embed blue-green infrastructure in city planning and development regulations	Yes	Yes	Yes	Yes	No	High
	Develop shaded and green mobility corridors	Yes	Yes	No	Yes	Yes	High
	Promote urban agriculture	Yes	No	No	No	Yes	Average
	Promote green roofs and facades in buildings	Yes	No	No	Yes	Yes	Medium
Strengthen governance and community stewardship	Institutionalize biodiversity planning and legal frameworks	Yes	Yes	Yes	Yes	No	High
	Establish monitoring systems using City Biodiversity Index (CBI) and technology	Yes	Yes	Yes	Yes	No	High
	Promote public participation, education and stewardship	Yes	Yes	Yes	Yes	No	High
Health							
Strengthen health sector to withstand climate hazards	Accessibility of health services for all communities	Yes	Yes	Yes	Yes	No	High
	Develop and implement a citywide Heat Action Plan (HAP)	Yes	Yes	Yes	Yes	No	High
	Integrate climate risk into health sector planning and regulation	Yes	Yes	Yes	No	No	Medium
	Enhance heat, air quality and flood resilience of public health infrastructure	Yes	Yes	Yes	Yes	No	High
	Ensure sanitation and disease prevention in climate-sensitive areas	Yes	Yes	Yes	Yes	No	High
	Monitor climate-sensitive diseases and pandemics	Yes	Yes	Yes	Yes	No	High

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
Strengthen health governance and capacity for climate adaptation.	Capacity building for health professionals	Yes	Yes	No	Yes	No	Medium
	Community engagement and awareness	Yes	No	Yes	Yes	No	Medium
	Monitoring, evaluation and reporting	Yes	Yes	Yes	Yes	No	High
Air Quality Management							
Dust and emissions control during construction and infrastructure development	Enforce robust dust suppression and containment protocols	Yes	Yes	No	Yes	No	Medium
	Deploy real-time air quality monitoring and site surveillance systems	Yes	No	Yes	Yes	No	Medium
	Strengthen material handling, storage and transport regulations	Yes	Yes	Yes	No	No	Medium
	Adopt low-emission construction machinery and power solutions	No	Yes	Yes	Yes	No	Medium
	Implement specific measures for ready-mix concrete plants	Yes	Yes	Yes	No	No	Medium
	Mandate comprehensive construction environmental management plans	Yes	No	Yes	Yes	No	Medium
Integrate air quality resilience into urban and building design	Establish air filtration and ventilation standards for public buildings, schools and hospitals	Yes	Yes	No	Yes	No	Medium
	Implement worker and community protection measures	Yes	No	Yes	Yes	No	Medium
	Design and maintain vegetative buffers and include provision for pollution-suppression infrastructure.	Yes	Yes	Yes	Yes	No	High

Strategy	Potential Climate Resilience Interventions	Feasibility of the intervention					Overall Resilience
		Redundancy	Flexibility	Responsiveness/ re-organisation	Access to Information	Energy saving and GHG emission mitigation potential	
		(yes/no)	(yes/no)	(yes/no)	(yes/no)	(yes/no)	
Establish strong governance, enforcement and adaptive management for air quality	Setup and operationalize a Construction Air Quality Management Cell or Unit	Yes	Yes	Yes	Yes	No	High
	Implement a city-wide AQI linked adaptive construction response protocol	Yes	Yes	Yes	Yes	No	High

Annexure C. Power Demand of Amaravati in 2058

Classification	Estimated Power Demand (MW)
Residential	1076.6
Commercial	521.4
Government / Institutional	21.3
Industrial	498.9
AGC (Excluding DC)	169.3
Startup Area	202.4
Residential area in commercial & Industrial Zones	36.5
Utilities (Including District Cooling System)	123.2
Line losses @2.84%	77.5
Total Demand	**2726.9**

Annexure D. Renewable Energy (Solar PV) Integration Target for Amaravati

The table below illustrates the percentage of projected electricity consumption in the city targeted from renewable energy sources in the planning period in Amaravati; in both BAU and Climate Action Scenarios.

Parameter	Climate Action Scenario			BAU Scenario		
	2028	2043	2058	2028	2043	2058
Percentage of electricity consumption targeted from renewable energy (%)	15%	75%	100%	3.88%	19.60%	44.44%

Annexure E. Electric Cooking Target for Amaravati

The table below presents the targeted share of cooking energy demand expected to be met through electricity (powered by renewable energy sources) during the planning period in Amaravati, under both the BAU and Climate Action Scenarios.

Residential Sub-sector

Parameter	Climate Action Scenario			BAU Scenario		
	2028	2043	2058	2028	2043	2058
Percentage of energy demand for cooking met by electricity (%)	-	5%	10%	-	-	-
Percentage of electricity for cooking sourced from renewable energy (%)	100%	100%	100%	-	-	-

Commercial and institutional buildings/facilities sub-sector

Parameter	Climate Action Scenario			BAU Scenario		
	2028	2043	2058	2028	2043	2058
Percentage of energy demand for cooking met by electricity (%)	-	10%	15%	-	-	-
Percentage of electricity for cooking sourced from renewable energy (%)	100%	100%	100%	-	-	-

Annexure F. Estimated Modal Share of Transportation and Trip Generation Rates

The table below highlights the estimated modal share distribution across different transport modes, including private vehicles, public transport, and NMT, in both the BAU and Climate Action Scenarios.

Mobility Profile	Climate Action Scenario			BAU Scenario		
	2028	2043	2058	2028	2043	2058
Non-Motorised Transport (Walk + Cycle)	20%	24%	25%	20%	20%	20%
Private Vehicles	56%	30%	29%	58%	58%	58%
Public Transport	24%	46%	46%	22%	22%	22%

Note:

- *In the BAU scenario, the modal share is assumed to remain largely consistent across the planning period.*
- *Only bus-based public transport systems are assumed for 2028 and 2043, while by 2058, metro services are expected to be established, accounting for 45% of the total public transport share.*

Parameter	Units	Value
Average trip generation	trips/person/day	1.5

Note: The trip generation rate has been assumed to be constant throughout the planning period in both the Climate Action and BAU scenarios.

Annexure G. Estimated Fuel-Mix of the Vehicles/Transport Modes in Amaravati – Climate Action Scenario

Fleet mix by fuel	2028				2043				2058			
	Petrol	Diesel	CNG	Electric	Petrol	Diesel	CNG	Electric	Petrol	Diesel	CNG	Electric
2-Wheeler	64%	-	-	36%	10.5%	-	-	89.5%	4%	-	-	96%
Car	38%	48%	7%	7%	12%	15%	2%	71%	3%	4%	1%	92%
Bus	-	-	-	100%	-	-	-	100%	-	-	-	100%
Metro	-	-	-	100%	-	-	-	100%	-	-	-	100%
Rail	-	-	-	100%	-	-	-	100%	-	-	-	100%
Taxi/Cabs	-	-	-	100%	-	-	-	100%	-	-	-	100%

Annexure H. Estimated Fuel-Mix of the Vehicles/Transport Modes in Amaravati – BAU Scenario

Fleet mix by fuel	2028				2043				2058			
	Petrol	Diesel	CNG	Electric	Petrol	Diesel	CNG	Electric	Petrol	Diesel	CNG	Electric
2-Wheeler	96%	-	-	4%	79.2%	-	-	20.8%	62%	-	-	38%
Car	40%	51%	6%	2%	37.7%	48.7%	3.7%	9.4%	35%	46%	1%	17%
Auto-Rickshaw	-	-	97%	3%	-	-	82.7%	17.3%	-	-	68%	32%
Bus	-	-	-	100%	-	-	-	100%	-	-	-	100%
Metro	-	-	-	100%	-	-	-	100%	-	-	-	100%
Rail	-	-	-	100%	-	-	-	100%	-	-	-	100%
Taxi/Cabs	40%	51%	6%	2%	-	-	90%	9%	-	-	82%	17%

Annexure I. Renewable Energy (Solar PV) Integration Target for Transportation in Amaravati (2028-2058)

The table below presents the estimated share of renewable energy in meeting the electricity demand of the transport sector in Amaravati under both the BAU and Climate Action scenarios.

Parameter	Climate Action Scenario			BAU Scenario		
	2028	2043	2058	2028	2043	2058
Percentage of electricity consumption targeted from renewable energy (%)	20%	40%	60%	0%	0%	0%

Annexure J. Solid Waste Processing in Amaravati (2028-2058) -Climate Action Scenario

Type	2028		2043		2058	
	Tonnes	Percentage	Tonnes	Percentage	Tonnes	Percentage
Waste to Energy (WtE)	462	88%	998	60%	2,354	60%
Waste to Recycling	-	-	89	5%	210	5%
Composting Plant	-	-	212	13%	500	13%
Biomethanation/Bio-CNG	-	-	170	10%	400	10%
Sanitary Landfill	66	12%	208	12%	491	12%

BAU Scenario

Type	2028		2043		2058	
	Tonnes	Percentage	Tonnes	Percentage	Tonnes	Percentage
Waste to Energy (WtE)	462	88%	718	43%	1,692	43%
Waste to Recycling	-	-	89	5%	211	5%
Composting Plant	-	-	621	37%	1,464	37%
Biomethanation/Bio-CNG	-	-	41	2%	98	2%
Sanitary Landfill	66	12%	208	12%	491	12%

Note:

- *In 2028, all waste is assumed to be processed through Waste-to-Energy (WtE) facilities as per the city's initial waste management plan.*
- *Approximately 10% of rejects from the treatment facilities are estimated to be sent to the sanitary landfill, in addition to the inert waste.*

Annexure K. Emission Factors

Emission factors have been maintained consistently across the planning period, both BAU and Climate Action Scenario, to ensure methodological uniformity and facilitate accurate comparison with the baseline year.

Emission Factors for Fuels and Grid-Electricity			
Fuel	**Emission factor per unit of fuel**	**Unit**	**Source**
LPG	2.98	tCO_2e/tonne	IPCC
PNG	0.00189	tCO_2e/cubic metre	IPCC
Petrol	2.30	tCO_2e/kilolitre	IPCC
Diesel	2.85	tCO_2e/kilolitre	IPCC
CNG (cubic m)	0.0021	tCO_2e/cubic metre	IPCC
Grid – Electricity (2023-24)	727.00	tCO_2e/million kWh	Central Electricity Authority (CEA) - CO_2 Baseline Database for the Indian Power Sector, version 20.0, 2024 Available at: https://cea.nic.in/wp-content/uploads/2021/03/User_Guide_Version_20.0.pdf

Emission Factors for Biological Treatment of Waste (IPCC Default)				
Type of Biological Treatment	CH4 Emission Factors (g CH4/kg waste treated)		N2O Emission Factors (g N2O/kg waste treated)	
	on a dry weight basis	on a wet weight basis	on a dry weight basis	on a wet weight basis
Composting	10.00	4.00	0.60	0.24
Anaerobic digestion at biogas facilities	2.00	0.80	Assumed negligible	Assumed negligible

Methane Correction Factor (MCF) for Landfill (IPCC Default)	
Type of Site	**(MCF) Default Values**
Managed – anaerobic	1

Annexure L. Meeting Minutes of Stakeholder consultations

MAU61 EECENV(OTH)/2/2025 CZLE I/4354756/2025

Minutes of Meeting on Online Stakeholder Consultation on Climate Change Action Plan for Amaravati

Date : 08.09.2025, 03.00 P.M – 4: 30 PM IST
Location : Virtual Meeting
Participants:

1. K Kanna Babu, I.A.S., Commissioner, APCRDA
2. G.Surya Sai Praveenchand, I.A.S, Additional Commissioner, APCRDA
3. Nitin Kumar Sharma, Director, Environment, APCRDA
4. Officials from APCRDA
5. Dhyanachandra H M, IAS, Commissioner, Vijayawada Municipal Corporation
6. P. Sreenivasulu, IAS, Commissioner, Guntur Municipal Corporation
7. Mr. Emani Kumar, Executive Director, ICLEI South Asia
8. Representatives from ICLEI South Asia team
9. Vijay Kumar, Chairman, AP State Biodiversity Board
10. Ravindra Babu, Joint Director, CDMA office
11. D. Chandra Sekhar, Additional Commissioner, Vijayawada Municipal Corporation
12. VS Dharmateja, Joint Director, Urban Greening and Forest, ADCL
13. D Srinivasa Reddy, Senior Infrastructure planner, ADCL
14. P Suryachandram, Chief Engineer (Vijayawada Zone), APTRANSCO
15. Smt M Padma Sujatha, Chief Engineer/Generation, APGENCO
16. Hima Sailaja, District Forest Officer, Guntur
17. Maqbool Ahmed, Deputy Director, DTCP
18. Deputy Director, AP Water Resources Department, Guntur
19. Zonal manager, Andhra Pradesh Industrial Infrastructure Corporation (APIIC), Guntur
20. District Public Transport Officer, Guntur, APSRTC
21. Deputy Transport Commissioner, Guntur, AP Transport
22. Hima Bindu, Deputy Director, Horticulture, AP Urban Greening and Beautification Corporation
23. Prasad, Project Manager, AP State Disaster Management Authority
24. Md. Nazeena Begum, Environmental Engineer, Guntur Regional office, APPCB
25. Stella Samuel, Head, Indian Meteorological Centre Amaravati
26. Dr Shoji D. Thottathil, Assistant Professor, Department of Environmental Science and Engineering, SRM University
27. Dr. P. Brahmaji Rao, Associate Professor, Head, Dept. of Environmental Sciences, Acharya Nagarjuna University
28. Representative from the AP State Energy Conservation Mission office
29. Representative from the Swachh Andhra Corporation
30. Representative from the New & Renewable Energy Development Corporation of Andhra Pradesh Ltd.
31. Representative from the School of Planning and Architecture, Vijayawada
32. Representative from APCPDCL, CRDA Circle
33. Boja Raju, Project Manager, Bapuji Rural Enlightenment and Development Society

pg. 1

Opening Remarks:

- The Additional commissioner, APCRDA, set the context for the meeting and explained the importance of preparation of the Amaravati Climate Change Action Plan, being prepared with the assistance of M/S ICLEI, as per the directives of NGT orders and EC conditions. Explained that this online meeting would kick-start the consultation process, leading to more detailed in-person meetings in the future.
- The Commissioner APCRDA gave his opening remarks on the importance of the change action plan, not only for regulatory compliance but also for ensuring Amaravati develops as a net-zero, climate-resilient capital city. He urged all departments to participate in the process actively and explained to them how sector-wise inputs could make the climate action plan robust and actionable.
- Mr. Emani Kumar from ICLEI South Asia outlined the purpose of the meeting, which is to ensure that all departments contribute to the Amaravati City climate action plan.

Discussion:

1. The project team from ICLEI South Asia explained the overall activities and progress on the Climate Change Action Plan (CCAP) for the Amaravati project. The plan involves assessing current and future greenhouse gas emissions and climate vulnerabilities, with a focus on both mitigation and adaptation strategies.
2. The following are the brief points about the presentation made:

- Trends in temperature and rainfall changes in Amaravati:
  - Explained methods used for Land Surface Temperature (LST) future projections for Amaravati, along with the respective data.
  - Flooding data analysis presented for Amaravati, along with flood-affected areas and flood mitigation measures proposed by APCRDA and ADCL.
- Climate risk impact on infrastructure was discussed, highlighting that the rising temperatures may increase water demand and energy usage. This will lead to health risks due to heat stress, flooding threats to infrastructure through inundation and accessibility challenges.
- The notified master plan of Amaravati has 30% of green and blue land use allocation to reduce greenhouse gas emissions from the buildings. The current GHG emission baseline (2024) and draft future emission projections (2028, 2043, 2058), considering planned interventions and targets, were discussed.
- The Additional Commissioner, APCRDA highlighted Amaravati's commitment to achieving 100% electricity consumption through renewable energy sources. Achieving this target will require active input and coordination with the Energy Department, and further discussions will be held at various government levels.
- ICLEI presented the future GHG emissions analysis done for Amaravati and the methods adopted.

- The approach adopted for setting climate action targets across the sectors was explained, referencing alignment with relevant national and state policies and targets, local plans and regulations, ongoing consultations with APCRDA officials, and key findings from the GHG emissions inventory as well as the Climate Risk and Vulnerability Assessment.
- Stella Samuel from IMD recommended that the project team use data from SRRG and DRMS stations, which offer rain gauge measurements, to support rainfall trend analysis. She also advised including data from the Bapatla IMD station.
- Prasad from APSDMA mentioned that, in addition to ongoing work on flood analysis, NRSC has completed a flood atlas report for Andhra Pradesh, which is available with APSDMA and can be shared for reference.
- Dr. Shoji D. Thottathil from SRM University pointed out the significant GHG emission i.e. methane emissions from small aquatic systems in the Amaravati region, which are often overlooked. He has been monitoring water quality and emissions and suggested that this data should be integrated into the climate action plan.
- Vijay Kumar Neelayapalem, Chairman, AP State Biodiversity Board highlighted the necessity of land for biodiversity activities and mentioned previous communications with the commissioners regarding this issue. Additional Commissioner, APCRDA assured that they would coordinate with ADCL to address land allocations to the extent required for the same.

In conclusion, the Additional Commissioner and Commissioner thanked the ICLEI team for presenting sectoral action plans and to all participants for their engagement. Attendees were encouraged to review the shared materials, consult within their departments, and share best practices or suggestions for Amaravati's climate action plan.

__ Commissioner
APCRDA

To
All the Participants for the necessary action.
Copy to:

The Additional Commissioner (Planning), APCRDA for information
The Additional Commissioner (Admin), APCRDA, for information
The Chairperson & Managing Director, ADCL, for information
The ESMU wing for necessary action

Digitally signed by
KUNNAPAREDDY KANNABABU
Date: 22-09-2025 12:56:03

Minutes of Meeting on Climate Change Action Plan for Amaravati

---

Date : 25.09.2025, 03.00 P.M 5.00 PM IST
Location : Auditorium, Ground floor, APCRDA office, Lenin centre, Vijayawada.

Participants:

- M.K.V Sreenivasulu, Managing Director, Andhra Pradesh Greening and Beautification Corporation
- R. Hima Bindu, General Manager, Andhra Pradesh Greening and Beautification Corporation
- BN Prabhakar, Executive Engineer, Andhra Pradesh Solar Power Corporation Pvt Ltd
- D Sarath Chandra, Consultant, Electrical Engineer, Andhra Pradesh Solar Power Corporation Pvt Ltd
- V Ramesh Babu, Deputy Executive Engineer, AP State Energy Conservation Mission
- G. Sreenivasulu, Deputy Executive Engineer, AP State Energy Conservation Mission
- G Sumanth, Engineer, AP State Energy Conservation Mission
- G. Sekhar, Assistant Director, Commissioner & Director of Municipal Administration
- G. Brahmaiah, Consultant, Commissioner & Director of Municipal Administration
- Md. Javeed, SWM Expert, Commissioner & Director of Municipal Administration
- D Rambabu, City Planner, Guntur Municipal Corporation (GMC)
- J Suraj Kumar, Deputy City Planner, Guntur Municipal Corporation (GMC)
- Chandra Bose, Deputy City Planner, Vijayawada Municipal Corporation
- M. Hari Prasad, Additional Director, LSE, APCRDA
- B John Benny, Deputy Director, LSE, APCRDA
- Nitin Kumar Sharma, Director Environment, APCRDA
- P Bhagavan Narayana Kumar, Assistant Conservator Of Forest, LSE, APCRDA
- G Praman Kumar, Senior Planner, LSE, APCRDA
- M Sri Gowri Shanthi, Senior Planner, USI, APCRDA
- G Raghavendra, Sustainability Specialist, APCRDA
- K Ravi, Environment Specialist, APCRDA
- A Siva Ramakrishna, Horticulture Officer, APCRDA

- Mr. Emani Kumar, Executive Director, ICLEI South Asia
- Representatives from ICLEI South Asia team

Online Participants

- Venu Prasad, Deputy Executive Engineer, APGENCO
- D Srinivasa Reddy, Senior Infrastructure planner, ADCL
- Prasad, Project Manager, AP State Disaster Management Authority
- Md. Nazeena Begum, Environmental Engineer, Guntur Regional office, APPCB
- Bhanu, UNICEF Consultant, Swachh Andhra Corporation
- Representative from the School of Planning and Architecture, Vijayawada

Opening Remarks:

- The Senior Planner (USI/ESMU), APCRDA, welcomed all participants and acknowledged their continued engagement in the consultation process. Referring to the earlier online meeting held on 08 September 2025, the planner informed attendees that the ICLEI team is now seeking more detailed, sector-specific feedback to support the finalization of the Amaravati Climate Change Action Plan (CCAP). This collaborative input is expected to strengthen the plan's relevance and effectiveness across key thematic areas.

Discussion:

- The Project team from ICLEI South Asia explained the overall activities and progress on the Climate Change Action Plan (CCAP) for the Amaravati project.
- The following are the brief points that were presented:
  - Review and synthesis of Amaravati's Master Plan, regional/infrastructure plans, zoning regulations, draft urban design guidelines
  - Analysis of baseline infrastructure, climate risk, and urban system impacts.
  - Identification of strategic mitigation and adaptation actions and target setting across nine urban sectors: energy and buildings, water supply, wastewater, stormwater, solid waste management, transportation, urban greening/biodiversity, health, and air quality.
  - Key goals include building Amaravati as an eco-friendly, low-carbon city with extensive green spaces, renewable energy integration, robust disaster resilience,

and efficient resource management.

1. **Key Points Highlighted in the Presentation**
   - Urban Design: The notified master plan of Amaravati has 30% of green and blue land use allocation planned on compact, mixed-use principles with high walkability.
   - Climate Risk Analysis: Data shows rising average and surface temperatures, increased frequency/intensity of rainfall events causing flooding, and the need for climate-resilient design and infrastructure.
   - GHG Emissions: Amaravati's per capita emissions are going to increase in the future due to higher electricity consumption with the growing population, and future interventions such as renewables, NMT, efficient buildings, and sustainable waste management can drastically reduce the emissions.
   - Sectoral Targets and Strategies for 100% Renewable Energy for city utilities, rainwater harvesting in all buildings, 50% reuse of treated water, and Nature-based solutions for storm management, decentralized waste management, EV transport, 30% blue green network, and readiness for heat impacts, early warning community awareness, and construction pollution protocols discussed.

2. **Stakeholder Input & Sectoral Discussions**
   - DEE, APGENCO suggested focusing on renewable energy. He flagged the proximity of the NTTPS power plant and compliance with pollution norms. As the power plant is close to Amaravati city.
   - DEE, APSECM highlighted the need to fast-track the adoption of the new Energy Conservation Building Code (2024), statutory enforcement, and inclusion of green building standards. Recommended AP Housing Corporation involvement for EWS solar appliance installations.
   - Additionally, the DEE, APSECM underscored the importance of establishing energy management centers, promoting efficient appliance standards, and implementing decentralized monitoring mechanisms. A phased approach was suggested for the adoption of these measures across both private and public buildings to ensure effective and scalable implementation.
   - Project Manager, APSDMA suggested including the NDMA heatwave mitigation guidelines (cool roof tech, green corridors/bus shelters), ward-level contingency plans for future flood events, robust early warning/sensor systems, and aligned city zoning to avoid high-risk development
   - DCP, GMC raised concerns about the ecological impacts of massive construction on agricultural/marshy land, suggested preparing robust

construction waste/social management plans, and habitat/ecosystem protection studies.

- EE, APPCB stressed the need for separate demarcation for industrial zones in Amaravati city to avoid future pollution conflicts and legal issues; recommended stringent guidelines to be adopted for the oil spills and chemical disposals.

Closing Remarks:

In conclusion, the Director (Environment), APCRDA, extended sincere appreciation to the ICLEI team for their comprehensive presentation of sectoral action plans. The session reflected a collaborative spirit and a shared commitment to advancing sustainable development goals.

The Director also thanked all participants for their active engagement and valuable contributions throughout the consultation. Their insights and feedback are instrumental in shaping a robust and inclusive final document.

The final version of the action plan is expected to undergo review around mid-October 2025. During this period, additional suggestions from stakeholders will be carefully considered and incorporated to ensure the document reflects a broad consensus and aligns with regulatory and developmental priorities.

Director (Environment)
APCRDA

To
All the Participants for the necessary action.

Copy to:
The Commissioner, APCRDA, for information
The Additional Commissioner (Planning), APCRDA, for information
The Additional Commissioner (Admin), APCRDA for information
The Chairperson & Managing Director, ADCL for information
The ESMU wing for necessary action

APCRDA

STANDARD OPERATING PROCEDURES (SoPs)

ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY (APCRDA)

STANDARD OPERATING PROCEDURES (SoPs)

ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY
(APCRDA)

Contents

Introduction **1**

Need of the SOPs **1**

Objective of preparing SoPs **1**

How to Use the SOPs **1**

1 Assessment and Management of Environmental and Social Risks and Impacts (SoP): 1 ..... **5**

1.1 Introduction 5

1.2 Objective of SOP 1 5

1.3 Application of the SOP 5

1.4 Requirements for SOP 1 6

2 Labor and Working Conditions (SoP): 2 ..... **23**

2.1 Introduction 23

2.2 Objective of SOP 2 23

2.3 Application of the SOP 23

2.4 Audience 23

3 Resource Efficiency and Pollution Prevention (SoP): 3 ..... **32**

3.1 Introduction 32

3.2 Objective of SOP 3 32

3.3 Application of the SOP 32

3.4 Requirements for SOP 3 34

4 Community Health and Safety (SoP): 4 ..... **41**

4.1 Introduction 41

4.2 Objectives of SOP 4 41

4.3 Application of the SOP 41

4.4 Requirements for SOP 4 42

5 Biodiversity Conservation (SoP): 5 ..... **46**

5.1 Introduction 46

5.2 Objectives of SOP 5 47

5.3 Application of the SOP 47

5.4 Requirements for SOP 5 48

6 Stakeholder Engagement, Grievance Redress Management, Communication and Information Disclosure. (SoP): 6 53

6.1 Introduction 53

6.2 Objective of SOP 6 53

6.3 Application of the SOP 53

6.4 Stakeholder Engagement Plan 57

6.5 Proposed action plan 57

Standard Operating Procedure (SOP-7) 60

7 Gender Based Violence (GBV) Grievance Redress Mechanism (GRM) 60

List of Annexures 77

Annexure I: Strengthening Environmental and OHS/E&S Clauses in Bidding Documents 77

Annexure II: Suggestive Budget Table 78

Annexure III: Monthly Reporting Templates 80

Annexure IV: Environmental Acts, and Rules 100

Annexure V -Procedures for Implementation of the C ESMP 101

Annexure-VI: Training Plan 102

Annexure VII: Applicable Labor Laws 109

Annexure VIII: Labor Compliance Quarterly Reporting Format 117

Annexure IX: Template For Grievance Redressal Mechanism 124

Annexure X: Template for Code of Conduct 126

Annexure XI: Abstract of the Contract Labour Act, 1971 128

Annexure XII: Abstract of the Building and Other Construction Workers' (Regulation of Employment and Condition of Service) Act, 1996 132

Annexure XIII: Abstract of the Payment of Wages Act, 1936 and the Rules Thereunder 138

Annexure XIV: Abstract of the Payment of Gratuity Act and Rules, 1972 141

Annexure XV: Abstracts of the Employee Compensation Act, 1923 146

Annexure XVI: Abstract of the Maternity Benefit Act, 1961 151

Annexure XVII: Minimum Wages (Central) Rules 154

Annexure XVIII: Notice Displaying Employment Details 160

Annexure XIX: Form-A 161

Annexure XX: Form-B 163

Annexure XXI: Form-C 165

Annexure XXII: Form-D 166

Annexure XXIII: Form-VIII 167
Annexure XXIV: Form-XII 168
Annexure XXV: Schedule-III 169
Annexure XXVI: Form-XXIII 170
Annexure XXVII: Payment of Wages (Nomination) Rules, 2009 171
Annexure XXVIII: Form-XI 172
Annexure XXIX: Incident Reporting to World Bank 174
Annexure XXX: SOP for Traffic Management 176
Annexure XXXI: Environmental Clearance Flowchart 185
Annexure XXXII: Indicative Mitigation Measures for Efficient Usage of Resources and Pollution Measures 186
Annexure XXXIII: Budget 194
Annexure XXXIV: Indicative Monitoring Plan 196
Annexure XXXV: Indicative Reporting Formats 199
Annexure XXXVI: Emergency Response Plan Template 201
Annexure XXXVII: Key Safeguard Measures in Accordance with the National and State Laws and MDBs Standards for Labor Influx Management 204
Annexure XXXVIII: HIRA Format 206
Annexure XXXIX: Labor Influx Study Tool 207
Annexure XXXX: Budget Tables 209
Annexure XXXXI: General Guideline for Preparation of Mitigation Measures for Biodiversity Conservation, and Biodiversity Management Plan 210
Annexure XXXXII: Monitoring and Reporting Process 215
Annexure XXXXIII: Workflow Mechanism on Parishkaram portal 217
Annexure XXXXIV: GRM Escalation levels for Land Complaints on Parishkaram portal: 218
Annexure XXXXV: GRM Escalation levels for Labour Complaints on Parishkaram portal: 219
Annexure XXXXVI: INCIDENT REPORT/DOCUMENTING FORM- GBV 220
Annexure XXXXVII: CONSENT FOR RELEASE OF INFORMATION 221
Annexure XXXXVIII: GBV SERVICE PROVIDERS 222
Annexure XXXXIX: GBV REFERRAL PATHWAY MAPPING 223
Annexure XXXXX: ROLE OF GBV SERVICE PROVIDERS 224
Annexure XXXXXI: MONITORING FOR GBV COMPLIANCE 226
Annexure XXXXXII: DEFINITIONS OF SEA/SH TERMS 227
Annexure XXXXXIII: SURVIVOR-CENTERED APPROACH 229

Annexure XXXXXIV: CODE OF CONDUCT FOR CONTRACTOR'S PERSONNEL 231
Annexure XXXXXV: Details of Anganwadi, Primary School, Village Secretariat and Primary Health Centre (PHC) 235

List of Tables

Table 0-1: An Overview of the Standard Operating Procedures and How to Use Them 2
Table 1-1: Key Requirements for the Assessment and Management of Environmental and Social Risks and Impacts 7
Table 2-1: Key Requirements for Labor and Working Conditions 24
Table 3-1: Key Requirements for Resource Efficiency and Pollution Prevention 34
Table 4-1: Key Requirements for Community Health and Safety 42
Table 5-1: Key Requirements for Biodiversity Conservation 48
Table 6-1: SOP for GRM 54

List of Figures

Figure 1-1: Assessment and Management of Environment Risks and Impacts 6
Figure 7-1: Structure of SEA/SH GRM mechanism 62
Figure 7-2: Incident Reporting Process 64
Figure 7-3: Flow of ICC mechanism 68
Figure 7-4: Monitoring Structure 75

Acronyms

Acronym	Acronym description
ADCL	Amaravati Development Corporation Limited
AIUDP	Amaravati Integrated Urban Development Program
APCRDA	Andhra Pradesh Capital Region Development Authority
APPCB	Andhra Pradesh Pollution Control Board
APSBB	Andhra Pradesh State Biodiversity Board
APWALTA	Andhra Pradesh Water, Land And Trees Authority
BMP	Biodiversity Management Plan
BNHS	Bombay Natural History Society
BOCW	Building And Other Construction Workers.
CCI	Child Care Institution
C-ESMP	Contractor's Environmental And Social Management Plan
CIA	Cumulative Impact Assessment
COVID-19	Coronavirus Disease 2019
CPHEEO	Central Public Health And Environmental Engineering Organization
CSO	Civil Society Organization
CSR	Corporate Social Responsibility
CSR	Corporate Social Responsibility
CTE	Consent To Establish
CTO	Consent To Operate
DPO	District Program Officer
DPR	Detailed Project Report
DSWO	District Social Welfare Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plans
ESMP	Environment And Social Management Plans
ESMU	Environment And Social Management Uni
ESMU	Environmental And Social Management Unit
ESS	Environment And Social Standards
GBV	Gender-Based Violence
GGBS	Ground Granulated Blast-Furnace Slag
GOAP	Government Of Andhra Pradesh

Acronym	Acronym description
GIIPs	Good International Industry Practice
GRM	Grievance Redress Mechanism
GVB	Gender-Based Violence
HIRA	Hazard Identification And Risk Assessment
ICAR	Indian Council Of Agricultural Research
ICT	Information And Communication Technology
IFIs	International Financial Institutions
IUCN	International Union For Conservation Of Nature
LMP	Labor Management Procedures
LULC	Land Use And Land Cover
MDB	Multilateral Development Bank
MEPMA	Mission For Elimination Of Poverty In Municipal Areas
MoEFFCC	Ministry Of Environment, Forest &And Climate Change
MSIH	Manufacture, Storage, And Import Of Hazardous Chemicals
NABET	National Accreditation Board For Education And Training
NABL	National Accreditation Board For Testing And Calibration Laboratories
NBA	National Biodiversity Authority
NBWL	National Board For Wildlife
NRSC	National Remote Sensing Centre
OHS	Occupational Health And Safety
OSC	One Stop Centre
Pas	Protected Areas
PgMC	Program Management Consultants
PIA	Project Influence Area
POSH	Prevention Of Sexual Harassment
PPE	Personal Protective Equipment
PUC	Pollution Under Control
RAP	Reclaimed Asphalt Pavement
SEA/SH	Sexual Exploitation And Abuse Or Sexual Harassment
SEAC	State-Level Expert Appraisal Committee
SEAC	State Level Expert Appraisal Committee
SEIAA	State Level Environment Impact Assessment Authority

Acronym	Acronym description
SEP	Stakeholder Engagement Plan
SERP	Society For Elimination Rural Poverty
SOP	Standard Operating Procedure
WWF	World Wide Fund For Nature

Introduction

The Government of Andhra Pradesh (GOAP) plans to build Amaravati as a new capital city on a 217.23 square kilometer site in Guntur district with assistance of World Bank and Asian Development Bank through Amaravati Integrated Urban Development Program (AIUDP). Phase I of Amaravati development will be implemented over a period of 5 years (2024–2029) with an estimated investment of $3.64 billion. The AIUDP program comprises implementing climate-resilient, sustainable, and inclusive infrastructure and service delivery solutions; supporting inclusive green economic growth; and strengthening inclusive governance and financing frameworks. The expected outcomes of the program are access to inclusive, efficient, and resilient infrastructure and public services, and jobs provided.

Need of the SOPs

The Government of Andhra Pradesh has obtained environmental clearances for the capital city development project and is initiating the project after completing all due diligence pertaining to the Environment & Social Management System in compliance with national and state regulations, such as the Environmental Protection Act (1986) and EIA Notification (2006). However, while reviewing the safeguard documents, banks observed certain gaps in implementing environmental risk management, including inconsistencies in Environmental Management Plans (ESMPs) and Bills of Quantities (BOQs), stakeholder participation and strengthening of the ESMU team , GBV/SEA, GRM and waste management issues which have not properly addressed . To address these issues, the bank advised preparing Standard Operating Procedures (SOPs) to address gaps in the ESMPs, including budgetary provisions in procurement, Related Disbursement Linked Indicators (DLI) to be achieved by ESMU in coordination with stakeholders and ensuring regular reporting to the banks as well as regulatory authorities. Further, it has been agreed that SoPs will be prepared and adopted under AIUDP. The bank also advised that these SOPs should be integrated into the planning and implementation of the capital city development project and can also be used in upcoming projects under APCRDA/ADCL, whether funded by state or MDBs.

Objective of preparing SoPs.

Objective of Preparing SOPs to address the current gaps in EMPs to manage key construction-related environmental and OHS risks that were not adequately covered in existing EMPs, such as waste management, wastewater treatment, traffic management, OHS, labor influx, GBV/SEA risks, and GRM. These SOPs address critical E&S procedural requirements at all stages of project preparation, implementation, monitoring, and operation.

How to Use the SOPs

Table 0-1 provides a brief overview of each SOP and how to use them.

Table 0-1: An Overview of the Standard Operating Procedures and How to Use Them

Standard operating procedure (SOP)	Brief about the SOP contents	How to use the SOP
SOP 1: Assessment and Management of Environmental and Social (E&S) Risks and Impacts	▪ E&S risk management: Processes for assessing and managing risks, including screening, impact assessment, and mitigation planning. ▪ Management plan: Procedures and templates for developing environment and social management plans (ESMPs), and procedures for development of monitoring and reporting.	▪ Conduct comprehensive E&S risk screenings as per SOP guidelines. ▪ Develop ESMPs based on impact assessments. ▪ Incorporation of the E & S clauses in Bidding Documents (See Annexure I) ▪ Implementation of C ESMPs (see Annexure V) ▪ Monitor and evaluate to assess the effectiveness of implemented ESMPs. ▪ ICT tool will be used to monitor the compliance conditions of the EC, NGT, and the Bank. The tool will be brought into operation Mid-year 2025. ▪ Reporting (Shall be as per the ICT E & S tool. See Annexure III with indicative items for reporting) ▪ Post-Construction Environmental Monitoring
SOP 2: Labor and Working Conditions	▪ Detail steps to prepare and implement labor management procedures (LMPs). ▪ Steps for implementing employment and working conditions and statutory compliance with labor laws ▪ Sections from laws or policies that requires compliance for	▪ Prepare LMPs. ▪ OHS Implementation and Management ▪ Monitor compliance with labor welfare laws and policies. ▪ Prepare process and progress monitoring reports.

Standard operating procedure (SOP)	Brief about the SOP contents	How to use the SOP
	occupational health and safety and labor welfare. ▪ Procedures for community workers and workers' grievance management procedures.	
SOP 3: Resource Efficiency and Pollution Prevention	▪ Procedures: Steps for impact assessment and action plans, with budgeting templates.	▪ Conduct impact assessments and develop action plans for resource efficiency and pollution prevention. ▪ Implementation ▪ Utilize provided templates for monitoring and tracking progress.
SOP 4: Community Health and Safety	▪ Impact on host community: Procedures to be followed for assessment of impact on host community due to labor influx and construction-induced impacts. ▪ Sexual exploitation and abuse or sexual harassment (SEA/SH) management: Guidelines for preventing and addressing these activities. ▪ Emergency response and crisis management procedures.	▪ Assess impact on host community and develop mitigation plans for addressing health and safety concerns. ▪ Implement measures to prevent SEA/SH and prepare for emergency situations. ▪ Implement measures to address community health and safety. ▪ Monitor and report.
SOP 5: Biodiversity Conservation	▪ Biodiversity screening to assess risk management plan, including mitigation, monitoring, and reporting.	▪ Conduct biodiversity screening and risk assessment or critical habitat assessment. ▪ Collect baseline data. ▪ Develop a biodiversity management plan (BMP). ▪ Evaluate to assess the effectiveness of implemented BMP.

Standard operating procedure (SOP)	Brief about the SOP contents	How to use the SOP
		▪ Monitor and report.
SOP 6: Grievance Redressal Mechanism	▪ Setting up of grievance redressal mechanism (GRM).	▪ Address and report grievances. ▪ Monitor and report on stakeholder engagement and GRM.
SOP 7: Gender Based Violence (GBV) Grievance Redress Mechanism (GRM)	▪ SEA/SH/GBV Grievance Redressal Mechanism	▪ Report Through the Proper Channels ▪ Use Support Structures Efficiently ▪ Ensure Survivor Consent and Confidentiality ▪ Monitoring & Reporting

1 Assessment and Management of Environmental and Social Risks and Impacts (SoP): 1

1.1 Introduction

The APCRDA & the ADCL has developed SOPs that detail processes and procedures aligned with the Environment and Social Standards (ESS) requirements of various Multilateral Development Banks (MDBs), Good International Industry Practice (GIIPs) and relevant acts / regulations of Government of India and Government of Andhra Pradesh. The SOPs emphasizes the importance of integrating E&S considerations into decision-making to promote sustainable development outcomes. This approach will strengthen the existing processes of the Government of Andhra Pradesh by aligning them with the practices of MDBs. It also underscores the need for stakeholder engagement, transparency, and accountability in managing E&S risks and impacts.

SOP 1 covers assessment and management of E&S risks and impacts required for the APCRDA & ADCL's investments that entail civil works. The SOP lays down procedures for identification, assessment, minimization, and mitigation of E&S risks and impacts, including monitoring and evaluating these impacts throughout the project cycle.

1.2 Objective of SOP 1

The key objectives are to define procedures for screening and scoping, determining the level of E&S risk, conducting impact assessments, and adopting mitigation measures, that is:

- **Risk identification:** Identify potential E&S risks associated with the project at planning and implementation stages.
- **Impact assessment:** Assess the potential E&S impacts of the project throughout its life cycle, including during the construction, operation, and decommissioning phases.
- **Mitigation and management:** Adopt a mitigation hierarchy approach to avoid impacts, minimize or reduce, restore or rehabilitate, and Offset residual impacts. Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels. Once risks and impacts have been minimized or reduced, restore or rehabilitate with suitable interventions. Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.

1.3 Application of the SOP

SOP 1 provides guidelines for APCRDA & ADCL's staff responsible for planning and implementation of capital region development projects, concerned consultants like Program Management Consultants (PgMC), Project Management Consultants (PMC), etc. and contractors associated with the APCRDA & the ADCL to assess and manage E&S risks in projects in compliance with national and state laws and regulations, including MDBs and GIIPs.

1.4 Requirements for SOP 1

The procedures for conducting the E&S risk assessment and formulating E&S instruments for mitigation.

Environmental and Social Risks and Impact Assessment

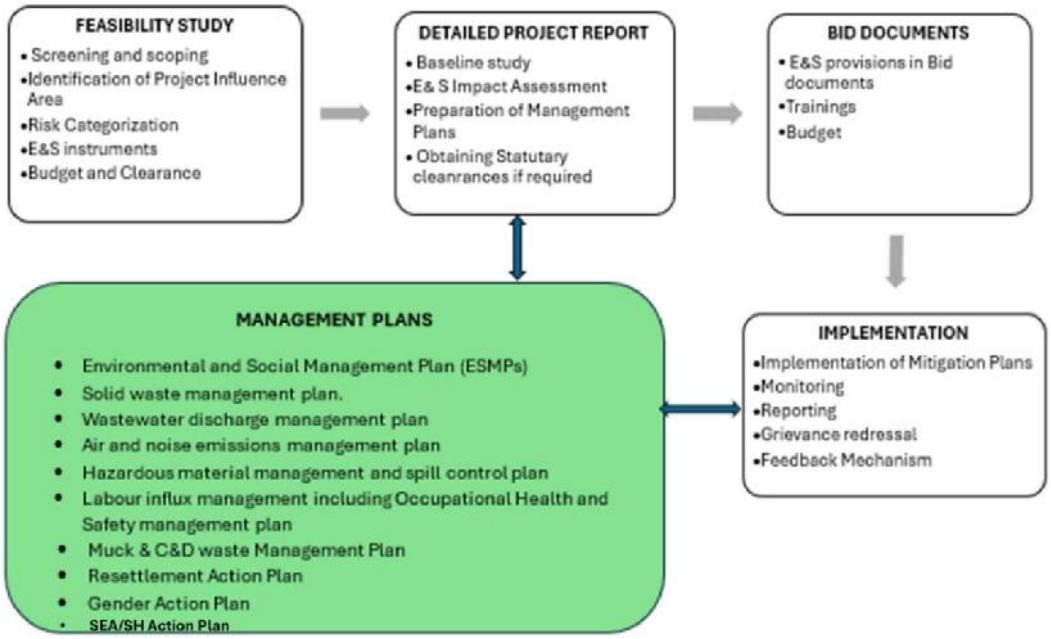


Figure 1-1: Assessment and Management of Environment Risks and Impacts

Table 1-1: Key Requirements for the Assessment and Management of Environmental and Social Risks and Impacts

<table>
<tr><th>Sr. No.</th><th>Activity</th><th>Relevant laws and sections</th><th>Procedure</th><th>Responsibility</th></tr>
<tr><td colspan="5">Feasibility study – Environmental and Social (E&S) screening and scoping</td></tr>
<tr><td rowspan="2">01</td><td rowspan="2">Screening and scoping</td><td rowspan="2">• Section 7 (II and III) of the Environmental Impact Assessment (EIA) Notification, 2006</td><td>i. Conduct public consultation with stakeholders and local communities to gather additional information and understand their concerns and perceptions regarding project's potential impacts.
ii. Use the screening output to establish the category of E&S risks given and scope the boundary of the E&S assessment.

Note: The screening criteria will undergo revisions or updates if additional E&S impacts are identified or if there are changes in national rules and regulations.</td><td>Empaneled Accredited EIA Consultant[i1]</td></tr>
<tr><td>Screening and scoping as per Section 7 of EIA Notification, 2006:
<table><tr><td>Screening</td><td>State-level expert appraisal committee (SEAC) will determine whether a category B project would require further EIA. The projects requiring an EIA report are category B1 and remaining projects will be category B2.</td></tr><tr><td>Scoping[2]</td><td>Expert appraisal committee (EAC) in case category A project and SEAC in case of category B project determines the comprehensive terms of reference (ToR) for the preparation of the EIA report.</td></tr></table></td><td>Andhra Pradesh State Environment Impact Assessment Authority (SEIAA)</td></tr>
</table>

[1] Accredited EIA Consultant Organizations https://eia.nabet.qci.org.in/Accredited_EIA_Consultant.aspx

[2] *Process starts with submission of Form 1 and Form 1A(See https://environmentclearance.nic.in/report/downloadForm.html),, including the proposed ToR to the EAC or SEAC for category A and category B1/B2, respectively. Based on these documents, the EAC or SEAC will determine the comprehensive ToR and will convey to the APCRDA & the ADCL within 60 days of receipt of Form 1.*

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
			Note: The screening process will determine whether the project requires an EIA, a cumulative impact assessment (CIA), or an environmental and social management plan (ESMP).	
02	Determine project influence area (PIA)	• General condition stipulated in the schedule of EIA Notification, 2006 • General conditions are not applicable to Building projects/township and area development projects, EIA notification 2006	i. As per the general condition stipulated in the Schedule of EIA Notification, 2006, *"Any project or activity specified in category 'B' will be treated as category A, if located in whole or in part within 10km from the boundary of: (a) protected areas notified under the Wild Life (Protection) Act, 1972, (b) critically polluted areas as identified by the Central Pollution Control Board from time to time, (c) eco-sensitive areas as notified under section 3 of the Environment (Protection) Act, 1986, and (d) inter-state boundaries and international boundaries."* Based on this requirement, it is recommended to use a 10km radius as the PIA for gathering secondary environmental data. ii. In other circumstances, where impacts remain within the project footprint area, a PIA of 500m is considered for collecting primary environmental data. **Note:** Adjustments to the PIA for collecting primary environmental data would be required if any of the parameters listed under point (i) are observed and/or the impacts go beyond the footprint area.	Empaneled Accredited EIA Consultant
03	Risk categorization and establishing preparation of E&S instruments	• Schedule of EIA Notification, 2006	i. **Categorization as per EIA Notification, 2006 and its subsequent amendments:** The Schedule of EIA Notification, 2006 lists projects or activities under categories A and B:	Empaneled Accredited EIA Consultant

<table>
<tr><th>Sr. No.</th><th>Activity</th><th>Relevant laws and sections</th><th>Procedure</th><th>Responsibility</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Category[3]</th><th>Report type</th><th>Clearance</th><th>Authority</th></tr>
<tr><td>A</td><td>Detailed EIA report</td><td>Environmental clearance (EC)</td><td>MoEFCC</td></tr>
<tr><td>B1</td><td>Detailed EIA report</td><td>EC</td><td>SEIAA</td></tr>
<tr><td>B2</td><td>Prefeasibility report</td><td>EC</td><td>SEIAA</td></tr>
</table>
The detailed EC process is provided in SOP 3 - Resource Efficiency and Pollution Prevention.

ii. Risk Categorization by MDBs or external funding agencies: All MDBs have their own frameworks for categorizing projects, such as categories High, Substantial and Low. Based on the project's category, they have guidelines to address any potential E&S impacts
iii. An independent consultant (accredited by NABET) will be hired for Category A/B1 projects to conduct the EIA study and obtain EC wherever required
</td><td></td></tr>
<tr><td>04</td><td>Budget and clearance</td><td>• Section 7 (II) of EIA Notification, 2006</td><td>i. Estimate the cost of E&S risk management for the project cost-benefit analysis in the feasibility study.
ii. Based on the above risk categorization identified in the feasibility study, develop ToR to prepare E&S instruments (detailed EIA / ESIA, EMP/ESMP, biodiversity management plan (BMP), Resettlement Action Plan (RAP), labor management procedure (LMP), and so on.)
iii. Estimate the monitoring, mitigation, and capacity building costs of E&S risk and impacts of the project activities.</td><td>APCRDA & ADCL</td></tr>
</table>

[3] *Most of the APCRDA & the ADCL projects fall within category B as per the EIA Notification, 2006 (that is, covering land area ≥ 50 hectares and or built up area ≥ 1,50,000 square Meters).*

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
			iv. **For categories A and B1, as per EIA Notification, 2006**: Submit Form 1 and Form 1A (see https://environmentclearance.nic.in/report/downloadForm.html), including the proposed ToR to the EAC or SEAC for category A and category B1, respectively. Based on these documents, the EAC or SEAC will determine the comprehensive ToR and will convey it to the APCRDA & ADCL within 60 days of receipt of Form 1.	
Detailed project report (DPR) – EIA / ESIA				
05	Baseline study	• Section 7 (II) of EIA Notification, 2006 Applicable for category A and B1 projects	**"Standard ToR for EIA / EMP report for Projects/Activities requiring Environmental Clearance under EIA Notification, 2006," published by MoEF & CC, Government of India during April 2015 for Amaravati.** Collect primary and secondary data from the PIA to determine direct and indirect impacts[4] under the project. i. **Standardized data collection methods:** Depending on the environmental parameters of relevance, either random sampling or stratified sampling techniques may be used for data collection. - For **random sampling**, each potential data point within the study area has an equal chance of being selected. For instance, for water sample collection, random number generators or GIS tools can be used to generate random coordinates within the study area. - **Stratified sampling** involves selecting sampling points at regular intervals (for example, every km along the river) for spatial coverage and to capture gradients or trends in environmental parameters. For instance, a water sample can be collected by establishing a grid or transect pattern across	Empaneled accredited EIA consultant with NABL environment lab certification

[4] *Direct impacts refer to immediate and measurable consequences of a project, such as habitat destruction, pollution emissions, or noise disturbance, directly caused by project activities. Indirect impacts are secondary or consequential effects that occur as a result of direct impacts, such as induced development, changes in land use patterns, or socioeconomic shifts in the local community.*

<table>
<tr><th>Sr. No.</th><th>Activity</th><th>Relevant laws and sections</th><th>Procedure</th><th>Responsibility</th></tr>
<tr><td></td><td></td><td></td><td>the study area, wherein spacing between sampling points can be determined based on the size of the area.
ii. Based on these techniques, samples can be collected consistently at each location according to established protocols.

Note: Remote sensing and GIS: Utilize remote sensing data (for example, satellite imagery, Light Detection and Ranging) and GIS for creating a land use and land cover [5] (LULC) map and analysis of environmental features and changes over time.

iii. Indicators: Depending on the type of investment, collect data of relevant parameters (that is, air quality, water resources, biodiversity, traffic, and so on). The suggestive indicators for the following parameters are:

<table>
<tr><th>Parameters</th><th>Suggestive indicators</th></tr>
<tr><td>Air quality</td><td>- Levels of particulate matter (PM_{10}, $PM_{2.5}$)
- Nitrogen oxides (NO_2)
- Sulfur dioxide (SO_2)</td></tr>
<tr><td>Water resources</td><td>- Quality and flow of surface water bodies affected by construction
- Runoff
- Erosion and sedimentation</td></tr>
<tr><td>Biodiversity</td><td>- Sensitive habitats
- Endangered species
- Ecological corridors</td></tr>
</table>
</td><td></td></tr>
</table>

[5] *Land cover refers to the surface cover on the ground—vegetation, urban infrastructure, water, bare soil, and so on. Land use refers to the purpose the land serves, such as recreation, wildlife habitat, or agriculture.*

Sr. No.	Activity	Relevant laws and sections	Procedure		Responsibility
				(See SOP 6 – Biodiversity Conservation.)	
			Soil	- Type of soil, its composition - Potential geological hazards - Nutrient content - pH levels - Organic matter - Heavy metal concentrations - Soil's bearing capacity	
			Noise	- Ambient noise Levels - Noise sources	
			Traffic	- Traffic counts - Traffic speeds - Vehicle types - Peak hour analysis - Accidents	
			Climate change	- Extreme weather events - Increased river flows resulting in erosion and flooding - Erratic rainfall - Connectivity and mobility - Climate change adaptation strategies - Greenhouse gas emissions	
			Waste management	- Types of waste - Existing methods of storage and collection - Disposal mechanism	
			Hazardous waste management	- Presence of hazardous waste - Storage - Disposal mechanism	

<table>
<tr><th>Sr. No.</th><th>Activity</th><th>Relevant laws and sections</th><th>Procedure</th><th>Responsibility</th></tr>
<tr><td></td><td></td><td></td><td>

Social baseline data

i. **Data collection:** Latest Socio economic surveys by the APCRDA shall be used.

ii. **Indicators:** Following indicators shall be considered for collating baseline of the population and adverse impact on assets and vulnerable communities.

<table>
<tr><th>Parameters</th><th>Suggestive indicators</th></tr>
<tr><td>Demographic</td><td>- Household size and composition
- Age distribution
- Gender distribution
- Vulnerability</td></tr>
<tr><td>Economic</td><td>- Employment status (for example, unemployment rate, types of employment)
- Skills
- Occupational</td></tr>
<tr><td>Education</td><td>- Literacy rate
- Educational attainment levels (for example, levels of schooling completed)</td></tr>
<tr><td>Health</td><td>- Prevalence of diseases and health conditions</td></tr>
<tr><td>Assets</td><td>- Housing, commercial, common</td></tr>
<tr><td>Housing</td><td>- Typology of house
- Tenurial arrangements
- Area of house</td></tr>
</table>

</td><td></td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Activity</th><th>Relevant laws and sections</th><th>Procedure</th><th>Responsibility</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Commercial</td><td>- Typology
- Tenurial arrangements
- Area</td></tr>
<tr><td>Social Infrastructure</td><td>- Water
- Health facility, banks, roads, education, markets, modes of transportation</td></tr>
<tr><td>Common Property Resources</td><td>- Area
- Typology
- Usage, nature of dependency</td></tr>
</table>
</td><td></td></tr>
<tr><td>06</td><td>Environmental and social impact assessment (ESIA)</td><td>• Section 7 (II) of EIA Notification, 2006</td><td>Environment impact assessment
i. Assess baseline data to predict direct and indirect environmental impacts on factors such as air, water, and soil pollution; habitat loss; noise; waste; and climate change.
ii. Consider the project's nature, scale, and location, and then identify the pathways through which these impacts may occur. For example, pollution from construction activities may flow to the nearby water bodies through runoff, affecting aquatic ecosystems.
iii. Compare the baseline data with predicted impacts to assess and identify the type of mitigation measures by adopting mitigation hierarchy.
iv. Analyze institutional and capacity risks related to government agencies or departments on the process of environment, forest, and wildlife clearances and pollution.
Social impact assessment
i. Assess risks and impacts related to: (a) land use patterns and tenurial arrangements, land access and availability, food security and land values, and any corresponding risks related to conflict over land and natural resources; (b) disadvantaged or vulnerable</td><td>Empaneled Accredited EIA Consultant</td></tr>
</table>

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
			population groups; c) livelihood related risks and impacts; (d) The risks related to SEA/SH/GBV etc ii. Analyze the impacts on private assets of titleholders and nontitle holders (encroachers and squatters)—that is, land, trees, and structures—and common property resources (structures, natural resources, and social infrastructure).	
07	Environmental and social management plan (ESMP)	• Section 7 (II) of EIA Notification, 2006	i. Identify the significant E&S impacts of the project based on the findings of the ESIA. ii. Assess risks associated with these impacts, considering their likelihood and potential consequences. iii. Develop specific measures to mitigate and monitor the identified risks and impacts. iv. Prioritize the mitigation measures based on their effectiveness, feasibility, and urgency by following mitigation hierarchy approach. v. Clearly define responsibilities for implementing each mitigation measure by assigning tasks to the APCRDA & the ADCL, contractors, Consultants (PgMC, PMCs, etc.), nongovernmental organizations (NGOs) or civil society organization (CSOs) and local communities. vi. Establish specific targets and timelines for implementing and monitoring each mitigation measure. vii. Incorporate the ESMP into the overall project plans and schedules. viii. Develop monitoring and evaluation protocols to assess the effectiveness of the ESMP. ix. Engage with project stakeholders throughout the development of the ESMP. x. Review and update the ESMP as and when needed, particularly if there are changes in project scope, new risks emerge, or mitigation measures prove ineffective.	Empaneled Accredited EIA Consultant

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
08	Critical habitat or Biodiversity assessment and mitigation plan	• EIA Notification, 2006 • Wildlife Protection Act, 1972 • GIIP	i. Develop a biodiversity mitigation plan involving a systematic approach to minimize negative impacts on local ecosystems and species following the mitigation hierarchy. (See SOP 5– Biodiversity Conservation.)	Empaneled Accredited EIA Consultant
09	Labor management, including occupational health and safety	• GIIP • Conditions of EC & NGT orders	i. Identify the different types of project workers that are likely to be involved in the project. ii. Set out the ways of meeting the requirements of MDBs, including national or state laws and regulations that apply to the different types of workers. (See SOP 2 – Labour and Working Conditions and SOP 4– Community Health and Safety.)	Contractor PMC PgMC
10	Grievance Redressal Mechanism (GRM) and Information Disclosure	• GIIP	i. Engage with relevant stakeholders and conduct public consultations, including with affected communities, throughout the planning, preconstruction, and construction phases, including screening, impact assessment, and mitigation planning process. (See SOP 6-Grievance Redressal Mechanism (GRM) and SoP 7 on GBV-GRM ii. ii. Information on consultations, grievances received and addressed to be disclosed on the websites, in visible places in public office premises in local languages and other important language iii. Information related to SEA/SH/GBV case redressal is mentioned in SOP-7 GBV GRM	PMCs, PgMC, APCRDA
11	SEA/SH prevention action plan	• GIIP	• Integrate a gender perspective into the design, implementation, monitoring, and evaluation of projects • Establish effective mechanisms to prevent and respond to SEA/SH including GBV.	PMC/PgMC/ APCRDA & ADCL

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
			• Assess GBV risks regularly throughout project implementation (See SOP 4 – Community Health and Safety.)	
12	Budget	• GIIP	i. Establish a budget to effectively allocate resources, estimate costs, manage and monitor risks and impacts through Site Specific ESMP, ensure compliance, promote transparency, and plan for the long-term sustainability of E&S initiatives. See Annex II of SOP 1 - for suggested budget table.	APCRDA & ADCL
Procurement				
13	E&S provisions in Bid documents	• GIIP	i. Incorporaterate E&S annexures including cost implications in the bid document: ESMP, code of conduct, applicability of labor laws & Environmental regulations. ii. Include E&S provisions under the conditions of contract. See Annex 1 of SOP 1 iii. **Bidders' requirement:** Submit declaration of environment, social, health and safety (ESHS) past performance; ESHS performance security; contractor's ESMP (C-ESMP); and ESMP budget included in the bill of quantities (BOQ).	APCRDA & ADCL, ESMU
14	Bid Evaluation	• GIIP	i. Evaluate the capabilities related to personnel, past performance, and experience of the bidder during bid evaluation process.	APCRDA & ADCL, ESMU
Project implementation				
15	Implementation of mitigation plans	• Section 2 & 10 of EIA Notification, 2006 • GIIP	i. Supervise contractors for the implementation of the ESMP and compliance with labor laws, producing monitoring reports. including grievance redressal. ii. E & S ICT tool shall be used for reporting by the contractors. Compliance shall be submitted on monthly basis to the APCRDA. and the compliance as per the C ESMP will be verified by PMC and monitored by PgMC. The PMC on regular basis ensures the implementation of the C ESMPs, identifies gaps and guides the contractor with corrective measures with the support from PgMC.	PMCs PgMC APCRDA & ADCL, ESMU

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
			The PMC will report to the PgMC and ESMU on the violations and non compliances and suggests penalties. The PgMC on periodic basis does field inspections to confirm the compliance from the contractor and PMC, reports to the ESMU and recommends the corrective measures for improvement and penalties for violations and non compliances. The ESMU ensures compliances and suggests for revisions in the C ESMP based on the reports from The PMC, PGMC and field observations. iii. Coordinate with other concerned agencies, local governments, and communities to support the implementation of the ESMP and compliance of labor welfare laws. iv. Conduct regular meetings, workshops, and training sessions to build capacity and foster collaboration (See training plan).	
			i. Designate a focal person ESMU of APCRDA, ADCL, PgMC and PMC. ii. Supervise civil works, ensuring compliance with all E&S design parameters and ESMP implementation. iii. Ensure day-to-day compliance E&S monitoring during the construction phase.	ESMU PMC & PgMC Focal persons PMCs
			i. Undertake periodic monitoring to ensure the implementation of the compliance as per the mitigation plans. ii. Prepare corrective actions.	PMCs PgMC,
			i. Prepare (C-ESMP) with site-specific mitigation measures. ii. Recruit environmental, labor, health, and safety managers responsible for implementing the contractors' environmental, health, and safety responsibilities and liaising with government agencies. iii. Implement mitigation and monitoring measures proposed in the ESMP and LMP. See SOP 2 and SOP 4.)	Contractors

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
16	Monitoring	• Section 10 of EIA Notification, 2006 • GIIP	i. Review the specific E&S requirements, monitoring parameters, and compliance criteria outlined in the C-ESMP. ii. Develop a monitoring checklist that aligns with the requirements and parameters specified in the C-ESMP. (See Annexure II.) iii. Communicate the monitoring schedule and requirements to construction contractors and subcontractors. iv. Conduct regular site inspections and observe construction activities and conditions against the C-ESMP requirements. v. Document observations, noting compliance with or deviations from the C-ESMP. vi. Record all inspection findings accurately on the inspection monitoring checklist. Include photographs or sketches as necessary to document conditions.	PMC PgMC PMC PMC PMC PMC
			i. Designate a focal person from ESMU of APCRDA, ADCL, PgMC and PMC. ii. Perform regular site inspections to observe construction activities by focusing on areas identified as critical for E&S protection. iii. Utilize checklists or inspection forms to systematically record observations. (See Annexure III.) iv. Document compliance with C-ESMP requirements and note any deviations or concerns.	APCRDA & ADCL Project offices Focal persons PMC PMC
			i. Prepare project-specific monitoring plan by identifying the specific parameters and attributes to be monitored (for example, air quality, water quality, noise levels, biodiversity, GBV, consultations, and grievances). Monitoring shall be done through NABL accredited Environment labs. ii. Select locations where monitoring will occur during construction and operation phases (Post construction monitoring). Post construction monitoring will be on quarterly basis for 1 year period.	Contractors Contractors APCRDA & ADCL

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
			Site specific remedial actions shall be taken up as per best practices in case of deviation. iii. Define the duration and frequency of monitoring activities for each phase (construction and operation). Consider seasonal variations and project milestones that may affect monitoring requirements. iv. Conduct site visits and verify adherence to C-ESMP requirements and regulatory standards. v. Identify instances of noncompliance, document findings, and recommend corrective actions to bring the project back into compliance.	PgMC, APCRDA & ADCL PgMC, APCRDA & ADCL
			i. Incorporate the developed monitoring plan into the C-ESMP. ii. Carry out the scheduled monitoring activities as per the established plan and timelines. iii. Use facilities recognized by the National Accreditation Board for Testing and Calibration Laboratories (NABL) for monitoring of environment parameters.[6]	Contractors
17	Reporting	• Section 10 of EIA Notification, 2006 • GIIP	i. Review reports submitted by contractors to ensure adherence to regulations, consistency in data collection, and compliance with project requirements. ii. Submit regular progress / compliance reports to MDBs /Government of Andhra Pradesh (GoAP) / Regulatory authority like SPCB/ NGT as per project requirement.	PgMC /ESMU
			i. Facilitate submission of regular reports from the contractors. ii. Compile Project reports and submit to the ESMU and the APCRDA & ADCL.	Focal persons PMC/ PgMC
			i. Prepare progress monitoring reports on E&S activities as per the C-ESMPs and compile monitoring findings into comprehensive reports.	PgMC

[6] *The list of NABL-accredited laboratories is available at https://nabl-india.org/nabl/file_download1.php?filename=2024022200648-NABL-400-doc.pdf.*

<table>
<tr><th>Sr. No.</th><th>Activity</th><th>Relevant laws and sections</th><th>Procedure</th><th>Responsibility</th></tr>
<tr><td></td><td></td><td></td><td>ii. Submit reports to the ESMU according to agreed timelines.</td><td></td></tr>
<tr><td></td><td></td><td></td><td>i. Prepare periodical reports (reporting period shall be as per project requirements) on E&S compliances as per the C-ESMP and regulatory compliances, including environment monitoring data.
ii. Submit regular reports to the APCRDA & ADCL Project offices.
iii. The suggested reporting template to be submitted by the contractor is provided in Annexure II.
iv. The following monitoring templates are developed focusing on monitoring and reporting the information required during the execution of the project:
<table>
<tr><th>Type of report</th><th>Frequency of submission</th></tr>
<tr><td>Regulatory compliance report</td><td>As per project requirement. (see Annexure II)</td></tr>
<tr><td>E&S compliance monitoring table</td><td>As per project requirement (See Annexure II)</td></tr>
<tr><td>All related E&S issues, accidents, or incidents resulting from project activities</td><td>Within 24 hours of the issue (See Annexure II)</td></tr>
<tr><td>Labor-related compliance reports</td><td>See SOP 2 – Labour and Working Conditions</td></tr>
<tr><td>Accidents or incidents report</td><td>See SOP 2 – Labour and Working Conditions</td></tr>
<tr><td>Environment parameters monitoring report</td><td>See SOP 3 – Resource Efficiency and Pollution Prevention</td></tr>
<tr><td>Monitoring report for GBV</td><td>See SOP 4 – Community Health and Safety</td></tr>
</table></td><td>Contractors</td></tr>
</table>

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
			v. <table><tr><td>Biodiversity monitoring report</td><td>See SOP 5 – Biodiversity Conservation</td></tr><tr><td>Grievance registration form and grievance registration portal</td><td>See SOP 6 - Grievance Redressal Mechanism (GRM) and Information Disclosure</td></tr></table>	
18	Training	• GIIP	i. Conduct capacity-building initiatives with the assistance of specialist institutions, PgMC, and PMCs to deliver training to project stakeholders, contractors, and ADCL/APCRDA engineers and staff responsible for execution and implementation of E&S measures at sites.	ESMU, APRCDA /PgMC / PMC
19	Feedback mechanism and continuous improvement	• Section 7 (III) of EIA Notification, 2006 • Section 51 of RFCTLARR Act, 2013	ii. Facilitate communication among stakeholders, including project teams, regulators and affected communities by following feedback mechanism: - Stakeholder engagement - Grievance redressal - Disclosure	APCRDA & ADCL or ESMU/ PgMC, PMCs

2 Labor and Working Conditions (SoP): 2

2.1 Introduction

SOP 2 provides procedures for safeguarding the rights of workers, ensure the provision of fair wages, and maintain safe working conditions, thereby fostering an atmosphere of respect and fairness in the workplace.

2.2 Objective of SOP 2

The objectives of this SOP are to ensure compliance with national and state labor welfare laws and regulations.

2.3 Application of the SOP

This SOP covers a wide range of areas including employment regulations, service conditions, wage payment, equal remuneration, social security, occupational health and safety (OHS) conditions, grievance redressal, prohibition of child or forced labor, prevention of SEA/SHand Grievance redressal of SEA/SH

2.4 Audience

The SOP applies to all types of project workers including direct workers, contract workers, primary suppliers,[7] and community workers.

[7] *In certain cases, the primary supplier may assume control and legal responsibilities, while in other instances, they may act as intermediaries in the procurement and hiring of workers.*

2.0 Requirements for SOP 2

Table 2-1: Key Requirements for Labor and Working Conditions

Sr. No.	Activity	Relevant laws and sections	Procedure	Outcomes	Responsibility
Feasibility					
01	Screening	• Good International Industry Practices (GIIP)	Apply environmental and social (E&S) screening checklist as per SOP 1 to determine: i. Level of skills available in the project influence area (PIA) ii. Availability of local contractors iii. Category of workers expected to be engaged iv. Availability of space for labor camps Estimate budget for labor requirement.	Job opportunities to local people Reduction in labour influx	Contractor
Detailed project report (DPR) preparation					
02	Labor management procedure (LMP)	• Sections 7, 12, and 28 to 37 of the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 (BOCW) • Rules 23, 34 to 54, 208, 209, 223, 231, 238, 240, 241, 243 to 247, and 249, of BOCW Central	Design the LMP to address the ways in which labor laws and rules of the Government of India (GoI) and the GoAP, apply to different categories of project workers—that is direct, contracted, primary supply workers, and community workers.		Contractor with guidance from PMC & PgMC

Sr. No.	Activity	Relevant laws and sections	Procedure	Outcomes	Responsibility
		Rules, 1998 & AP BOCW Rules1999. • Sections 7, 12, and 16 to 27 of the Contract Labour Act, 1970 • Rules 17, 21, 76, and 81 read with 71 of the Contract Labour (R & A) Central Rule 1971 &AP CL(R&A) Rules 1971 • Section 4 of the Inter-State Migrant Workmen Act, 1979. • Rules 3, 7, and 55 of the Inter-State Migrant Workmen (RE & CS) Central Rules, 1980 & AP inter-state migrant workmen rules 1982. • Sections 25 and 26 of the Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 • Rule 22 of the Minimum Wages (Central) Rules,	Design the LMP to provide guidance on allocation of resources as well as implementation, monitoring, and reporting on compliance with labor standard. The LMP should broadly cover the following aspects: i. Overview of labor use on the project: Provide details related to the number and types of workers, characteristics of workers, and timing of labor requirements. ii. Key potential risks: Risks associated with the project, such as likely incidence of forced or child labor, presence of migrant or seasonal workers, risk of labor influx, possible accidents or emergencies, and understanding and implementation of occupational health and safety (OHS) requirements. iii. Brief overview of labor legislation (See Annexure VII). iv. Responsible staff for engagement and management of workers, contractors, and subcontractors, OHS, training of workers, and addressing workers' grievances,	Implementation of basic rights for labour – working hours, minimum and fair wage Risk reduction Promotes gender equality Opportunities for women	

Sr. No.	Activity	Relevant laws and sections	Procedure	Outcomes	Responsibility
		1950 & AP Minimum wage Rules 1960 • Rule 8 of The Rights of Persons with Disabilities Rules, 2017 • Sections 3 and 9 of The Child and Adolescent Labour (Prohibition and Regulation) Act, 1986 • Section 12, Child Labour (Prohibition and Regulation) Amendment Act, 2016 • Rule 17 of The Child and Adolescent Labour (Prohibition and Regulation) Rules, 1988 • Section 4 of The Bonded Labour System (Abolition) Act, 1976 • Sections 3 (1) 4 (1), and 7 of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH) • Section 3 of The Industrial Disputes Act,	including monitoring of primary suppliers. v. Policies and procedures on occupational health and safety (OHS). vi. Age of employment: Ensure minimum age of employment is met and process followed for verifying the age of workers to prevent hiring underage workers. vii. Terms and conditions of employment related to wages, hours of work, workers' organization, including nondiscrimination and equal opportunities. viii. Contractor management: Outline the process for selection of contractors and provisions on OHS and labor as well as procedures for monitoring performance in the bid document. ix. Community workers: Monitoring and reporting the terms and conditions of their work. x. Primary supply workers: Monitoring and reporting the terms and conditions of their work. xi. Women's safety and security at the workplace: Set a code of conduct and conditions of employment.		

Sr. No.	Activity	Relevant laws and sections	Procedure	Outcomes	Responsibility
		1947 (Workers Committee) • Section 4 of the Trade Unions Act, 1926 • Sections 4 and 5 of the Equal Remuneration Act, 1976 • Section 21 of the Rights of Persons with Disabilities Act, 2016 • Rule 8 of The Rights of Persons with Disabilities Rules, 2017 ▪ Section 3 of The Bonded Labour System (Abolition) Act, 1976 ▪ Section 4 of the maternity benefit Act, 1961 ▪ Sections 19 (a) and (b) and Section 26 of the Bonus Act, 1965 ▪ Sections 3 and 4 of the Workmen's Compensation Act, 1923	xii. Grievance mechanism: Process for management of grievances related to workers, including workplace sexual exploitation and abuse or sexual harassment (SEA/SH). (See SOP-7 on GBV-GRM. Estimate the budget for LMP and incorporate into the DPR. Disclose a copy of LMP on the APCRDA website.		APCRDA

Sr. No.	Activity	Relevant laws and sections	Procedure	Outcomes	Responsibility
		▪ Sections 5 and 6 of the Employees' Provident Funds (EPF) and Miscellaneous Provisions Act, 1952 ▪ Sections 11, 39, 40, and 43 of the Employees' State Insurance Act, 1948 • GIIP			
03	Environmental and Social Management Plan (ESMP)	• GIIP	Summarize provisions of LMP and include it in the ESMP (see SOP 1)		Contractor
04	Bidding document and bid evaluation	• Applicable relevant laws and rules are mentioned above as in point no 2.1	Bid documents to include a section on E&S requirement under the conditions of contract: i. Compliance to labor laws and regulations ii. Prohibition and prevention of SEA/SH iii. Prohibition of forced and child labor iv. Monitoring and reporting on LMP, ESMP, and OHS v. Staffing and training of personnel including workers of sub-contractors	Projects meet the statutory requirements Women safety	APCRDA (Andhra Pradesh capital region development Authority) & ADCL (Amaravati Development Corporation Limited), Contractor

Sr. No.	Activity	Relevant laws and sections	Procedure	Outcomes	Responsibility
			vi. Preparation of contractor's ESMP (C-ESMP) before commencement of work vii. Budget line items specific to ESMP and LMP implementation in the bill of quantities (BOQ) viii. Penalty clause for breach of contract ix. Annexures for ESMP and code of conduct. Evaluate the E&S capabilities related to personnel, past performance, and experience of the bidder during bid evaluation process.		
Implementation					
05	ESMP	• Applicable relevant laws and Rules are mentioned above as in point no 2.1 • GIIP	i. Once contract is awarded, prepare C-ESMP. ii. Obtain relevant licenses, environmental clearances, and registration. iii. Monitor environmental parameters related to water, air, noise, and so on. iv. Set up relevant committees (safety, Internal Complaints Committee or ICC, and so on). v. Display notice boards at camp and worksites.	Value of program works complying with E & S safeguards	Contractor

Sr. No.	Activity	Relevant laws and sections	Procedure	Outcomes	Responsibility
			vi. Maintain registers and records. vii. Establish workers' grievance mechanism. viii. Train workers on OHS, labor welfare, and code of conduct. ix. The workers will sign code of conduct. (Refer to Annexure 9 in SoP on GBV GRM) x. In case of accidents: - Prepare the incident report[8] - Conduct root cause analysis - Prepare action taken report - Prepare corrective action plan. For details, refer to the ESMP attached to the contract document.		
06	Monitoring and reporting	• Applicable relevant laws and rules are mentioned above as in point no 2.1	i. Develop reporting formats for monthly progress report. ii. Update monitoring checklist as and when required. iii. Adopt information and communication technology (ICT) monitoring system for real-time reporting on labor standard compliance.		Environmental and Social Management Unit (ESMU) PMC, PGMC

[8] *Inform the respective MDBs within 24 hours of the incident and submit the incident investigation report within 10 working days. Also refer to Annexure XXII: FormXI under SOP 2.*

Sr. No.	Activity	Relevant laws and sections	Procedure	Outcomes	Responsibility
			iv. Conduct periodical site visits to ensure compliance with labor standards using the checklist (see Annexure VII). v. Conduct periodic on-site and off-site monitoring to ensure compliance with ESMP (refer to SOP 1). vi. Prepare monthly and quarterly reports and submit to concerned officials for review. **Note:** Provide periodic training on use of ICT and other monitoring tools to staff, consultants and contractors (including subcontractors).		

3 Resource Efficiency and Pollution Prevention (SoP): 3

3.1 Introduction

SOP 3 outlines the requirements for ensuring resource efficiency and effective pollution prevention and management throughout every stage of the project's life cycle. This means that from the initial planning and design phases to construction and operation, the project must consistently adhere to practices that minimize resource use and reduce E&S risks and impacts. SOP 3 ensures that these practices are integrated into all aspects of the project to achieve environmental sustainability and social inclusion.

The purpose of this SOP is to outline the procedures and practices required to ensure effective resource efficiency and pollution prevention throughout the planning, construction, and operational phases of the New Capital City Development Project. This SOP is designed to align with national and state environmental regulations and incorporate internationally recognized good industry practices.

3.2 Objective of SOP 3

The objectives of this SOP are:

- Promote the sustainable use of resources, including energy, water, and raw materials
- Avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities
- Avoid or minimize project-related emissions of short- and long-lived climate pollutants
- Avoid or minimize generation of hazardous and non-hazardous waste and proper disposal.

3.3 Application of the SOP

SOP 3 Provides a clear and standardized framework for staff, consultants, and contractors associated with the APCRDA to help minimize negative E&S impacts, optimize resource use, and promote sustainable development practices.

All project activities shall prioritize the efficient use of energy, water, raw materials, and other natural resources. Project design and construction must incorporate sustainable building practices, including energy-efficient systems, low-impact materials, and technologies aimed at reducing water consumption and minimizing the carbon footprint. Resource efficiency measures shall be integrated into procurement plans, construction scheduling, and operational planning.

Existing legal and regulatory norms on borrow areas, mining and quarry shall be followed and prior permissions shall be obtained.

Pollution prevention measures shall be implemented to minimize emissions to air, discharges to water, and the generation of hazardous and non-hazardous waste. Air pollution control

strategies shall include dust suppression, emissions monitoring, and the use of low-emission construction equipment. For water pollution prevention, sediment and erosion control measures, stormwater management systems, and proper wastewater treatment protocols shall be strictly enforced. Waste management procedures shall include the segregation, recycling, safe storage, and authorized disposal of solid and liquid waste streams, in compliance with applicable laws and the project's Waste Management Plan.

Hazardous materials, including fuels, chemicals, and lubricants, must be handled, transported, and stored following stringent safety protocols. Spill prevention, control, and countermeasures (SPCC) must be in place at all relevant sites. The use of materials and technologies that generate significant pollutants or are considered environmentally hazardous shall be discouraged in favor of cleaner alternatives.

Environmental monitoring programs shall be implemented to measure and report on key indicators related to air quality, water quality, waste generation, energy and water usage. These monitoring results shall be periodically reviewed by the Authority and shared with relevant stakeholders, including the World Bank as per the environmental and social management plan.

All contractors and subcontractors shall be contractually required to comply with these procedures. Capacity-building initiatives, including awareness and training programs on resource efficiency and pollution control, shall be conducted regularly for all personnel involved in the project. Regular audits and inspections shall be conducted to ensure adherence to this SOP, and corrective actions shall be implemented promptly in the event of non-compliance.

This SOP shall be reviewed and updated periodically to reflect changes in legal requirements, project conditions, and technological advancements to ensure continuous improvement in resource efficiency and pollution management practices.

3.4 Requirements for SOP 3

Table 3-1: Key Requirements for Resource Efficiency and Pollution Prevention

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
Feasibility study – Environmental and social (E&S) screening and scoping				
01	Screening and scoping	• Section 7 (II and III) of Environmental Impact Assessment (EIA) Notification, 2006	Apply E&S screening tool to determine the presence of the following in the project influence area (PIA): i. Impacts on water quality (surface or underground) and water resource availability and use ii. Impacts on air, noise, and soil iii. Storage of waste/hazardous waste iv. Energy conservation measures. Stakeholder consultations: Map the stakeholders, develop the tools for consultations, and inform the stakeholders of the project scope (as per SOP 6).	Empanelled Accredited EIA Consultant[ii]
Detailed project report (DPR) – Environment and social impact assessment (ESIA)				
02	Baseline data	• Section 7 (II) of EIA Notification, 2006	Refer to SOP 1 – Assessment and Management of Environmental and Social Risks and Impacts for baseline data collection methods, baseline environmental parameters, and respective indicators.	Empanelled Accredited EIA Consultant
03	Environmental clearance (EC)	• Section 7 (II) of EIA Notification, 2006	i. **Application:** Submit Form 1 and supplementary Form 1A, along with the requisite documents (prefeasibility project report or conceptual plan).	Empanelled Accredited EIA Consultant

<table>
<tr><th>Sr. No.</th><th>Activity</th><th>Relevant laws and sections</th><th>Procedure</th><th>Responsibility</th></tr>
<tr><td></td><td></td><td></td><td>ii. Categorization: The EIA Notification, 2006 groups projects into two main categories:
<table>
<tr><th>Category</th><th>Report type</th><th>Clearance</th><th>Authority</th></tr>
<tr><td>A</td><td>Detailed EIA report and public consultation</td><td>EC</td><td>Ministry of Environment, Forest and Climate Change (MoEFCC)</td></tr>
<tr><td>B1</td><td>Detailed EIA report and public consultation</td><td>EC</td><td>State Environment Impact Assessment Authority (SEIAA)</td></tr>
<tr><td>B2</td><td>Prefeasibility report</td><td>EC</td><td>SEIAA</td></tr>
</table>
iii. Screening (done only for category B projects): The expert appraisal committee (EAC) screens if the project requires EIA or not. If yes, then it is categorized B1, and if not, then B2.
iv. Scoping: The EAC or state-level EAC (SEAC) sets the terms of reference (ToR) for the EIA based on Form 1 and Form 1A and applicant's proposed ToR. The ToR is sent to the project proponent within 60 days of receiving Form 1.
v. Public consultation: Conduct public consultations for category A and category B1 projects, except as noted in the EIA Notification, 2006. (For building projects, area and township projects, public consultations are not applicable)
vi. Final EIA report: Submit the final EIA report and required documents to the regulatory authority.
vii. Appraisal: The EAC or SEAC reviews the application and public feedback and decides on the appraisal within 60 days of the final EIA submission.</td><td></td></tr>
</table>

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
			viii. **Granting of EC:** The regulatory authority decides on the EC within 45 days of receiving recommendations, based on the expert committee's input and public feedback. ix. **Compliance and monitoring:** After EC is granted, the proponent must follow EC conditions, and the project is regularly monitored for environmental compliance. x. **Post project monitoring and compliance:** After the project starts, post project monitoring is conducted to assesses environmental impacts and the effectiveness of mitigation measures. The EC flow chart for category B1 projects is provided in Annexure XXXI.	
04	Environmental impact assessment (EIA)	• Section 7 (II) of EIA Notification, 2006	i. Conduct an EIA by taking into account the potential impact of the project activities on ambient conditions (such as ambient air quality). See SOP 1 – Assessment and Management of Environmental and Social Risks and Impacts. ii. Consider climate adaptation measures during the design phase, focusing on enhancing resilience to climate-related stressors such as increased rainfall, temperature extremes, and rising water levels, wherever feasible.	Empanelled Accredited EIA Consultant
05	Environmental and social management plan (ESMP)	• Section 7 (II) of EIA Notification, 2006	i. Prepare an ESMP by following the steps outlined in SOP 1 – Assessment and Management of Environmental and Social Risks and Impacts by considering ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention measures in accordance with the mitigation hierarchy, wherever possible. ii. Indicative mitigation measures for efficient usage of resources and pollution measures are provided in Annexure-XXXII. **Note:** The indicative mitigation measures provided in Annexure-XXXII are project and location specific.	Empanelled Accredited EIA Consultant

<table>
<tr><th>Sr. No.</th><th>Activity</th><th>Relevant laws and sections</th><th>Procedure</th><th>Responsibility</th></tr>
<tr><td>06</td><td>Budget</td><td></td><td>i. Estimate the budget for this SOP as per Annexure-XXXIII and integrate in the consolidated budget provided in SOP 1.</td><td>Empanelled Accredited EIA Consultant</td></tr>
<tr><td colspan="5">Procurement</td></tr>
<tr><td>07</td><td>Bid document and evaluation</td><td></td><td>ii. Include provision on mitigation and monitoring measures under conditions of contract in bid documents and attach ESMP.</td><td>APCRDA /ESMU</td></tr>
<tr><td colspan="5">Implementation</td></tr>
<tr><td>08</td><td>Consent authorization management from APPCB</td><td>• Water (Prevention & Control of Pollution) Act, 1974
• Air (Prevention & Control of Pollution) Act, 1981
• Conditions of EC & NGT orders</td><td>To establish an industry with potential for water or air pollution,[9]; prior consent under the Water Act and Air Act is to be obtained, respectively, which needs to be obtained in two phases:
<table><tr><td>Consent to establish (CTE)</td><td>To be obtained prior to establishing any industry, process, or plant</td></tr><tr><td>Consent to operate (CTO) [initial and renewal]:</td><td>Once the process plant is established along the required pollution control systems, obtain consent to operate for the unit</td></tr></table>Note: The consent is given for a particular period, which is mandatory to be renewed regularly.</td><td>Empanelled Accredited EIA Consultant</td></tr>
<tr><td>09</td><td>Implementation of ESMP</td><td>• Sections 2 and 10 of EIA Notification, 2006</td><td>Refer to SOP 1 – Assessment and Management of Environmental and Social Risks and Impacts.
Based on the project, the C- ESMP shall include provisions for</td><td>Contractor</td></tr>
</table>

[9] *Classification of industries/units from Pollution Control Board, Andhra Pradesh Pollution control Board is available on: https://pcb.ap.gov.in/APPCBDOCS/Tenders_Noti//Cir-21-03-latest-categories-of-industries.pdf*

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
		• Water (Prevention & Control of Pollution) Act, 1974 • Air (Prevention & Control of Pollution) Act, 1981 Conditions of EC & NGT orders • SWM rules 2016 • Battery waste management rules 2022 • Plastic waste management rules • C & D waste management rules 2016 • Hazardous waste management rules • Biomedical waste management rules • Central Ground Water Authority	A. Onsite Waste water treatment 1. Waste water treatment systems for black water, sullage from kitchen, grey water, waste water from RMC plant and appropriate site level arrangements for the construction runoffs, waste water from tyre wash 2. Reuse of treated Waste water 3. Scientific disposal of Sludge (As directed by authority) 4. Necessary statutory permissions to be obtained. 5. Facilities shall be planned with all measures for prevention of surface and ground water pollution, odour, vector control 6. Safety provisions, trained personnel to be deployed B. Onsite Waste processing, storage and handing over recyclables, hazardous wastes, inerts to authorised facilities 1. Appropriate provisions and procedures for collection, segregation, storage 2. Processing of organic waste and reuse of compost 3. Tie up with authorised facilities to handover the bio medical waste, e wastes, battery wastes, plastics, other recyclables, hazardous wastes and inerts. 4. Necessary statutory permissions to be obtained. 5. Necessary provisions for storing the Biomedical waste shall be included and disposed to nearest biomedical waste treatment plant	

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
		(CGWA) NOC if Ground Water Extracted • Environmental Clearance as per EIA Notification 2006 for Mining of Minerals • Indian Roads Congress (IRC) guidelines for borrow pits	6. Provisions for handling Hazardous waste shall be included in compliance with the hazardous waste management rules and shall be handed over to the authorised facility. 7. Provisions for handling Batteries and e wastes in compliance to the relevant rules shall be included and disposed other authorised facilities 8. Facilities shall be planned with all measures for prevention of surface and ground water pollution, air pollution, odour control, vector control 9. Safety provisions, trained personnel to be deployed C.C & D wastes 1. The C & D waste shall be stored in segregated manner in the site. 2. The C & D waste shall be handled and disposed as per the C & D waste management rules and CPCB guidelines. 3. Measures for control of air and Noise pollution D. Top Soil 1. The top soil upto 30 cm shall be conserved. 2. Prior to commencement of works, topsoil shall be removed and stored separately. 3. The stored top soil either shall be refilled in the same site or shall be used for horticulture purposes. MoUs shall be entered with existing waste management facilities such as C&D waste recycling plant, and hazardous waste management facilities in Vijayawada, Guntur, and nearby cities. Compliance shall be submitted to the authority on the MoUs entered, waste handed over to the authorised	

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
			facilities and records under the relevant rules shall be maintained and reported.	
10	Monitoring	• Section 10 of EIA Notification, 2006	i. Carry out monitoring for E&S parameters as per the ESMP. ii. The frequency of monitoring for air, water, noise and soil pollution and waste depends on factors such as project size, duration, complexity, environmental sensitivity, regulatory requirements (as per CTO and EC conditions), and project-specific risks. iii. Refer to Annexure-XXXIV for an indicative monitoring plan specifying the attributes to be monitored based on specific parameters, applicable standards, and duration of monitoring to be undertaken during the construction and operation stages of a project. **Note:** Critical locations including construction camp site and any other plant site to be selected for monitoring of E&S parameters during construction stage as per project requirement. Refer to SOP 1 – Assessment and Management of Environmental and Social Risks and Impacts.	Contractor
11	Reporting	• Section 10 of EIA Notification, 2006	Submit periodical environment and social parameters monitoring reports. Indicative reporting formats provided in Annexure-XXXV. Refer to SOP 1 – Assessment and Management of Environmental and Social Risks and Impacts.	Contractor
12	Training		Conduct capacity-building initiatives with the assistance of other specialist institutions and consultants to deliver trainings to the project stakeholders, including their staff, consultants, and the contractors. The trainings will be conducted at the state and divisional levels, depending on training requirements. Refer to the training plan.	APCRDA, ESMU, or consultant

4 Community Health and Safety (SoP): 4

4.1 Introduction

Community health and safety hold paramount significance. It entails adopting proactive measures to identify and mitigate potential health and safety risks associated with project activities, guaranteeing that communities remain protected from any negative effects due to construction activities.

4.2 Objectives of SOP 4

The objectives of the SOP are to:

- Avoid or minimize community exposure to project-related traffic and road safety risks, diseases, and hazardous substances and SEA/SH risks
- Manage and respond to project-related emergency events.

4.3 Application of the SOP

This SOP covers the aspects related to community health and safety, including addressing risks related to labor influx, unsafe migration, and gender-based violence (GBV).

4.4 Requirements for SOP 4

The procedures for assessing risks and impacts on community health and safety and the implementation of incorporated mitigation measures are outlined in Table 4-1

Table 4-1: Key Requirements for Community Health and Safety

Sl no.	Activity	Relevant laws and sections	Procedures	Responsibility
Feasibility study				
01	Screening and scoping		i. Apply environmental and social (E&S) screening checklist as per SOP 1 to determine: • Prevalence of communicable and waterborne diseases • Migration pattern • Identifying hotspots for GBV • Prevalence of social conflict • GBV service providers in the area (see Annexure-XXXXVIII) • Traffic trends and accident hotspots. ***Note: SEA/SH risk assessment should be carried out at different phases of the project life cycle.*** ii. Estimate budget for mitigation measures for community health and safety.	APCRDA/ADCL, PgMC, PMC
Detailed project report (DPR)				
02	Community health and safety impact assessment		i. Collect and analyze baseline data from the project influence area (PIA) to determine the following direct and indirect impacts: • Incidence of communicable and water \borne diseases • Traffic related data: traffic count, speed, vehicle types, peak hour analysis, accidents, and so on • Existing pollution levels • Access to social infrastructure • Presence of hazardous materials and waste • Migration pattern • Crime rates incidents and type of GBV incidents. • Profile of host communities: employment, education, skills, and so on • Existing social conflicts.	APCRDA/ADCL, PgMC, PMC

03	Mitigation measures incorporated in the environmental and social management plan (ESMP) and labor management procedure (LMP)		i. Identify risks and incorporate the following corresponding mitigation measures or plans into the ESMP: • Traffic management and road safety • Emergency response management (see Annexure-XXXVI) • Hazardous waste and materials management • Community infrastructure • Labor influx management (see Annexure-XXXVII) • SEA/SH measures (see SOP-7)	APCRDA/ADCL, PgMC, PMC
Procurement				
04	Bid document and evaluation	• Standard Bidding Document, Evaluation and Qualification Criteria.	i. Bid documents to include a section on E&S requirements under the conditions of contract. Clauses relevant to community health and safety are: • Traffic management, emergency response, and hazardous waste and material management within the ESMP • Prohibition and prevention of SEA/SH • Preparation of a contractor's ESMP (C-ESMP) before commencement of work • Budget line items specific to ESMP implementation in the bill of quantities (BOQ) • Penalty clause for breach of contract • Annexures: ESMP and code of conduct • Evaluate the E&S capabilities related to personnel, past performance, and experience of the bidder during the bid evaluation process.	Environmental and Social Management Unit (ESMU)
Implementation				
05	Implementation	• Standard Bidding Document, C-ESMP. • The Sexual Harassment of Women at Workplace (Prevention, Prohibition	i. Once the contract is awarded, prepare and implement C-ESMP, which incorporates the following plans: • Traffic management and road safety – Emergency response management • Hazardous waste and materials management • Hazard identification and risks assessment (See Annexure-XXXVIII)	Contractors

		and Redressal) Act, 2013 (POSH) ● Sec 38 to 41, Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 (BOCW) ● BOCW Act 1996 and Rule 34 to 54 of BOCW Central Rule 1998	• Labor influx management (See Annexure-XXXIX). ii. Undertake IEC activities to create awareness on road safety, traffic management, SEA/SH, grievance redressal, work schedule, labor camps, and mitigation plans. iii. Establish stakeholder platforms representation from local governing bodies, nongovernmental organizations (NGOs) or civil society organizations (CSOs), utilities, and divisional offices and organize fortnightly meetings. iv. Implement SEA/SH prevention and response mitigation measures as per project-specific ESMP and/or SEA/SH action plan (see SOP-7 on GBV-GRM). v. Display notifications and notices (with focus on SEA/SH, community health and safety, communicable and noncommunicable diseases, grievance redressal, hazardous waste management, and so on) at camp, construction sites, and among project-affected communities vi. Maintain records for the following: • Number of SEA/SH complaints received, number of complaints disposed of, and number of cases pending for more than 90 days • Trainings and IEC activities conducted on SEA/SH, community health and safety, communicable and noncommunicable diseases, and emergency response plan at camp, construction sites, and project-affected communities (including information on date, name, and designation of resource person, number of personnel sensitized, and photos of the trainings) • Accidents and fatalities • Grievances. vii. Conduct regular meetings, workshops, and training sessions to build capacity and foster collaboration	

06	Monitoring and reporting	• Standard Bidding Document	i. The required monitoring procedures to be followed by the APCRDA will be carried in accordance with SOP 1 – Assessment and Management of Environment and Social Risks Impact. ii. Monitor compliance with C-ESMP requirements and note any deviations or concerns in the monthly and quarterly progress report. iii. Periodic on-site monitoring of construction activities and PIA to identify potential hazards related to traffic and road safety, GBV hotspots, social conflict, communicable disease, community exposure to health issues, construction induced grievances, and accidents and fatalities. iv. Review C-ESMP to verify that appropriate mitigation measures actions are included. v. Prepare monthly and quarterly reports and submit them to concerned officials for review. vi. Estimate budget for mitigation measures for community health and safety (See Annexure-XXXX)	ESMU

5 Biodiversity Conservation (SoP): 5

5.1 Introduction

In keeping with the will of the Government to build **'people's capital'**, land procurement mechanism has been designed to be voluntary and based on consensual process of land pooling. Land pooling mechanism is mainly adopted for development of the capital city area wherein the land parcels owned by individuals or group of owners are legally consolidated by transfer of ownership rights to the Authority, which later transfers the ownership of a part of the land back to the land owners for undertaking of development for such areas. Lands under use for agriculture have been pooled which are having no such prominent biodiversity areas or rich in biodiversity. There are no forests in the program area/ World bank funded area. All the lands pooled were earlier with agriculture ecosystem. The only forest i.e., Tadepalli RF existing in the capital city is being preserved as green lungs of the capital city without any non-forestry activity as per the conditions of the Honourable NGT. A study will be conducted with the biodiversity expert for listing the species and their conservation measures.

SOP 5 outlines procedures for identifying impacts on the identified biodiversity , and if unavoidable, minimizing and mitigating through this SoP.

This SOP sets out the procedures and responsibilities for maintenance and enhancement of existing biodiversity during the planning, construction, and operational phases of the New Capital City Development Project. It aligns with applicable national legislation and international good practices to avoid, minimize, and mitigate adverse impacts on biodiversity.

The assessment of biodiversity in the city shall form basis for taking measures for the maintenance of existing biodiversity. The local climate, native species, the targets of the master plan shall be the basis for enhancement of biodiversity.

Greenery connectivity shall be maintained or enhanced through avenue plantation, buffer zones, water bodies and green spaces.

Construction activities shall be managed for the protection of the existing trees, soil stabilization, erosion control, and restriction of night-time work to reduce disturbances to nocturnal fauna. Invasive species introduction shall be strictly prevented.

The project shall promote sustainable use of natural resources. Use of native plant species shall be prioritized to enhance local biodiversity and ecosystem resilience.

All contractors and subcontractors shall comply with relevant rules and acts of biodiversity conservation. This SOP shall be reviewed and updated to reflect the latest ecological data collected by the biodiversity expert and the changes suggested.

5.2 Objectives of SOP 5

The key objectives are to establish existing biodiversity using approved procedures and to protect them during implementation of projects that could have an impact on biodiversity.

5.3 Application of the SOP

The scope of SOP 5 covers all projects and activities, regardless of scale, that have potential impacts on biodiversity and ecosystem services.

5.4 Requirements for SOP 5

This SOP, read with SOP 1, details the procedures to systematically determine the project's area of influence (PIA), identify risks to biodiversity and ecosystem services, for maintenance and enhancement of biodiversity. See Table 5-1

Table 5-1: Key Requirements for Biodiversity Conservation

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
Feasibility study – Biodiversity screening and scoping				
01	Screening and scoping – (Biodiversity assessment)	• Section 7 (II and III) of Environmental Impact Assessment (EIA) Notification, 2006 and its subsequent amendments • Indian Forest Act, 1927 (IFA) • Forest (Conservation) Act, 1980 • Wildlife (Protection) Act, 1972 (WPA) • Conditions of EC & NGT order	i. Identify the presence of different species and categories of species under different Schedules of Wildlife Protection Act, 1972 and IUCN. a) Habitats essential for ecological functions or characteristics crucial to maintain the biodiversity b) Engage an independent Biodiversity Expert c) The existing forest in the city shall be preserved as per the NGT order.	APCRDA or consultant/ Biodiversity expert appointed by APCRDA
Detailed project report (DPR) – Biodiversity assessment				

<table>
<tr><th>Sr. No.</th><th>Activity</th><th>Relevant laws and sections</th><th>Procedure</th><th>Responsibility</th></tr>
<tr><td>02</td><td>Baseline data collection</td><td>• EIA Notification, 2006; WPA, 1972 and the Forestry Conservation Act, 1980
• Conditions of EC pertaining to Biodiversity conservation / ecology restoration</td><td>Stepwise approach for baseline biodiversity data collection
i. Sampling design (study direct and indirect impact areas of the project)
a) Data are to be collected using stratified random sampling across various ecosystems (for example, forest, grassland, and aquatic).
b) The biodiversity experts, local stakeholders such as the biodiversity management committee, conservation nongovernmental organizations (NGOs), research institutes and universities are to be consulted during the sampling design.
ii. Methods
Data collection, analysis, indicators, and potential impacts
<table><tr><th>Survey</th><th>Methods for data collection and analysis</th><th>Indicators</th><th>Potential impacts</th></tr><tr><td>Habitat type (vegetation survey)</td><td>i. Vegetation survey using belt transect and nested quadrat sampling (10 × 10m size)
ii. Collect abundance data on tree (girth at 1.37m from the base and tree height),</td><td>i. Map habitat and forest types
ii. Species richness index, diversity index, and community structure composition
iii. List of flora and status of critical species
v. List of nonnative invasive plant species</td><td>• change in plant community structure
• Loss of native flora and primary forest
•</td></tr></table></td><td>EIA Consultant / Biodiversity expert engaged by APCRDA</td></tr>
</table>

Sr. No.	Activity	Relevant laws and sections	Procedure				Responsibility
				shrub, and herb species for community structure assessment ii. Identify habitat (natural or modified) and forest types based on plant community structure and composition			
			Fauna survey[10]	i. Conduct inventory study for mammals, avifauna, butterflies, reptiles, and amphibians	i. Species richness, encounter rate, and density estimates ii. List of faunal diversity ii. List of critical species, sizes, and location of habitats	• Habitat loss •	
				i. Identify migratory, endemic, or restricted	i. Presence of endangered migratory (Convention on	• Threat to habitat and population	

[10] *Sutherland, William J., ed. 2006. Ecological Census Techniques: A Handbook. Cambridge: Cambridge University Press.*

<table>
<tr><th>Sr. No.</th><th>Activity</th><th>Relevant laws and sections</th><th>Procedure</th><th>Responsibility</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>habitat species based on the survey data</td><td>Migratory Species, United Nations Environment Programme) and endemic species</td><td></td></tr>
</table>

(Note: The methods, data analysis, indicators, and potential impacts listed may vary depending on the specific scale, design, and implementation of each construction project. This table provides a general overview and should be adapted based on site-specific details and local conditions.)</td><td></td></tr>
<tr><td>8.</td><td>Biodiversity maintenance and enhancement</td><td>• As per Conditions of EC for biodiversity conservation
• MDBs guidelines on biodiversity conservation & management
• Guidelines of MoEFCC & State Environment dept for biodiversity conservation
•</td><td>• Suggestions if any, for biodiversity conservation, habitat protection and species specific protection from the Biodiversity expert will be implemented
• The indicative mitigation measures to minimize adverse impacts on biodiversity within the direct and indirect impact areas are detailed in Annexure-XXXXI
• The measures shall be site-specific and may be adjusted based on the scale and nature of the project. It is to be updated as necessary to reflect the unique conditions of the project area.
• The measures may include – measures for prevention of pollution in water bodies
Using nature based solutions and designs specific to site. Improve tree cover along the boundary with Native species, aquatic species to be planted.
• The Plan shall include enhancement of the tree cover in the existing settlements – open spaces, public and semipublic spaces, master plan green spaces in the neighborhood areas using native species with community concept.
• Improvement of tree cover on the existing hills and hillocks</td><td>APCRDA – ESMU</td></tr>
</table>

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
			• Protection of existing trees, priority for translocation, replacement tree plantation in a ratio of 1:10 for every tree felled. • Prior permissions from competent authority	
9.	Monitoring and Reporting	• As per conditions of EC • MDB reporting requirement • As per guidelines of MoEFCC/State Forest department	**i.** Sampling framework for biodiversity monitoring, methodologies, and indicators for assessment of impact of project activities (see Annexure-XXXXI)	APCRDA, ESMU
10.	Budget	• As per guidelines of state forest department / MoEFCC • Conditions of EC	The budget for the measures to be implemented by the contractor will be met from the ESMP funds allocated in the BoQ. Budget for other measures like awareness, survey enumeration etc to be taken up by the ESMU will be as per the actuals.	EIA consultant / Biodiversity expert

6 Stakeholder Engagement, Grievance Redress Management, Communication and Information Disclosure. (SoP): 6

6.1 Introduction

Grievance Redressal Mechanism is most effective when established early and maintained throughout the project cycle. It should be integrated into the identification, assessment, and management of E&S risks and impacts. A robust mechanism ensures concerns are addressed transparently, fostering trust and accountability. SOP 6 outlines the process for grievance management and must be read alongside other SOPs for coherence.

6.2 Objective of SOP 6

- To outline the comprehensive Grievance Redressal Mechanism (GRM) inclusion of Gender Based Violence (GBV) and labour for all construction works within capital city Amaravati.
- This section details the procedural steps, channels for grievance submission, escalation mechanisms, monitoring and reporting frameworks, and the tier-based institutional arrangements to ensure timely, transparent, and survivor-centered redressal of complaints across all project stages.

6.3 Application of the SOP

This Standard Operating Procedure (SoP) is to be applied across all stages of the project lifecycle to ensure an accessible, transparent, and accountable grievance redressal process. It outlines clear channels for grievance submission, defined timelines for resolution, and structured escalation mechanisms. The SoP covers all types of grievances, including general project-related issues, construction labour concerns, and those related to Sexual Exploitation and Abuse (SEA), Sexual Harassment (SH), and Gender-Based Violence (GBV). It integrates both digital and physical platforms—such as helplines, web portals, and in-person submission points—and specifies the roles and responsibilities of key stakeholders including APCRDA, ADCL, PgMC, PMC, and gender committees. The procedure emphasizes a survivor-centered approach for handling SEA/SH/GBV complaints, ensures confidentiality, and mandates compliance with legal frameworks like the POSH Act, enabling timely, sensitive, and effective grievance resolution.

Table 6-1: SOP for GRM

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
01	Existing mechanism for handling grievances under APCRDA (Annexure-XXXXIII)		Grievances can be submitted through any of the following channels: ■ E-mail (Amaravati.bonds@apcrda.org), post, and in-person to Head office and Unit office officials ■ Complaint/Suggestion boxes at unit offices and at project sites ■ Toll free helpline number (1902) ■ Web portal (https://parishkaram.el91.com/grievances/) - Escalation level in Annexure-XXXXIV. Two separate dropdown options will be provided for construction labour grievances- Escalation level in Annexures-XXXXV and GBV grievances. ■ State level grievance redressal committee. (https://meekosam.ap.gov.in/) **Procedural steps of GRM** **1: Receive, register, and acknowledge the grievances** Upon receipt of complaints at Unit office and Head office, the office staff will log the complaint in the online grievance register (Parishkaram portal) integrated with helpline and online portal within 24 hours. A unique identification number will be sent to the complainant through a text message in local language as and when complaint is registered. Helpline operators may contact the complainant during this step, for further clarification.	

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
			If the complaint is received through the portal or the helpline number, the operator will log the complaint and acknowledge its receipt immediately. Complaints registered at workplace: On receipt of the complaints at workplace, the project personnel shall enter the complaints in the grievance register and ICT tool of APCRDA. **2: Develop resolutions and respond to complainant** The complaint will then be transferred to the project personnel for investigation and resolution. The progress on petition will be updated automatically through SMS to the complainant. The grievance will be if the complainant is satisfied with the resolution. To the extent possible, investigation must be completed within 15 working days of the grievance first being logged. **3: Escalation of grievances, if complainant is dissatisfied** If the complainant rejects the proposed resolution, the complaint will be escalated to the higher-level grievance redressal committee within 15 days of its decision, to re-open and review. On every Saturday (working day), the commissioner, APCRDA reviews all the grievances with direct interaction with the complainants & the concerned CA/subject Heads regarding the satisfaction of the complaint. All the complainants proposed for review meeting will be intimated through IVRS calls and also direct phone call from a team of GRM wing on previous day of review. After review of each grievance, by the commissioner APCRDA, the grievance is disposed accordingly.	

Sr. No.	Activity	Relevant laws and sections	Procedure	Responsibility
			4: Recourse to legal and other formal recourse The complainant is free to approach the court of law. Additionally, affected persons can file complaints regarding the Land Acquisition, Rehabilitation and Resettlement (LARR) Authority for land acquisition cases, NSP, LPS and other grievances to the commissioner APCRDA.	
2.	Addressing grievances related to sexual exploitation and abuse or sexual harassment (SEA/SH)		Refer to SoP 7 on GBV-GRM.	
3.	Addressing Labour-related Grievances		Refer to Annexure IX	.

6.4 Stakeholder Engagement Plan

Stakeholder engagement is an important activity for the smooth and tension free implementation of the project. The Stakeholder Engagement Program will primarily focus on the following.

- To inform the local community about project plans, schedule associated activities and potential employment opportunities.
- To explore the community expectation towards project duration and social safeguard measures ensured during the execution period.
- To explore the prevalence of most common communicable diseases in the locality.
- To conduct health education program and support the local program to control the spread of communicable diseases.
- To inform the local community about the GRM systems available.

6.5 Proposed action plan

Objectives	Activities	Time Plan	Target Plan	Means of verification
Inform the local community about project plans, schedule associated activities and potential employment opportunities & explore the community expectation towards project duration and social safeguard measures ensured during the execution period.	Workshop & FGDs	First quarter	4 programs in 1 year	Reports & Photographs of workshop and FGDs
To explore the prevalence of most common communicable diseases in the locality	Conduct a rapid community health survey	First quarter	One health survey/Secondary sources	Survey reports
Health education programs and	Health education programs on	Once in a quarter	Total 12 programs in 3 years	Reports and photographs

support the local programs to control the spread of communicable diseases.	communicable diseases and preventive measures.			
Inform the local community about the GRM system available at project level as well as APCRDA and GoAP.	Brochures and information boards on GRM system	During the first quarter.	Brochures (as per requirement) and information boards at prominent locations	Sample copy of brochure and photos of information boards installed.
Community Health & Safety plan	Details will be provided			
Demobilization Plan	Details will be provided			

Communications

The Communications Wing of APCRDA is actively involved in various tasks to ensure effective public relations, media engagement, and information dissemination. Below are the key ongoing activities

Ongoing activities	Description
Newspaper Advertising	Publishing advertisements related to APCRDA through agencies
Social Media Management	Managing and updating social media platforms to highlight government welfare activities & ongoing construction activities from the perspective of APCRDA.
Press Note Writing	Drafting and issuing official press releases regarding APCRDA's initiatives, projects, and policy updates.

Giving Rejoinders	Addressing misinformation and ensuring accurate representation of APCRDA's work through timely rejoinders.
Crisis Management	Handling media crises and ensuring that APCRDA's reputation is maintained through proper communication strategies.
Website Content Updating	Regularly updating content on APCRDA's official website to reflect ongoing projects, achievements, and government policies.
Speeches and Departmental Writings	Drafting speeches for officials and preparing various departmental reports and documents.

Next steps

Action points	Description
Engaging an External Agency	A proposal is underway to outsource all social media management and content creation activities to a professional agency for better outreach and efficiency.
Launching a digital tool	Citizen Engagement Module to capture • All the community engagement events in Amaravathi • Forums that cover the discussion points and outcomes of those events • Option for citizens to feed their suggestions/ideas. • Latest message feeds of APCRDA Social Media Handles (Facebook, X, Instagram, YouTube)
Developing a Social Media Monitoring System	Implementing a tool to track media mentions, social media trends, and sentiment analysis related to APCRDA.
Creating a Monthly Newsletter	A regular newsletter will be designed to update stakeholders about APCRDA's initiatives, progress reports, and key highlights.

Standard Operating Procedure (SOP-7)

7 Gender Based Violence (GBV) Grievance Redress Mechanism (GRM)

About the project:

Following the bifurcation of Andhra Pradesh (AP) in 2014, Amaravati was designated as the new capital. To facilitate its development, the Amaravati Capital City (ACC) Project was launched in 2014. To support the implementation of Phase 1, the Government of Andhra Pradesh (GoAP) has sought financial assistance from the World Bank under its Program-for-Results (PforR) Financing model, as well as from the Asian Development Bank (ADB) through its Results-Based Lending (RBL) Policy. The Program Development Objective (PDO) is to facilitate the institutional, socioeconomic, and infrastructural development of Amaravati, with the broader goal of creating an economically vibrant, inclusive, and sustainable capital city.

This large-scale initiative encompasses the development of urban infrastructure and essential services, the integration of climate-resilient features, the creation of blue-green urban amenities, and the expansion of sustainable transport infrastructure and services. Additionally, the project strengthens governance frameworks to ensure long-term sustainable urbanization. A key focus of the ASCCDP is to foster sustainable economic growth, generate better employment opportunities, and enhance inclusive urban development. Furthermore, the initiative integrates gender-sensitive urban planning and incorporates safeguarding mechanisms to mitigate social risks, particularly those associated with Sexual Exploitation and Abuse (SEA), Sexual Harassment (SH), and Child Sexual Exploitation and Abuse (CSEA)

Structure of implementation

The Andhra Pradesh Capital Region Development Authority (APCRDA) serves as the regulatory and planning authority for the capital region, overseeing planning, coordination, execution, supervision, financing, and sustainable development efforts. APCRDA is also responsible for Environmental and Social (E&S) risk management, including the implementation of SEA/SH risk mitigation strategies. Since the project's inception, specialized Gender-Based Violence (GBV) experts and external consultants have been engaged to assess and address SEA/SH risks.

The Amaravati Development Corporation Limited (ADCL) is tasked with executing specific functions of the APCRDA, including overseeing major infrastructure works in Amaravati. The ADCL is responsible for design quality, procurement of contractors and consultants, and supervision of infrastructure execution.

The APCRDA will appoint a Program Management Consultant (PgMC) to strengthen overall Program implementation capacity. The PgMC scope will include Program management and monitoring, design quality and implementation oversight, and E&S management. The APCRDA and the ADCL will hire separate Project Management Consultants (PMCs) to supervise and

monitor compliance of infrastructure works to agreed standards and performance. The PgMC will plan activities at the Program level, facilitate coordination among all PMCs, establish a common digital monitoring and evaluation framework, and develop tools for reporting and decision-making by the APCRDA and the ADCL. Meanwhile, the PMCs will carry out similar activities at the contract supervision level.

APCRDA has appointed GBV specialists to conduct SEA/SH risk assessments and establish risk management protocols. As part of this, contractors are mandated to adhere to strict Codes of Conduct, implement robust safety systems, and enforce SEA/SH-specific management measures to safeguard vulnerable populations.

Purpose of the document:

The SEA/SH GRM SOP offers guidance on providing a fair and timely response to project-induced SEA/SH grievances and complaints raised by female project staff and community members affected by the project stakeholders including contractors/subcontractors, service providers, local authorities, security personnel, suppliers/delivery agents/vendors, and laborers mobilized under the project. The SOP outlines procedures for the uptake, incident reporting, accountability framework, response, referral mechanism, and monitoring and documentation pertaining toSEA/SH-related cases or complaints arising from activities implemented by the APCRDA and its contractors. While the use of this GRM is highly encouraged for seeking to redress for project-induced SEA/SH grievances and complaints, survivors may also utilize other existing mechanisms and facilities provided by the government, community, and civil society organizations.

1. SEA/SH Grievance Redressal Mechanism

To mitigate identified SEA/SH risks and to respond to incidents related to SEA/SH pertaining to the project, a dedicated grievance redressal mechanism is integrated into the overall project GRM mechanism. This mechanism will be known as SEA/SH Grievance Redressal Mechanism.

2. Structure of SEA/SH Grievance Redressal Mechanism

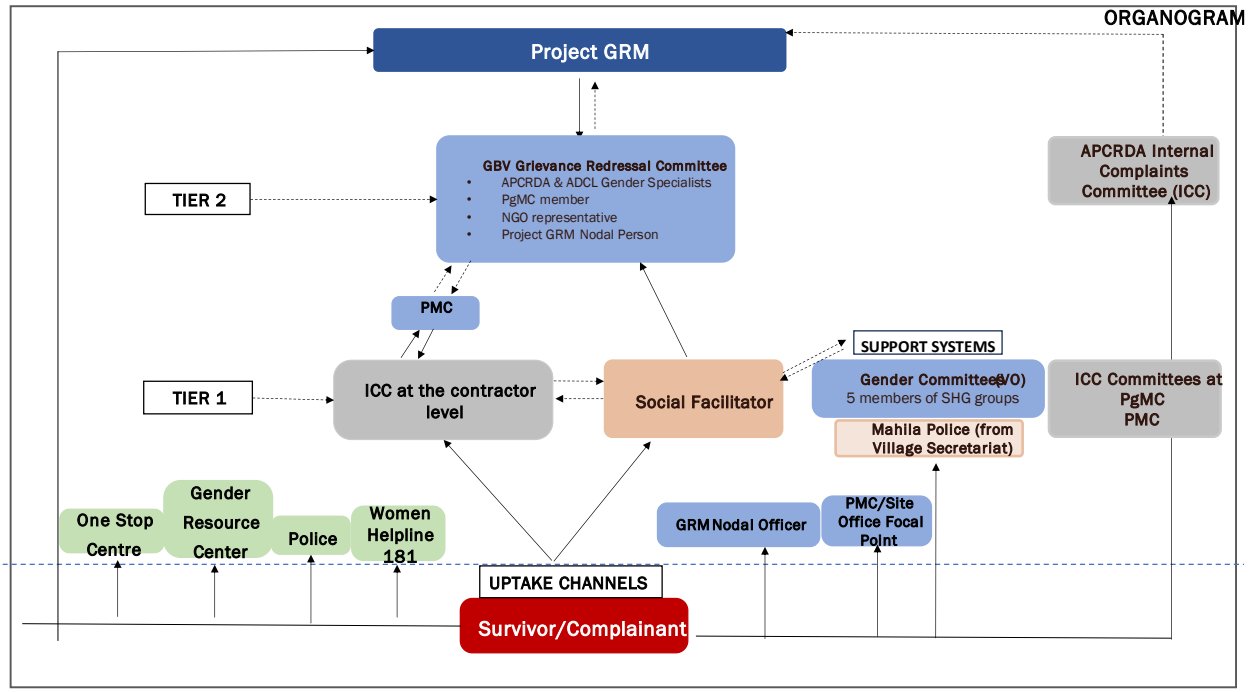


Figure 7-1: Structure of SEA/SH GRM mechanism

Tier-1	Tier-2
ICC at contractor level according to POSH Act, 2013	SEA/SH GRM Committee[1] at the APCRDA
Social Facilitator at APCRDA	*Chaired by:* Nominated
Supported by: • Gender Committees (5 members of SHG groups • Mahila (Female) Police (Village Secretariat)	*Members:* • APCRDA Gender Specialist • ADCL Gender Specialist • PgMC member • NGO representative • Project GRM nodal person

Definition of Structures	
Internal Complaints Committee	Mandated by Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013, every employer/establishment employing ten or more employees is required to constitute an Internal Complaints Committee (ICC) in order to provide a suitable redressal mechanism for cases concerning harassment at workplace
Gender Committee	Federation of Self Help Groups at the sub-village level formed under Society for Elimination Rural Poverty (SERP) / Mission for

	Elimination of Poverty in Municipal Areas (MEPMA) and it exists at village level.
Social Facilitator	APCRDA Staff at the Village level
Mahila Police (Village Secretariat)	Female Police at the village secretariat level whose role is to help facilitate the survivor
One Stop Centre	A centrally-sponsored initiative to address gender-based violence by providing integrated support to women affected by violence through a range of services under one roof, police facilitation, medical aid, psychosocial counselling, legal support, and temporary shelter (5 days)
Women Helpline (181)	Provides emergency/non- emergency services or information regarding schemes/services to women or to anyone calling on her behalf.

Internal Complaints Committees within the project

The Internal Complaints Committee (ICC) structure within the project is established at multiple administrative levels to ensure comprehensive coverage and accountability in addressing sexual harassment and gender-based violence (GBV). It includes instituting ICCs at APCRDA, ADCL, PgMC, PMC, and all contractors with more than 10 employees.

At the contractor level, the ICC is responsible for receiving and addressing GBV or sexual harassment complaints at the worksite. The committee will work in close coordination with the Social Facilitator of APCRDA, who will support survivor and facilitate communication. The responsibilities of this ICC include conducting prompt and unbiased inquiries, recommending appropriate disciplinary action, ensuring strict confidentiality, and submitting periodic reports summarizing the nature of complaints, their status, and actions taken.

At the APCRDA level, an ICC will be constituted to address all complaints related to sexual harassment at workplace. The project Grievance Redressal Committee (GRC) will oversee the overall implementation and functioning of ICC across all project entities. The project GRC monitors the performance of ICC at the contractor level, reviews unresolved or escalated cases, ensures compliance with the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013, and leads capacity-building efforts through training and awareness programs. This hierarchical structure enables a clear escalation mechanism and fosters consistency, transparency, and accountability in handling GBV-related grievances.

As per the Act, the ICC at each level shall consist of the following members, nominated by the employer:

1. Presiding Officer: A senior woman employee of the organization. If such a person is unavailable, the Presiding Officer may be nominated from another office or department of the same employer or, if necessary, from a relevant external organization.

2. Two or more internal members: Employees with a demonstrated commitment to women's welfare, or those with experience in social work or legal knowledge.

3. One external member: A representative from a non-governmental organization or an individual with expertise in issues related to sexual harassment. At least 50% of the committee members must be women.

This structured approach ensures robust protection for all personnel involved in the project and reinforces a zero-tolerance stance toward workplace harassment.

3. Procedure for timely and safely handling SEA/SH complaints

This section outlines the different steps and considerations to be followed from the uptake of the SEA/SH allegation case to its closure. All reports and allegations of SEA/SH shall be handled in line with the survivor-centric approach with respect, non-discrimination, safety and confidentiality while ensuring that the survivors receive immediate response services.

The following steps will be followed from the uptake of the SEA/SH allegation case to its closure:

1. **STEP 1:** Receive, register and acknowledge the grievance
2. **STEP 2:** Review and administrative verification of grievance
3. **STEP 3:** Respond to grievance
4. **STEP 4:** Case closure and follow up

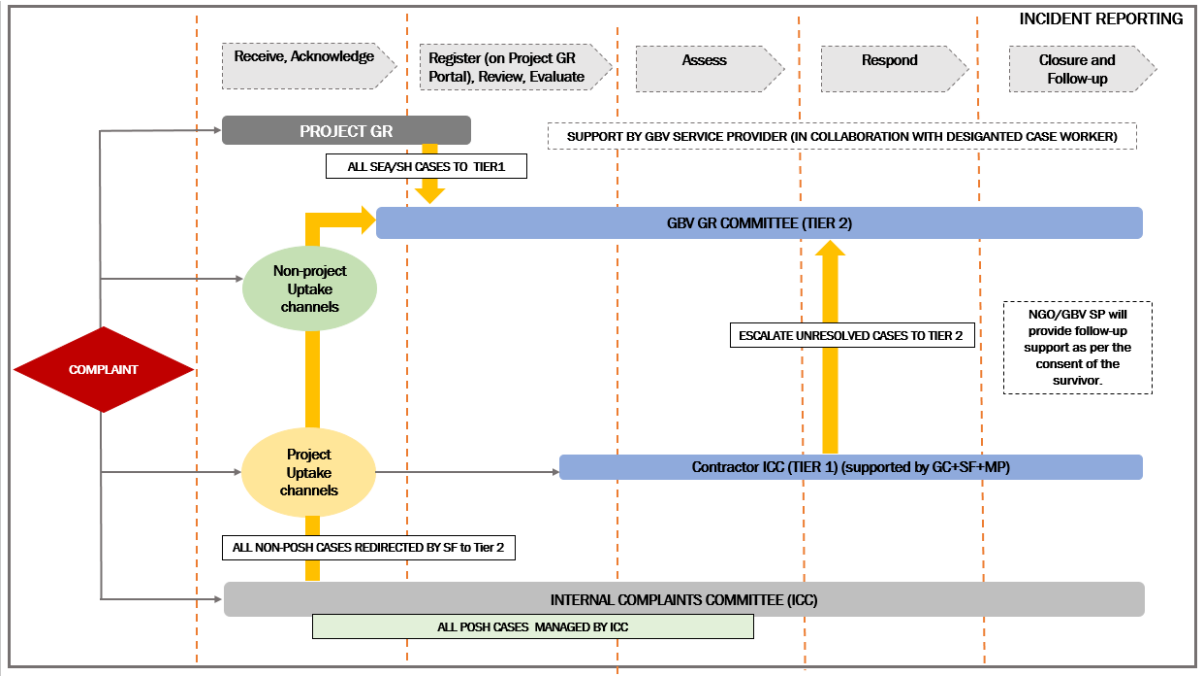


Figure 7-2: Incident Reporting Process

STEP 1: Receive, Register and acknowledge the grievance

1. Complaints will be received through the following uptake channels across all levels:

At Site level (Tier 1)

At the contractor level, the focal point towards handling gender issues will be receiving SEA/SH complaints (when a complaint comes directly to the Contractor). This focal point will see if the complaint will go to Social Facilitator or ICC (depending on whether a complaint is POSH or non-POSH). Additionally, this focal point will have the responsibility to conduct awareness programs in collaboration with NGO.

Social Facilitator will act as the GBV focal person at Tier 1, and will be informed of all SEA/SH complaints received at Tier 1, and she will inform further ensuring confidentiality. Social facilitator also will ensure that the contractor is being informed and engaged if the case is pertaining to his jurisdiction

Survivors can file their SEA/SH grievances at Tier 1 through letters, telephone, complaint box, or through trusted individuals (with their consent), if they choose to not visit in person or stay anonymous.

ACPRDA level (Tier 2)

As mandated under POSH Act, 2013, an Internal Complaint Committee (ICC) (henceforth referred to as APCRDA ICC) is established at the APCRDA to address grievances related to sexual harassment at workplace (POSH complaints).

For redressal of all other non-POSH complaints, a committee constituting of APCRDA Gender Specialist, ADCL Gender Specialist, and a representative each from PgMC, PMC,and Nodal Officer-Grievances from APCRDA will be established. This Committee will be known as *SEA/SH Grievance Redressal Committee* and will serve as the ***Tier 2 Committee*** at the APCRDA level. *(as shown in Fig: 2.1)*

APCRDA Gender Specialist will act as the overall GBV focal person and will be informed of all SEA/SH complaints received by uptake channels including Tier 1, Tier 2, and ICCs, while ensuring confidentiality. She will also be responsible for maintaining coordination with all levels pertaining to a complaint.

As there is a high likelihood that the survivor may not use the formal channel of GRM and may wish to see the GBV focal person they may choose to drop a complaint confidentially via letters, telephone, complaint boxes at Tier 2.

Other uptake channels:

Survivors may choose to register complaints directly with the Gender Focal Persons or ICC across all administrative levels including:

- Project Grievance Redressal Cell/Portal
- Contractor Gender Focal Point/ICC
- APCRDA Gender Specialist
- PMC Gender Focal Point/ICC
- PgMC Gender Focal Point/ICC

Additionally, the survivor may file their SEA/SH grievance at any of the existing service providers at their disposal. These may include (not be limited to):

GBV Service Provider	Jurisdiction
Women Helpline (181)	State level
Childline (1098)	State level
One Stop Centre	District level
District Legal Service Authority	District level
Domestic Violence (DV) Cell	District level
Gender Resource Committee	Block/Taluka level
Police Station/Women Help desk	Block/Sub-block level

Registering complaints on the grievance redressal digital application.

A Grievance Redressal digital application, *Parishkaram* has been developed for enabling citizens to register their grievances with the relevant departments of APCRDA. Each complaint is assigned a unique Grievance ID, allowing users to track the status of their submissions through the application.

The Social Facilitator will register the GBV/SEA/SH grievances received at Tier 1 at the site level on this portal and the APCRDA Gender Specialist will register the case in the portal if received at the APCRDA level. All POSH complaints received by ICCs will be registered by a designated member in the ICC.

The case will be registered on *Parishkaram* portal with the details given below.

Survivor Details
• Age • Gender • Contact • Location
Whether case is related to the project? (Yes/No)
Incident Details (if Yes)
• Name of accused • Employer name • Site location • Date and time of the incident • Description of the incident (in survivor's own words)
(If No, refer to GBV Service Providers with survivor's consent)

From the portal, the case will be informed to the GBV focal person at Tier 2 (APCRDA Gender Specialist) thereby keeping all concerned levels informed.

STEP 2: Review and administrative verification of grievance

1. The GBV focal persons will be responsible for reviewing all SEA/SH complaints received at their respective Tiers. Once a complaint is registered, it will be reviewed by the GBV focal persons at Tier 1/Tier 2, depending on where the complaint is registered. The review and resolution timeframes will be based on the following:

Type of Grievance	Severity	Time taken to attend/resolve the grievance	Administrative Verification Team
Eve Teasing	Low Risk	7 Days	Tier 1
Lewd Gesture	Low Risk	7 Days	Tier 1
Verbal Abuse	Medium Risk	4 Days	Tier 1
Physical Harassment	High Risk	2 Days	Tier 1/Tier 2
Sexual Abuse/Harassment	High Risk	2 Days	Tier 1/ Tier 2
Rape	High Risk	2 Days	Tier 1/Tier 2
Sexual Harassment at workplace[4] (as per POSH Act)	High Risk	2 Days	Concerned ICC
		The case will be escalated to Tier 2 when the grievance is not addressed/resolved within the stipulated time	

2. Once the link to the project has been established, the grievance will be acknowledged for further verification by the Tier/ICC the complaint was received. This step may involve visiting the project site.[11]

3. At the same time, the survivor will be referred to a relevant, pre-identified intermediary GBV service provider(s), with the survivor's written informed consent (and informed assent for children). The GBV service provider(s) will immediately provide appropriate support services– such as medical assistance, security, psychosocial counselling, and shelter – within their scope. They should also refer the survivor to other relevant organizations working on GBV (e.g. legal support) if needed and with consent of the survivor.

4. The Social Facilitator will act as the **designated case worker** and will accompany the survivor to the Service Providers and throughout the course of the verification. They will be trained on specific skills in managing of SEA/SH cases and facilitating referrals. The Social

[11] *If the complaint is found to be unrelated to the project, it will be referred to a GBV service provider with survivor's consent.*

Facilitator and the APCRDA Gender Specialist will have regular coordination and communication on the cases. The APCRDA Gender Specialist will also monitor and provide oversight on case management, resolution, and documentation.

1. If the survivor approaches ICC, then the procedure will take place as per *Figure 7-3: Flow of ICC mechanism*

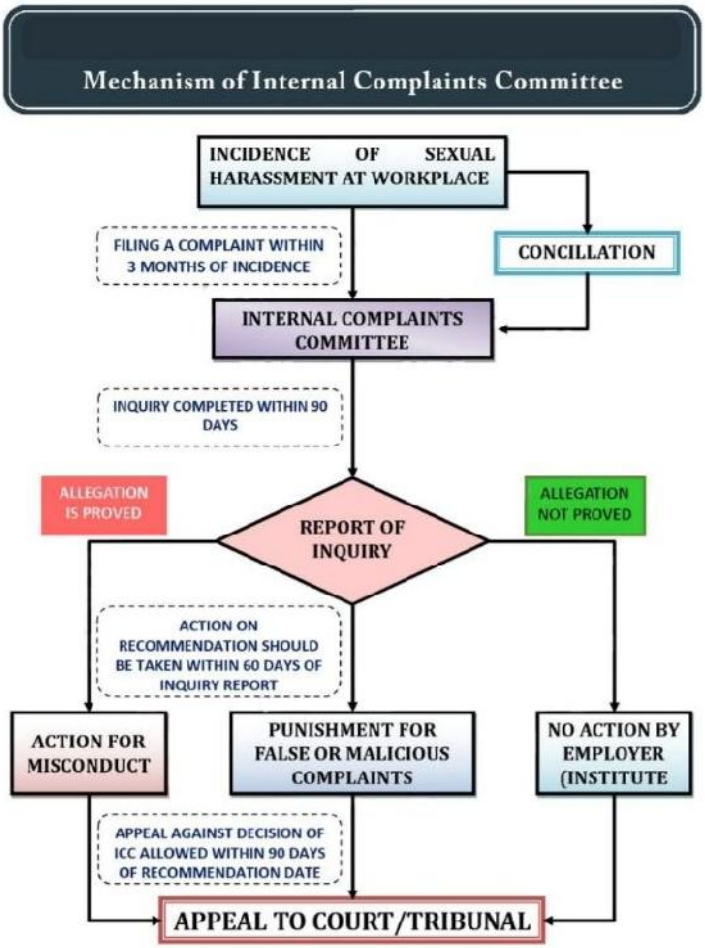


Figure 7-3: Flow of ICC mechanism

STEP 3: Respond to grievance

1. Depending on the findings of the enquiry, the perpetrator will be dealt with accordingly and actions can range from a warning to a suspension and termination, and handover to the relevant authorities (police, DLSA) in severe cases.

2. For low and medium risk cases, if the complaint remains unresolved at Tier 1 within the stipulated timeframe, it will escalate to Tier 2. For unresolved POSH complaints, cases may be referred to *SEA/SH Grievance Redressal Committee* while maintaining coordination with APCRDA Gender Specialist.

3. It is pertinent to keep the survivor informed about the steps taken in response to their complaint by the case worker (or Social Facilitator).

4. Precedence will be given to the survivor wherein they will be the first to be informed to assess their safety, before the verification's conclusions are communicated to the perpetrator.

STEP 4: Case closure and follow up

1. A case may be considered closed, if it fulfils one or more of the following conditions:
   i. Once appropriate actions have been taken against the perpetrator.
   ii. If the survivor approaches Social Facilitator and has been referred to the relevant GBV service providers, received adequate assistance, and no longer requires support.
   iii. If the survivor does not wish to submit an official complaint, the complaint is closed automatically. However, the survivor will still be provided with the option for referrals to registered GBV service provider.

2. Once the grievance is resolved, an update will go to the relevant Tier 1 and Tier 2.

3. The designated Social Facilitator will follow up with the survivor.

4.Roles and responsibilities

A. PROJECT STAKEHOLDERS

Stakeholder	Roles and responsibilities
SEA/SH GRM Committee/APCRDA	1. To ensure that the SEA/SH GRM is functional and accessible at the Program sites, and all relevant and accountable structures are following the steps, processes and protocols provided in the SOP. 2. To ensure monitoring and supervision roles are carried out by PgMC, PMC, Contractors and processes for reporting and documentation are followed. 3. SEA/SH incidents reported at Tier 1 or Tier 2 are notified to APCRDA senior management, who then inform the Bank (TTL) within 48 hours. 4. The APCRDA Gender Specialist at Tier 2 will be responsible for monitoring the response and referral measures and maintaining close communication and coordination with the Tier 1 Social Facilitator and ICC Committee at Contractor level and ICC Committee at the APCRDA level. 5. APCRDA will monitor and appraise SEA/SH action plan implementation against key SEA/SH GRM indicators developed with support from PgMC. 6. APCRDA will share the compiled quarterly/annual reports with the Bank.
Role of PgMC *Reporting to:* *APCRDA*	1. PgMC gender focal point will support APCRDA in overall monitoring and oversight. 2. The PgMC gender focal point will be part of GBV Grievance Redressal Committee. 3. It will provide project-level monitoring through its extended arm, PMC and ensure the functioning of GRM, SOP and action plan 4. PgMC will compile all reports monthly and share with APCRDA.

	5. The Supervising Engineer/director will be the ultimate accountable member for taking measures on breach of code of conduct related to SEA/SH by contractors/ laborers.
Role of PMC *Reporting to: PgMC*	1. The Supervising Engineer, or Gender Focal Person from PMC will monitor SEA/SH compliance by workers, contractors, supervision consultants and staff at the project level. 2. They will conduct site-level monitoring and supervision visits 3. PMC will monitor the status on the implementation of project's SEA/SH Action Plan at the site level: a. Successful implementation of SEA/SH Action Plan (Y/N) b. Number of training courses related to SEA/SH delivered c. Percentage of workers that have signed a CoC d. Percentage of workers that have attended CoC training 4. PgMC will monitor GRM implementation and report SEA/SH grievance data with four points; a. Project-related (Y/N) b. Nature of the case c. Age and/or sex (if available) d. Whether the survivor was referred to service provider
Role of APCRDA Internal Complaints Committee *Reporting to: APCRDA (on a monthly basis*	1. APCRDA will coordinate with APCRDA Gender Specialist to keep them abreast of all case related developments. 2. APCRDA ICC will monitor implementation and case management report with the following information: a. Number of POSH cases received/referred/received, disaggregated by age (if available) b. The number of cases open c. The number of cases closed
Roles of the APCRDA/ ADCL Gender Specialists *Reporting to: APCRDA*	The APCRDA Gender Specialist (with the support of ADCL Gender Specialist) at Tier 2 is responsible for coordinating, monitoring, and facilitating an effective, survivor-centered response to SEA/SH (Sexual Exploitation, Abuse, and Harassment) cases reported through the grievance redressal mechanism. Their key responsibilities include: **1. Case verification and referral coordination** - Upon confirmation of a SEA/SH case's link to the project: • Once the APRCDA Gender Specialist has been informed of a SEA/SH complaint at Tier 1, they will provide adequate support to the Social Facilitator for initial response, verification, and case referral, **2. Ensuring survivor consent and safe referrals** • Ensure that the survivor's written informed consent (and informed assent in the case of children) is obtained before making any referral. • Facilitate referral of the survivor to pre-identified, trusted GBV service providers, for appropriate services:

	• Coordinate with service providers to ensure timely and adequate response. • Ensure confidentiality and non-disclosure of survivor identities throughout the process **3. Monitoring and oversight** • Work in coordination with: o PgMC Gender Specialist o Project Management Consultant (PMC) • To monitor SEA/SH compliance at project, site, and worker levels involving contractors, staff, and consultants. **4. Case escalation and resolution support** • Oversee escalation of low and medium-risk cases from Tier 1 to Tier 2 when unresolved beyond the stipulated timeframes. • Support Tier1 in decision-making and resolution, ensuring survivor safety and dignity are prioritized. **5. Reporting and Documentation** • Compile and submit monthly monitoring reports that include: o Number of SEA/SH complaints received (disaggregated by age and gender) o Number of open cases and average duration of case handling o Number of cases closed and duration before closure o Number of survivors referred to GBV services (and those who declined referral) • Ensure reports exclude all personal or identifying survivor details, preserving privacy and security. **6. Capacity Building** • Ensure Social Facilitators and focal points are trained in trauma-informed, survivor-centered approaches • Build capacity in ethical reporting, referral, and documentation procedures
Role of the Social Facilitator	The Social Facilitator plays a key role in ensuring a timely, respectful, and rights-based response to complaints related to gender-based violence (GBV). Their responsibilities are as follows: **1. Immediate Support & Coordination** • Each facilitator will be assigned to one or more labour camp site. The Facilitators will be female and if the Facilitator is male, then he will be accompanied by a female person from the Gender Committee or a Mahila Police of respective village. • Provide support to Tier 1 Committee in addressing SEA/SH complaints. • Facilitate access to: o Immediate medical attention o Trauma-informed psychosocial support and counselling • Ensure the survivor's safety and well-being remain the top priority.

	2. Data Management and Confidentiality • Securely upload the survivor's details to the GBV-GRM (*Parishkaram)* Portal of APCRDA, ensuring the information is accurate and handled with strict confidentiality. • Comply with all data protection protocols and legal requirements. • Use non-stigmatizing, inclusive language in documentation and communication. ***3*. Case management** • Serve as the designated case worker for the survivor. • Accompany and support the survivor when engaging with relevant Service Providers and during the course of verification. **4. Handling Non-Project Related Cases** • If the reported incident is not related to the project, refer the survivor to locally available service providers, including: • Ensure the survivor is connected to appropriate care and support, regardless of project involvement with survivor consent. **5. Liaison and follow-up** • Serve as a consistent point of contact between the contractor and Tier 2. • Follow up to ensure appropriate support services are being provided and that the survivor's needs and preferences are respected throughout. **6. Upholding Ethical and Inclusive Practice** • Treat every survivor with dignity, empathy, and without discrimination based on gender identity, caste, socioeconomic background, or any other factor. • Maintain a survivor-centered approach that empowers individuals to make informed decisions about their care and next steps. • Continuously build awareness on gender sensitivity, trauma-informed care, and inclusive communication. • Attend mandatory trainings on survivor-centered and trauma-informed approach.

B. SUPPORT STAKEHOLDERS

Stakeholder	Roles and responsibilities
Role of NGO *Reporting to:* *APCRDA*	NGO will play the role of overall supervision and oversight. Responsibilities will include supervising the following: • The implementation of the SEA/SH Action Plan • The functioning of GRM to address and resolve SEA/SH complaints using GRM indicators related to SEA/SH
Role of Gender Committees	Gender Committees act as critical support systems in ensuring a timely, coordinated, and rights-based response to SEA/SH complaints within labour sites and surrounding areas. They will

	provide support to Tier 1 Committee for addressing SEA/SH complaints. **1. Site Monitoring** Gender Committees at the village level shall conduct bi-weekly visits to nearby construction and labour sites. These visits will be overseen and guided by SERP and APCRDA. Their consistent presence ensures ongoing engagement with workers and early identification of grievances. **2.Awareness and Capacity Building** Gender Committees are responsible for conducting awareness programs on GBV, SEA, and SH for labourers, educating them about relevant legal provisions and the grievance redressal mechanisms (GRMs) available to them. They will actively participate in all capacity-building initiatives and receive comprehensive training to effectively carry out these responsibilities. 4. **Emotional Support and Response Coordination** In medium to high-risk GBV cases, the Committees will serve as a local support mechanism, visiting the site to comfort survivors and provide immediate emotional support. They will work in collaboration with Social Facilitators and service providers to ensure the survivor's dignity and well-being remain central. **4. Ethical Conduct and Supervision** All activities undertaken by Gender Committees shall uphold principles of empathy, non-discrimination, and inclusivity. Their work will be closely monitored and supported by Gender Specialists at APCRDA/ADCL, ensuring accountability and adherence to survivor-centered practices
Role of Mahila Police	The Mahila Police stationed at the Village Secretariat serve as an essential part of the local support system in responding to SEA/SH cases. Their role complements and strengthens the efforts of Social Facilitators and Gender Committees. **1. Collaborative Support and Coordination** Mahila Police will extend their support to Social Facilitators and Gender Committees as and when required, particularly in responding to medium and high-risk cases. They will assist in ensuring the survivor's safety and in coordinating timely access to services. **2. Safety and Protection Measures** As trained law enforcement personnel, Mahila Police play a key role in ensuring the physical safety of survivors and maintaining a secure environment during field visits or sensitive interventions. They will

	provide necessary protection during accompaniment to legal or medical services, if required.

Role of GBV Service Providers
Reporting to:
APCRDA
	• Provide GBV support services to the survivor in close coordination with APCRDA Gender Specialist/ Social Facilitators, such as:
	  • Medical support
	  • Security
	  • Psychosocial counselling
	  • Legal assistance (if consented)
	  • Shelter (if required)
	• Work in coordination with project stakeholders and other GBV service providers in the area to provide holistic support to the survivor.
	• Some GBV service providers:
	  o Women Helpline (181)
	  o One Stop Centre
	  o Domestic violence cells
	  o Local NGOs or support services
	  o Legal aid/District Legal Service Authority
	• GBV Service Providers will provide monthly report to APCRDA with information on cases and actions taken by the project.
	• The GBV service provider must provide aggregate data on case load:
	  o Number of SEA/SH cases received/referred by the GRM, disaggregated by age and by sex, location;
	  o The number of cases open
	  o The number of cases closed
	  o The of cases that were referred to other services

Digital dashboard for reporting SEA/SH incidents

1. The SEA/SH GRM will be integrated into the Project GRM (or Parishkaram portal) to record all SEA/SH complaints
2. Limited logins will be provided to nominated GBV focal persons in Tier 1/Tier 2 who can register and view case-specific details on the portal.
3. The remaining Officers operating the portal may view SEA/SH complaints in the form of encrypted macro data.
1. Tier 2 will be immediately alerted of all SEA/SH related grievances reported on the portal.
2. The open case will be color-coded to signify its risk category: **Red for High Risk**, **Amber for Medium Risk**, **and Yellow for Low Risk**.
3. The case will go through the following sections:

1) Registration; 2) Review and Administrative Verification; 3) Response; 4) Closure. Once a case is closed, the case will be sent to the final section 5) Follow up

5. Monitoring and reporting

Effective supervision and oversight of the project's SEA/SH prevention efforts are vital and should therefore, be carefully considered. Effective oversight requires various stakeholders - APCRDA, PgMC, PMC, and NGO. Stakeholders must have clear roles and responsibilities. All those involved should have appropriate training and skills for the tasks assigned to them.

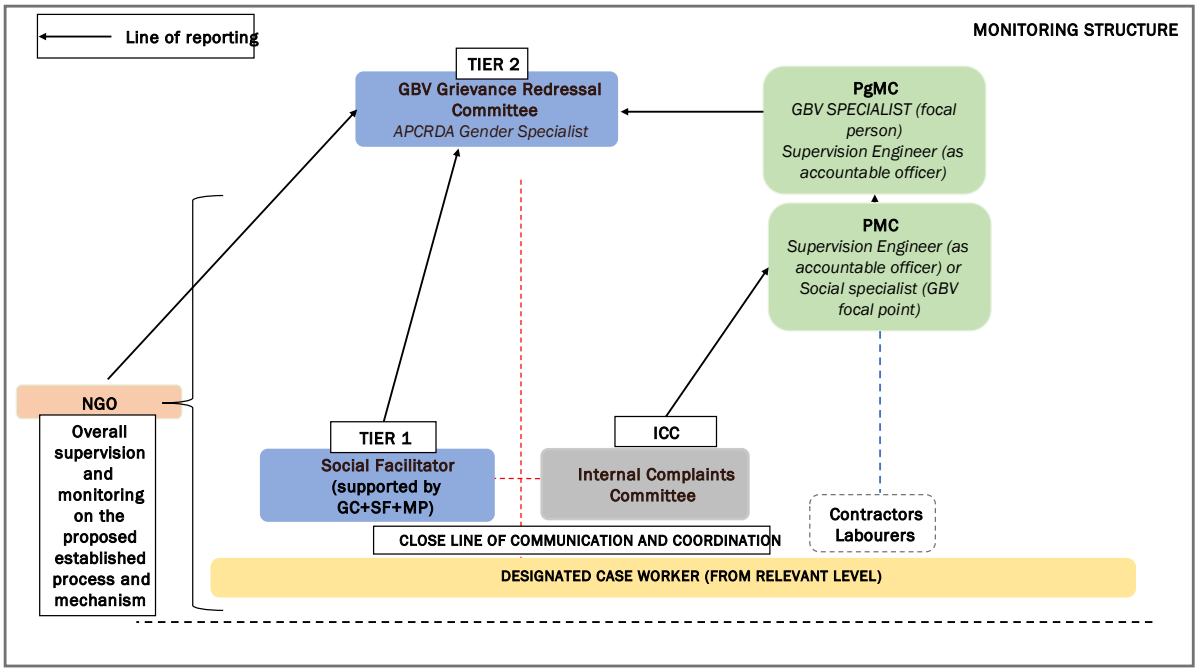


Figure 7-4: Monitoring Structure

Monthly Monitoring

The monthly monitoring report will be prepared by PMC after collecting information from ICC at Contractor level & GBV Service Provider. The report will be shared with PgMC who will verify the data. The report will finally be shared with APCRDA. The Monthly Progress Report (MPR) should include:

1. Number of SEA/SH cases received at project site.
2. Number of SEA/SH cases disposed of, at project site.
3. Number of cases pending for more than 90 days at Contractor level.
4. Number of cases managed and the kind of services provided.
5. Number of project-related SEA/SH complaints received and/or referred by the GRM at APCRDA disaggregated by age and sex
6. Number of open cases and the average time they have remained open at Contractor level and at APCRDA.
7. Number of cases closed; the average time they had remained open; and the number of days / months till case closure at Contractor level and at APCRDA.
8. Number of survivors accepting referral to GBV services for the reported incident and the number or survivors that did not.

6. Disclosure of SEA/SH Grievance Redress Mechanism

Prior to commencement of construction activities, the project with support from the NGO to provide sensitization training to members of the Gender committees at village secretariat level who will then carry out community sensitization program in order to disseminate information about the SEA/SH Grievance Redress Mechanism. The information on SEA/SH redress mechanisms will also be part of the overall project level GRM dissemination activities including any consultation that the project conducts. The project office should broadcast about this SEA/SH GRM on local platforms regularly, with information on how and where survivors can submit SEA/SH related grievances including Child Sexual Abuse/Child Sexual Exploitation.

6.Relevant laws and sections:

Act	Section
POSH, 2013	Section 2(o) – Workplace Definition
	Section 3 – Prevention of Sexual Harassment
	Section 4 – Constitution of Internal Complaint Committee (ICC)
	Section 19 – Duties of Employer
POCSO, 2012	Section 3, 5, 7, 9 – Definitions of Sexual Offences
	Section 11 – Sexual Harassment of a Child
	Section 12 – Punishment for Sexual Harassment
	Section 19 – Mandatory Reporting
	Section 23 – Media and Identity Protection
	Section 26 – Role of Police

List of Annexures

Annexure I: Strengthening Environmental and OHS/E&S Clauses in Bidding Documents

Objective. Standardize and strengthen environmental and OHS clauses across all bidding documents to ensure uniformity in environmental and OHS compliance.

The following EHS and OHS conditions with cost implications will be included in the bidding documents:

- Past performance of the contractor on E&S aspects, including SEA and GBV
- E&S staff with the contractor
- Mitigation measures to address construction impacts
- Code of Conduct for the contractor's personnel
- Management strategies and implementation plans (MSIPs) to manage the E&S risks
- A C-ESMP with site-specific management plans, including an OHS plan
- Labor Management Procedure

Annexure II: Suggestive Budget Table

Budget categories	Description	Quantity	Unit costs (INR)	Time years	Total costs (INR)	Remarks
Preparation	Expenses for conducting screening and ESIA, preparation of mitigation plans (ESMP, LMP, SEP, BMP, community health and safety, CHMP and RAP,					
Obtaining statutory permissions for compliance	Expenses associated with obtaining permits and complying with environment and social (E&S) regulations					
Implementation	Expenses for implementation of the mitigation plans					
Environment monitoring	Expenses for carrying out environment monitoring such as air quality, water quality, soil and noise monitoring, and so on, including third-party audit, contractor E&S					

Budget categories	Description	Quantity	Unit costs (INR)	Time years	Total costs (INR)	Remarks
	performance and site-specific ESMP implementation					
Social monitoring	Expenses for monitoring RAP, IPDP, SEP, GRM, labour and community health and safety, third-party audit					
Communication and outreach	Budget for preparation and dissemination of IEC materials, stakeholder consultation, workshops					
Institutional Strengthening	Budget for human resources and training personnel on environment and social management					
Documentation and reporting	Costs for documentation and establishing monitoring and reporting mechanism					
Remediation and corrective actions	Cost of retroactive remedial or corrective actions					

Annexure III: Monthly Reporting Templates

Template A: Regulatory Compliance Monitoring Format

Name of the contractor:

Name of the subproject:

Reporting for the month of:

Reporting shall be done through ICT E & S tool and the below compliance monitoring generic structure is adopted in the ICT tool.

Component	Applicable legislation	Compliance status	Actions required

Subject wise Google forms are being developed, which will be basis for the development of the ICT E & S monitoring and reporting tool:

1. **Environment -**https://docs.google.com/forms/d/1UbLVAtku_6wUjv-xdhiKrsRbGKU3xptkxiFTBMWn6Y4/edit
2. **OHS -** https://docs.google.com/forms/d/1WwzLXpO8rz9uRKahpKDEHuS6xFctLGFjOOkra5DDKHI/edit
3. **Labour law compliance-** https://docs.google.com/forms/d/e/1FAIpQLScRH9IJpNedzAn37uZyGZo7lTNEwnXr29HI6dGVfolGRUAZMA/viewform
4. **Gender:** https://docs.google.com/forms/d/e/1FAIpQLSdZFAiTXSUUg5ZcW81YEsJdLCt0kAGE5e26jGcyx8gHmBgARw/viewform
5. **Livelihood and skill development:** https://docs.google.com/forms/d/1mPZLUq_7Sj9mhxCi2v-4IY_Yxjz7Hhhal95KrPfU2hE/edi
6. **GRM:** https://forms.office.com/Pages/DesignPageV2.aspx?lang=en-GB&subpage=design&FormId=DQSIkWdsW0yxEjajBLZtrQAAAAAAAAAAAAMAAAUMR1xUMjEyVERXVFlFOVhaTzdCUzRHTzZHR0JXOS4u&Token=e51493bf448c412cad5483900c7863c8

Template B: Compliance as per Indicative list of Items for Contractor's Environmental and Social Management Plan (C-ESMP)

Name of the contractor:
Name of the subproject:
Reporting for the month of:

- The following are the indicative activities (but not limited) that need to be complied by the contractor during the contract duration. On award of work, the contractor shall work out a C-ESMP in line with labour laws and other regulatory guidelines along with the quantities of each of these indicated activities (which should be sufficient for effective implementation of the C-ESMP and other E&S clauses mentioned in the bid document) and submit for approval of PMC/Employer The modalities of monitoring these activities is to be jointly finalised by Employer/contractor.
- During periodical inspection, in case of necessity, on direction of Employer, the contractor shall provide additional quantities and activities.
- The payment for all these activities shall be made out of provisional sum. The payments are subjected to scrutiny and approval of all the activities done at site.

- The total payment for these activities/additional/new for the entire project duration shall be within ceiling amount of 1%.
- The contractor shall also, for the performance of its E&S obligations hereunder during the Construction Period, furnish the Performance Security for an amount equal to 0.1 per cent of the bid amount/contract value in the shape of unconditional and irrevocable Bank Guarantee/ Insurance Surety Bond valid until 60 days after the completion of work. This E&S Performance Security shall be over and above the Performance Security mentioned above

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
1	Permissions Clearances/Consents/NoC/ Authorisation/license etc	The contractor shall ensure that permissions from the regulatory bodies are obtained for Hot mix plant, RMC plant, Crusher, Quarries, Borrow areas, Tree cutting, Water for construction purposes, hazardous wastes, Biomedical wastes etc Licences, insurance for the labour (local and migrant), Registration for specific work under labour laws Temporary shelter for workers considering the local climate- Bachelor accommodation with secured room with adequate space, ventilation, lights, fans , Bedding		
2	Labour camps as per the applicable National/State laws and quantity as per the personnel	▪ Temporary shelter for workers considering the local climate - family accommodation with secured room with adequate space, ventilation, lights, fans, Bedding		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
		▪ Provide meals at a reasonable cost or free of charge to its Contractor's Personnel per shift in a Dining area and ensure minimum nutritional requirements ▪ Secured and Sanitary toilets/ Bio toilets with lights - for Men 1 pan for 25 persons ▪ Secured and Sanitary toilets/ Bio toilets with lights - for Women 1 pan for 25 ▪ persons Secured bathroom for Men with Water supply and lights ▪ Secured bathroom rooms for Women with Water supply and lights ▪ Common Wash Areas Separate Wash areas for women in labour camps ▪ Common Kitchen with ventilation, lights, storage racks for raw materials ▪ Supply of Environment friendly fuels for Kitchen ▪ Common Dining Area with ventilation, fans and lights ▪ Appropriate water storage units for supply of water for domestic usage to the camp		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
		▪ Appropriate water storage units for supply of potable water for domestic usage to the camp ▪ Crèche for children ▪ Sanitation and Housekeeping activities within the camp includes periodic cleaning of overhead tanks, toilets, sweeping, Disinfection ▪ Dustbins of appropriate capacities for wet (Blue) and dry (Green) wastes and disposal at designated locations ▪ Pest control measures ▪ Onsite sewage treatment facilities/ Mobile STP Sludge/septage removal and disposal at the designated locations ▪ Power back up - Gas based Gensets with acoustic enclosure with stacks as per CPCB air and noise emission standards. ▪ Water treatment unit for supplying potable water considering the raw water source Water Supply line for potable water to kitchen and to water disposal points near rooms ▪ Fencing around the labour camp to secure the workers and to prevent entry of stray animals		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
		▪ Security personnel Signage's in the labour camps on the safety, code of conduct, sanitation, SEA/SH ▪ Camp level area lighting ▪ Store space for the workers to buy daily needs First Aid kits within labour camps ▪ Proper ventilated Health check rooms with chairs, tables, at least two beds, screens ▪ Fire control equipment Ambulance shall be available in the project site Arrange visiting doctor for periodic consultations and tie-up with nearest super speciality hospital for emergency treatments ▪ Arrange female nurse in the First aid room Medical Check Up - The Contractor shall organise medical check-ups carried out by a doctor for all Contractor's ▪ Personnel prior to the initial mobilisation to the Project Area for diagnosis of any disease conditions, fitness level and later on quarterly basis to check general health condition fitness for the work. ▪ Common room for trainings/general meetings/Grievance redressal meetings with chairs, tables, lights and fans		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
		▪ Open drains within the camp site for storm water drainage ▪ Transportation of workers between labour camps and work sites		
3	Supply of work specific PPE to the workers and personnel on site as per the National standards	▪ Safety Jackets with reflective coating and water proofing Supply of work specific Safety helmets considering work place hazards related to electrical, falling objects ▪ Supply of work specific Safety shoes considering work place hazards related to sharp objects on floor/ground, electrical, slippage, thermal conditions in the work areas ▪ Supply of work specific Safety gloves considering work place hazards related to sharp objects, handling wet materials, chemicals, mechanical tools, electrical, slippage, thermal ▪ Supply of Safety ear plugs to all workers in a radius of 100' distance from noise sources ▪ Supply of Safety Masks of Minimum FFP 2 type or equivalent in all areas of potential sources of Dust, fumes from welding, emissions from vehicles ▪ Supply safety belt for the person working at heights Suitable safety apparatus for personnel working in confined spaces Safety Eye protective wear		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
		▪ Supply of quality and work specific PPEs for women as per the women's body proportion		
4	Traffic management in consideration to the applicable guidelines, IRC, APCRDA instructions and local police	▪ All the vehicles deployed shall meet emission norms as per applicable rules. ▪ All the vehicles deployed shall have valid PUC certificate ▪ The loaded vehicles with material shall be covered with Tarpaulins ▪ Tyre wash facility shall be provided in construction site ▪ Speed limit boards shall be displayed along the haulage routes within 2km from the site ▪ Speed limiting barriers and speed bumps shall be arranged along the haulage routes within 2km from the site including in the nearest settlements ▪ Deployment of flag men in the nearest settlement and on the approach road to the site for management of traffic during peak hours ▪ Display no honking sign boards near to the sensitive receptors in the nearest settlement		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
		▪ Display warning sign boards to alert public on construction zone, unauthorised entry, heavy vehicular movement ▪ Arrange informative display boards with project information and directions to site along the haulage routes		
5	Environmental Monitoring as per the CPCB guidelines and IS standards by the NABL accredited lab	▪ Surface water quality analysis for the parameters mentioned in IS 2296 on quarterly basis in the nearest water bodies ▪ Ground Water quality analysis for the IS 10500 parameters on Quarterly basis in project site, labour camps and nearest habitation Potable water quality analysis for IS 10500 parameters on monthly basis ▪ Noise levels during day peak work hours on monthly basis I. The Construction site II. Within 500 m on haulage road to construction site III. In nearest settlements during peak hours IV. labour camps V. Near to Hot mix plant/RMC plant/ DG sets Noise levels during Night work hours on monthly basis I. The Construction site II. Within 500 m on haulage road to construction site		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
		III. In nearest settlements during peak hours IV. labour camps V. Near to Hot mix plant/RMC plant/ DG sets Soil Quality analysis as per the ICAR recommended parameters (pH, EC, Organic carbon, N, P, K and other parameters as suggested on Quarterly basis in the construction site, site surroundings, labour camp surroundings Regular internal monitoring of minimum Lighting Lux levels in work areas and maintenance of records Ambient Air Quality Monitoring on monthly basis for the parameters So2, No2, PM10, PM2.5, O3, CO, VoC and other parameters as suggested ■ The Construction site ■ Within 500 m on haulage road to construction site ■ Downwind side in nearest settlements during peak hours ■ labour camps ■ Additional parameters under Air, Water, Soil in case of any polluting events noticed		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
6	Occupational, Health and Safety as per the applicable labour laws/GIIP	▪ Arrange the Hard MS/GI Sheet barricading up to 7 m height around the construction site to reduce the fugitive emissions to the surrounding area ▪ Arrange adequate area lighting in the construction site, haulage routes, surrounding the construction site during night/low light conditions ▪ Arrange adequate lighting inside the under construction building to enable both day and night working conditions ▪ Supplying and fixing of cautionary and informative signs boards on Safety of the workers in all work areas ▪ Provide work specific arrangements for personnel to prevent trip, slip and falls hazards ▪ Arrange fall protection arrangements for the scaffolding, along the stairs, floor edge Walking Surfaces or boards at height should be of sound construction and to be provided with safety rails and safety belts ▪ Arrangement for head protection around the building from falling objects and with necessary signage's		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
		▪ Arrangement of Vibration Control Damping tools shall be used Arrangement of Adequate safety barricades near heavy machinery considering the radial movement ▪ Arrangement of Adequate safety barricades with retro reflective snickering near excavated areas Arrangement of Personnel near heavy machinery to control and guide movement with appropriate tools like flags/hand held batons appropriate to day/night conditions ▪ Arrangement of warning signage boards -with emergency contacts, site E & S officer contact, Grievance officer contact ▪ Arrangement of Firefighting equipment shall be arranged in the construction site and near to the fuel storage and handling area ▪ Arrangement of Measures to prevent water stagnation and mosquito breeding ▪ Arrangement of basic amenities in the construction site - secured and sanitary toilets for men and women, drinking water, rest areas, food, first aid etc. Arrangement of Pest control measures in the construction site		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
		▪ for lifting and bending activities manual material handling techniques will be adopted and job rotation will be ensured for long standing works ▪ risk assessment report including gender specific risks will be submitted by the contractor along with the work method statements before starting each activity. ▪ Transport facility will be provided for women workers ▪ The streets, labour camps, construction site will be well lit during night time. All the labour movement areas will be maintained free from slip, trip and fall hazards.		
7	Signage and display boards as per the E & S requirements	▪ Make arrangement to Display Grievance Redressal Boards with project information along the Projects ▪ Arrangement of warning signage boards -with emergency contacts, site E & S officer contact, Grievance officer contact, list of trained first aiders with contacts ▪ Display informative board on GBV, SEA/SH and punishment under the law		
8	Waste Management as per the CPHEEO/CPCB guidelines and GIIP	▪ Arrangement of dust bins within the construction sites for collection of wet and dry wastes		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
	(Good International Industry Practices)	▪ Onsite arrangement of space with shelter, spill control kits, impermeable floor and drain, collection pits for collecting, segregation and temporary storage of wastes into the streams -e waste, batteries, used oils, contaminated soils/materials, plastics, empty cement bags, used chemical cans, electrical wastes, steel cutting, plumbing wastes, glass, Tyres or any other hazardous wastes etc ▪ Space for temporary storage of bulk wastes like C & D wastes and other wastes ▪ Transportation of C & D wastes to the designated location ▪ Transportation of Top soil up to 30cm depth to the designated location ▪ Transportation of excavated soils other than topsoil to the designated location ▪ Transportation of other recyclable wastes to the designated collection location ▪ Arrangement with Authorised dealer/facility to hand over the biomedical wastes Hazardous waste (Used oil etc) handing over to		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
		the APPCB authorised recyclers/ TSDF by providing disposal certificates ■ The sludge and septage shall be cleared through authorised operator in the region and shall be ensured for disposal in nearest STP/FSTP or authorised dealer/facility		
9	Insurance	■ The contractor shall take Public liability insurance if any material under the PLI act is handled. ■ Arrangement of truck/s mounted with water fogging guns to control dust in the construction site, labour camp, along haulage routes and in nearest settlement and water sprinkling along roads wherever applicable. ■ Arrange Oil, Grease & Sludge Separator in all applicable areas such as vehicle bay, vehicle Garage, fuel storage areas, fuel handling areas ■ Silt Fencing along the drains or at the sedimentation ponds in construction site to Protect water bodies ■ Minimum onsite treatment systems for the effluents from the batching plant as per the consent conditions of PCB/GIIP		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
10	Mitigation Measures as per the relevant applicable standards and guidelines	▪ Arrangement of Noise Barriers near all potential noise sources and as per the site conditions ▪ Arrangement of site specific measures to protect adjacent properties from dust and air pollution ▪ Arrangement of appropriate site specific measures to indicate and prevent any flooding conditions ▪ For power back up in all practicable cases arrange solar panel based supplies during emergencies in the construction site with stacks ▪ For power back up in all practicable cases arrange gas based gensets as a power back during emergencies in the construction site with stacks DG sets for power back (to be used only) if gas based and solar based arrangements are not feasible and DG sets to have stacks to limit ground level concentrations ▪ Existing trees to be translocated ▪ Topsoil excavated during construction activities shall be used for horticulture/landscape development within the project site. The contractor shall arrange adequate drains to ensure drainage of storm water during monsoons		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
12	Capacity building Trainings/Workshops/Awareness Programs	Training sessions for his personnel in two-folds: ▪ Introductory sessions for starting work at the Project Area, and technical training as required in relation to the execution of the works ▪ Training for the workers on Contractor Environment, Health & Safety Management plan, Code of conduct, GBV/SEA/SH, Occupational safety Awareness on HIV/AIDS, Pandemics such as COVID-19 & Medical Camps Firefighting, Mock Drills First Aid Training, CPR Testing		
13	Rehabilitation & Reinstatement of Sites at the Closure of the Project	Site rehabilitation - Rehabilitate all Project Areas and landscapes disturbed by the works, to their original condition where possible upon completion of construction and prior to the provisional acceptance of the works. Close collaboration with all statutory stakeholders will be conducted in cooperation with the Employer during the reinstatement. This will include all temporarily acquired sites including borrow areas, quarry areas, camp site, storage areas, diversions, etc.		
14	Social Aspects	Formation and functioning of Internal complaints committee for gender related issues as per the POSH act Provide temporary safe access to		

Sl No.	Environmental and social aspects	Description of the item	Proposed mitigation measures as per C-ESMP	Status of compliance
		individual properties/ settlements /activity areas in case of disturbance to regular routes. Formation and functioning of grievance redressed cell Consultations with stakeholders as and when required to prevent social conflicts due to labour influx		

Note: This table is subjective and is customizable as per the need of each project.

Template C: E&S Reporting from Project Activities

Name of the contractor:
Name of the subproject:
Reporting for the month of:

Project name:	Reporting period:	Prepared by:	Date:
Overview of the E&S issue			
Description of the issue			
Affected areas			
Timeline			
Impact assessment			
Severity*			
Stakeholders affected			
How did you find out about it and when?			
Clear facts or conflicting versions?			
Ongoing or contained?			
Loss of life or severe harm?			
Authorities informed? If so, how specifically? What has their response to date been?			
Mitigation plan			
Mitigation measures			
Timeline			

* Severity classification of the incident with example:

Examples	Environmental	Social	Occupational health and safety
Indicative: *Small-scale incident that could indicate risk of future serious events*	Poor quality or delayed site restoration and revegetation	Minor instances of inappropriate behavior of security forces or other contractor personnel	Minor job site injuries; absence of health & safety plan and training
Serious: *Incident that has caused significant harm to workers, community members, or the environment*	Overexploitation of natural resources	Case(s) of mistreatment of community members or vulnerable groups by project workers or security forces	Injuries requiring off-site medical attention
Severe: *An incident that caused great harm to individuals or the environment (for example, fatality, GBV, forced or child labor)*	Major river contamination causing decimation of fish population or other aquatic resources	Forced evictions or resettlement of communities without due process or compensation	Any fatality

Annexure IV: Environmental Acts, and Rules

S.No	Description
1	The Indian Forest Act, 1927
2	The Indian Forest (Amendment) Act, 2017
3	The Andhra Pradesh Forest Act, 1967
4	The Andhra Pradesh Forest (Amendment) Act, 2016
5	The Wildlife (Protection) Act, 1972
6	The Wildlife (Protection) Amendment Act, 2006
7	The Water (Prevention and Control of Pollution) Act, 1974
8	The Air (Prevention and Control of Pollution) Act, 1981
9	The Environment (Protection) Act, 1986
10	Batteries (Management and Handling) Rules, 2001
11	The Biological Diversity Act, 2002 and Biological Diversity Rules, 2004
12	Environment Impact Assessment Notification, 2006
13	Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
14	Solid Waste Management Rules, 2016
15	E-Waste (Management) Rules, 2016
16	E-Waste (Management) Amendment Rules, 2018
17	Construction and Demolition Waste Management Rules, 2016
18	Plastic Waste Management Rules, 2016
19	Plastic Waste Management (Amendment) Rules, 2018
20	Bio-Medical Waste Management Rules, 2016.
21	Bio-Medical Waste Management (Amendment) Rules, 2018.
22	Final Judgement of Hon'ble National Green Tribunal – 17-11-2017

Annexure V -Procedures for Implementation of the C ESMP

1. ICT tool with E & S module shall be used for ensuring the compliance of the ESMP.
2. Contractors, PMCs, PgMC, ESMU and officials from the APCRDA/ADCL will be provided access to the ICT tool for reporting and monitoring.
3. The ICT E & S module consists of the ESMP conditions encompassing the aspects on the Statutory, Labour, Environment, Social, Gender/SEA/SH, GRM, Stakeholder Engagement. The ICT tool has provisions to upload various formats of files (videos, photographs, documents).
4. The contractor by 20th of every month shall report the C ESMP compliance certified by the project manager.
5. The PMC on regular basis ensures the implementation of the C ESMPs, identifies gaps and provides guidance to the contractor on corrective measures for improvement with the support from PgMC.
6. The PMC by 22nd of every month will verify the compliance report, lists out the violations, non-compliances and corrective measures proposed and a certified report by the project manager will be submitted to the PgMC.
7. The PMC will issue notices to the Contractor for the Violations, Non-Compliances with item wise corrective actions, timelines and penalties in case of non adherence to comply with corrective action within timelines. The timelines specification shall consider the risks/damages associated with the violation and noncompliance and timelines in any case shall not exceed 15 days. An alternative arrangement shall be suggested to minimise the risk and damage.
8. The PMC will issue notices to the Contractor through the ICT tool.
9. The PgMC shall independently does periodic field inspections to confirm the compliance from the contractor and PMC, reports to the ESMU and recommends the corrective measures for improvement and penalties for violations and non-compliances.
10. The PgMC shall verify the reports from the Contractors and PMCs and does a follow up on the Notices issued and ensure corrective measures are rectified within the timelines. The PgMC will certify the reports from the PMCs and recommends for improvements in C ESMP implementation and submits report by 27th to the ESMU with gaps, recommendations on Penalties.
11. The PgMC through the ICT shall issue notices to the PMCs for all gaps in the KPIs to be complied by the contractors. The PgMC shall recommend for penalties to the PMCs as per the bid provisions.
12. The Notices issued to the Contractors, PMCs are accessible to the ESMU and APCRDA/ADCL officials.
13. The ESMU ensures compliances, recommends for penalties and suggests for revisions in the C ESMP based on the reports from the PMC, PGMC and field observations.

Annexure-VI: Training Plan

Sr. No.	Training area	Participant	Training contents	Duration	Frequency	Methodology	Training aids	Resource person	Level
01	Assessment and management of environmental and social (E&S) risks and impacts	• APCRDA / ADCL Concerned officials • E&S focal persons	**Module 1:** • Overview of the EIA notification 2006 and its applicability, EC requirements, MDBs E&S policies, and GIIP **Module 2:** • Introduction and scope of Standard Operating Procedure (SOP) 1 • SOP 1 procedures and instruments • Overview of the Bid document E & S conditions, Key E & S staff at various levels, their roles, C ESMP and its	1 day	Two times in a year during construction stage. 1st session in 1st year will be given prior to the commencement of the works.	• Lectures, • Individual and group presentations • Hands-on practice	• Audio and visual aids • Printed materials	• ESMU, PgMC/PMC • Expert from MDBs	• HO of APCRDA & ADCL

Sr. No.	Training area	Participant	Training contents	Duration	Frequency	Methodology	Training aids	Resource person	Level
			implementation procedures • Monitoring and reporting , ICT tool						
		Contractors	**Module 1:** • Overview of the EC requirements, NGT orders and compliance • MDBs E&S policies and GIIP **Module 2:** • Introduction to ESMP • Preparation and development of contractor's ESMP (C-ESMP)	1 day	One time at the preconstruction phase	• Presentation • Hands-on practice	• Audio and visual aids • Printed materials	• ESMU / PgMC/PMC • Expert from MDBs	• ADCL site offices • Contractors • PMCs team
02		• E&S focal persons	**Modules:**	1 day	Bi - Annually	• Presentation	• Audio and visual aids	• ESMU / PgMC/PMCs	• Site offices of ADCL

Sr. No.	Training area	Participant	Training contents	Duration	Frequency	Methodology	Training aids	Resource person	Level
	Labor and working conditions	• Contractors	• Introduction and scope of SOP 2 • Overview of the labor management procedure (LMP) and its implementation • Labor laws and their implementation (employment conditions, wages, and so on) • Social security (compensation, Employees' State Insurance [ESI], Employees' Provident Fund [EPF], and so on) • Occupational health and safety (Building and Other Construction Workers (Regulation of Employment and			• Hands-on practice	• Printed materials	• Expert from MDBs • Labor inspector or expert from the Labour Department, AP	• Contractors • PMCs team

Sr. No.	Training area	Participant	Training contents	Duration	Frequency	Methodology	Training aids	Resource person	Level
			Conditions of Service) Act, 1996 or BOCW) • Workers' grievance management • Monitoring and reporting (on-site and information and communication technology or ICT tool)						
			<u>Modules</u>: • Data entry in ICT tool on labor law compliance • Role of contractors while reporting	1 day	Following the contract award and subsequently as necessary	• Demonstration • Hands-on practice	• Audio and visual aids • Handout	• PgMC / PMC / ESMU	• ADCL site offices • PMCs • PgMC
03	Resource efficiency and pollution prevention	• E&S focal persons	**<u>Modules</u>**: • Pollution types (air, water, soil, and noise) and their effects • Waste reduction and management	1 day	Bi - Annually	• Lectures and presentation	• Audio and visual aids • Site visit for practical experience	• Expert from the PHED and APPCB • PgMC/PMC • Expert from MDBs	• APCRDA & ADCL official at HO & site offices • Contractors • PMCs

Sr. No.	Training area	Participant	Training contents	Duration	Frequency	Methodology	Training aids	Resource person	Level
			• Types of resources (renewable and nonrenewable) • Water conservation techniques • Site visit for training (as a part training program for practical knowledge)						
04	Community health and safety	• E&S Focal Person • Contractors	**<u>Modules</u>**: • Traffic management plan • Emergency response management plan • Hazardous waste and materials management plan • Labor influx management • Sexual exploitation and abuse or sexual	1 day	Bi - Annually	• Lectures and presentation • Case study	• Audio and visual aids • Printed materials	• ESMU • PgMC/PMC • MDBs • Labor inspector or expert from the Labour Department, AP	• Site offices of ADCL • Contractors • PMCs

Sr. No.	Training area	Participant	Training contents	Duration	Frequency	Methodology	Training aids	Resource person	Level
			harassment (SEA/SH) and gender-based violence (GBV) mitigation • Relevant laws and its implementation • Monitoring and reporting						
05	Biodiversity conservation	• E&S focal persons • Contractor	**<u>Modules</u>**: • Critical habitat assessment • Wildlife protection and conservation laws (state and national) • Rights and responsibilities of citizens • Importance of awareness and education • International good practices for biodiversity conservation	1 day	Annually	• Lectures and presentation • Case study	• Audio and visual aids • Printed materials	• ESMU • PgMC • Subject specialist (species-specific) • Expert from MDBs	• HO & Site offices of APCRDA & ADCL

Sr. No.	Training area	Participant	Training contents	Duration	Frequency	Methodology	Training aids	Resource person	Level
06	Stakeholder engagement and information disclosure	• E & S focal persons • Contractors	**<u>Modules</u>**: • Introduction and scope of SOP 06 • Stakeholder mapping and consultation • Disclosure requirements • Grievance redressal mechanism (including SEA/SH complaints) • Overview of stakeholder engagement plan (SEP) and its implementation • Online reporting tools and role of the APCRDA & ADCL • Monitoring and reporting	1 day	Annually	• Lectures and presentation • Demonstration	• Audio and visual aids • Printed materials • Handout	• PgMC/ESMU	• HO & Site offices of APCRDA & ADCL

Annexure VII: Applicable Labor Laws

Sr. No.	Activity	Relevant Laws
1	Necessary relevant licenses and registrations	▪ Sections 7 and 12 of the Contract Labour Act, 1970 ▫ Registration of certain establishments (Section 7) ▫ Licensing of contractors (Section 12) ▪ Rule 17, 21, of the Contract Labour (R&A) Central Rule, 1971 & AP Rules 1971 ▫ Manner of making application for registration of establishments (Rule 17) ▫ Application for a licensee (Rule 21) ▪ Sec-7 and 12 of the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 (BOCW Act) ▫ Registration of establishments (Section 7) ▫ Registration of building workers as beneficiaries (Section 12) ▪ Rule 23 of the BOCW Central Rules, 1998 & AP Rules 1999 ▫ Manner of making application for registration of establishments ▪ Sec-4 of Inter-State Migrant Workmen Act, 1979 ▫ Registration of certain establishments ▪ Rules 3 and 7 of the Inter-State Migrant Workmen (Regulation employment and Conditions of Services) Central Rules, 1980 & AP Rules 1982 ▫ Form and manner of making application for registration of establishment. (Rule-3) ▫ Application for a licensee (Rule 7) ▪ Sections 25 and 26 of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 for Sewage Treatment Plants in Labor Camps ▫ Application form for Consent or Authorization, Schedule I Common Application for Consent
2	Registration of building workers as beneficiaries	▪ Section 12 of the BOCW Act, 1996 ▫ Registration of building workers as beneficiaries

Sr. No.	Activity	Relevant Laws
3	Terms and conditions of employment	▪ Section 12 of BOCW Act, 1996 ▫ Minimum age is 18 and maximum zge is 60 for beneficiary registration ▪ Rule 22 of the Minimum Wages (Central) Rules, 1950 & Rule 23 of AP Minimum wage rules 1960 ▫ Publicity to the minimum wages fixed under the Act ▪ Rules 238, 241, 248, and 249 of the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998 & AP Rules 1999 ▫ Notice of wage periods and so on ▫ Muster roll, wages register, deduction register, overtime register, and issue of wage books and service certificates ▫ Payment of wages ▫ Display of notices of wage regarding date of payment of wages ▪ Rule 81 read with Rule 71 of the Contract Labour (Regulation and Abolition) Central Rules, 1971 & AP Rules 1971 ▫ A notice showing the wage period and the place and time of disbursement of wages shall be displayed at the place of work (Rule 71) ▫ Notices showing the rates of wages, hours of work, wage period, dates of payment of wages, names and addresses of the inspectors having jurisdiction, and date of payment of unpaid wages, shall be displayed. (Rule 81) ▪ Rule 55 of the Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Rules, 1980 & Rule 47 of AP Rules 1982 ▫ Notices showing the rates of wages, hours of work, wage period, dates of payment of wages, names and addresses of the Inspectors having jurisdiction, and date of payment of unpaid wages, shall be displayed. ▪ Rule 8 of The Rights of Persons with Disabilities Rules, 2017 ▫ Manner of publication of equal opportunity policy

Sr. No.	Activity	Relevant Laws
4	Prohibition of child and forced labor	▪ Sections 3 and 9 of the Child and Adolescent Labour (Prohibition and Regulation) Act, 1986 □ Prohibition of employment of children in certain occupations and processes (Section 3) □ Notice to inspector (Section 9) ▪ Rule 17 of the Child and Adolescent Labour (Prohibition and Regulation) Rules, 1988 □ Certificate of age ▪ Section 4 of the Bonded Labour System (Abolition) Act, 1976 Abolition of bonded labour system
5	Workers' employment card	▪ Rule 76 of the Contract Labour (R & A) Central Rule 1971 & AP Rules 1971 Employment Card
6	Medical examination of workers	▪ Rule 223 of the BOCW Central rules, 1998 & AP Rules 223 Medical examination of building workers, and so on.
7	Compulsory display	▪ The Building and Other Construction Workers' (Regulation of Employment & Conditions of Service) Central Rules, 1998, Rule 241 & AP Rules 1999 □ Abstract of BOCW Act, 1996 ▪ Sec-12, Child Labour (Prohibition and Regulation) Amendment Act, 2016 ▪ The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013, Section 3(1) and Section 4 (1), 7 ▪ Clause 117 of the BOCW (RE & CS) Act's Central Rules, 1998 □ Warning sign, barricades, and so on ▪ Abstract of the □ The Contract Labour Act, 1970 □ The Payment of Wages Act, 1936 □ The Payment of Gratuity Act, 1972 □ The Employee Compensation Act, 1923 □ The Maternity Act, 1961 The Minimum Wage Act, 1948

Sr. No.	Activity	Relevant Laws
8	Welfare of workers	▪ Chapter VI, Sec 28 to 37 of BOCW Act, 1998. ▫ Hours of work, welfare measures, and other conditions of service of building workers ▪ Rule 243 to 247 of the BOCW Central Rules, 1998 & AP Rules 1999 ▫ Welfare of building workers ▪ Sec-40 to 62 Chapter V of the Contract labour Central Rules, 1971 & AP Rules 1971 ▫ Welfare and health of contract labor
9	Maintenance of register and records	▪ Sec 30 of BOCW Act, 1996. ▫ Maintenance of registers and records ▪ Rule 240 and 241 of the BOCW Central Rules, 1998 & AP Rules 1999 ▫ Register of persons employed as building workers (Rule 240) ▫ Muster-roll, wages register, deduction register, overtime register, and issue of wage books and service certificates (Rule 241) ▪ Rule 75, 78 of the Contract labour Central Rules, 1971 & AP Rules 1971 & AP Rules 1999 ▫ Register of persons employed (Rule 75) ▫ Muster Roll, Wages Registers, Deduction Register and Overtime Register (Rule 78)
10	Safety committee, safety officer, and safety committees' records of meetings	▪ Rules 208, 209, and 231 of the BOCW Central Rules, 1998 & AP Rules 1999 ▫ Safety Committee (Rule 208) ▫ Appointment of Safety Officer (Rule 209) ▪ First aid box (Rule 231)
11	Grievance mechanism	▪ Section 3 of The Industrial Disputes Act, 1947 (Workers Committee)
12	Workers' organization	▪ Section 4 of the Trade Unions Act, 1926 Mode of registration of Trade Union
13	Non-discrimination	▪ Section 4 and 5 of the Equal Remuneration Act, 1976

Sr. No.	Activity	Relevant Laws
	and equal opportunities	▫ Duty of employer to pay equal remuneration to men and women workers for same work or work of a similar nature (Sec-4) ▫ No discrimination to be made while recruiting men and women worker (Sec-5) ▪ Section 21 of the Rights of Persons with Disabilities Act, 2016 ▫ Equal opportunity policy ▪ Rule 8 of The Rights of Persons with Disabilities Rules, 2017 ▫ Manner of publication of equal opportunity policy
14	Occupational health and safety	▪ Part III, Chapter VI of the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998 (Annexure). ▫ Safety and Health-General Provisions ▪ Rules 5, 6, and 8 of the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998) & AP Rules 1999 ▫ Duties and responsibilities of employers, employees and others (Rule 5) ▫ Responsibilities of architects, project engineers, and designers (Rule -6) ▫ Duties and responsibilities of workers (Rule 8) ▪ Rules 234–237, Chapter XXVIII of the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Rules, 1998 & AP Rules 1999 ▫ Hours of work, rest intervals, and weekly off, and so on ▪ Sec-16 to 27, Chapter V of the Contract Labour (Regulation and Abolition) Act, 1970 ▫ Welfare and health of contract labor
15	Contracted workers	▪ Sections 20 and 21 of The Contract Labour (Regulation and Abolition) Act, 1970 The Andhra Pradesh Capital Region Development Authority & Amaravati Development Corporation Limited (APCRDA & ADCL) will have responsibility and liability as principal employer
16	Community workers	▪ No specific law covers voluntary labor. However, general principles of civil law and constitutional guarantees apply. Clear

Sr. No.	Activity	Relevant Laws
		facilities should be provided at par with labor laws applicable to the work site; and the nature of work performed should be within the expected skillset and should not be bonded labor. ■ Section 3 of The Bonded Labour System (Abolition) Act, 1976 □ Abolition of bonded labour system. ■ Section 3 of The Child and Adolescent Labour (Regulation and Abolition) Act, 1986 □ Prohibition of children in certain occupations and process.
17	Primary supply workers	■ Section 3 of The Bonded Labour System (Abolition) Act, 1976 □ Abolition of bonded labour system. ■ Section 3 of The Child and Adolescent Labour (Regulation and Abolition) Act, 1986 □ Prohibition of children in certain occupations and process.
18	Women safety and security	■ Section 4 of the maternity benefit Act, 1961 □ Employment of, or work by, women prohibited during certain periods. ■ Section 4 of the Sexual Harassment of Women at Workplace (Prevention Prohibition and Redressal) Act, 2013 □ Constitution of the internal complaints committee (ICC)
19	Social security	▪ The Bonus Act, 1965, Section 19 (a) and (b) and Sec-26 ▪ Sections 3 and 4 of the Workmen's Compensation Act, 1923 ▪ Sections 5 and 6 of the Employees' Provident Funds and Miscellaneous Provisions Act, 1952 ▪ Sections 11, 39, 40 and 43 of the Employees' State Insurance Act, 1948
20	Reporting of accidents and occupational diseases	■ Rule 210 and Rule 230 of the BOCW Central Rule, 1998 & AP Rules 1999 □ Reporting Accident (Rule 210)
21	Safety committee and safety officer	■ Sec 38 of the BOCW Act, 1996 □ Requirement for employers to form a safety committee and appoint a safety officer if 500 or more workers engaged
22	Health and safety policy	■ Clause 39 of the BOCW Act's Central Rules, 1998 & AP Rues 1999

Sr. No.	Activity	Relevant Laws
		▫ Safety policy to be framed by the contractors wherein 50 or more workers employed.
23	First -aid	▪ Sec 36 of the BOCW Act, 1996 ▫ First aid facility to be provided
24	Responsibility of employer	▪ Sec 44 of the BOCW Act, 1996 ▫ Employer shall provide constant and adequate supervision, ensure compliance with provisions relating to safety, and take all practical steps to prevent accidents
25	Excessive noise and vibration	▪ Clause 34 of the BOCW Act's Central Rules, 1998 & AP Rules 1999 ▫ Adequate measures to be taken for noise and vibration hazards
26	Fencing motors and so on	▪ Clause 37 of the BOCW Act's Central Rules, 1998 & AP Rules 1999 ▫ Ensure fencing to all motors, cogwheels, chains, friction gearing, flywheels, shafting, and dangerous machinery parts
27	Lifting and carrying weight	▪ Clause 38 of the BOCW Act's Central Rules, 1998 &AP Rules 1999 ▫ Ensure standards of maximum weight carried by adult man is 55 kg and adult woman is 30kg
28	Overhead protection	▪ Clause 40 of the BOCW Act's Central Rules, 1998 & AP Rules 1999 ▫ The employer is required to install overhead protection along the periphery of every building under construction that will be 15 meters or taller upon completion.
29	Slipping, tripping, cutting, drowning, and falling hazards	▪ Clause 42 of the BOCW Act's Central Rules, 1998 & AP Rules 1999 ▫ - Ensure passageways, platforms, and other construction work areas at buildings are free from dust, debris, and obstructions that may cause tripping
30	Eye protection	▪ Clause 45 of the BOCW Act's Central Rules, 1998 &AP Rules 1999 ▫ - Contractors shall provide suitable PPE for eye protection
31	Head protection and other suitable protective apparel	▪ Clause 46 of the BOCW Act's Central Rules, 1998 & AP Rules 1999 ▫ - Contractors shall provide safety helmets and PPE
32	Electrical hazards	▪ Clause 47 of the BOCW Act's Central Rules, 1998 & AP Rules 1999

Sr. No.	Activity	Relevant Laws
		◻ - Take adequate measures to prevent accident/incident due to electrical hazards.
33	Stability of Structure	■ Clause 49 of the BOCW Act's Central Rules, 1998& AP Rules 1999 ◻ - Employers must guard structures at construction sites to prevent falling, collapse, or weakening due to wind pressure vibration or other factors
34	Stacking of materials	■ Clause 51 of the BOCW Act's Central Rules, 1998& AP Rules 1999 ◻ - Ensure safe and orderly storage and stacking of building materials at construction sites to ensure health and safety for all
35	Use of safety helmets and shoes	▪ Clause 54 of the BOCW ct's Central Rules, 1998& AP Rules 1999 ◻ - Ensure that all workers performing construction work in buildings or other structures wear safety shoes and helmets that meet national standards
36	Fire safety	■ Clause 35 of the BOCW Act's Central Rules, 1998& AP Rules 1999 ◻ - Contractors shall ensure fire protection at site by providing sufficient fire extinguisher equipment and training persons to operate such equipment
37	Emergency action plan	▪ Clause 36 of the BOCW Act's Central Rules, 1998& AP Rules 1999 ◻ - There shall be an emergency action plan in place to handle emergency situation if contractor employs more than 500 workers at site
38	Warning signs, barricades, and so on	■ Clause 117 of the BOCW Act's Central Rules, 1998& AP Rules 1999 ◻ - The contractors shall ensure warning signs, barricades at the construction site

Annexure VIII: Labor Compliance Quarterly Reporting Format

1. CHECKLIST FOR TRACKING LABOR-RELATED ISSUES

	I. PROJECT DATA	
1.1	Name of project	
1.2	Duration	
1.3	Start date	
1.4	Estimated completion date	
1.5	Location	
1.6	Name and contact information (email or phone) of contractor	
1.7	Name and contact information (email or phone) of all subcontractors	
1.8	Type of activities (project description)	

	II. LABOR PROFILE ***This data is to be collected for each <u>individual</u> laborer working on the project, including temporary labor, labor hired through subcontractors or labor contractors/groups***					
2.1	Number of laborers by sex	*Male*		*Female*		***Total***
2.2	Number of laborers by skill	*Skilled*		*Semi-skilled*	*Unskilled*	***Total***
2.3	Number of laborers by origin	*Local (same or adjoining district)*		*Other state*	*Other country*	***Total***
2.4	Number of laborers by age	*14–18*	*18–25*	*25–50*	*Above 50*	***Total***
2.5	Source of labor	*Contractor*	*Subcontractor*	*Independent*	*Other*	***Total***

	III. WAGES			
3.1	Amount of wages paid (men)	*Skilled*	*Semi-skilled*	*Unskilled*

3.2	Amount of wages paid (women)	*Skilled*	*Semi-skilled*	*Unskilled*
3.3	Rate of wages below, equal to, or more than minimum wage?			
3.4	Frequency of payment (daily, weekly, or monthly)			
3.5	Deductions made, if any (with details)			
3.6	Mode of payment (cash, bank transfer, or checks)			
3.7	Is overtime paid, and if so, at what rate?			
3.8	Is overtime register maintained at work spot as per Form IV of Minimum Wages Central Rules?			
3.9	Is muster maintained at work-spot as per Form V of Minimum Wages Central Rules?			
3.10	Is register of wages maintained at work-spot as per Form X of Minimum Wages Central Rules?			
3.11	Is labor provided with wage slip as per Form XI of Minimum Wages Central Rules?			
3.12	How many hours is the working day?			
3.13	How many leaves in a week does the labor get?			

	IV. MAINTENANCE OF OTHER LABOUR RECORDS	
4.1	Is a copy of photo ID of each laborer kept with the employer?	
4.2	Is verification of qualifications/ experience for all semi-skilled and skilled labor done? If so, by which documents?	
4.3	Is contact information of labor's next of kin kept for each labourer?	
4.4	How many laborers have been employed from State Employment Exchange?	

V. FACILITIES					
5.1	Details of labor camps	Number	Permanent or temporary	Location	Distance from nearest village or habitation
		1…			
		2…			

5.2	Type of housing in labour camp on leased land (temporary shelters, kuchha, or pukka)	
5.3	Is there any housing on public land like roadsides, open fields, and other spaces?	
5.4	Is there any housing in rented accommodation in residential areas? If so, who is it rented by?	
5.5	How many laborers have families on or near worksite?	
5.6	Is drinking water available on-site and at the campsite?	
5.7	Are latrines and urinals provided on-site and at the campsite?	
5.8	Are first aid facilities provided on site?	
5.9	Does a doctor visit the worksite or campsite regularly?	
5.10	Is there a tie-up with a hospital or dispensary near the worksite or campsite?	
5.11	Is woollen clothing or rainwear provided?	
5.12	Is there a provision for a crèche or nursery?	
5.13	Is there a facility for cooking or canteen facility for all labor?	

5.14	Are leisure activities or facilities available for all labor	
5.15	Is transport to and from the worksite provided to labour?	
	Is there a mechanism in place for addressing grievances within the workplace? Note:	

VI. SUPERVISION BY LABOR OFFICIALS		
6.1	Has the worksite or campsite been inspected by a labour official?	
6.2	How many times has the worksite or campsite been inspected by a labor official since commencement of work?	
6.3	What documents were inspected by labor officials?	
6.4	What documents were maintained and which ones were not?	
6.5	What directions were given by labor officials?	
6.6	What is the mode of compliance with such directions?	
6.7	Are you facing any legal proceedings on labor issues in Labour Court, Commissioner for Employees' Compensation, or other?	

VII. STATUTORY DISPLAY	
7.1	Display of the abstract of relevant labour laws

7.1.2	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 (BOCW Act) ***(Yes/No)***	
7.1.3	The Contract Labour Act, 1970 ***(Yes/No)***	
7.1.4	The Payment of Wages Act, 1936 ***(Yes/No)***	
7.1.5	Payment of Gratuity Act, 1972 ***(Yes/No)***	
7.1.6	Employee Compensation Act, 1923 ***(Yes/No)***	
7.1.7	The Maternity Benefit Act, 1961 ***(Yes/No)***	
7.1.8	The Minimum Wages Act, 1948 ***(Yes/No)***	
7.2	The rate of wages of employees, category of workers, working hours, weekly rest, date of payment of wages, date of unpaid wages, name and contract details of the labor inspectors (local) at the workplace. ***(Yes/No)***	
7.3	The code of conduct of workers	
7.4	Display of notice of Child and Adolescent Labor under Child Labour (Prohibition and Regulation) Amendment Act, 2016 ***(Yes/No)***	
7.5	Display ICC under the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act) ***(Yes/No)***	
7.6	Display of emergency telephone numbers ***(Yes/No)***	
7.7	Display of hazards ***(Yes/No)***	
7.8	Signage for referral pathway of emergency exit plan and other remarkable points, for example, assembly area, entry path, exit path, store, site office, labor camp, kitchen, assembly area, dining, and so on; code of conduct ***(Yes/No)***	
7.9	Display health and safety signage ***(Yes/No)***	
7.10	Display of grievance redressal committee ***(Yes/No)***	

VIII. ACCIDENTS, EMERGENCIES, AND INCIDENTS		
8.1	What is the nature of accidents or emergencies usually occurring at a worksite like yours?	
8.2	Is a functioning first aid available at the campsite or worksite?	
8.3	Is functioning fire-fighting equipment available at the campsite or worksite?	

8.4	Which is the nearest doctor, clinic, or dispensary?	
8.5	Which is the nearest hospital?	
8.6	Which is the nearest police station?	
8.7	Are details of the nearest doctor, clinic, dispensary, hospital, or police station available and prominently displayed at worksite or campsite?	
8.8	What is the system of informing next of kin?	
8.9	Do you have ESI or ECA coverage?	
8.10	What is your familiarity with accident reporting procedures?	
8.11	What is your familiarity with police reporting procedures?	
8.12	Has an internal complaints committee been constituted and other appropriate measures undertaken at the workplace as per the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013	

IX. HEALTH AND SAFETY		
9.1	Have you established a safety committee at the workplace?	
9.2	Have you appointed safety officer at the workplace?	
9.3	Have you developed a health and safety policy tailored specifically for the project?	
9.4	Have you completed the hazard identification and risk analysis (HIRA) on your side?	
9.5	Are you implementing measures for fire safety at the workplace, including the installation of fire extinguishers?	
9.6	Is a functioning first aid available at the campsite or worksite?	
9.7	Have you provided a sufficient amount of personal protective equipment to all employees?	
9.8	Have you conducted a safety audit at the site?	
9.9	Have you created a comprehensive plan for responding to emergencies and ensuring preparedness?	

9.10	Have you placed warning indicators and safety barriers at the workplace?	
9.11	Are you taking steps to maintain the secure and orderly arrangement of construction materials at the sites?	
9.12	What procedures are followed to inform the authorities regarding an accident or incident?	
9.13	Do you provide safety training to the workers?	
9.14	Have you carried out a mock drill in relation to emergency procedures?	

Annexure IX: Template For Grievance Redressal Mechanism

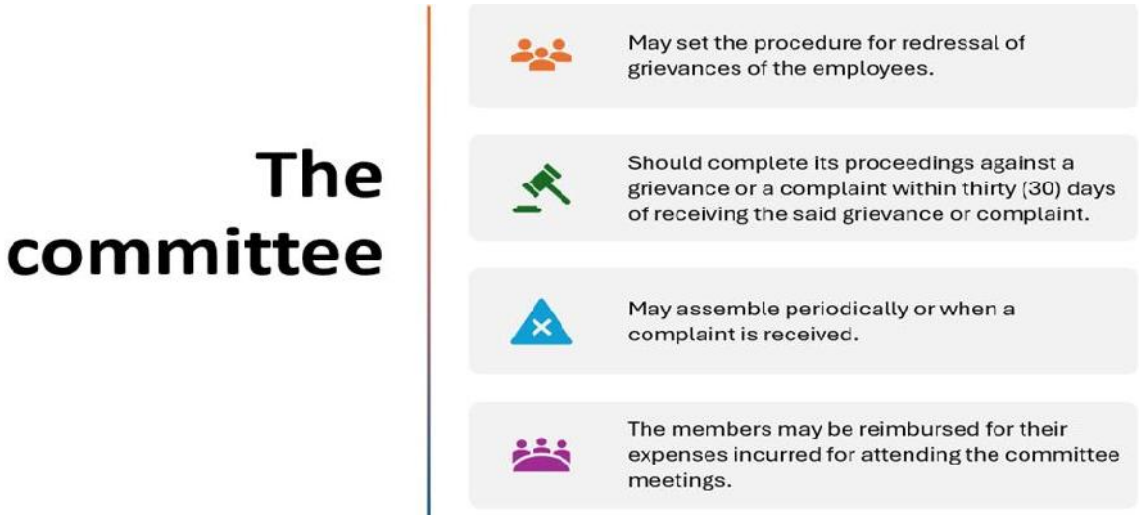
Grievance Redressal Mechanism for the labours or workers of the contractor

In addition to the above mechanism, the contractor will provide a mechanism for the labour to register their complaints.

As per the Industrial Disputes Act, 1947 the employer shall set up a Grievance Redressal Committee, once the workplace has more than 20 employees and shall continue to maintain it regardless of employee count. The Grievance Redressal Committee shall comprise a maximum of six (6) members. The committee shall have followed constitution:

14. It shall consist of equal number of members from the employer and the employees.
15. The chairperson of the committee shall be selected from the employer and employees on rotational basis every year.
16. For every two members of the committee, one shall be a woman

Notice: A notice may be posted at the workplace to inform the employees of the committee details and procedure. In the alternative, a grievance or complaints drop box facility may be set up, which can be cleared periodically by the committee members. Note: The Grievance Redressal Committee set up at a workplace does not take away from the employee the right to approach the courts, tribunals or the authorities.



No sitting fee for the member has been mandated under the law, and appointment must be seen as voluntary and gratis.

The committee can redress disputes arising from industrial grievances of the employees, which is any dispute or difference between employers, principal or contract, and employee or between employees, which is connected with the employment/ non-employment /terms of employment/conditions of labour

These are, but not limited to: wages, including the period and mode of payment; compensatory and other allowances; Hours of work and rest intervals; leave with wages and holidays; bonus, profit sharing, provident fund and gratuity; shift working; classification by grades; rules and proceedings of discipline; rationalization and retrenchment of employees.

Stage	Description	Actions	Timeframe
1	Submission of grievance	Worker submits grievance in writing or verbally to the designated authority.	Within 24 hours of occurrence of grievance
2	Receipt acknowledgement	The designated authority acknowledges receipt of the grievance.	Within 48 hours of receipt of grievance
3	Investigation	The designated authority investigates the grievance thoroughly.	Within 7 days of receipt of grievance
4	Resolution	The designated authority proposes a solution and communicates it to the laborer.	Within 15 days of receipt of grievance
5	Appeal process	If the worker is unsatisfied with the resolution, they can appeal to a higher authority.	Within 3 days of receiving the resolution
6	Review and final decision	The higher authority reviews the appeal and makes a final decision.	Within 7 days of receiving the appeal
7	Implementation	If the decision favors the worker, the designated authority implements the resolution.	Within 7 days of the final decision
8	Feedback	The laborer provides feedback on the resolution process.	Within 7 days of implementation

Annexure X: Template for Code of Conduct

Sr. No.	Code of conduct	Description
1	Punctuality and attendance	Workers are expected to arrive on time for work and maintain regular attendance as per the agreed-upon schedule.
2	Professionalism	Workers must conduct themselves in a professional manner at all times, including dressing appropriately, communicating respectfully, wearing personal protective equipment (PPE) and adhering to company policies and procedures.
3	Workplace safety	Workers should prioritize their safety and the safety of others by following all safety protocols, using PPE as required, and reporting any hazards or incidents promptly.
4	Respect for colleagues	Workers are expected to treat their colleagues with respect, dignity, and fairness, regardless of differences in role, background, or opinion. Bullying, harassment, discrimination, or any form of disrespectful behaviour will not be tolerated. Sexual harassment is strictly prohibited and may lead to legal actions. Refer to Code of Conduct given in GBV-GRM SoP 7. Ref: Appendix II-ESMP –c.Indicative list of items.
5	Confidentiality	Workers must respect the confidentiality of company or firms' information, customer data, and any other sensitive information they may have access to during the course of their work.
6	Compliance with laws and regulations	Workers are required to comply with all applicable laws, regulations, and industry standards relevant to their work, including but not limited to labor laws, health and safety regulations, and environmental protection laws.
7	Conflict of interest	Workers should avoid situations where their personal interests conflict with the interests of the company. If such conflicts arise, they must disclose them promptly to the appropriate authority.
8	Use of company resources	Workers should use company resources, including equipment, facilities, and funds

Sr. No.	Code of conduct	Description
		responsibly and only for authorized purposes. Personal use of company resources is prohibited. They can only be used in accordance with company policies.
9	Reporting violations	Workers are encouraged to report any violations of this code of conduct or any unethical behavior they observe to the appropriate authority without fear of retaliation.
10	Continuous improvement	Workers should strive for continuous improvement in their skills, knowledge, and performance to contribute positively to the company's goals and objectives.

Annexure XI: Abstract of the Contract Labour Act, 1971

(*Source:* World Bank's Handbooks and Toolkits for Labour Compliances in India EST Kit-1)

The act aims at the abolition of contract labor in respect of such categories as may be notified by the appropriate government and at regulating the service conditions of contract labor where abolition is not possible.

APPLICABILITY

- This act applies: To every establishment in which 50(AP act 21 of 2015) or more workmen are employed or were employed on any day of the preceding 12 months as contract labor. [Sec 1(4)(a)]
- To every contractor who employs or who employed on any day of the preceding 12 months 50(AP act 21 of 2015) or more workmen. [Sec 1(4)(a)]

To whom does it not apply?

It shall not apply to establishments in which work only of an intermittent or casual nature is performed [Sec 1(5)(a)]. If question arises whether work performed in an establishment is of an intermittent or casual nature, the appropriate government shall decide that question after consultation with the central board or, as the case may be, a state soard, and its decision shall be final [Sec 1(5)(b)]. For the purpose of this subsection, work performed in an establishment shall not be deemed to be an intermittent nature

- If it was performed for more than 120 days in the preceding 12 months; or
- If it is of a seasonal character and is performed for more than 60 days in a year.

Administration

The act is administered by the central or state advisory boards, as the case may be, whereon the labor commissioner will be a member. [Secs 3 and 4]

Who is principal employer?

The head of any office or department of government or local authority or, in a factory, the owner or occupier of the factory or a person named as the manager of the factory under the Factories Act, 1948, is the principal employer under the act. [Sec 2(g)]

What are wages?

For the purpose of this act, the expression "wages" shall have the same meaning assigned to it under the Payment of Wages Act.

Who is a workman?

"Workman" means any person employed in or in connection with a work of skilled, semi-skilled, or unskilled, manual, supervisory, technical, or clerical nature for hire or reward, whether terms of employment are express or implied. The expression "workman" does not include:

a) Any person employed mainly in a managerial or administrative capacity
b) A person being employed in a supervisory capacity but draws wages exceeding Rs 500 per mensem or exercises either by the nature of the duties attached to his office or by reason of the powers vested in him, functions mainly of a managerial nature
c) A person who is an out-worker, that is to say, a person to whom any articles or materials are given out on behalf of the principal employer to be made up, cleaned, washed, altered, ornamented, finished, repaired, adapted, or otherwise processed for sale for the purpose of the trade or business of the principal employer and process is to be carried out either in the home of the out-worker or in some other premises, not being premises under the control and management of the principal employer. [Sec 2(i)]

Contractor to make payment of wages

The contractor shall be responsible for payment of wages to each contract worker employed by him, such amounts as wages and at such intervals as are agreed upon in the contract. The contractor should ensure that the wages are disbursed in the presence of an authorized representative of the principal employer. [Sec 21]

The obligations of the principal employer

In the case the contractor fails to make payment of wages within the prescribed period or makes short payment, the principal employer shall be liable to make payment of wages in full or the unpaid balance due, as the case may be, to the contract laborer employed by the contractor and recover the amount so paid from the contractor either by deduction from any amount payable to the contractor under any contract or as a debt payable by the Contractor. [Sec 21]

Employer's obligation

Every principal employer of an establishment shall, under this act, make an application to the registering officer in Form I for registration of his establishment. If the establishment fails to so register, it is prohibited to employ contract labor after the expiry of the period permitted for making the application. [Secs 7(1) and (2)]

Licensing of contractors

No employer shall undertake any work through contract labor except under the license issued by the licensing officer [Sec 11]. Such license will contain conditions as to hours of work, fixation of wages, and other essential amenities for the contract employees. Such license shall be valid for a specific period whereafter the employer may apply for renewal [Sec 12(2)]. Any appeal against an order of the licensing officer may be made by the employer within 30 days before the appellate officer nominated by the government. [Sec 15]

Welfare, safety, and health measures

Every principal employer governed by this act is responsible for maintaining such standards of welfare, safety, and health of contract laborers as prescribed in detail in the act. [Secs 16–21]

Registers and records

Registers of contractors: Every principal employer shall maintain, in respect of each registered establishment, a register of contractors in Form XII. [Rule 74]

Employment card: a) Every contractor shall issue an employment card in Form XIV to each worker within three days of employment of the workers.
b) The card shall be maintained up to date, and any change in the particulars shall be entered therein. [Rule 76]

Service certificate: On termination of employment for any reason whatsoever, the contractor shall issue to the workman whose service have been terminated a service certificate in Form XV. [Rule 77]

Muster roll, wages register, deduction register, and overtime register: Every contractor shall, in respect of each job on which he engages contract labor [Rule 78]:

- Maintain a muster roll and registers of wages in Forms XVI and XVII, respectively, provided that a combined register of wage-cum-muster roll in Form XVIII shall be maintained by the contractor where the wage period is a fortnight or less;
- Maintain a register of deductions for damage or loss, register of fines and registers of advances in Form XX, Form XXI, and Form XXII, respectively; and
- Maintain a register of overtime in Form XXIII recording therein the numbers of hours of, and wages paid for, overtime work if any.

Every contractor shall obtain the signature or thumb impression of the worker concerned against the entries relating to him on the register of wages or muster roll-cum-wages register, as the case may be, and the entries shall be authenticated by the initials of the contractor or his authorized representative and shall also be duly certified by the authorized representative of the principal employer in the following manner:

The authorized representative of the principal employer shall record under his signature a certificate at the end of the entries in the register of wages or the register of wages-cum-muster roll), as the case may be, in the following form: “Certified that the amount shown in column no……has been paid to the workman concerned in my presence on (date) a (place) or deposit in concerned laborer’s bank account.”

Display of the act: Every contractor shall display an abstract of the act and rules in English and Hindi and in the language spoken by the majority of workers in such form as may be approved by the chief labor commissioner (central advisory board)(Rule 79). The contractor shall also display notices showing rates of wages, hours of work, wage period, dates of payment of wages in conspicuous places at the establishment and the worksite. [Rules 80–81 (1) and (2)]

Returns

Every principal employer shall, within 15 days of the commencement or completion of each contract job under each contractor, submit a return to the inspector intimating the actual dates of commencement and completion of such contract work in Form VI-B [Rule 81(3)]. Every contractor shall send half yearly returns in Form XXIV (in duplicate) so as to reach the licensing officer concerned not later than 30 days from the close of the half year [Rule 82(1)]. Every principal employer of registered establishment shall send annually a return in Form XXV (in duplicate) so as to reach the registering officer concerned not later than February 15 following end of the year to which it relates. [Rule 82(2)]

Penalties

Contravention of provisions of the act will attract punishment by way of imprisonment or fine or both.

Annexure XII: Abstract of the Building and Other Construction Workers' (Regulation of Employment and Condition of Service) Act, 1996

(*Source:* World Bank's Handbooks and Toolkits for Labour Compliances in India EST Kit-1)

An act to regulate the employment and conditions of service of building and other construction workers and to provide for their safety, health, and welfare measures and for other matters connected therewith or incidental thereto.

APPLICABILITY

This act applies:

- To every establishment in which 10 or more workmen are employed or were employed on any day of the preceding 12 months as building workers. [Sec 1(4)]

Explanation: For the purpose of this subsection, the building workers employed in different relays in a day either by the employer or the contractor shall be taken into account in computing the number of the building workers employed in the establishment. [Sec 1(4)]

Administration

The act is administered by the central or state advisory committee, as the case may be, whereon the labor commissioner will be a member. [Secs 3 and 4]

Important definitions

a) **Beneficiary** means a building worker registered under Section 12.
b) **Building or other construction work** means the construction, alteration, repairs, maintenance, or demolition of, or, in relation to, buildings, streets, roads, railways, tramways, airfields, irrigation, drainage, embankment and navigation work; flood control works (including storm water drainage works); generation, transmission, and distribution of power; water works (including channels for distribution of water); oil and gas installations; electric lines, wireless, radio, television, telephone, telegraph, and overseas communications; dams, canals, reservoirs, watercourses, tunnels, bridges, viaducts, aqueducts, pipelines, towers, cooling towers, transmission towers, and such other work as may be specified in this behalf by the appropriate government, by notification, but does not include any building or other construction work to which the provisions of the Factory Act, 1948 (63 of 1918), or The Mines Act, 1932 (35 of 1952), apply.
c) **Building worker** means a person who is employed to do any skilled, semi-skilled, or unskilled, manual, supervisory, technical, or clerical work for hire or reward, whether the terms of employment be express or implied, in connection with any building or other construction work but does not include:
    i. Any person employed mainly in a managerial or administrative capacity; or
    ii. A person being employed in a supervisory capacity but draws wages exceeding Rs 1600 per mensem or exercises either by the nature of the duties attached to his office or by reason of the powers vested in him, functions mainly of a managerial nature.
d) **Employer** means the owner and includes:

i. In relation to a building or other construction work carried on by or under the authority of any department of the government, directly without any contractor, the authority specified in this behalf, or where no authority is specified, the head of the department;
ii. In relation to a building or other construction work carried on by or on behalf of a local authority or other establishment, directly without any contractor, the chief executive officer of that authority or establishment; and
iii. In relation to a building or other construction work carried on by or through a contractor, or by the employment of building workers supplied by a contractor, the contractor.

The responsibility of the employer

An employer shall be responsible for providing constant and adequate supervision of any building or other construction worker employed by him, and such wages shall be paid on or before such date as may be prescribed.

In case the contractor fails to make payment of wages within the prescribed period or makes short payment, then the employer shall be liable to make payment of wages in full or the unpaid balance due, as the case may be, to the building worker employed by the contractor and recover the amount so paid from the contractor either by deduction from any amount payable to the contractor under any contract or as a debt payable by the contractor. [Sec 45]

Employer's obligation

Every employer of an establishment shall, under this act, make an application to the registering officer in Form I for registration of his establishment. If the establishment fails to so register, it is prohibited to employ a building worker after the expiry of the period permitted for making the application. [Secs 7(1) and (2)]

RESPONSIBILITIES AND DUTIES OF EMPLOYERS, ARCHITECTS, PROJECT ENGINEERS, DESIGNERS, BUILDING WORKERS, AND OTHERS

A) Duties and responsibilities of employers, employees, and others

1. It shall be the duty of every employer who is undertaking any of the operations or works related to or incidental to building or other construction work to which these rules apply
   a. To comply with such of the requirements of these rules as are related to him provided that the requirements of this clause shall not affect any building worker if and so long as his presence in any place of work is not in the course of performing any work on behalf of his employer and he is not expressly or impliedly authorized or permitted by his employer to do the work: and
   b. To comply with such of the requirements of these rules as are related to him in relation to any work, act, or operation performed or about to be performed by him.

2. It shall be the duty of every employer who erects or alters any scaffold to comply with such of the requirements of the provisions of these rules as relates to the erection or alteration of scaffolds having regard to the purpose or purposes for which the scaffold is designed at the time of erection or alteration, and such employer who erects, installs, works, or uses any plant or equipment in a manner which complies with those provisions.
3. Where a contractor, who is undertaking any of the operations or works to which these rules apply, appoints any artisan, tradesman, or other person to perform any work or services under a contract for services, it shall be the duty of the contractor to comply with such of the requirements of these rules as affect that artisan, tradesman, or other person and for this purpose any reference in these rules to an employee shall include a reference to such artisan, tradesman, or other person, and the contractor shall be deemed to be his employer.
4. It shall be the duty of every employee to comply with the requirements of such of these rules as are related to the performance of or the refraining from an act by him and to cooperate in carrying out these rules.
5. It shall be the duty of every employer not to permit an employee to do anything not in accordance with the generally accepted principles of standard safe operating practices connected with building and other construction work as specified by the state government.
6. No employee shall do anything that is not in accordance with the generally accepted principles of standard safe operating practices connected with building and other construction work as specified by the state government.
7. No person related with any building and other construction work shall wilfully do any act that may cause injury to him or to others.
8. It shall be the duty of every employer not to allow lifting appliance, lifting gear, lifting device, transport equipment, vehicles, or any other device or equipment to be used by the building workers that does not comply with the provisions given in these rules.
9. It shall be the duty of the employer to maintain the latrines, urinals, washing facilities, and canteen in a clean and hygienic condition. The canteen shall be located in a place away from the latrines and urinals and polluted atmosphere and at the same time be easily accessible to the building workers.
10. It shall be the duty of the employer to abide by the dates fixed and notified by him for payment of wages for a period in accordance with these rules, and no change in such dates and such period shall be effected without notice to the building workers and the inspector. The employer shall ensure timely payment of wages as specified under these rules and at the place and time notified by him. Where the employer is a contractor, he shall ensure that the wages of building workers are paid in the presence of a representative of the employer of the establishment or owner of the premises from whom he has taken the work on contract and obtain signatures of such representative in token of having witnessed the payment of wages.
11. It shall be the duty of the employer to ensure that the lifting appliance, lifting gear, earth moving equipment, transport equipment, or vehicles used in the building or other construction work undertaken by him conforms to the requirements relating to testing, examination, and inspection of such equipment as provided under these rules. It shall be the duty of every person in the service of the government or any local or other public authority to comply with the requirements relating to him as given in these rules.

B) **Responsibilities of architects, project engineers, and designers**

1. It shall be the duty of the architect, project engineer, or designer responsible for the design of any project or part thereof or any building or other construction work to ensure that, at the planning stage, due consideration is given to the safety and health aspects of the building workers who are employed in the erection, operation, and execution of such projects and structures as the case may be.
2. Adequate care shall be taken by the architect, project engineer, and other professionals involved in the project not to include anything in the design that would involve the use of dangerous structure or other processes or materials hazardous to the health or safety of building workers during the course of erection, operation, and execution, as the case may be.
3. It shall also be the duty of the professionals involved in designing the buildings, structures, or other construction projects, to take into account the safety aspects associated with the maintenance and upkeep of the structures and buildings where maintenance and upkeep may involve special hazards.

C) Responsibilities of the person in the service of the state government and the board

1. It shall be the duty of every person in the service of the government of any state or a board to comply with the directions given by the central government from time to time to carrying into execution in that state the provisions of the act and these rules.

D) Duties and responsibilities of workers

1. It shall be the duty of every building worker to comply with the requirements of such of these rules as relate to him and act and cooperate in carrying out the requirements of these rules, and if he discovers any defects in the lifting appliance, lifting gear, or lifting device concerning any transport equipment or other equipment, to report such defects without unreasonable delay to his employer or foreman or other person in authority.
2. No building worker shall, unless duly authorized, or except in case of necessity, remove or interfere with any fencing, gangway, gear, ladder, hatch covering, lifesaving appliances, lighting, or other things whatsoever required by the act and these rules to be provided. If any of aforesaid things are removed, they shall be restored at the end of the period during which its removal was necessary by the person engaged in that work.
3. Every building worker shall use only means of access provided in accordance with these rules, and no person shall authorize or order another to use means of access other than such means of access.
4. It shall be the duty of a building worker to keep the latrines, urinals, washing points, canteen, and other facilities provided by the employer for securing his welfare in a clean and hygienic condition.

E) Exemption: The chief inspector of building and construction may, by order in writing and subject to such conditions and for such period as may be specified therein, exempt from all or any of the requirements of these rules to:

1. Any building or other construction work if the chief inspector is satisfied that such building work is confined to such workers where it is not convenient to take measures as provided in these rules;
2. Any appliance, gear, equipment, vehicle, or other device if the chief inspector is satisfied that the requirement of such appliance, gear, equipment, vehicle, or other device is not necessary for use, or equally effective measures are taken in lieu thereof;

3. Provided that the Chief Inspector shall not grant exemption under this rule unless he is satisfied that such exemption would not adversely affect the safety, health, and welfare of building workers.

Hours of work, welfare, and other conditions of service, safety, and health measures

Every employer governed by this act is responsible for maintaining such standards of hours of work, welfare, and other conditions of service, safety, and health measures of building workers as prescribed in detail in the act. [Rules 234 to 247]

Registers and records

Registers of building workers: Every employer shall maintain, in respect of each registered establishment, a register of building workers in Form XV. [Rule 240]

Service certificate: On termination of employment for any reason whatsoever, the employer shall issue to the workman whose service has been terminated a service certificate in Form XXIV. [Rule 241(2)(b]

Muster roll, wages register, deduction register, and overtime register: Every employer shall, in respect of each job on which he engages building workers [Rule 241]:

- Maintain a muster roll and registers of wages in Forms XVI and XVII, respectively, provided that a combined register of wage-cum-muster roll in Form XVIII shall be maintained by the employer where the wage period is a fortnight or less;
- Maintain a register of deductions for damage or loss, register of fines, and registers of advances in Form XIX, Form XX, and Form XXI, respectively;
- Maintain a register of overtime in Form XXII, recording therein the numbers of hours of, and wages paid for, overtime work if any; and
- Every employer shall, where the wage period is one week or more, issue wage book in Form XXIII to the building worker at least a day prior to the disbursement of wages to them. Every employer shall obtain the signature or thumb impression of the building worker concerned against the entries relating to him on the register of wages or muster roll-cum-wages register, as the case may be, and the entries shall be authenticated by the initials of the employer or his authorized representative.

Display of the act and notices

Every employer shall display an abstract of the act and rules in English and Hindi and in the language spoken by the majority of workers in such form as may be approved by the chief labor commissioner (central advisory board). [Rule 241(5)] The employer shall also display notices showing rates of wages, hours of work, wage period, and dates of payment of wages in conspicuous places at the establishment and the worksite. [Rule 249]

Returns

Every employer shall, at least 30 days before commencement or completion of any building or other construction work under his control, submit a return to the inspector, intimating the actual dates of commencement and completion of such contract work in Form IV. [Rule 239(1)]

Every employer shall send annual return in Form XXV (in duplicate) so as to reach the registering officer concerned not later than February 15 following the end of each calendar year with a copy to the Inspector having jurisdiction. [Rule 242]

Annexure XIII: Abstract of the Payment of Wages Act, 1936 and the Rules Thereunder

(*Source:* World Bank's Handbooks and Toolkits for Labour Compliances in India EST Kit-1)

Whom the act affects

1. The act applies to the payment of wages to persons employed in any factory or industrial establishment receiving less than Rs 24,000 per month.
2. No employed person can give up by contract or agreement his rights under the act.

Definition of wages

3. "Wages" means all remuneration (whether by way of salary, allowances, or otherwise) payable to an employed person in respect of his employment or of work done in such employment. It includes bonuses, if provided for expressly or implicitly in the contract of employment, and any sum payable for want of proper notice or discharge. It excludes the value of any house-accommodation, supply of light, water, medical attendance, or other amenity or any service excluded by the state government; any contribution paid by the employer to any pension or provident fund; any traveling allowance or the value of any traveling concession or other special expenses entitled by the employment; any sum paid to the employed person to defray special expenses entailed on him by the nature of his employment; and any gratuity payable on the termination of employment.

Responsibility for and method of payment of wages

4. The manager of the factory or industrial establishment is responsible for the payment under the act of wages to persons employed, and any contractor employing persons is responsible for the payments to the persons he employs.
5. No wage period shall exceed one month.
6. Wages shall be paid on a working day within 7 days or at the end of the wage period (or within 10 days if 1,000 or more persons are employed). The wages of the person discharged shall be paid not later than the second working day from the day on which his employment is discharged.
7. Payments in kind are prohibited.

Fines and deductions

8. No deduction shall be made from the wages of an employed person except those authorized by or under this act. (See paragraphs 9–15)
9. (a) Fines can be imposed only for such acts and omissions as the employer may, with the previous approval of the chief inspector of factories, specify by a notice displayed at or near the main entrance of the factory or industrial establishment and after giving the employed person an opportunity for explanation.
   (2) Fines:
   - shall not exceed 3 percent of the wages payable in a month;
   - Shall not be recovered by instalments, or later than 90 days of the date of Imposition;

- Shall be recorded in a register and applied to such purposes beneficial to the employed persons as approved by the chief inspector; and
- Shall not be imposed on a child.

10. (a) Deductions for absence from duty can be made only on account of the absence of the employed person at times when he should be working, and such deductions must not exceed an amount which is in the same proportion to his wages for the wage period at the time he was absent in that period and is to total time he should have worked.
    (b) If 10 or more employed persons, acting in concert, absent themselves without reasonable cause and without due notice, the deduction for absence can include wages for 8 days in lieu of notice, but no deduction for breaking a contract can be made from a person less than 15 years of age or a woman.

There must be provision in writing forming part of the contract of employment and requiring the employee to give notice of the termination of such employment, the period of such notice not exceeding either 15 days or the wage period, whichever is less; or the period of the notice that the employer is required to give of the termination of that employment. The above provision must be displayed at or near the main entrance of the factory or industrial establishment. No deduction of this nature can be made until a notice that this deduction is to be made has been posted at or near the main entrance of the factory or industrial establishment. No deduction must exceed the wages of the employed person for the period by which the notice he gives of leaving employment is less than the notice he should give under his contract.

11. Deductions for damage to or loss of goods expressly entrusted to an employed person or loss of money for which he is required to account, where such damage or loss is directly attributable to his neglect or default, such deduction cannot exceed the amount of the damage or loss caused and can be made only after giving the employed person an opportunity for explanation.
12. Deductions can be made, equivalent to the value thereof, for house accommodation, amenities, and services (other than foods and raw material) supplied by the employer provided these are accepted by the employed person as a part of the terms of his employment and have, in the case of amenities and services, been authorized by order of the state government.
13. (a) Deductions can be made for recovery of advances or for adjustment of overpayments of wages.
    (b) Advances made before the employment began can only be recovered from first payment of wages or a complete wage period, but no recovery can be made of advances given for traveling expenses before employment began.
    (c) Advances of unearned wages can be made at the employer's discretion during employment, but must not exceed the amount of two months wages without the permission of an inspector.
14. Deductions can be made for subscriptions to and for repayment of advances from any recognized provident fund.
15. Deductions can be made for payments to cooperative societies approved by the state government or subject to any conditioned imposed by the state government.

Inspections

16. An inspector can enter on any premises and can exercise powers of inspection (including examination of documents and taking of evidence) as he may deem necessary for carrying out the purpose of theact.

Complaints of Deductions or Delays

17. Where irregular deductions are made from wages or delays in payment take place, an employed person can make an application in the prescribed form within Twelve months to the authority appointed by the state government for the purpose. An application delayed beyond this period may be rejected unless sufficient cause for the delay is shown. Any legal practitioner, official of a registered trade union, inspector under the act, or other person acting with the permission of the authority can make the complaints on behalf of an employed person. A single person may be presented by or on behalf of any number of persons belonging to the same factory or industrial establishment the payment of whose wages has been delayed.

Action by the authority

18. The authority may award compensation to the employed person in addition to ordering the payment of delayed wages or the refund of illegal deductions. If a malicious or vexatious complaint is made, the authority may impose a penalty not exceeding Rs 375.00 on the applicant and order that it be paid to the employer.

Appeal against the authority

19. An appeal against an order or direction made by the authority may be referred within 30 days to the district court
    (a) By the employer, if the total sum directed to be paid exceeds RS 300; or
    (b) By any person directed to pay a penalty for a malicious or vexatious application.

Punishment for breaches of the act: Anyone delaying the payment of wages beyond the due date or making any unauthorized deduction from wages is liable to a fine up to Rs1500-7500, but only if prosecuted with the sanction of the authority or the appellate court.

20. The employer, who:

Does not fix a wage period, make payment in kind, fails to display at or near the main entrance of the factory or industrial establishment of this abstract in English and the language of the majority of the employed persons, contravenes certain rules made under the act and is liable to a fine not exceeding Rs 3750. A complaint to this effect can be made only by the inspector,or with his sanction.

Annexure XIV: Abstract of the Payment of Gratuity Act and Rules, 1972

(*Source:* World Bank's Handbooks and Toolkits for Labour Compliances in India EST Kit-1)

1. EXTENT OF THE ACT

The act extends to the whole of India:

Provided that in so far as it relates to plantations or ports, it shall not extend to the state of Jammu and Kashmir. [Sec 1(2)]

2. TO WHOM THE ACT APPLIES

The act applies to: (a) every factory, mine, oilfield, plantation, port, and railway company; (b) every shop or establishment within the meaning of any law for the time being in force in relation to shops and establishments in state, in which 10 or more persons are employed, or were employed, on any day of the preceding 12 months; and (c) such other establishment, or class of establishments, in which 10 or more employees are employed or were employed, on any day of the preceding 12 months, as the central government may, by notification, specify in this behalf. [Sec 1(3)]

3. DEFINITIONS

(a) "Appropriate government" means:

(i) In relation to an establishment:

- Belonging to or under the control of the central government
- Having branches in more than one state
- Of a factory belonging to or under the control of the central government,
- Of a major port, mine, oilfield, or railway company, of the central government,

(ii) In any other case, the state government. [Sec 2(a)]

(b) "Completed year of service" means continuous service for one year. [Sec 2(b)]

(c) "Continuous service" means uninterrupted service and includes service that is interrupted by sickness, accident, leave, lay-off, strike, or a lock-out or cessation of work not due to any fault of the employees concerned, whether such uninterrupted service was rendered before or after the commencement of this act.

Explanation I: In the case of an employee who is not in uninterrupted service for one year, he shall be deemed to be in continuous service if he has been actually employed by an employer during the 12 months immediately preceding the year for not less than

(i) 190 days, if employed below the ground in a mine, or

(ii) 240 days, in any other case, except when he is employed in a seasonal establishment.

Explanation II: An employee of a seasonal establishment shall be deemed to be in continuous service if he has actually worked for not less than 75 percent of the number of days on which the establishment was in operation during the year. [Sec 2(b)]

(d) "Controlling authority" means an authority appointed by an appropriate government under Sec. 3. [Sec 2(d)]

(e) "Family" in relation to an employee shall be deemed to consist of:

(i) In the case of a male employee, himself, his wife, his children, whether married or unmarried, his dependent parents, and the widow and children of his predeceased son, if any;

(ii) In the case of a female employee, herself, her husband, her children, whether married or unmarried, her dependent parents and the dependent parents of her husband and the widow and children of her predeceased son, if any:

Provided that if a female employee, by a notice in writing to the controlling authority, expresses her desire to execute her husband from her family, the husband and his dependent parents shall no longer be deemed for the purposes of this act to be included in the family of such female employee unless the said notice is subsequently withdrawn by such female employee.

Explanation III: Where personal law of an employee permits the adoption by him of a child, any child lawfully adopted by him shall be deemed to be included in his family, and where a child of an employee has been adopted by another person and such adoption is, under the personal law of the person making such adoption, lawful, such child shall be deemed to be excluded from the family of the employee. [Sec 2(h)]

4. NOMINATION

a) Each employee who has completed one year of service, after the commencement of the payment of Gratuity (Central) Rules, 1972, shall make within 30 days of completion of one year of service, a nomination. [Sec 6(1) read with Rule 8, 6(1)]
b) If an employee has a family at the time of making a nomination, the nomination shall be made in favor of one or more members of his family, and any nomination made by such employee in favour of a person who is not member of his family shall be void. [Sec 6(3)]
c) If at the time of making a nomination the employee has no family, the nomination can be made in favor of any person, but if the employee subsequently acquires a family, such nomination shall forthwith become invalid and the employee shall make within 90 days a fresh nomination in favor of one or more members of his family. [Sec 6(4) read with Rule 6(3)]
d) A nomination or a fresh nomination or a notice of modification shall be signed by the employee or, if illiterate, shall bear his thumb impression in the presence of two witnesses, who shall also sign a declaration to that effect in that nomination, fresh nomination, or notice of modification of nomination as the case may be. [Rule 6(5)]
e) A nomination may, subject to the provisions of Secs 6(3) and (4) be modified by an employee any time after giving to his employer a written notice of his intention to do so. [Sec 6(5)]
f) A nomination or fresh nomination or notice of modification of nomination shall take effect from the date of receipt of the same by the employer. [Rule 6(6)]

5. APPLICATION FOR GRATUITY

a) An employee who is eligible for payment of gratuity under the act, or any person authorized in writing to act on his behalf, shall apply ordinarily within 30 days from the date the gratuity become payable, provided that where the date of superannuation or retirement. [Rule 7(1)]
b) A nominee of an employee who is eligible for payment of gratuity shall apply, ordinarily within one month from the date the gratuity became payable to him, to the employer. [Rule 7(2)]

c) A legal heir of an employee who is eligible for payment of gratuity shall apply, ordinarily within one year from the date the gratuity became payable to him, to the employer. [Rule 7(3)]

d) The employer shall also entertain an application for payment of gratuity filed after the expiry of the periods specified above, if the applicant adduces a sufficient cause for the delay. [Rule 7(5)]

6. PAYMENT OF GRATUITY

1. Gratuity shall be payable to an employee on the termination of his employment after he has rendered continuous service for not less than five years:

a. On his superannuation:

b. On his retirement or resignation:

c. On his death or disablement due to accident or disease:

Provided that the completion of continuous service of 5 years shall not be necessary where the termination of the employment of any employee is due to death or disablement:

Provided further that in case of death of the employee, gratuity payable to him shall be paid to his nominee or, if no nomination has been made, to his heirs, and where any such nominees or heirs are a minor, the shares of such minor, shall be deposited with the controlling authority who shall invest the same for the benefit of such minor in such bank or other financial institution, as may be prescribed, until such minor attains majority.

Disablement means such disablement that incapacitates an employee for the work which he was capable of performing before the accident resulting in such disablement. [Sec 4(1)]

2. For every completed year of service or part thereof in excess of 6 months, the employer shall pay gratuity to an employee at the rate of 15 days wages based on the rate of wages last drawn by the employee concerned:

Provided that in the case of a piece-rated employee, daily wages shall be computed on the average of the total wages received by him for a period of three months immediately preceding the termination of his employment, and, for this purpose, the wage paid for any overtime work shall not be taken into account:

Provided further that in the case of an employee employed in seasonal establishment, the employer shall pay the gratuity at the rate of seven days' wages for each season. [Sec 4(2)]

Examination: In case of a monthly rated employee, the 15 days' wages shall be calculated by dividing the monthly rate of wages last drawn by him by 26 and multiplying quotient by 15.

3. The amount of gratuity payable to an employee shall not exceed Ten Lakhs Rupees. [Sec 4(3)]

7. FORFEITURE OF GRATUITY

1) The gratuity of an employee, whose services have been terminated for any act, wilful omission, or negligence causing any damages or loss to, or destruction of, property belonging to the employer, shall be forfeited to the extent of the damages or loss so caused.

2) The gratuity payable to an employee shall be wholly forfeited
   a. If the services of such employee have been terminated for his riotous or disorderly conduct or any other act of violence on his part: or
   b. If the services of such employee have been terminated for any act which constitutes an offense involving moral turpitude, provided that such offense is committed by him in the course of his employment. [Sec 4(6)]

8. NOTICE OF OPENING, CHANGE, OR CLOSURE OF THE ESTABLISHMENT

1) A notice shall be submitted by the employer to the controlling authority of the area within 30 days of any change in the name, address, employer, or nature of business. [Rule 3(2)]
2) Where an employer intends to close down the business, he shall submit a notice to the controlling authority of the area at least 60 days before the intended closure. [Rule 3(3)]

9. APPLICATION TO CONTROLLING AUTHORITY FOR DIRECTION—IF AN EMPLOYER

1) Refuses to accept a nomination or to entertain an application for payment of gratuity
2) Issues a notice either specifying an amount of gratuity that is considered by the applicant less that what is payable or rejecting eligibility to payment of gratuity
3) Having received an application for payment of gratuity, fails to issue notice within 15 days, the claimant employee, nominee, or legal heir, as the case may be, may within 90 days of the occurrence of the cause for the application, apply to the controlling authority for issuing a direction under Sec. 7(4) with as many extra copies as are the opposite party: Provided that controlling authority may accept any application on sufficient cause being shown by the applicant after the expiry of the period of 90 days. [Rule 10].

10. APPEAL

Any person aggrieved by an order of the controlling authority may, within 60 days from the date of the receipt of the order, prefer an appeal to the regional labor commissioner (central) of the area who has been appointed as the appellate authority by the central government: Provided that the appellate authority may, if it satisfied that the appellant was prevented by sufficient cause from preferring the appeal within the said period of 60 days, extend the said period by a further period of 60 days. [Sec 7(7)]

11. MACHINERY FOR ENFORCEMENT OF THE ACT OR RULES IN CENTRAL SPHERES

All assistant labor commissioners have been appointed as controlling authorities and all the regional labor commissioners as appellate authorities.

12. POWERS OF THE CONTROLLING AUTHORITY

The controlling authority, for the purpose of conducting an inquiry as to the amount of gratuity payable to an employee or as to the admissibility of any claim of, or in relation to, an employee for payment of gratuity, or as to the person entitled to receive the gratuity, shall have the same powers as are vested in court, under the Code of Civil Procedure, 1908, in respect of the following matters, namely:

a) Enforcing the attendance of any person or examining him on oath;
b) Requiring the discovery and production of documents;
c) Receiving evidence on affidavits; and
d) Issuing commissions for the examination of witnesses. [Sec 7(5)]

13. RECOVERY OF GRATUITY

If the amount of gratuity payable is not paid by the employer, within the prescribed time, to the person entitled thereto, the controlling authority shall, on an application made to it in this behalf by the aggrieved person, issue a certificate for that amount to the collector, who shall recover

the gratuity, together with compound interest thereon at the rate as prescribed by the government, from the date of expiry of the prescribed time, as arrears of land revenue and pay the same to the person entitled thereto. [Sec 8]

14. PROTECTION OF GRATUITY

No gratuity payable under the Payment of Gratuity Act and rules made thereunder shall be liable to attachment in execution of any decree or order of any civil, revenue, or criminal court. [Sec 13]

15. PENALTIES FOR OFFENSES

1. Whoever, for the purpose of avoiding any payment to be made by himself or of enabling any other person to avoid such payment, knowingly makes or causes to be made any false statement or false representation, shall be punishable with imprisonment for a term which may extend to 6 months, or with a fine which may extend to Rs 10,000, or with both.[Sec 9(1)]
2. An employer who contravenes, or makes defaults in complying with, any of the provisions of the act or any rule or order made thereunder shall be punishable with imprisonment for a term which may extend to one year, or with a fine which may extend to Rs20,000 or with both:

Provided that if the difference relates to nonpayment of any gratuity payable under the Payment of Gratuity Act, the employer shall be punishable with imprisonment for a term which shall not be less than six months unless the court trying the offense, for reasons to be recorded by it in writing, is of opinion that a lesser term of imprisonment or the imposition of a fine would meet the ends of justice. [Sec 9(2)].

16. DISPLAY OF NOTICE

The employer shall display conspicuously a notice at or near the main entrance of the establishment in bold letters in English and in the language understood by the majority of the employees specifying the name of the officer with designation authorized by the employer to receive on his behalf notices under the Payment of Gratuity Act, or the rules made thereunder. [Rule 4J]

17. DISPLAY OF ABSTRACT OF THE ACT AND RULES

The employer shall display an abstract of the Payment of Gratuity Act and the rules made thereunder in English and in the language understood by the majority of the employees at a conspicuous place at or near the main entrance of the establishment. [Rule 20]

Annexure XV: Abstracts of the Employee Compensation Act, 1923

(*Source:* World Bank's Handbooks and Toolkits for Labour Compliances in India EST Kit-1)

1. **Definitions: [**Section 2(1), Section 2(1)(d)]. (a) "Dependent" means any of the following relatives of a deceased workman, namely:
    1. A widow, a minor legitimate son, and unmarried legitimate daughter, or widowed mother; and
    2. If wholly dependent on the earnings of the workman at the time of his death, a son or a daughter who has attained the ages of 18 years and who is infirm.
    3. If wholly or in part dependent on the earnings of the workman at the time of his death:
        a) A widower
        b) A parent other than a widowed mother
        c) A minor illegitimate son, an unmarried illegitimate daughter, or a daughter legitimate or illegitimate if married and a minor or if widowed and a minor
        d) A minor brother or an unmarried sister or a widowed sister if a minor
        e) A widowed
        f) A minor child of a predeceased son
        g) A minor child of a predeceased daughter where no parent of the child is alive
        h) A paternal grandparent if no parent of the workman is alive.
        i) Section 2(1)(g): "Partial disablement" means where the disablement is of a temporary nature, such disablement as reduced the earning capacity of a workman in any employment in which he was engaged at the time of the accident resulting in the disablement, and where the disablement is of a permanent nature such disablement as reduces his earning capacity in every employment which he was capable of undertaking at that time: provided that every injury specified in Schedule I, shall be deemed to result in permanent partial disablement.
        j) Section 2(1): "That disablement" means such disablement, whether of temporary or permanent in nature, as incapacitates a workman for all work which he was capable of performing at the time of the accident resulting in such disablement; permanent total disablement shall be deemed to result from the permanent total loss of the sight of both eyes or from any combination of injuries specified in Schedule I where the aggregate percentage of the loss of earning capacity, as specified in that Schedule against those injuries, amounts to 100 percent.
        k) Section 2(I)(dd): "employee" means a person, who is {i) a railway servant as defined in clause (34) of section 2 of the Railways Act, 1989, not permanently employed in any administrative 24 of 1989. district or sub-divisional office of a railway and not employed in any such capacity as is specified in Schedule II; or (ii) (a) a master, seaman or other member of the crew of a ship, (b) a captain or other member of the crew of an aircraft, (c) a person recruited as driver, helper, mechanic, cleaner or in any other capacity in connection with a motor vehicle, (d) a person recruited for work abroad by a company, and who is employed outside India in any such capacity as is specified in Schedule II and the ship, aircraft or motor vehicle, or company, as the case may be, is registered in India; or (iii) employed in any such capacity as is

specified in Schedule II, whether the contract of employment was made before or after the passing of this Act and whether such contract is expressed or implied, oral or in writing; but does not include any person working in the capacity of a member of the Armed Forces of the Union; and any reference to any employee who has been injured shall, where the employee is dead, include a reference to his. dependants or any of them;

2. Section 3(1): Employer's liability for compensation:

If personal injury is caused to a employee by accident arising out of and in the course of his employment, his employer shall be liable to pay compensation in accordance with the provisions of chapter II of the act, provided that the employer shall not be so liable:

a) In respect of any injury that does not result in the total or partial disablement of the workmen for a period exceeding three days;
b) In respect of any injury not resulting in death caused by an accident which is directly attributable to:
   i) The employee having been at the time thereof under the influence of drink or drugs;
   ii) The willful disobedience of the employee to an order expressly given, or to a rule expressly framed, for the purpose of securing the safety of workmen; or
   iii) The willful removal or disregard by the employee of any safety guard or other device that he knew to have been provided for the purpose of securing the safety of workmen.

3. Section 4:

a) Amount of compensation: Subject to the provision of this act, the amount of compensation shall be as follows, namely: where death results from the injury an amount equal to fifty per cent. of the monthly wages of the deceased *[employee] multiplied by the relevant factor; or an amount of *[one lakh and twenty thousand rupees], whichever is more;
b) where permanent total disablement results from the injury : an amount equal to sixty per cent. of the monthly wages of the injured *[employee] multiplied by the relevant factor; *[one lakh and twenty thousand rupees], whichever is more;
   Explanation I.--For the purposes of clause (a) and clause (b), "relevant factor", in relation to a *[employee] means the factor specified in the second column of Schedule IV against the entry in the first column of that Schedule specifying the number of years which are the same as the completed years of the age of the *[employee] on his last birthday immediately preceding the date on which the compensation fell due.
c) Where permanent partial disablement results from the injury:
   i. In the case of an injury specified in Part II Schedule I, such percentage of the compensation which would have been payable in the case of permanent total disablement as is specified therein as being the percentage of the loss of earning capacity caused by that injury; and
   ii. In the case of an injury not specified in Schedule I, such percentage of the compensation payable in the case of permanent total disablement, as is proportionate to the loss of earning Capacity (as assessed by the qualified medical practitioner) permanently caused by the injury:

Explanation: Where more injuries than one are caused by the same accident, the amount of compensation payable under this head shall be aggregated but not so in any case as to exceed

the amount that would have been payable if permanent total disablement had resulted from the injuries.

d) Where temporary disablement, where total or partial, results from the injury : a half monthly payment of the sum equivalent to twenty-five per cent. of monthly wages of the *[employee], to be paid in accordance, payable on the sixteenth day:
   i. From the date of the disablement, where such disablement lasts for a period of twenty-eight days or more; or
   ii. After expiry of a waiting period of three days from the date of the disablement, where such disablement lasts for a period of less than 28 days, and thereafter half- monthly during the disablement or during a period of 5 years, whichever period is shorter;

Provided that:

a) There shall be deducted from any lump sum or half-monthly payments to which the employee is entitled the amount of any payment or allowance that the workman has received from the employer by way of compensation during the period of disablement prior to the receipt of such lump sum or of the first half-monthly payment, as the case may be;
b) No half-monthly payment shall in any case exceed the amount, if any, by which one-half the amount of the monthly wages of the employee before the accident exceeds one-half the amount of such wages which he is earning after the accident; and
c) On the ceasing of the disablement before the date on any half-monthly payment falls due, there shall be payable in respect of half-month a sum proportionate to the duration of the disablement in that half-month.

4. Section 3(2) and (2-A): Occupational diseases for which compensation is payable

If a employee employed in any employment specified in Part A of Schedule III contracts any disease specified therein as an occupational disease peculiar to that employment, or, if a employee, while in the service of an employer in whose service he has been employed for a continuous period of not less than six months (which period shall not include a period of service under any other employer in the same kind of employment) in any employment specified in Part B of Schedule III, contracts any disease specified therein as an occupational disease peculiar to that employment, or if a employeewhile in the service of one or more employers in any employment, specified in Part C of Schedule III, for such continuous period as the central government may specify in respect of each such employment, contracts any disease specified therein as an occupational disease peculiar to that employment, the contracting of the disease shall be deemed to be an injury by accident within the meaning of this section and, unless the contrary is proved, the accident shall be deemed to have arisen out of, and in the course of the employment.

If any disease specified in Part C of Schedule III as an occupational disease peculiar to that employment has been contracted by any employee during the continuous period specified above in respect of that employment and the workman has during such period been employed in such employment under more than one employer, all such employers shall be liable for the payment of compensation under this act, in such proportion as the commissioner may, in the circumstances, deem just.

5. Section 9: Compensation not to be assigned, attached, or charged

Save as provided by this act, no lump sum or half-monthly payment payable under this act shall in any way be capable of being assigned or charged or be liable to attachment or pass to any person other than the workmen by operation of law, nor shall any claim be set off against the same.

6. Section 10: Notice and claim: (1) No claim for compensation shall be entertained by a commissioner unless notice of the accident has been given in the manner hereinafter provided as soon as practicable after the happening thereof and unless the claim is preferred before him within two years of the occurrence of the accident or, in case of death, within two years from the date of death: Provided that, where the accident is the contracting of a disease in respect of which the provisions of Section 3(2) are applicable, the accident shall be deemed to have occurred on the first of the days during which the employee was continuously absent from work in consequence of the disablement caused by the disease:

Provided further that the want of or any defect or irregularity in notice shall not be a bar to the entertainment of a claim:

a) If the claim is preferred in respect of the death of a employee resulting from an accident that occurred on the premises of the employer, or at any place where the employee at the time of the accident was working under the control of the employer or of any person employed by him, and the employee died on such premises or at such place, or on any premises belonging to the employer, or died without having left the vicinity of the premises or place where the accident occurred; or
b) If the employer or any one of several employers or any person responsible to the employer for the management of any branch of the trade or business in which the injured employee was employed had knowledge of the accident from any other source at or about the time when it occurred.

Provided, further, that the commissioner may entertain and decide any claim to compensation in any case notwithstanding that the notice has not been given, or the claim has not been preferred, in due as provided in this subsection, if he is satisfied that the failure so to give notice or prefer the claim, as the case may be, was due to sufficient cause.

1) Every such notice shall give the name and address of the person injured and shall state in ordinary language the cause of the injury and the date on which the accident happened, and shall be served on the employer or upon any one of several employers or upon any person responsible to the employer, for the management of any branch of the trade or business in which the injured workman was employed.
2) The state government may require that any prescribed class of employers shall maintain at their premises at which workmen are employed a notice-book in the prescribed form that shall be accessible at all reasonable times to any injured workman employed on the premises and to any person acting bona fide on his behalf.
3) A notice under this section may be served by delivering it at or sending it by registered post addressed to the residence or any office or place of business of the person on whom it is to be served, or, where a notice book is maintained, by entry in the notice book.

7. Section 12: Contracting: (1) Where any person (hereinafter referred to as the principal) in the course of or for purposes of his trade or business contracts with any other person (hereinafter referred to as the contractor) for the execution, by or under the contractor of the whole or any part of any work which is ordinarily part of the trade or business, the principal shall be liable to pay to any workman employed in the execution of the work any compensation which he would

have been liable to pay if that workman had been immediately employed by him and where compensation is claimed from the principal; this Act shall apply as if reference to the principal were substitute for references to the employer except that the amount of compensation shall be calculated with reference to the wages of the workman under the employer by whom he is immediately employed:

1) Where the principal is liable to pay compensation, he shall be entitled to be indemnified by the contractor, or any other person from whom the employee could have recovered compensation, and where a contractor who is himself a principal is liable to pay compensation or to indemnify a principal, he shall be entitled to be indemnified by any person standing to him in the relation of a contractor from whom the employee could have recovered compensation, and all questions as to the right to and the amount of any such indemnity shall, in default of agreement, be settled by the commissioner.
2) Nothing herein shall be construed as preventing a employee from recovering compensation from the contractor instead of the principal.
3) This provision shall not apply in any case where the accident occurred elsewhere than on, in, or about the premises on which the principal has undertaken or usually undertakes, as the case may be, to execute the work or which are otherwise under his control or management.

8. Section 17: Contracting out: Any contract or agreement whether made before or after the commencement of the Workmen's Compensation Act, whereby a employee relinquishes any right of compensation from the employer for personal injury arising out of or in the course of the employment, shall be null and void insofar as it purports to remove or reduce the liability of any person to pay compensation under this act.

9. Section 22(3): Form of application: If the applicant is illiterate or for any other reason is unable to furnish the required information in writing, the application shall, if the applicant so desires, be prepared under the direction of the commissioner.

10. Section 24: Appearance of parties: Any appearance, application, or act required to be made or done by any person before or to a commissioner (other than an appearance of a party which is required for the purpose of his examination as a witness) may be made or done on behalf of such person by a legal practitioner or by an official of an Insurance Company or a registered Trade Union or by an Inspector appointed under Section 8(1) of the Factories Act, 1948, or Section 5(1) of the Mines Act, 1952, or by any other officer specified by the state government in this behalf, authorized in writing.

Annexure XVI: Abstract of the Maternity Benefit Act, 1961

(*Source:* World Bank's Handbooks and Toolkits for Labour Compliances in India EST Kit-1)

1. No employer shall knowingly employ a woman during the 6 weeks immediately following the day of her delivery of miscarriage or medical termination of pregnancy, and no woman shall work in any establishment during the said period.
2. No pregnant woman shall, on a request being made by her in this behalf, be required by her employer to do during the period of one month immediately preceding the period of 6 weeks before the date of her expected delivery and also for any period during this period of 12 weeks for which she does not avail of leave of absence, any work which is of an arduous nature or which involves long hours of standing, or which in any way is likely to interfere with her pregnancy or the normal development of the fetus, or is likely to cause her miscarriage or otherwise to adversely affect her health.
3. Subject to the provisions of the act, every woman who has actually worked in an establishment of the employer from whom she claims maternity benefit for a period of not less than 80 days, including the days during which she was laid off, shall be entitled to, and her employer shall be liable for, the payment of maternity benefit at the rate of her average daily wages, or the minimum rate of wage fixed or revised under the Minimum Wages Act, 1948, or Rs 10 a day, whichever is highest, for the period of her actual absence not exceeding 8 weeks immediately preceding the day of delivery and the remaining period immediately following that day
4. Provided further that where a woman dies during the period for which maternity benefit is payable to her, the benefit shall be payable only for the days up to and including the day of her death. However, where the woman having been delivered of a child, dies during her delivery or during the remaining period of maternity benefit leaving behind in either case the child, the employer shall be liable for the payment of maternity benefit for the entire period of maternity benefit following the day of her delivery, but if the child also dies during the said period, then, for the days up to and including the day of the death of the child.
   (a) The amount of maternity benefit for the period preceding the date of her expected delivery shall be paid in advance by the employer to the woman on production of a certificate in Form B stating that she is pregnant and is expected to be delivered of a child within 6 weeks of the date of production of the certificate, and the amount due for the subsequent period shall be paid by the employer to the woman within 48 hours of production of the certificate in Form B or Form D stating that she has been delivered of a child or production of a certified extract from a birth register maintained under the provisions of any law for the time being in force.
5. (a) Any woman employed in an establishment and entitled to maternity benefit under the provisions of this act may give notice in writing in Form E to her employer, stating that her maternity benefit and any other amount to which she may be entitled under this act may be paid to her or to such person as she may nominate in the notice and that she will not work in any establishment during the period for which she receives maternity benefit.
   (b) In the case of a woman who is pregnant, such notice shall state the date from which she will be absent from work, not being a date earlier than 06 weeks from the date of her expected delivery.

(c) Any woman who has not given the notice when she was pregnant may give such notice as soon as possible after the delivery.

(d) On receipt of the notice, the employer shall permit such woman to absent herself from the establishment until the expiry of the remaining period of maternity benefit after the day of her delivery.

6. (a) Every woman entitled to maternity benefits under the act shall also be entitled to receive from her employer a medical bonus of Rs 1000/- if no prenatal, confinement and postnatal care is provided for by the employer free of charge. The medical bonus shall be paid along with the second installment of the maternity benefit.

   (b) In case of medical termination of pregnancy, a woman shall, on production of a certificate in Form B, be entitled to leave with wages of the rate of maternity benefit for a period of 1 month immediately following the day of her medical termination of pregnancy. The wages shall be paid within 48 hours of production of the certificate in Form B.

   (c) A woman suffering from illness arising out of pregnancy, delivery, premature birth of child, or miscarriage or medical termination of pregnancy or tubectomy operation shall, on production of a certificate in Form B, be entitled, in addition to the period of absence allowed to her on account of maternity or miscarriage or medical termination of pregnancy or tubectomy operation, as the case may be, to leave with wages at the rate of maternity benefit for a maximum period of one month. The wages for the leave period shall be paid within 48 hours of the expiry of that period.

7. Every woman delivered of a child who returns to duty after such delivery shall, in addition to the interval for rest allowed to her, be allowed in the course of her daily work two breaks of 15 minutes duration for nursing the child until the child attains the age of fifteen months. An extra sufficient period, depending upon the distance to be covered, shall be allowed for the purpose of the journey to and from the creche or the place where the children are left by women while on duty, provided that such extra period shall not be less than 5 minutes and more than 15 minutes duration.

8. (a) When a woman absents herself from work in accordance with the provisions of the act, it shall be unlawful for her employer to discharge or dismiss her during or on account of such absence or to give notice of discharge or dismissal on such a day that the notice will expire during such absence, or to vary to her disadvantage any of the conditions of her service.

   The discharge or dismissal of a woman at any time during her pregnancy, if the woman but for which discharge or dismissal would have been entitled to maternity benefit or medical bonus shall not have the effect of depriving her of the maternity benefit or medical bonus.

   Provided that where the dismissal is for one or more of the following acts, the employer may, by order in writing communicated to the woman, deprive her of the maternity benefit or medical bonus or both:

   (i) Willful destruction of employer's goods or property;
   (ii) Assaulting any superior or coemployee at the place of work;
   (iii) Criminal offense involving moral turpitude resulting in conviction in a court of law;
   (iv) Theft, fraud, or dishonesty in connection with the employer's business or property; and
   (v) Willful nonobservance of safety measures or rules on the subject or willful interference with safety devices or with fire-fighting equipment.

(b) Any woman deprived of maternity benefit or medical bonus or both may, within 60 days from the date on which the order of such deprivation is communicated to her, appeal in Form G to the competent authority, and his decision on such appeal whether the woman should or should not be deprived of maternity benefit or medical bonus or both, shall be final.

9. If a woman works in any establishment after she has been permitted by her employer to absent herself under the provisions of the act, she shall forfeit her claim to the maternity benefit for such period.

10. (a) Any woman claiming the maternity benefit or any other amount to which she is entitled under the act and any person claiming that payment due has been improperly withheld may make a complaint to the Inspector in writing in Form H or Form I, as the case may be.

(b) The inspector may, of his own motion or on receipt of a complaint in Form H or Form I, make an inquiry or cause an inquiry to be made, and if satisfied that payment has been wrongfully withheld, may direct the payment to be made in accordance with his orders.

(c) Any person aggrieved by the decision of the inspector may, within, 30 days from the date on which such decision is communicated to such person, appeal to the chief inspector.

(d) The decision of the competent authority where an appeal has been preferred to him or of the inspector where no such appeal has been preferred, shall be final.

11. (a) The employer shall supply to every woman employed by him at her request free of cost copies of Forms B, C, D, E, F, G, H, and I.

(b) The failure to submit a notice, appeal, or complaint in the prescribed form will not affect the right of a woman entitled to receive maternity benefit or any other amount due under the act. Where a notice, appeal, or complaint has been received in a form other than the prescribed form, the authority concerned shall within 15 days of the receipt of such notice, appeal, or complaint, require the woman to submit the notice, appeal, or complaint, as the case may be in the prescribed form.

(c) All entries in the muster-roll shall be made in ink and maintained up-to-date, and it shall always be available for inspection by the Inspector during working hours.

Annexure XVII: Minimum Wages (Central) Rules

FORM IX-A

(Rule 22)

Notice

Abstracts of the Minimum Wages Act, 1948 and the

Rules Made Thereunder

(*Source:* World Bank's Handbooks and Toolkits for Labour Compliances in India EST Kit-1)

I. Whom the act affects

1. (a) The act applies to persons engaged in scheduled employments or in specified class of work in respect of which minimum wages have been fixed.
   (b) No employee can give up by contract or agreement his rights insofar as it purports so reduce the minimum rates of wages fixed under the act.

II. Definition of wages

1) "Wages" means all remuneration payable to an employed person on the fulfilment of his contract of employment and includes house rent allowance. It excludes:
   (a) The value of any house accommodation, supply of light, water, medical attendance, or any other amenity or any service extended by general or special order of the appropriate government;
   (b) Contribution paid by the employer to any pension fund or provident fund or under any scheme of social insurance;
   (c) The travelling allowance or the value of any travelling concession;
   (d) The sum paid to the person employed to defray special expenses entailed by him by nature of his employment; and
   (e) Gratuity payable on discharge.
2) The minimum rate of wages may consist of:
   (a) A basic rate of wages and special allowance called the cost-of-living allowance;
   (b) A basic rate of wages with or without a cost-of-living allowance and the cash value of any concessions, like supplies of essential commodities at concession rates; and
   (c) An all-inclusive rate comprising basic rate, cost of living allowance, and cash value of concession, if any.
3) The minimum wages payable to employees of scheduled employments notified under Section 5, read with Section 3 or as revised from time to time under Section 10, read with Section 3, may be:
   a. A minimum time rate,
   b. A minimum piece rate,
   c. A guaranteed time rate, or
   d. An overtime rate,

differing with (i) different scheduled employments, (ii) different classes or work, (iii) different localities, (iv) different wage-periods, and (v) different age groups.

III. Computation and conditions of payment

The employer shall pay to every employee engaged in scheduled employment under him wages at a rate not less than the minimum rate of wages fixed for that class of employee. The

minimum wages payable under this act shall be paid in cash unless the government authorizes payment thereof either wholly or partly in kind.
Wage-period shall be fixed for the payment of wages at intervals not exceeding one month or such other longer period as may be prescribed.
Wage shall be paid on a working day within 7 days of the end of the wage-period or within 10 days if 1,000 or more persons are employed.
The wages of a person discharged shall be paid not later than the second working day after his discharge.
If an employee is employed on any day for a period less than the normal working day, he shall be entitled to receive wages for a full normal working day provided his failure to work is not caused by his unwillingness to work but by the omission of the employer to provide him with work for that period.
Where an employee does two or more classes of work to each of which a different minimum rate of wages is applicable, the employer shall pay to such employee in respect of the time respectively occupied in each such class of work, wages at not less than the minimum rate in force in respect of each such class.
Where an employee is employed on piece work for which minimum time rate and not a minimum piece-rate has been fixed, the employer shall pay to such employee wages at not less than the minimum time rate.

IV. Hours of work and holidays

The number of hours that shall constitute a normal working day shall be:

a) In the case of an adult, 9 hours;
b) In the case of a child, 4.5 hours.

The working day of an adult worker, inclusive of the intervals of rest, shall not exceed 12 hours on any day.
The employer shall allow a day of rest with wages to the employees every week. Ordinarily, Sunday will be the weekly day of rest, but any other day of the week may be fixed as such rest day. No employee shall be required to work on a day fixed as a rest day unless he is paid wages for that day at the overtime rate and is also allowed a substituted rest day with wages. (See Rule 23).
When a worker works in an employment for more than 9 hours on any day or for more than 48 hours in any week, he shall in respect of overtime worked be entitled to wages in scheduled employment other than agriculture, at double the ordinary rate of wages.

V. Fines and deductions

No deduction shall be made from wages except those authorized by or under the rules.

i) Deductions from the wages shall be one or more of the following kinds, namely:
   Fines: An employed person shall be explained to personally and also in writing the act or omission in respect of which the fine is proposed to be imposed and given an opportunity to offer any explanation in the presence of another person. The amount of the said fine shall also be intimated to him. It shall be subject to such limits as may be specified in this behalf by the central government. It shall be utilized in accordance with the directions of the central government.
ii) Deductions for absence from duty.
iii) Deductions for damage to or loss of goods entrusted to the employee for custody, or for loss of money for which he is required to account, where such damage or loss is directly

attributable to his neglect or default. The employed person shall be explained to personally and also in writing the damage or loss, in respect of which the deduction is proposed to be made and given an opportunity to offer any explanation in the presence of another person. The amount of the said deduction shall also be intimated to him. It shall be subject to such limits as may be specified in this behalf by the central government.

iv) Deductions for house accommodations supplied by the employer or by the state government or any authority constituted by a state government for providing housing accommodation.

v) Deductions for such amenities and services supplied by the employer as the central government may by general or special order authorize. These will not include the supply of tools and protectives required for the purposes of employment.

vi) Deductions for recovery of advances or for adjustment of overpayment of wages. Such advances shall not exceed an amount equal to wages for two calendar months of the employed person, and the monthly installment of deduction shall not exceed one-fourth of the wages earned in that month.

vii) Deductions of income tax payable by the employed person.

viii) Deductions required to be made by order of court or other competent authority.

ix) Deductions for subscription to and for repayment of advances from any provident fund.

x) Deductions for payment to cooperative societies or deductions for recovery of loans advanced by an employer from out of a fund maintained for the purpose by the employer and approved in this behalf by the central government or deductions made with the written authorization of the person employed for payment of any premium on his life insurance policy to the Life Insurance Corporation of India established under the Life Insurance Act, 1956 (31 of 1956).

xi) Deductions for recovery or adjustment of amount other than wages, paid to the employed person in error or in excess of what is due to him:

Provided that prior approval of the inspector or any other officer authorized by the central government in this behalf is obtained in writing before making the deductions, unless the employee gives his consent in writing to such deduction.

xii) Deductions made with the written authorization of the employed person (which may be given once generally and not necessarily every time a deduction is made) for the purchase of securities of the Government of India or of any state government or for being deposited in any Post Officer Savings Bank in furtherance of any savings scheme of any such government.

Every employer shall send annually a return in Form III showing the deduction from wages so as to reach the inspector not later than the February 1 following the end of the year to which it relates.

VI. Maintenance of registers and records

Every employer shall maintain at the work spot a register or wages in the form prescribed specifying the following particulars for each period in respect of each employed person:

(c) The minimum rates of wages payable

(d) The number of days in which overtime was worked

(e) The gross wages

(f) All deductions made from wages

(g) The wages actually paid and the date of payment.

Every employer shall issue wage slips in the form prescribed containing prescribed particulars to every person employed.

Every employer shall get the signature or the thumb impression of every person employed on the wage book and wage slips.

Entries in the wage book and wage slips shall be properly authenticated by the employer or his agent.

A muster roll, register of fines, register of deductions for damage or loss, and register of overtime shall be maintained by every employer at the work spot in the form prescribed.

Every employer shall keep exhibited at the main entrance to the establishment and its office notice in English and in a language understood by a majority of the workers of the following particulars in a clean and legible form:

a) Minimum rate of wages;
b) Abstracts of the Acts and the rules made thereunder; and
c) Name and address of the inspector.

Register of wages, muster roll, register of fines, register of deductions for damage or loss, and register of overtime shall be preserved for a period of three years after the date of last entry made therein.

All registers and records required to be maintained by an employer under the rules shall be produced on demand before the inspector provided that where an establishment has been closed, the inspector may demand the production of the registers and records in his office or such other place as may be nearer to the employers.

VII. Inspectors

An inspector can enter in any premises and can exercise powers of inspector (including examination of document and taking of evidence) as he may deem necessary for carrying out the purposes of the act.

VIII. Claims and complaints

Where an employee is paid less than the minimum rates of wages fixed for his class of work, or less than the amount due to him under the provisions of this act, he can make an application in the prescribed form within six months to the authority appointed for the purpose. An application delayed beyond this period may be admitted if the authority is satisfied that the applicant had sufficient cause for not making the application within such period.

Any legal practitioner, official of a registered trade union, inspector under the act, or other person acting with the permission of the authority can make the complaint on behalf of an employed person.

(A single application may be presented on behalf of or in respect of a group of employed persons whose wages have been delayed, if they are borne on the same establishment and their claim relates to the same wage-period or periods.)

A complaint under Section 22(a) relating to payment of less than the minimum rates of wages or less than the amount due to an employee under the provisions of the act can be made to the court only after an application in respect of the facts constituting the offense has been presented under Section 20 and has been granted wholly or in part, and the appropriate government or an officer authorized by it in his behalf has sanctioned the making to the complaint.

A complaint under Section 22(a) or 22(b) regarding contravention of the provisions relating to hours of work and weekly day of rest or other miscellaneous offenses relating to maintenance of

registers, submission of returns, and so on, can be made to the court by or with the sanction of an inspector. The time limits for making such complaints are one month from the date of grant of sanction by the Inspector, in the case of offense falling under Section 22(b) and six months from the date on which the offense is alleged to have been committed, in the case of offenses falling under Section 22(a).

IX. Action by the authority

The authority may direct the payment of the amount by which the minimum wages payable exceeds the amount actually paid, together with the payment of compensation not exceeding 10 times the amount of such excess. The authority may direct payment of compensation in cases where the excess is paid before the disposal of the application.

If a malicious or vexatious complaint is made, the authority may impose a penalty not exceeding Rs 50 on the application and order that it be paid to the employer.

Every direction of the authority shall be final.

X. Penalties for offense under the Act

Any employer who pays to any employee less than the amount due to him under the provisions of this act or infringes any order or rules in respect of normal working day or weekly holiday, shall be punishable with imprisonment of either description for a term which may extend to 6 months or with a fine which may extend to Rs 500 or with both.

Any employer who contravenes any provision of the act or of any rule or order made thereunder shall, if no other penalty is provided for such contravention by the act, be punishable with a fine which may extend to Rs 500. If the person committing any offense under the act is a company, every person who at the time the offense was committed, was in charge of and was responsible to the company for the conduct of the business of the company as well as the company shall be deemed to be guilty of the offense and shall be liable to be proceeded against and punished accordingly. No such person will be liable to punishment if he proves that the offense was committed without his knowledge or that he exercised all due diligence to prevent the commission of such offense.

Any director, manager, secretary, or other officer of the company with whose consent or connivance an offence has been committed is liable to be proceeded against and punished under the act.

Note: (a) “Company” means anybody corporate and includes a firm or other association of individuals.

(b) “Director” in relation to a firm means a partner in the firm.

XI. Minimum rates of wages fixed

Name of Undertakin.....

Sr. No.	Category of employee	Minimum wages

XII. Name and addresses of inspector(s)

Name	Address

Annexure XVIII: Notice Displaying Employment Details

(*Source:* World Bank's Handbooks and Toolkits for Labour Compliances in India EST Kit-1)

A notice in English or Hindi and a language understood by a majority of the employees (if any other), should be posted in a conspicuous place. This notice must set down the terms of employment, including the following details:

- The rate of wages of employees at the workplace
- The hours of work or work timings for the employees
- The weekly rest day
- The wage period for the employees, whether monthly, weekly, or fortnightly
- Date fixed for payment of wages to the employees
- Date fixed for payment of unpaid wages to the employees
- The contact details, such as name and address of the local labor inspector
- The list of acts or omissions at the workplace by an employee that are punishable or can legally invite a fine, along with amount of fine
- Any other terms as may be prescribed.

Annexure XIX: Form-A

[Under Rules-75, of The Contract Labour (Regulation and Abolition) Central Rules, 1971

FORMAT OF EMPLOYEE REGISTER

[PART A: FOR ALL ESTABLISHMENT]

Name of the Establishment.....Name of Owner.....LIN.....

Sl. no.	Employee code	Name	Surname	Gender	Father's or spouse's name	Date of birth	Nationality	Education level	Date of joining	Designation
1	2	3	4	5	6	7	8	9	10	11

Category address (HS/S/SS/US)	Type of employment	Mobile	UAN	PAN	ESIC ID	LWF	AADHAAR	Bank account number	Bank	Branch (IFSC)
12	13	14	15	16	17	18	19	20	21	22

Present address	Permanent address	Service book number	Date of exit	Reason for exit	Mark of identification	Photo	Specimen signature or thumb impression	Remarks
23	24	25	26	27	28	29	30	31

*Note: #*In case the age is between 14 to 18 years, mention the nature of work, daily hours of work, and intervals of rest in the remarks column.
AADHAAR = spell out; ESIC = spell out; HS = highly skilled; IFSC = spell out; LIN = spell out; PAN = spell out; S = skilled; SS = semi-skilled; UAN = spell out; US = unskilled.

Annexure XX: Form-B

[Under Rule Rule-78 (a) and (1) (i) The Contract Labour (Regulation and Abolition), Central Rules, 1971]

FORMAT FOR WAGE REGISTER

Rate of minimum wages and since the date.....				
	Highly skilled	Skilled	Semi-skilled	Unskilled
Minimum basic				
DA				
Overtime				

Name of the establishment.....Name of owner.....LIN.....

Wage period from.....to.....(Monthly, fortnightly, weekly, daily, or piece rated)

Sl. no. of employee register	**Name**	**Rate of wage**	**No. of days worked**	**Overtime hours worked**	**Basic**	**Special basic**	**DA**	**Payment overtime**	**HRA**	**Others**	**Total**
1	2	3	4	5	6	7	8	9	10	11	12

Deduction								**Net payment**	**Employer share PF welfare fund**
PF	**ESIC**	**Society**	**Income Tax**	**Insurance**	**Others**	**Recoveries**	**Total**		
13	14	15	16	17	18	19	20	21	22

Receipt by employee or bank transaction ID	**Date of payment**	**Remarks**
23	24	25

Note: In case of Mines Act any Leave Wages paid should be shown in the Others Column and specially mentioned in the Remarks column also. DA = spell out; ESIC = spell out; HRA = spell out; PF = spell out.

Annexure XXI: Form-C

[Under rule Rule-78 (a) and (1), (ii) of The Contract Labour (Regulation and Abolition), Central Rules, 1971]

FORMAT OF REGISTER OF LOAN/RECOVERIES

Name of establishment.....LIN.....

Sl. No. in employee register	Name	Recovery type (Damage, loss, fine, advance, or loan)	Particulars	Date of damage or loss*	Amount
1	2	3	4	5	6

Whether show cause issued*	Explanation heard in presence of	Number of instalments	First month and year	Last month and year	Date of complete recovery	Remarks
7	8	9	10	11	12	13

Note: *Applicable only in case of damage/loss/fine.

Annexure XXII: Form-D

[Under Rule Rule-78 (a) and (1)(i) of The Contract Labour (Regulation and Abolition), Central Rules, 1971]

FORMAT OF ATTENDANCE REGISTER

Name of Establishment.....Name of Owner.....LIN.....

For the Period from.....To.....

Sl. No. in employee register	Name	Relay# or set work	Place of work*	Date		Summary no. of day	Remarks no. of day	Signature of register keeper
				In	Out			
1	2	3	4	5	6	7	8	9

Note: #Relay and *Place of Work in case of mines only (underground, opencast, or surface).
In case an employee is not present

Annexure XXIII: Form-VIII

[Under rule 77 of the Contract Labour (Regulation and Abolition) Central Rules, 1971; rule 24192) (b) of Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Central Rules, 1998; and rule 50 of the Inter State Migrant Workmen (Regulation of Employment and Conditions of Service) Central Rules, 1980]

SERVICE CERTIFICATE

1 Name of contractor or employer*:

2 LIN or PAN no. of the contractor or employer*:

3 Email ID of the contractor or employer*:

4 Mobile no. of the contractor or employer*:

5 Nature and location of work*:

6 Name of principal employer*:

7 LIN or PAN no. of the principal employer*:

8 Email ID of the principal employer*:

9 Mobile no. of the principal employer*:

10 Name of the workman or building and other construction worker*:

11 UAN or AADHAAR no.:

12 Mobile no.:

13 Serial number in the register of workmen:

14 Registration number, date and name of the Board if the building and other construction worker is registered as a beneficiary:

15 Period of employment:

16 Designation:

Seal and signature of contractor

Note: *Please strike off whichever is not applicable.

Annexure XXIV: Form-XII

[Under rule 76 of the Contract Labour (Regulation and Abolition) Central Rules, 1971]

EMPLOYMENT CARD

A) Name of contractor:
A1) LIN or PAN no. of the contractor:
A2) Email ID of the contractor:
A3) Mobile no. of the contractor:

Passport size photo

B) Nature and location of work:
C) Name of principal employer:
C1) LIN or PAN no. of the principal employer:
C2) Email ID of the principal employer:
C3) Mobile no. of the principal employer:

D) Name of workman:
D1) UAN or AADHAAR no.:
D2) Mobile no.:

1. Serial number in the register of workmen employed:
2. Nature of designation:
3. Wages rate (with particulars of unit, in case of piecework):
4. Date of commencement of employment:
5. Blood Group
6. Remarks:

Seal and signature of contractor

Annexure XXV: Schedule-III

[Under rule-231 (b) of Building and Other Construction Workers (Regulation of employment and Condition of Services) Central rules, 1998]

CONTENTS OF FIRST-AID BOX

- A sufficient number of eyewash bottles filled with distilled water or suitable liquid clearly indicated by a distinctive sign which shall be visible at all times
- 4% xylocaine eye drops, boric acid eye drops, and soda bicarbonate eye drops
- 24 small, sterilized dressings
- 12 medium-sized sterilized dressings
- 12 large sterilized dressings
- 12 large sterilized burn dressings
- 12 (15 cm) packets of sterilized cotton wool
- 2 100ml bottle of certimide solution (1%) or suitable antiseptic solution
- 1 (200ml) bottle of mercurochrome (2%) solution water
- 1 (120ml) bottle of Salvolatile having the doses and mode of administration indicated on label
- 1 pair of scissors
- 1 roll of adhesive plaster (6cm X 1m)
- 2 rolls of adhesive plaster (2cm X 1m)
- 2 pieces of sterilized eye pads in separate sealed packets
- A bottle containing 100 tablets (each of 325mg) of aspirin or any other analgesic
- 12 roller bandages 10 cm wide
- 12 roller bandages 5 cm
- 1 tourniquet
- A supply of suitable splints
- 3 packets of safety pins
- Kidney tray
- A snakebite lancet
- 1 (30ml) bottle containing potassium permanganate crystals
- 1 copy of first aid leaflet issued by the DGFASLI
- Six triangular bandages
- Two pairs of suitable, sterilized, latex hand gloves

Annexure XXVI: Form-XXIII

[Under rule 241 (2) (a) of Building and Other Construction Workers (Regulation of Employment and Condition of Services) Central Rules, 1998]

WAGE BOOK

Name and address of employer

Name and address of establishment where building or other construction work is carried on

Name and permanent address of establishment

Nature of building or other construction work

For the week, fortnight, or month ending.....

1. No. of days worked.....
2. No. of units worked in case of piece-rate workers.....
3. Rate of daily/monthly wages/piece-rate.....
4. Amount of overtime wage.....
5. Gross wages payable.....
6. Deductions, if any, on account of the following.....
   - (a) Fines
   - (b) Damage or loss
   - (c) Loans and advances
   - (d) Subscription toward provident fund
   - (e) Subscription toward the Building Workers' Welfare Fund
   - (f) Any other deductions, e.g, subscriptions to cooperative society or account of loans from cooperative society/housing loans, or contribution to any relief fund as per provision of clause (P) or Section 7 (2) of the Payment of Wages Act or for payment of any premium of life insurance corporation.
7. Net amount of wages paid.....

Initials of the employer
or his representative

Annexure XXVII: Payment of Wages (Nomination) Rules, 2009

FORM-I Nominated and Declaration Form

(See Rule 3)

1. Name of person making nomination:
2. Father's or husband's Name:
3. Date of birth:
4. Sex:
5. Marital status: (In block letters)
6. Address (Permanent):
   Address (Temporary):

I hereby nominated the person(s)/cancel the nomination made by me previously and nominate the person(s) mentioned below to receive any amount due to me from the employer, in the event of my death.

Name of nominee or nominees	**Address**	**Nominee relationship with the member**	**Date of birth**	**Total amount of share of accumulations in credit to be paid to each nominee**	**If the nominee is minor, name relationship and address of the guardian who may receive the amount during the minority of nominee**
1	2	3	4	5	6

1. Certified that I have no family, and should I acquire a family hereafter, the above nomination shall be deemed as cancelled.
2. *Certified that my father or mother is/are dependent upon me.
3. *Strike out whichever is not applicable.

Signature or the thumb impression of the employed person.

CERTIFICATE BY EMPLOYER

Certified that the above declaration and nomination has been signed/thumb impressed before me by Shri/Smt./Kum..... employed in my establishment after he/she has read the entry/entries or has been read to him/her by me and got confirmed by him/her.

Place:
Date:

Signature of the employer other authorized officer of the establishment and Designation

Annexure XXVIII: Form-XI

PART-A
ACCIDENT REPORTING FORM

[Rule 210(7) of the Building and other construction workers (Regulation of employment and condition of services) Central Rules, 1998]

1. **Particulars of accident:**
   a. Exact place where accident occurred:
   b. Date:
   c. Time:
   d. What the injured person was doing at the time of accident:
   e. Weather condition:
   f. How long employed by you for this particular job:
   g. Particulars of equipment, machine, or tool involved and condition of the same after the accident occurred:
   h. Brief description of the accident:
2. **Nature of injuries:**
   a. Fatal:
   b. Nonfatal:
   c. If nonfatal, state precisely the nature of injuries (describe in detail the nature of injury, for instance fracture of right arm, sprain, and so on):
   d. First aid: given not given
   e. If not, give the reasons:
   f. Name and designation of the person by whom first aid was given:
   g. If admitted to hospital, name of the hospital, address of the hospital:
      Name of the doctor:
      Phone no.:
3. **Mode of transport used ambulance/any other mode (please specify):**
4. **How much time was taken to shift the injured person**
   a. If very late, state the reasons:
   b. How the reporting was made:
      Phone or special messenger letter, email, or SMS
   c. Who visited the accident site first and what action was proposed by him?
   d. What are the actions taken for the investigation of the accident by the employer? (Describe about photographs, video film, or measurements taken, and so on):
5. **Particulars of persons giving witness:**

a.	Name	Address	Occupation	Mobile no.
1.				
2.				
3.				
4.				

6. **Particulars in case of fatal:**
   Date and time:
   Whether workers registered with Building and Other Construction Worker's Welfare Board.
   If yes, give registration number and name of the board:
7. **Dangerous occurrences as covered under the regulation number.** (Give details):
   a. Collapse or failure of lifting appliances, hoist conveyors, and so on:

b. Collapse or subsidence of soil, any wall, floor, gallery and so on:
c. Collapse of transmission towers, pipeline, bridges and so on:
d. Explosion of receiver, vessel, and so on:
e. Fire and explosion:
f. Spillage or leakage of hazardous substances:
g. Collapse, capsizing, toppling, or collision of transport equipment:
h. Leakage or release of harmful toxic gases at the construction site:
i. Failure of lifting appliance, loose gear, hoist, or building and other construction work machinery, transport equipment, and so on:

8. Certificate from the Employer or authorized signatory:

Date:..... Seal and signature of the employer designation

Annexure XXIX: Incident Reporting to World Bank

CONFIDENTIAL
THE WORLD BANK/IFC/M.I.G.A.
OFFICE MEMORANDUM
DATE:
TO: _____, Country Director, _____
FROM: _____, (title, TTL/ co-TTL), unit
EXTENSION: _____
SUBJECT: _____
Country: _____ (name of project_____) (P#_____)
Conclusions Regarding a _____ (type of incident) on the _____ Project Site

1. The _____Project was approved by the Bank's Board of Executive Directors on ____ (date). The Project consists of___ components. The first component focuses on _____. The second component provides _____ (etc., as relevant). The Project involves loans from IBRD to fund both components and the _____ (Trust Fund or other sources) to fund the_____.

2. The Project is implemented through _____ (type of implementation arrangement). Describe the partners, implementation arrangements, and other key details.

3. Briefly describe the Environmental and Social Management Plan (ESMP) and provisions for best practices to health, safety, and environmental procedures being followed during implementation. These best practices are/will be reflected and refined in a _____ (type of document) that is being/was prepared by the Engineering, Procurement, and Construction contractor.

4. The most recent supervision mission took place on ___(date) to review progress of the Project's implementation. Provide brief detail as to status in relation to ESMP.

5.On _____ (date), _____ (which counterpart/partner) informed the Bank (and other project financiers) that a _____ (type of incident) had occurred _____ (where) project site (see Appendix 1 with relevant correspondence), and shared written investigative reports prepared by _____ (counterpart/contractor) about the incident. The incident took place on _____ and involved a _____ (identify who/what and institutional relationship(s)).

6. A mission traveled to _____ (incident site) on _____ (dates), to investigate the _____ (incident) and follow up with _____ (counterparts), and review the environmental, health & safety (EHS)/Occupational Health and Safety (OHS) system ____ (or other systems) at the _____ project sites. The mission involved technical and EHS specialists from the Bank, _____ (other financing partners) which are involved in financing the project. In particular, the mission included _____ (name key World Bank (WB) and other team members, including title and organization). _____ (describe materials shared, how these reflected any recommendations by WB or other experts made prior to the incident). The mission report is included in Appendix 2.

7. After the ____(incident), ___ (describe actions by Borrower and implementing partners; who was informed; internal investigations of the accident). Describe any independent reviews undertaken, by whom and when) to consider the factual circumstances and the root causes of the incident.

8. The following root causes for the accident were identified: (list as appropriate, 1–2 sentences each)

9. In summary, the incident was clearly _____ (describe conclusions).

10. The investigation also revealed shortcomings _____ (for example, in the rules and design of the EHS system; absence of clear leadership on-site; lack of proper communication on contractor schedules; inadequate designation of exclusion zones; design flaws; cultural and language barriers; the absence of contractor EHS personnel at the site of the accident; an apparent lack of clear roles and responsibilities of EHS staff; an apparent lack of authority of EHS personnel to stop work in case of unsafe working practices; failure to involve the contractors' management in EHS issues; other….).

11. _____ (describe effort by Borrower/contractor, for example, to strengthen the EHS system at the project site(s) because of these findings; corrective actions are currently being implemented; implementation of the corrective measures observed during the site visit).

12. _____ (describe reports shared with the WB). The mission concluded that, with proper implementation of the reports' recommendations, the EHS system (_____ or other systems as relevant) on-site should significantly reduce the risk of similar future incidents.

13. On ____(date), the Borrower/implementing partner received a letter complaint from _____ (the affected party, his/her family), raising questions about the circumstances of the incident. Describe actions taken by the Borrower/implementing partner. Note whether these actions were in line with the implementing partner's Corporate Social Responsibility (CSR) policy for similar situations.

14. The mission also discussed with ___ (implementing partner/Borrower) the need for incident notification of the international financial institutions (IFIs) in case of a serious incident in the future. The mission and ____ (the Borrower/implementing partner) agreed that, in case of a serious incident, IFIs will be notified within 24 hours after __ (the Borrower/implementing partner) notification of the incident.

Cleared by: _____, Project Practice Manager, _____ (unit)

CC: as per notification guide

Annexure XXX: SOP for Traffic Management

Subject	**:**	**TRAFFIC MANAGEMENT**
Applicability	**:**	Binding on Contractors engaged for capital city works
Purpose	**:**	To provide a practical procedure and guidelines for managing traffic during Construction.
Scope	**:**	This SOP shall be applicable to all the construction works pertaining to the trunk roads and other road networks in the Amaravati Integrated Urban Development Program in the Amaravati Capital City, Guntur.
Responsibilities & Procedure	**:**	**Contractor's Responsibilities** ***Planning & Initial Assessment:*** • Make videography and photographs of the entire stretch in the project area prior commencement of the work to capture all the features all along the transportation routes from source to the project site locations, which includes designated routes, alternate routes, and any other routes, indicated time-to-time by the authority. • Provide qualified road safety personnel with support staff to serve as a site safety team, Designate Roles and Responsibilities for the safety personnel. • Prepare an overall Traffic Management Plan (TMP) or adopt if it was already prepared by the PMC or APCRDA, with revisions as agreed with the PMC if warranted. The TMP includes a Traffic Diversion Plan (TDP), the Temporary Traffic Measures, including without being limited to measures to ensure safety such as design of the work zone, signages, pedestrian & other non-motorized traffic facilities. • Appoint a Site Traffic Management Supervisor (STMS) to manage and co-ordinate execution of the Traffic Management Plans throughout the life span of the road project. • Prepare accurate and compliant Traffic Diversion Plans (where an external TDP Designer is not appointed) • Ensure the TMP submission has been reviewed internally within the contractor's organization, reviewed by the Supervision Consultant and reviewed by the PMC prior to submission to the TMP Approvals. • Ensure all stakeholders and members of the public are consulted and informed of the road project and potential disruption prior to any works being undertaken. • Allocate adequate and available resources that ensure the effective implementation of this SOP.

		During Construction: • Prepare detailed site traffic management plan (STMP) for each site and submit for approval at least 5 days prior to commencement of works on any section of road. • The STMP shall be site-specific and shall be prepared by considering the factors such as nature of work activities, peak hours of traffic with respect to the locations, traffic routes (designated or alternate routes), settlements and sensitive receptors (Educational institutions, hospitals, court, religious places, ecological sensitive locations) along the routes, type of vehicle, permissible speed and no. of trips, etc. • Ensure that the STMPs have specific control measures to minimize adverse impacts on local communities and road users due to overspeed, dust & noise and to maintain smooth traffic flow. • The STMPs shall contain measures related to unforeseen situations like temporary diversion from designated routes and these measures shall address the aspects related to safety of all road users, activities, residential areas and sensitive receptors along the road. • Consultation with local traffic police should be given priority in considering certain points related to the existing conditions of traffic, traffic flow, peak hours of traffic, day and night traffic, critical accident spots, blind spot areas, major junctions, sharp curves, narrow roads, etc. • Undertake regular inspections of the STMPs to ensure a proactive approach towards safety and compliance is adopted. • Work collaboratively with Supervision Consultants, PMCs, PgMC, and APCRDA to ensure work zone safety and adjust the STMP as needed. • Work collaboratively with the APCRDA, PMC and PgMC to accurately report any crashes/incidents ((major, minor, fatal accidents, dangerous occurrences etc) occurring within the work zone and follow all incident management protocols. • Conduct daily toolbox talks with the construction crews and provide proper guidance on the safety requirements for the specific works to be performed and maintain pep talk records and reporting to the safety engineers. • Provide a grievance redress mechanism, a procedure that provides a clear and transparent framework to address safety related complaints by the construction crew, road users and the communities. • Ensure that safe work practices and safe work culture are enforced and that unsafe conditions are corrected.

		• Ensure that all worksites are complying to health, safety and environment policies, safety standards, safe method of working safe systems and safe procedures are followed. ***Traffic Control:*** • Provision of traffic safety devices and road signs in construction zones as per IRC: SP:55, other relevant IRC codes, and other local and international applicable guidelines. • Identify the potential accident locations by consultation with local traffic police and historical crash records such as critical accident spots, blind spot areas, major junctions, sharp curves, narrow roads, etc and ensure to provide necessary safety measures at those locations. • Warn the road user clearly and sufficiently well in advance and protect the work zones with no access to the civilians or nearby communities. • Include as traffic warning and control devices in work zones signs, delineators, beacons, barricades, cones, pylons, pavement markings, portable message board, flaggers, sound-based warning devices, vehicle activated signs, and flashing lights. • Arrange for the suitably qualified workers to erect signs and other traffic control devices and trained workmen such as flagmen, banksman, operators, drivers, etc and aware of safety aspects at construction site. • Ensure that there is sufficient stabilization area before the traffic approaches the work area. • Ensure hard barricade and they are not obstructing the road user. • Ensure that men machinery and equipment are well within the barricades. • Provide smooth transition of lanes and the length of transitions to be as per speed of the road. Ensure no obstructions that may hinder the visibility of the incoming traffic. • Provide advance warning area with suitable signage's to warn motorist before approaching road work zone. Continues monitoring of aforesaid. • Provide safe and clearly marked lanes for guiding road users and clear demarcation of buffer zone and work zone for workers. • Enforce to use appropriate personal protective equipment. • Appropriate signs such as Mandatory/Regulatory Signs, Cautionary/Warning Signs, Information/Guide Signs, etc shall be erected at the appropriate locations. • Ensure the provision for first aid facilities and emergency response arrangements.

		• Provide safety measures that anticipate driver behaviour through project's work zones especially at unusual alignments, uneven lanes and closed lanes. • Ensure all the construction vehicles and heavy machinery are having valid PUC (Pollution under control) certificates, licences, Insurances and well fit prior to perform the task; • Ensure all the construction vehicles are holding necessary fitness certificate and shall be in good condition and drivers should check the condition of vehicle before use such as tyre condition and pressure; breaks working correctly; Horns (front and rear) and audible and visible alarms working correctly; Lights (front and rear) working correctly, Mirrors clean and properly set, Secure and properly adjusted seat, etc. • Fit all vehicles and equipment used in construction with exhaust silencers. • Maintain and Service all construction vehicles regularly and during routine servicing operations, check the effectiveness of exhaust silencers and if found defective replace those; • Identify all the existing features such as trees, utility lines, infrastructure, public or private properties, ecological features etc., along the routes of transport and take necessary precautionary measures to prevent damages. o Road safety survey will be carryout prior to transport the materials to identify utilities, trees, public or private properties etc. o Escort vehicle will be provided along with the transporting equipment's to guide. o Identify and protect the utilities, public & private properties with suitable media to prevent damages. • In case of any damages to the unforeseen features to the public or private properties carry out immediate rectification measures through appropriate communication and approval procedures. • All existing roads used by vehicles which are part of the works, shall be kept clear of all dust/mud or other extraneous materials dropped by such vehicles and other obstructions from the site immediately. • At the construction sites within 150 m of the nearest habitation, noisy construction works such as crushing, operation of DG sets, use of high noise generation vehicles shall be stopped during the night time between 10.00 pm to 6.00 am. Working hours- of the construction activities shall be restricted around educational institutions/health centres (silent zones) up to a distance of 100 m from the sensitive receptors i.e., schools, health centres and hospitals etc.

		• Ensure the implementation of the requirements of this SOP and related procedures within their respective functional areas. ***Emergency Preparedness and Response Plan*** • Procedure during occurrence of an accident Scenario1: Fatality: Inform to the concerned police department-Call Ambulance/check for nearest hospital-communicate to the responsible persons (Project management/Safety personnel of Contractor concerned to that road section-Make a communication to the victim's family and further necessary formalities as per the applicable labour laws and or agreement conditions-Document and reporting the accident-Contact insurance company and pursue as per the legal formalities-Investigate the root cause-Take corrective actions to rectify the non-compliances-Necessary measures to avoid recurrence of the incidents-Review and improve the safety systems - Revise the plan. Other scenarios may include but not limited to: *Scenario:2 Major/Minor injuries* *Scenario:3 Damage to properties* *Scenario:4 Vehicle breakdown (Loaded & unloaded)* *Scenario:5 Material spillage leading to traffic interruption* • Establish protocols for coordination with local emergency services for each scenario; strengthen the system by developing safe working practices, safe methods, safe work culture and safe conditions. • Display of Emergency preparedness and Response boards with the Contact details of Police, Ambulance, Nearest Hospital, Fire Brigade, Project Management-Project Manager, Safety Engineer. • Ensure the contacts of project management shall be updated in case there is a change of persons in the team and should be in working condition at all times. • Identify suitable places for Display of Emergency preparedness and Response Boards, at all construction zones and all identified critical locations along the traffic routes from source to delivery, all construction vehicles. • Establish and implement procedures for handling traffic accidents or other emergencies. • Maintain close coordination with the construction safety officers and formulate site safety guidelines & prepare checklist for safety auditing by field supervision team on day-to-day basis.

		• Periodical monitoring and reporting of all the mitigation measures as specified in the C-ESMP. • Environmental monitoring of attributes such as ambient air, noise, soil and water (surface and ground water) at the locations approved by the engineer/authority through the NABL accredited monitoring agency. • Green belt or vegetation cover shall be developed at the locations specified by the engineer/authority to mitigate dust pollution and for noise attenuation. • Conduct regular water sprinkling on construction sites, construction roads, and stockpiled material. • The temporary traffic detours in settlement areas shall be kept free of dust by frequent water sprinkling. • Solid barriers, such as plywood or plastic sheeting, can be used to protect against dust by separating work zones. • Maintain driving surfaces clean as a standard site management practice; regular cleaning or sweeping. • Construction vehicles carrying soil, sand, or other fine materials to and from the construction sites shall be properly covered with tarpaulin sheets or any other suitable material to avoid spillages. • Reporting and follow-up on construction safety issues / lapses as appropriate. • Undertake hands-on-training programs and conduct mock safety drills as required from time to time. • Usage of appropriate personal protective equipment (PPE) such as helmets, eye wears, shoes, gloves, masks, nose mufflers, etc • Perform regular monitoring of road safety as per the *URDPFI guidelines, 2014. Volume II B. Ministry of urban development*. • Take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as may be required by the engineer for the information and protection of traffic approaching or passing through the section of the roads under construction. ***Risk Assessment*** • Risk assessments shall be conducted to identify potential hazards, determine the associated risks and impacts, evaluate the risks and prepare corrective measures to control/minimise these risks, record the findings and review assessment and revise the plans as necessary. • Perform daily site inspections of construction zones to identify potential hazards and develop strategies to mitigate them.

		Communication Mechanism: • Maintain close co-ordination with local authorities to develop detour plans and traffic schedules that reduce congestion and disruption to residents. • Proper communication and co-ordination with the concerned departments shall be maintained. • Maintain close co-ordination between the project management and the safety engineers on the critical issues and shall be resolved immediately. ***Trainings, Awareness programs, Workshops:*** • Instruct, educate and aware all the workmen and project personnel regarding the hazards & risks associated and preventive or control measures. Training should generally be provided to management, supervisors, workers, and occasional visitors to areas of risks and hazards. • Ensure to provide induction trainings which includes hazard and risks associated with traffic management. New project personnel joining during implementation shall not be permitted without taking induction trainings. • Conduct appropriate trainings, mock drills including general and task-specific trainings relevant to traffic management to all the workmen in the workplace as per the needs and requirements of the project. • Conduct specific trainings to workers on the traffic safety and related topics such as first aid, firefighting, flagman, banksman, operators of heavy vehicles/machinery, drivers etc • Conduct orientation and training for new employees on proper safety procedures; maintain registers and records of issue of Personal protective equipment's (PPEs), first aid facilities, firefighting equipment, daily toolbox talks, pep talks, awareness programs, trainings, workshops, mock drills, accident/incident reporting etc. • Plan and conduct safety education and advise on road safety education, training, and publicity programs; pedestrian safety, road users, etc., plan to conduct safety programs to school children. ***Project management consultant (PMC)Responsibilities:*** • Review and approve the construction zone safety plans and traffic management and safety plans prepared by the Contractors and ensure their strict compliance with IRC SP 55 - 2014 and all other applicable safety regulations, before commencement of construction works at site. • Maintain close co-ordination with the Contractor, PgMC, Authority and other departments and review safety aspects at all construction activities.

		• Conduct regular safety inspections to identify safety lapses and advice the contractor for the corrective measures in the stipulated time; • Reporting timely to the PgMC/Authority as per the reporting mechanism ***Program Management Consultant (PgMC) Responsibilities:*** • Assist the APCRDA in establishing and operating programme's safety management system, promoting safe work culture, establishing traffic safety performance indicators, performance reviews, monitoring and reporting and timely remedial and corrective actions. • Ensure all Traffic Diversion Plans (Traffic Diversion Plans) produced by contractors and consultants working on road projects under their management are fully checked and compliant prior to submission to the Traffic Diversion Plans Approvals. • Ensure all relevant Stakeholders are consulted and informed of the intention to undertake works within the right of way and implement TTM (Temporary Traffic Management) Works with the Traffic Diversion Plans Approvals from APCRDA and Compliance Monitoring Team. • Develop & implement framework for programme assurance functions safety, environment and security) aligned with existing Programme documents. • Promote design for safety and identify and reduce safety risks through appropriate planning and design. • Ensure all the projects and agencies engaged with APCRDA comply with the safety standards during all stages of the project, • Oversee the traffic safety management, monitoring and reporting • Assist APCRDA by developing road safety standards, guidelines, and best practices in line with national and international safety regulations, • Monitor contractor compliance with road safety regulations during the construction phase and ensure traffic control measures are implemented properly. • Conduct post-construction safety audits to ensure roads are safe for public use and suggest improvements where needed. • Review traffic studies, ability to use macro/micro modeling tools to predict traffic patterns, and recommend solutions • Evaluate transportation infrastructure projects, considering factors such as land use, and community needs. • Perform safety assessments of transportation systems, identifying potential hazards and communicate results

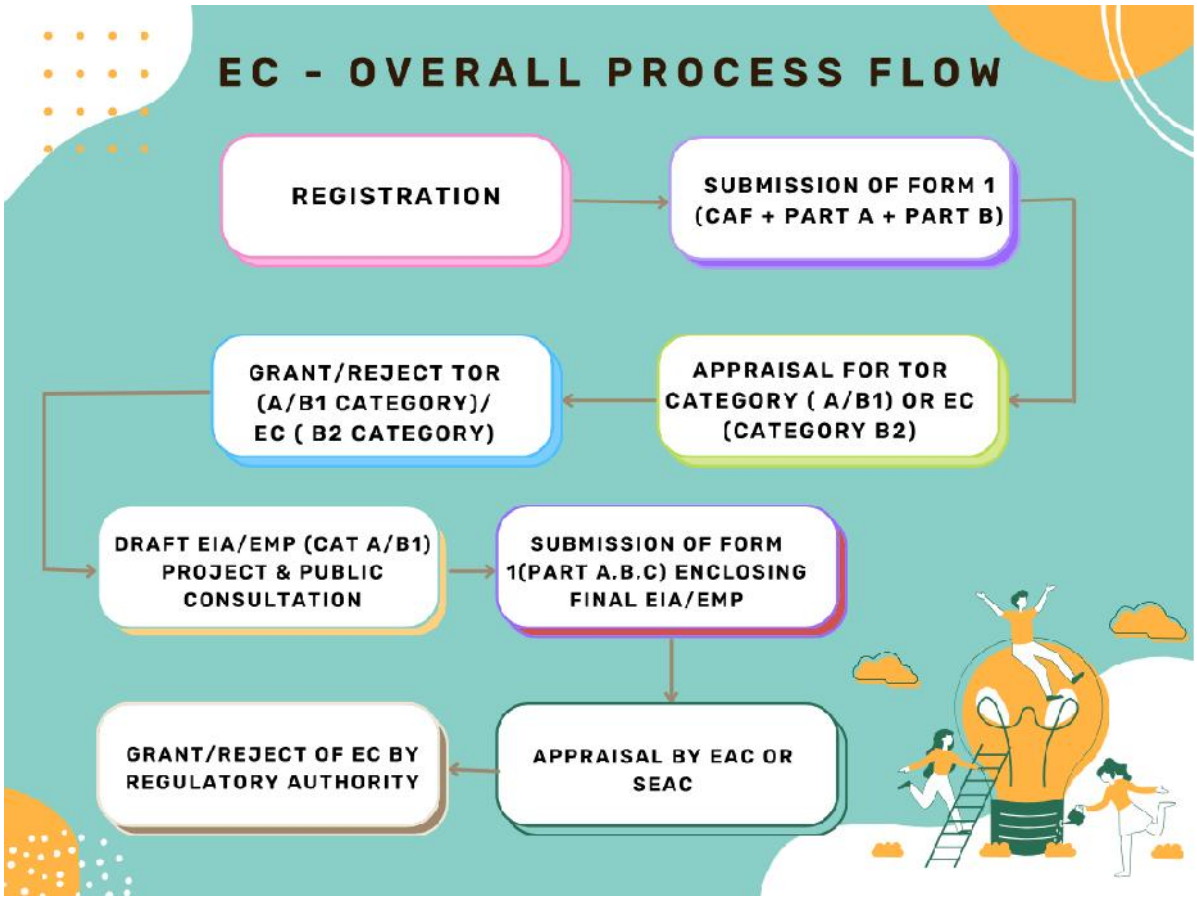
		Authority's Responsibilities: • Monitor to maintain close co-ordination of filed units with the nodal agencies such as revenue department, RTA and local traffic police departments, for smooth flow of traffic at all times. • Any failure to comply with the legal requirements or other requirements as per the conditions of Contract will be considered for strict actions as per the provisions of Contract, such as imposing penalties.
Liabilities		• Contractor is liable to pay penalties for any notified non-compliances pertaining to the traffic safety in accordance with the Contract agreement Clauses/ Conditions.
Maintenance of records		• Contractor shall submit the immediate incident/Accident report to PgMC/PMC and a detailed accident investigation report to APCRDA. • Accident and Incident Investigation Reports shall be maintained and submitted every fortnight to APCRDA.
Applicable Statutory Permissions/Policies/ Conditions/ Guidelines	**:**	• *IRC SP 055: 2014 Guidelines on Traffic Management in Work Zones* • *IRC 067:2022(Amendment) Code of Practice for Road Signs* • *IRC: SP:88-2019- Manual on Road Safety Audit* • *IRC:35-2015 - Code of Practice for Road Markings* • *The National Urban Transport Policy of the Government of India, 2006 (NUTP)* • *Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines;*

History of amendments:

The latest versions of the Documentation Format must be used at all times. This page needs to be updated whenever there is a change in the version number of the documents.

Sr. No.	Date of amendment	Version	Details of amendment
1	08.03.2025	01	Initial approval of the documentation format

Annexure XXXI: Environmental Clearance Flowchart[12]



[12] https://parivesh.nic.in/#/ec-process-flow

Annexure XXXII: Indicative Mitigation Measures for Efficient Usage of Resources and Pollution Measures

Components	Relevant laws	Mitigation measures
Resource efficiency		
Energy efficiency	▪ The Energy Conservation Act, 2001 with subsequent amendments ▪ GIIP ▪ Conditions of EC & NGT orders	▪ Use energy-efficient lighting systems in construction site offices, work areas, and temporary facilities. ▪ Replace traditional lighting fixtures with LED lights, which consume less energy, have longer lifespans, and provide better illumination. ▪ Assess the site's potential for solar and wind energy and install portable solar panels or small-scale wind turbines to generate electricity for construction site needs, if feasible. ▪ Use construction vehicles, such as excavators, bulldozers, and cranes that are designed to operate more efficiently and consume less fuel per unit of work performed. ▪ Use energy efficient motors and pumps with VFDs to reduce energy consumption. ▪ Use Low emission generator sets for to reduce Greenhouse gases. ▪ Prioritize the use of newer, more efficient equipment models and technologies, such as hybrid or electric-powered machinery, to reduce fuel consumption and greenhouse gas emissions. **Use of sustainable construction practises like -** ▪ Design trunk road alignments, LPS, Flood mitigation alignments works structures to minimize earthwork, cut and fill operations, and the quantity of materials required (preconstruction phase). ▪ Choose construction materials with low embodied energy and high durability. ▪ Utilize locally sourced materials to minimize transportation emissions and support local economies. ▪ Opt. for recycled materials where feasible to reduce the energy required for extraction and production. ▪ Schedule construction activities to minimize idle time for equipment and workers.

Components	Relevant laws	Mitigation measures
		▪ Implement traffic management strategies to minimize congestion and reduce vehicle idling time during construction activities. Efficient traffic management can help reduce fuel consumption and emissions from construction vehicles and improve overall project efficiency.
Water conservation	▪ The Water (Prevention and Control of Pollution) Act, 1974 with subsequent amendments ▪ GIIP ▪ Conditions of EC & NGT Orders	▪ Implement erosion and sediment control measures to prevent soil erosion and minimize sedimentation of water bodies during construction activities. ▪ Rainwater harvesting systems - to capture and store rainwater for use in construction activities such as dust suppression, compaction, and tyre wash etc. ▪ Implement systems to recycle and reuse water on construction sites like constructing sedimentation tanks. ▪ Use water-efficient equipment and machinery during construction activities to minimize water consumption. Choose equipment with water-saving features such as low-flow nozzles for equipment washing, water-efficient toilets and sinks in construction site facilities, and water-recycling systems for equipment cooling. ▪ Use STP treated water for site purposes like – landscaping, dust suppression, tyre wash etc.
Material selection and optimization	▪ GIIP ▪ Conditions of EC	▪ Prioritize the use of sustainable materials that have lower environmental impacts and contribute to resource efficiency. Examples include recycled aggregates, reclaimed asphalt pavement (RAP), Fly ash, ▪ Ground granulated blast-furnace slag (GGBS), and recycled plastics. ▪ Use locally sourced materials to reduce transportation emissions and support local economies. Examples of locally sourced materials that can be utilized for Amaravati construction projects are stone aggregates, soil, timber, fly ash, gravel, and brick among others etc. ▪ Employ design and construction techniques that minimize material consumption and waste generation. This may include optimizing structural designs to reduce material usage, adopting prefabrication and

Components	Relevant laws	Mitigation measures
		modular construction methods to minimize on-site waste, and implementing lean construction principles to streamline processes and improve efficiency. ■ Select materials that are durable and have a long service life to minimize the need for frequent maintenance and replacement by considering factors such as weather resistance, corrosion resistance, and resistance to wear and tear to ensure infrastructure longevity and reduce life cycle costs. ■ Promote the recycling and reuse of construction materials to minimize waste generation and conserve resources.
Pollution prevention		
Air pollution	■ Air (Prevention & Control of Pollution) Act, 1981 and subsequent amendments. ■ Conditions of EC & NGT Orders	■ Implement regular watering of unpaved roads and construction sites to suppress dust. ■ Install barriers or enclosures around particularly dusty activities (for example, demolition, RMC plants, Crusher plants etc.) to contain dust. ■ Install water sprinklers on stockpiles of soil, aggregates other materials with tarps or other coverings to prevent dust emissions. ■ Ensure all construction vehicles and equipment having PUC certificate and are regularly maintained to reduce emissions and improve efficiency. ■ Use equipment with advanced emission control technologies like Dust collectors, retro fixtures for generator sets etc. ■ Conduct regular ambient air monitoring as per the environmental and social management plan (ESMP) i.e. is NAAQ standards.
Construction waste management	■ Construction and Demolition	■ Segregate construction and demolition waste and deposit at collection center or hand over it to the authorized processing facilities.

Components	Relevant laws	Mitigation measures
	Waste Management Rules 2016 and subsequent amendments. ■ Conditions of EC	■ Ensure that there is no littering or deposition so as to prevent obstruction to the construction works, traffic or the public or drains. ■ Ensure that other wastes (such as solid waste) does not get mixed with C&D waste and is stored and disposed separately. ■ Projects generating more than 20 tons or more in one day or 300 tons per project in a month (large generators) must submit a waste management plan and get appropriate approvals from the Andhra Pradesh Pollution Control Board, before starting construction or demolition or remodelling work. The application for obtaining authorization (Form I) is available on https://cpcb.nic.in/displaypdf.php?id=d2FzdGUvQyZEX3J1bGVzXzIwMTYucGRm. ■ Large generators to have environment management plan to address the likely environmental issues from construction, demolition, storage, transportation process, and disposal or reuse of construction and demolition (C&D) waste. ■ Large generators to segregate the waste into five streams such as concrete, soil, steel, wood and plastics, bricks, and mortar. ■ Large generators to pay relevant charges for collection, transportation, processing, and disposal as notified by the concerned authorities.
Hazardous waste management	■ Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016	■ **Waste identification:** Determine the types of hazardous waste to be generated during construction activities, such as paints, solvents, chemicals, batteries, asbestos-containing materials, used lubricants, and contaminated soil. ■ **Waste classification:** Classify and label the waste according to its properties and potential hazards. ■ **Storage:** Establish a designated storage area for hazardous waste that is secure, well-ventilated, and equipped with containment measures to prevent leaks, spills, and unauthorized access. The storage area should be located away from sensitive environments, water sources, and public access areas.

Components	Relevant laws	Mitigation measures
	and subsequent amendments. ■ Conditions of EC	■ Use appropriate containers, such as drums, bins, or tanks, to store hazardous waste safely. Ensure that containers are compatible with the waste they contain and are labelled with the appropriate hazard information. ■ **Containment:** Implement secondary containment measures, such as berms, dikes, or spill trays, around storage areas and containers to contain spills or leaks and prevent hazardous substances from reaching the environment. Secondary containment should have sufficient capacity to contain the volume of the largest container plus additional runoff. Spill kits are to be placed to control spills. ■ **Training:** Train construction workers in proper handling and transportation procedures for hazardous waste, including techniques for lifting and moving containers safely, using personal protective equipment (PPE), and minimizing the risk of spills or releases. ■ Make an application in Form 1 to the APPCB, to obtain an authorization. Detailed process is available at https://pcb.ap.gov.in/PCBLive/PCB/WasteManagement. Send or sell the hazardous and other waste to an authorized actual user or recycler or dispose in an authorized disposal facility. A list of units registered with the APPCB (list is available with authority). ■ Transport the hazardous and other wastes from the project establishment to an authorized actual user or to an authorized disposal or recycler facility in accordance with the provisions of these rules. ■ Maintain a record of hazardous and other wastes managed in Form 3 and prepare and submit to the Pollution Control Board, Andhra Pradesh, an annual return containing the details specified in Form 4 on or before June 30 following the financial year to which that return relates.
Solid waste management	■ Solid Waste Management Rules, 2016 and	■ **Waste Identification:** Identify the types of solid waste generated during construction activities, such as concrete, wood, metal, plastics, cardboard, waste generated from labour camps, and packaging materials. ■ **Segregation:** Segregate waste into separate categories to facilitate recycling, reuse, or proper disposal.

Components	Relevant laws	Mitigation measures
	subsequent amendments. ▪ Conditions of EC	▪ **Designated waste storage areas:** Establish designated waste storage areas on the construction site that are easily accessible to workers and equipped with appropriate containers or bins for each waste stream. Ensure that storage areas are located away from sensitive environments and comply with local regulations. ▪ **Labelling:** Label containers clearly with the type of waste they contain to facilitate proper sorting and disposal. ▪ **Containment measures:** Implement measures to prevent windblown litter, spills, or contamination from solid waste storage areas. Use lids or covers on containers to prevent debris from escaping and install fencing or barriers around storage areas to prevent unauthorized access. ▪ **Regular waste collection and removal:** Establish a schedule for regular waste collection and removal from the construction site to prevent accumulation and maintain a clean and organized work environment.
Plastic waste management	▪ Plastic Waste Management Rules, 2016; Plastic Waste Management (Amendment) Rules, 2022	▪ **Minimize generation of plastic waste** and **segregate** plastic waste at the source in accordance with the Solid Waste Management Rules, 2000. ▪ **Do not litter:** Separate the plastic waste and ensure segregated storage of waste at source. Hand over segregated waste to urban local body, gram panchayat, agencies appointed by them, registered waste pickers, registered recyclers, or waste collection agencies.
Chemicals and hazardous materials	▪ Manufacture, Storage, and Import of Hazardous Chemicals (MSIHC) Rules, 1989	▪ Maintain an updated inventory of all chemicals and hazardous materials used on-site, including their quantities and locations. ▪ Conduct Environmental Aspect and Impact & risk assessments to identify potential hazards associated with each chemical and material and assess their impact on health and the environment. ▪ Store chemicals and hazardous materials in designated, secure areas with appropriate containment measures to prevent spills and leaks.

Components	Relevant laws	Mitigation measures
		■ Ensure all containers are clearly labelled with the chemical name, hazard symbols, and safety information. ■ Ensure material safety data sheets (MSDS) for all chemicals are readily available to all employees who may handle or be exposed to these substances. ■ Equip the site with appropriate spill response kits and ensure they are readily accessible. ■ Develop and implement spill response procedures, including containment, cleanup. Refer to SOP 4 for emergency response plan. ■ Implement secondary containment systems (for example, bunds or spill pallets) to capture leaks and prevent contamination of soil and water.
E-waste	■ E-Waste (Management) Rules, 2022 (applies to stakeholders involved in the life cycle of electronic and electrical equipment, including producers, ■ distributors and retailers, E-waste management	■ The following mitigation measures may be taken for handling E-waste: ■ Set a goal to minimize E-waste by extending the life of office equipment and promoting recycling. ■ Perform regular maintenance and software updates to ensure devices remain functional for as long as possible. ■ Refurbish devices to extend their usable life, whenever possible. ■ Set up clearly labelled E-waste collection bins or areas for the safe collection of electronics such as old cables, batteries, or nonfunctional devices. ■ Engage with certified E-waste recycling companies to ensure safe and responsible disposal.

Components	Relevant laws	Mitigation measures
	entities, and extended producer Responsibility holders)	

Annexure XXXIII: Budget

Budget Category	Description	Quantity	Unit costs (Rs)	Time or years	Total costs (Rs)	Remarks
Environmental monitoring	Expenses for carrying out environmental quality monitoring from MoEFCC and National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited labs	As mentioned in the consent copy				
Water conservation	Expenses for implementing erosion and sediment control measures					
	Expenses for establishing rainwater harvesting systems (if feasible)					
	Expenses for implementing systems to recycle and reuse water on construction sites (wherever feasible)					
	Expenses for using water-efficient equipment and machinery during construction activities to minimize water consumption (wherever feasible)					
	Expenses for potable drinking water for on-site workers and labor camp requirements					
Waste management	Development and implementation of a waste management plan					

Budget Category	Description	Quantity	Unit costs (Rs)	Time or years	Total costs (Rs)	Remarks
(C&D, SWM, E waste, HW etc.)						
Documentation and reporting	Costs for documenting findings and preparing reports required by regulatory authorities					
Compliance and permitting	Expenses associated with obtaining permits and complying with resource efficiency and pollution prevention, including any period renewals as necessary					
Remediation and corrective actions	Expenses associated with remedial works and corrective actions as required					

Annexure XXXIV: Indicative Monitoring Plan

Attribute	Parameter	Special guidance	Standards	Duration	Frequency
Air quality	SO2, NOx, PM10, PM2.5, O3, Pb, CO, NH3, C6H6, BaP, As, and Ni (As desired by the project)	High volume sampler to be located 50m from the plant in the downwind direction. Use method specified by CPCB for analysis as per 18th Nov 2009.	National Ambient Air Quality Standards, CPCB[13]	24-hour sampling (preparation and construction stage)	Ambient Air Quality Monitoring on monthly basis Refer the Indicative C-ESMP items in the SoP I Annexure Template 2
Water quality	As desired by the project	Grab sample, composite sample and integrated sampling methods for collection of sample from source and analyzed as per Standard Methods for Examination of Water and Wastewater	Indian Standards for Inland Surface Waters (IS: 2296, 1982) BIS Drinking Water standards (IS: 10500)[14]		Surface water quality on quarterly basis Ground Water quality analysis, Potable water quality analysis on monthly basis Refer the Indicative C-ESMP items in

[13] *National Ambient Air Quality Standards available at: https://cpcb.nic.in/upload/NAAQS_2019.pdf*
[14] *Indian Standard Specifications for Drinking Water is 10,500,1983 available at: https://cpcb.nic.in/wqm/BIS_Drinking_Water_Specification.pdf.*

Attribute	Parameter	Special guidance	Standards	Duration	Frequency
					the SoP I Annexure Template 2
Ambient noise	Noise levels on dB(A) scale	Equivalent noise levels using an integrated noise level meter kept at a distance of 15m from edge of pavement.	The Noise Pollution (Regulation and Control) Rules, 2000[15]	Leq in dB(A) of daytime and night time reading on every 1 hr of interval for 24 hrs. (preparation and construction stage)	Monthly basis Refer the Indicative C-ESMP items in the SoP I Annexure Template 2
Soil quality	Monitoring of physical, chemical and Biological (as desired by the project)	Sample of soil collected to acidified and analyzed using absorption spectrophotometer	Threshold for each contaminant set by national standards.	Auger grab sampling (preparation and construction stage)	Quarterly basis Refer the Indicative C-ESMP items in the SoP I Annexure Template 2
Waste management	Monitoring of waste generation, segregation, and disposal practices to ensure compliance with waste management plans and regulations, including e-waste	Visual inspection of waste handling areas and documentation of waste streams	Construction and Demolition Waste Management Rules, 2016; Hazardous and Other Wastes (Management and Transboundary Movement) Rules,	As per ESMP	Daily basis

[15] *Ambient Air Quality Standards in Respect to Noise available at: https://dteap.nic.in/oldnotifications/control%20of%20noise%20pollution%20in%20AP_0001_283..pdf*

Attribute	Parameter	Special guidance	Standards	Duration	Frequency
			2016; and Solid Waste Management Rules, 2016		

Note: Contractors to ensure using MoEFCC & NABL accredited labs for environmental monitoring. As = arsenic; BaP = benzo[a]pyrene; BIS = Bureau of Indian Standards; C_6H_6 = benzene; CO = carbon monoxide; CPCB = Central Pollution Control Board; dB(A) = decibel A-weighted; ESMP = environmental and social management plan; Leq = equivalent continuous sound level; MoEFCC – Ministry of Environment, Forest and climate change NH3 = ammonia; Ni = nitrogen; NOx = nitric oxide; O3 = ozone; Pb = lead; PM10 = Particulate matter 10; PM2.5 = Particulate matter 2.5 ;SO2 = sulfur dioxide;

Annexure XXXV: Indicative Reporting Formats

1 Air Quality

Air Quality Monitoring Report								
Project name:								
Monitoring period:								
Location:								
Date	Monitoring station	SO_2 µg/m3	NO_2 µg/m3	$PM_{2.5}$µg/m3	PM_{10} µg/m3	VoC µg/m3	NH_3 µg/m3	CO mg/m

Note: NO2 = Nitrogen dioxide; SO2 = Sulphur dioxide; PM10 = particulate matter; PM2.5 = Particulate matter 2.5, NH_3 = Ammonia, CO- Carbon monoxide.

2 Water Quality

Water Quality Monitoring Report						
Project name:						
Monitoring period:						
Location:						
Parameters	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6
Color						
Odor						
Taste						
Turbidity						
pH						
CaCO3						
Ca						
Mg						
Cu						
Fe						
Mn						
SO4						
Cl						
NO3						
F						
C6H5OH						
Hg						
Cd						
Se						

Water Quality Monitoring Report						
Project name:						
Monitoring period:						
Location:						
Parameters	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6
As						
Cn						
Pb						
Zn						
Anionic detergents (MBAS)						
Cr+6						
Mineral Oil						
Residual free chlorine						

3 Soil Quality

Soil Quality Monitoring Report							
Project name:							
Monitoring period:							
Location:							
Date	Location	pH 1	EC 2	organic Carbon 3	Nitrogen	Phosphorus	Potassium

Annexure XXXVI: Emergency Response Plan Template

Objectives	▪ **To control and contain the incident/accident and if possible, eliminate it.** ▪ **To minimize the effects of the incident on persons, property, and environment.** ▪ **To avoid confusion, panic and to handle the emergency with clear-cut actions.**
INFRASTRUCTURE FOR ON-SITE EMEREGCNY PLAN	
Emergency Control Center	▪ Emergency Control Center is to set up at the site. The Control Center is the focal point in case of an emergency to handle the emergency as directed and coordinated. Contractor needs assign an eligible employee to manage and lead this center.
Assembly point	▪ Assembly point is to set up farthest from the location of likely hazardous events, (near main gate) where persons from office area and visitors would assemble in case of emergency. Up-to-date list with log in time and date of all workers must be available at this point.
Communication System	▪ Since project site office setup is small, all such communication is done verbally or through cell phones.
Training and education	▪ Major emergency procedure should be laid down clearly and convincingly and conduct training and mock drill to everyone on-site, particularly Key Personnel and Essential workers.
Emergency Telephone Numbers display	The emergency telephone numbers shall be kept at the Emergency Control Center and display at an assembly point; such numbers include: ▪ Fire service ▪ Nearest hospital ▪ Ambulance ▪ Police station ▪ Child line ▪ Woman helpline ▪ Name and contact number of responsible persons of Emergency Control Centre.

EMERGENCY FACILITIES		
Firefighting Equipment	▪ Ensure installation of the fire hydrant, sprinkler, and adequate water storage to control fire accident.	
Emergency Lghting and Standby Power	▪ Ensure provision for emergency lighting and standby power supply at project site.	
Emergency Equipment and Rescue Equipment	▪ Ensure at project site that first aid kit, torches, ladders, and ropes are always available.	
Safety Equipment	▪ Safety helmets, boots, gloves, goggles and face shield, harness, and other appropriate PPE.	
PROBABLE EMERGENCY SITUATIONS AND CONTROL MEASURES		
Hazard	Probable Cause of the Accident	Control Measure
Fire	Electrical short circuit, LPG burst, oil storage leakage, and any other cause	▪ Fire extinguishers are useful for putting out small fires; in case of large fire: ▪ Call fire services immediately.
Earthquake	Natural calamities	▪ Drop, cover, and hold on under a sturdy object during an earthquake ▪ Follow instructions of the National Disaster Management Authority of India.
Flood	Natural calamities	▪ Staying informed about flood risks, having a plan, and following evacuation orders to stay safe. ▪ Follow instructions of the National Disaster Management Authority of India.
Thunder & Storm	Natural calamities	▪ Take sturdy shelter indoors during thunderstorms and avoid open areas, water, and tall objects to minimize lightning risk. ▪ Follow instructions of the National Disaster Management Authority of India.
Structural Collapse	Technical failure	▪ Evacuate immediately if suspect a collapse and prioritize safety by establishing a safe zone. ▪ Do not reenter and call emergency services immediately.
Chemical Spill	Human Error/Equipment Failure/Storage Issues/ Emergency Situations/	▪ Immediately evacuate personnel from the affected area to a safe distance to avoid exposure.

	Transportation Accidents/ Process Failures	▪ Notify local emergency services about the spill. ▪ Use appropriate containment measures, such as barriers, absorbent materials, and spill kits, to prevent the spread of the chemical. ▪ If safe to do so, stop the source of the spill, such as shutting off valves or securing leaking containers. ▪ Use suitable methods for cleaning up the spill, such as absorbents, vacuum systems, or specialized chemical neutralizers. ▪ Collect and properly dispose of contaminated materials and waste according to regulatory guidelines. ▪ Prepare a detailed report of the incident, including the nature of the chemical, the extent of the spill, and the response actions taken. ▪ Conduct a review to evaluate the response effectiveness and identify areas for improvement.

Annexure XXXVII: Key Safeguard Measures in Accordance with the National and State Laws and MDBs Standards for Labor Influx Management

Standards	Description	Labor Influx Management Practices
Engagement of local labor	Creating more opportunity for the locals rather than outsiders.	▪ Contractors should give preference to local labor; may be skilled, semi-skilled, and unskilled to minimize the labor influx.
Medical health check-up prior to employment and periodical health check-up.	Migrant worker's medical health check-up needs to be conducted in order to find out their existing communicable and noncommunicable diseases, if any.	▪ Medical health check-up shall be conducted as per the national, state labor laws and MDB standards.
Maintenance of register and records	Relevant registers and records related to employment of migrant workers need to be maintained.	▪ Ensure maintenance of relevant register and records of employment of migrant workers like employment record, payroll records, medical health record as per the national and state labor laws and MDB standards.
Fairness and transparency	Migrant workers should be treated fairly and should have access to clear information about their rights and working conditions.	▪ Transparent engagement processes with clear contracts outlining wages, benefits, and working conditions. ▪ Access to grievance redress mechanisms to report about unfair treatment, if any. ▪ Sensitize migrant workers about their rights and available support services.
Labor standards	Upholding core labor standards like non-discrimination, freedom of association, and minimum wage.	▪ Ensure migrant workers have the same labor rights and protections as domestic workers. ▪ Regular inspections to ensure compliance with labor standards.
Social inclusion	Promoting social integration of migrant workers and their families.	▪ Facilitating access to education, housing, and other social services for migrant workers and their families. ▪ Encouraging cultural exchange and community engagement programs. ▪ Combating discrimination against migrant workers.
Environmental sustainability	Minimizing environmental impact due to labor influx.	▪ Conducting regular environmental monitoring for large-scale projects with significant migrant worker populations.

Standards	Description	Labor Influx Management Practices
		▪ Developing sustainable infrastructure and housing for migrant workers. ▪ Promoting waste management and resource utilization.
Sensitization programs	On-site awareness programs	▪ Conduct sensitization programs on prevention of communicable diseases, SEA/SH, and sanitation and hygiene among others.
Implement code of conduct	A set of principles, rules, and standards that define the conduct and practices that workers are expected to uphold in their daily work responsibilities.	▪ Develop a code of conduct for all the workers with a clear statement of the mission, values including procedures that cover issues such as worker's behavior, harassment, discrimination, conflict of interest, and confidentiality.

Annexure XXXVIII: HIRA Format

(To be prepared by the contractor's safety Officer with coordination of line supervisors and to be reviewed in three months)

Hazard Description	Potential Consequences	Likelihood	Severity	Risk Level	Control Measures	Responsible Person	Action Required	Target Completion Date
Example: Slipping, Tripping	Slip, fall, injury	High	Moderate	High	• Place warning signs; clean spills promptly • Install ant slip mats • Use safety boots	Contractor/ Safety Officer	Implement control measures, conduct training	DD/MM/YYYY
Example: Electrical Hazard	Electric shock, fire	Moderate	High	High	• Regular maintenance of electrical systems • Training on safe electrical practices	Contractor/ Safety Officer	Conduct electrical safety audit, update safety protocols	DD/MM/YYYY

Annexure XXXIX: Labor Influx Study Tool

Sr. No.	Factor and Social Impact	Indicators & Methodology	Yes	No	Mixed
1.	Safety is compromised	▪ Locals complain of: ▪ Loitering ▪ Increase in petty crimes ▪ Interactions with members of the opposite sex ▪ Unruly behaviour of workers ▪ Attempts to visit local families ▪ Attempts to befriend children ▪ Bad influence on local youth ▪ Labor camp has insufficient facilities and workers are frequenting the neighbourhood to access these facilities ▪ Work is intermittent, and workers are frequenting the neighbourhood to pass time ▪ Arguments and conflicts taking place at water source and shops ▪ Migrants have been promising jobs in other places to local youth			
2.	Health is compromised	▪ Workers reported to be frequently visiting local medical facilities ▪ Workers appear to be carrying contagious diseases ▪ Workers known to be from areas with high incidence of TB, HIV-AIDS, and other communicable diseases ▪ Workers known to be frequently traveling in troops from one place to another with the contractors ▪ Workers have unhygienic habits ▪ Labor camp in unsanitary and unhygienic conditions ▪ Labor camp has insufficient water ▪ Labor camp has insufficient toilets and workers are using surrounding areas ▪ Labor camp has insufficient drainage and water is flowing into the surrounding area			

Sr. No.	Factor and Social Impact	Indicators & Methodology	Yes	No	Mixed
		▪ Locals are experiencing new ailments since the project started or labor came into the area			
3.	Economy is compromised	▪ Locals have lost land or have been displaced ▪ Locals feel they could have got employment which outsiders have been given ▪ Locals feel their wages have gone down because of incoming labor force ▪ Some local jobs have been taken up by the speculative/secondary influx of "followers" ▪ Some small trading and businesses have been taken up by speculative/secondary influx of "followers"			
4.	Social harmony is compromised	▪ Persons of different ethnicity, religion, culture toward which there is traditional hostility, are in the area ▪ Pre-existing socio-political tension/conflict in the region			

Annexure XXXX: Budget Tables

Budget category	Description	Quantity	Unit costs (Rs)	Time or rears	Total costs (Rs)	Remarks
Survey and Assessment costs	Expenses for assessment of Community Health and Safety Risks					
Stakeholder consultation	Budget for engaging with stakeholders and addressing concerns related to community health and safety, GBV					
Training and capacity building	Budget for training on GBV, code of conduct, STD/HIV, communicable, non-communicable diseases, safety trainings, mock drills					
Information dissemination	Budget for preparation and printing of statutory displays, signage's, posters, and so on.					

Annexure XXXXI: General Guideline for Preparation of Mitigation Measures for Biodiversity Conservation, and Biodiversity Management Plan

Following the identification of potential impacts on biodiversity, the initial approach is to explore alternative solutions through avoidance. If no viable alternatives are available, mitigation measures should be applied to reduce or minimize the impacts. These measures must be adhered to during the implementation phase as suggested by the Biodiversity expert to minimize adverse impacts and any residual effects.

The biodiversity maintenance and enhancement must include the following, but not limited to:

- Comprehensive information on the species and habitats
- Adherence to relevant local and National laws and regulations
- Necessary measures for safeguarding, monitoring processes, and improving biodiversity
- Roles and responsibilities and a budget for executing the designated actions
- Cost of any remedial works and corrective actions.

Indicative mitigation measures to minimize adverse impacts on the biodiversity

Table 1. Indicative mitigation measure for biodiversity conservation

Biodiversity Conservation Parameter	Action (suggestive mitigation measures)	Mitigation Cost	Measurements	Time Frame	Responsible Agency	Implementation	Monitoring/ Supervision	Monitoring Cost
Minimize habitat disturbance	• Avoid and minimise disturbance in natural habitat areas . • Avoid and Minimize no. of tree cutting. • Translocate the trees falling in the construction areas.		• Ensure the contractor avoid natural habitat and tree cutting	Project planning and preconstruction phase	APCRDA/ADCL/ PgMC/ PMC/ Contractors	Contractor	PgMC/PMC	
Habitat management	(iii) Activities suggested by the Biodiversity expert from time to time.		• Ensure workers are informed about Do's and Don'ts in the specified location	Preconstruction and construction phase	APCRDA/ADCL/ PgMC/ PMC/ Contractors	Contractor	PgMC/PMC	
	• Afforestation: Plant native tree species in cleared areas to restore habitat		• Ensure native plants are used in afforestation efforts • Evaluate the survival rate of planted trees	Preconstruction and construction phase	APCRDA/ADCL/ PgMC/ PMC/ Contractors	Contractor	PgMC/PMC	
	• Soil Conservation: Conserve topsoil, maintain existing		• Ensure topsoil is conserved	Preconstruction	APCRDA/ADCL/ PgMC/	Contractor	PgMC/PMC	

Biodiversity Conservation Parameter	Action (suggestive mitigation measures)	Mitigation Cost	Measurements	Time Frame	Responsible Agency	Implementation	Monitoring/ Supervision	Monitoring Cost
	vegetation cover, and utilize conserved topsoil for landscaping		and used for landscaping purposes	and construction phase	PMC/ Contractors			
	• Establish Vegetation Buffers: Create buffer zones of vegetation along water bodies to filter sediment and control erosion (if applicable)		• Verify establishment of vegetation buffer • Ensure local species planted	Preconstruction and construction phase	APCRDA/ADCL/ PgMC/ PMC/ Contractors	Contractor	PgMC/PMC	
	• muck disposal shall be done to prevent soil erosion, avoid disturbing natural habitats, and promote greenery in the disposal area		• Ensure contractor comply with the muck management in scientific manner to prevent erosion. The muck shall be used to fill the low lying areas and to raise the site levels.	Project planning, preconstruction and construction phase	APCRDA/ ADCL/ PgMC/ PMC/ Contractors	Contractor	PgMC/PMC	

Biodiversity Conservation Parameter	Action (suggestive mitigation measures)	Mitigation Cost	Measurements	Time Frame	Responsible Agency	Implementation	Monitoring/ Supervision	Monitoring Cost
	• Waste management plan be done as per the Solid Waste Management Rules, 2016, Govt. of India. • Construction and demolition waste management will be done as per the Construction and Demolition Waste Management Rules, 2016, Govt. of India.		• Ensure contractor follow waste management plan • Ensure no-waste dump within natural habitats (including aquatic ecosystem)	Project planning, preconstruction and construction phase	APCRDA/ ADCL/ PgMC/ PMC/ Contractors	Contractor	PgMC/PMC	
	• Identify and control Invasive Species: Create a checklist of non-native invasive flora and fauna in the buffer zone		• Ensure control of nonnative plant species	Preconstruction and construction phase	APCRDA/ ADCL/ PgMC/ PMC/ Contractors	Contractor	PgMC/PMC	

Biodiversity Conservation Parameter	Action (suggestive mitigation measures)	Mitigation Cost	Measurements	Time Frame	Responsible Agency	Implementation	Monitoring/ Supervision	Monitoring Cost
Training and awareness program	Organize workshops/training programs for site engineers and workers to ensure they follow SoP **Subject of interest** • Awareness of laws related to Biodiversity. • Ensure proper implementation of mitigation measures for biodiversity protection •		• Schedule and conduct workshops on half yearly basis to keep the workforce updated on laws and Biodiversity. requirements • Maintain records of all training sessions, including attendance, topics covered, and feedback received	Preconstruction and construction phase	APCRDA/ ADCL/ PgMC/ PMC/ Contractors	Contractor	PgMC/PMC	

Annexure XXXXII: Monitoring and Reporting Process

Table 1. Outlines the clearances to be obtained relevant laws of Govt. of India related to biodiversity conservation

Sl. No.	Biodiversity Aspect	Description	Competent Authority	Responsible Agency	Implementation	Supervision Monitoring	Relevant Laws
2.	2.1 Environment clearance	Mandatory clearance is required for projects with potential environmental impacts (Category A & Category B)	Ministry of Environment, Forest & Climate Change (MoEFCC)/ the State Level Environment Impact Assessment Authority (SEIAA), Govt. Of Andhra Pradesh	APCRDA	Contractor	PgMC/PMC	EIA Notification, 2006 (as subsequently amended)
	2.2 Tree cutting	Permission is required for cutting trees for the project from the forest department	State Forest Department	APCRDA/ State Forest Department	Contractor /State Forest Department	PgMC/PMC	AP WALTA

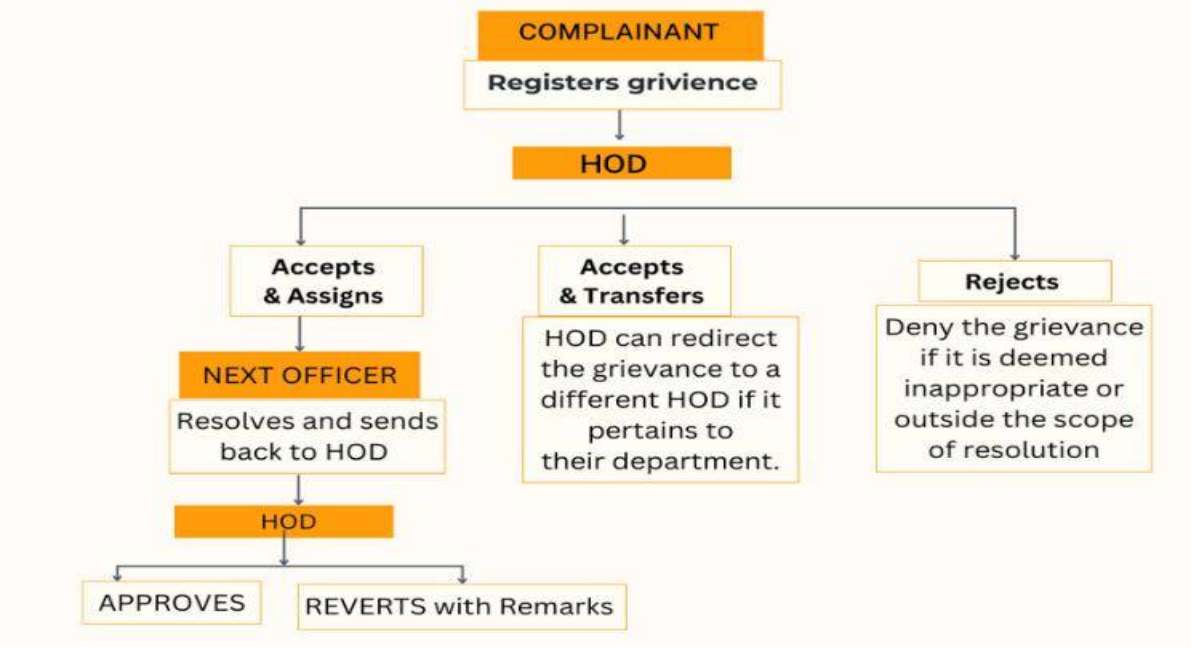
Institutional Framework

The Institutional Framework for monitoring and reporting is outlined in Table 2.

Table 2. Institutional Framework for Monitoring and Reporting

Level	Entity	Responsibilities
1.	APCRDA (ESMU unit)	• Supervise implementation of biodiversity enhancement
		• Ensure compliance with guidelines from MDBs, MoEFCC, and SEIAA, APPCB
		• Review and approve measures, schedules, and reports from the Biodiversity expert for implementation
2.	Program management consultant (PgMC)	• Coordinate monitoring and reporting activities with the PMC engineers and contractors about the existing biodiversity reported by the expert
		• Arrange awareness camps for contractors and workers focused on biodiversity protection and enhancement measures submitted by the expert during implementation.
3.	PMC	• Supervise the works and monitoring the protection aspects of the exiting biodiversity as identified and suggested by the Expert.
		• Liaise with APCRDA/PgMC for updates on site conditions and progress.
4.	Contractor	• Collect and document data on the exiting trees in the project area, water bodies, providing updates to the PMC, ESMU and Site engineer.
		• Ensure protection/mitigation measures are implemented as suggested by the Expert.

Annexure XXXXIII: Workflow Mechanism on Parishkaram portal



Annexure XXXXIV: GRM Escalation levels for Land Complaints on Parishkaram portal:

GRM for Lands Complaints		
Escalation Level	**Role**	**SLA**
Level 1	Tahsildar	0
Level 2	SDC (Unit)	5
Level 3	SDC (Lands)	5
Level 4	Appeal to Nodal Officer, GRM	5

Annexure XXXXV: GRM Escalation levels for Labour Complaints on Parishkaram portal:

GRM for Labour Complaints		
Escalation Level	**Role**	**SLA**
Level 1	PMC	5
Level 2	PGMC	5
Level 3	Concerned Engineer	5

Annexure XXXXVI: INCIDENT REPORT/DOCUMENTING FORM- GBV

Note: this form is to be filled by the designated GBV focal person of the GRM with complete sensitivity and non-biasness towards the survivor and the incident

PART 1

SURVIVOR INFORMATION

1. CASE NUMBER: (assign the Survivor a case number or incident number for confidentiality according to local coding protocols)
2. DATE AND TIME OF THE REPORT:
3. SURVIVOR AGE (DATE OF BIRTH):
4. SEX: FEMALE MALE OTHER (Please specify) RATHER NOT SAY
5. SUMMARY OF INCIDENT: (A brief summary of the incident without disclosing survivor's personal information)

PART 2

INFORMATION ON SERVICE PROVIDERS

Please indicate the organization and the time of the referral from the time the incident was reported. The survivor was referred to the following services.

1. Legal counselling/support
2. Psychosocial counselling
3. Shelter
4. Medical support
5. Police
6. Child helpline/children service providers: Child Helpline: 1098
7. OSC (One Stop Center)
8. Women Helpline (181)
9. Other

STATUS OF THE CASE

In coordination with the referred service provider, please provide information on the status of the case and accordingly document it 'CLOSED' in the GRM

Annexure XXXXVII: CONSENT FOR RELEASE OF INFORMATION

Note: The purpose of this form is to obtain the Survivor's permission to share their information about the incident with other authorized organizations/individuals. The survivor should be informed about the authorized organization/individuals (WB, project Manager, Service providers) to whom the information will be disclosed

I, _____, give my permission for (Name of Organization) to share information about the incident I have reported.

I understand that in giving my authorization, I am giving permission to (Name of Organization) to share the specific case information from my incident report with the PIC of the project/World Bank/Service Providers, so that I can receive the best possible care and assistance with safety and as per my need. I understand that the information will be treated with confidentiality and respect and shared only as needed to provide the assistance I need and request. I understand that releasing this information means that a person from the referred service provider may come to talk to me.

Signature or thumb print of the survivor:

Signature or thumb print of the parent/guardian (if survivor is under 18):

**Note: The consent form will be translated into Telugu and Hindi languages*

Annexure XXXXVIII: GBV SERVICE PROVIDERS

Departments	Government notified service providers		
	State level	**District level**	**Sub district level**
Society for Elimination Rural Poverty (SERP) & Mission for Elimination of Poverty in Municipal Areas (MEPMA)		State Mission Officer – MEPMA MPDO - SERP	• Gender Committee members – 5 per VO • A total of 345 Gender Committee members.
Women & Child Welfare Department (WCD)	Women Helpline (181)	• District social welfare officer (DSWO) • Project Director (PD-District), Women & Child Welfare Department (WCD) • Protection Officers • Child Care Institution (CCI) • Childline (1098) • One Stop Centre (OSC-CA)	• Child Development Project Officer (CDPO) • Shelter home: Shakti Sadan, Swadhar Greh, Nari Niketan • Sector supervisor • Anganwadi worker • Police

Health		• District Program Manager of National Health Mission (NHM)
		• District Medical & Health Officer (DMHO)
			• Primary Health Centre
			• First Referral Unit
			• Community Health Center
			• Staff nurse
			• Accredited Social Health Activist (ASHA)
			  • ASHA facilitator - Supervisor
			  • ASHA worker

Legal	State Legal Services Authority	District Legal Services Authority (DLSA)	
Home	Police	Police	Anti-human trafficking unit
Non-government Service Providers			
NGOs/CSOs/ CSR projects/Faith-based organizations			

Annexure XXXXIX: GBV REFERRAL PATHWAY MAPPING

Sl. No.	Stakeholder	Service provided by stakeholder	Referral Practice followed (Backward linkages)	Referral Practice followed (Forward Linkages)
1	Women Helpline (181)	Counseling, Emergency	OSC (for updates on open cases at OSC)	OSC, Police, Hospital
	One Stop Center	Police facilitation, medical aid, psychosocial counselling, legal support, temporary shelter (5 days)		
	Child Development Project Officer			Child Care Institutions
	Shakti Sadan, Swadhar Greh, Nari Niketan	Long term shelter		
	Child Care Institution (CCI)			
	Child Line (1098)			
	Anganwadi Worker	Outreach/awarenes ss		
	Police			
	Public Health Centre (PHC)/Community Health Centre (CHC)	Medical aid		
	Auxiliary Nurse Midwife (ANM)			
	Accredited Social Health Activist (ASHA Facilitator/ASHA Worker)			
	District Legal Services Authority (DLSA)			

Annexure XXXXX: ROLE OF GBV SERVICE PROVIDERS

Case Management system and Referral Procedure

- Upon receipt of any SEA/SH-related grievance, the GBV service provider will assess the safety of the survivor. The provider needs to develop an immediate safety or protection plan to address the risk of retaliation, possible breaches of confidentiality or other further violence against the victim. Subject to a risk- assessment and based on the survivor's consent and best interest, the safety or protection plan may include relocation support where necessary and appropriate.
- The nearest medical facility that can provide immediate medical care should be pre-identified. Such a medical facility should have provision for necessary treatment for conditions directly arising from sexual exploitation and abuse. GBV service providers in cases of sexual abuse, should inform survivors about the importance of seeking medical care within 72 hours and providing the necessary referral to services, including HIV post-exposure treatment, post exposure prophylaxis, and reproductive and sexual health care as needed and desired.
- Accessible and inclusive mental health and/or psychosocial support services should be identified and made available. If possible, the GBV service provider should be able to provide psychological first aid. The provision of basic psychosocial support, including psychological first aid, and psychosocial counselling to assist survivors should be easily accessible to any survivor. Depending on the need, referrals to more specialized mental health care should be undertaken.
- Allocation of resources: Some funds should be available for immediate needs of the victim. This may be used to provide shelter, food, and transport to access medical/psychological care and legal support for the victim if needed and only when the victim assent/consent.
- Survivors who may be displaced or are vulnerable may need food, clothing, livelihood, education support and assistance in reintegrating into their families, and communities. In addition, children who are survivors may need support in re-integration back to school. Children's family members may need support in food, clothing and school materials.
- Legal services: It is likely that a lot of survivors come from vulnerable communities, and they may not be able to navigate and access legal services. GBV service providers should be able to able to explain to the survivors what legal recourse they have. If a survivor then decides to pursue legal action, there should be provision to provide legal support.
- In cases of children born as a result of sexual exploitation and abuse, the project will help to facilitate the pursuit of paternity and child support claims for survivors. This will only be undertaken with consent, when requested by a victim, and in accordance with applicable customary, national and international laws.

Special Considerations for children under 18 years old:

- Children should be interviewed in a child-friendly space in a child- and adolescent-inclusive manner. In many cases this will require that a caregiver or trusted adult remains present during any interview. Special communication methods and styles may be needed. Staff interviewing children must have had training and past experience in working with child survivors.

- It is important to use language that is appropriate to the child's age and developmental level
- For children, informed consent should be taken from the child (depending on their understanding) and their parent or legal guardian. Keep in mind that sometimes informing the parents or caregivers could put the child at risk of retaliation, violence, and abuse. In such cases, legal system may need to be involved.
-
- For children under 18 years, it is obligatory to report SEA/SH to a legal authority, preferably with consent from the legal guardian.
- Assessment of the immediate safety of a child is most important. This means establishing (I) whether a child victim is safe to go back to their home environment or (ii) the likelihood that SEA/SH will happen if they go back to their current environment.
- Child safe houses based in the community need to be identified. These are places where a child could be sent if there is imminent danger of SEA/SH happening again.

Child-friendly outreach and communication

- Provide in-person feedback (in a child- and adolescent-inclusive manner for children) on the outcomes of the report and any investigation to the person (child or caregiver) who submitted the report.
- Consult with the survivor and their caregivers for advice on the best ways to provide mass communication/ feedback on cases.
- Deliver mass communication/feedback with anonymized information on the outcomes of reports and investigations of child SEA/SH cases in a way that is accessible to children. Special awareness programs should focus on schools/child clubs/community. Through these channels you can raise awareness regarding what constitutes SEA/SH and the GRM process. A child- and adolescent-inclusive reporting pathway should be developed. This should include a dedicated Hotline, and a variety of means for reporting, including for example, SMS, Facebook Page and Messenger contact, and a website.)
- Use child- and adolescent-inclusive language and communication methods to provide feedback.
- Use Information, Education and Communication (IEC) materials which are child-and adolescent- inclusive and age appropriate.

Annexure XXXXXI: MONITORING FOR GBV COMPLIANCE

Indicator	Frequency	Agency Responsible
A. Information Related to ICC/GRC		
Recordings of establishment of ICC	Preconstruction stage and upon changes	PgMC & PMC
Details of ICC/ members	Preconstruction stage and if any changes occur	PgMC & PMC
Meetings or activities conducted by ICC members	Quarterly reporting	PgMC & PMC
B. Dissemination of Information and Awareness Generation		
No. of sensitization trainings and workshops on GBV grievance procedures	Quarterly reporting	PgMC & PMC
Availability of displayed IEC materials/posters/banners/handwritten SOPs on GBV at camp and construction sites	Quarterly reporting	PgMC & PMC
C. Reporting		
No. of project-related SEA/SH complaints received and/or referred by the grievance mechanism disaggregated by age and sex	Concurrent monitoring	PgMC & PMC
the number of open cases and the average time they have remained open	Monthly Reporting	PgMC & PMC
the number of cases closed; the average time they had remained open; and the number of days / months till case closure	Monthly reporting	PgMC & PMC
the number of survivors accepting referral to GBV services for the reported incident and the number or survivors that did not	Monthly reporting	PgMC & PMC

Annexure XXXXXII: DEFINITIONS OF SEA/SH TERMS

Official Definition	Bank Operationalization	Example
Sexual Exploitation: Any actual or attempted abuse of a position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another.	In Bank-financed operations/projects, sexual exploitation occurs when access to or benefit from Bank-financed goods, works, non-consulting services or consulting services is used to extract sexual gain.	- A community member is promised employment on the World Bank-financed project site in exchange for sex. - A project worker connecting water lines to homes requests a sexual favor for access to water connection. - A project worker denies a woman passage through the worksite unless she performs a sexual favor
Sexual Abuse: Actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.	In Bank-financed operations/projects, sexual abuse occurs when a project worker (contractor staff, subcontractor staff, supervising engineer) uses force or unequal power vis-a-vis a community member or colleague to perpetrate or threaten to perpetrate an unwanted sexual act	- A project worker stays in the cafeteria after dinner and sexually assaults a kitchen staff member - A project worker touches an administrative staff member's breasts and says there is more to come. - A supervisor for a subcontractor asks his female colleague to join him for a business dinner with the main contractor. After dinner he asks her to entertain "the boss" in his room to show appreciation for the contract and her work.
Sexual Harassment: Any unwelcome sexual advance, request for sexual favor, verbal or physical conduct or gesture of a sexual nature, or any other behavior of a sexual nature that might reasonably be expected or be perceived to cause offense or humiliation to	In Bank-financed operations/projects, sexual harassment occurs within the context of the company of a subcontractor or contractor and relates to employees of the company experiencing	- A project worker sends sexually explicit text messages to a coworker - A project worker leaves an offensive picture that is sexually explicit on a co-worker's desk - A project worker asks all female employees to greet him with a kiss on the cheek every day before work.

another, when such conduct interferes with work, is made a condition of employment or creates an intimidating, hostile or offensive work environment.	unwelcome sexual advances or requests for sexual favors or acts of a sexual nature that are offensive and humiliating among the same company's employees.	

Annexure XXXXXIII: SURVIVOR-CENTERED APPROACH

The survivor-centered approach is based on a set of principles and skills designed to guide professionals—regardless of their role—in their engagement with survivors (predominantly women and girls but also men and boys) who have experienced sexual or other forms of violence. The survivor-centered approach aims to create a supportive environment in which the survivor's interests are respected and prioritized, and in which the survivor is treated with dignity and respect. The approach helps to promote the survivor's recovery and ability to identify and express needs and wishes, as well as to reinforce the survivor's capacity to make decisions about possible interventions.

Guiding principles of survivor-centered approach:

1. **Confidentiality –** do not disclose any information at any time and to any party without the informed consent of the person concerned. Share anonymized, non-identifiable information on a strict need-to-know basis.

2. **Respect -** actions are to be guided by respect of survivors' rights and choices. Survivors need to feel that they are believed and are in control of what happens to them.

3. **Non-discrimination -** survivors of violence should receive equal and fair treatment regardless of their age, race, religion, nationality, ethnicity, sexual orientation, or any other characteristics.

4. **Safety -** survivor's safety should always be considered the first and most important priority.

5. Enable **access to quality and holistic services** – health, psychological, legal/ security, safehouse/shelter, livelihood.

6. **Informed consent** – survivors must have all the information they need to make informed decisions; information must be provided in a language the survivor understands, clearly and accessible, and considers their personal circumstances.

Consent and Informed Assent

Consent is the informed choice underlying an individual's free and voluntary intention, acceptance or agreement to do something. No consent can be found when such acceptance or agreement is obtained through the use of threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. In accordance with the United Nations Convention on the Rights of the Child, the World Bank considers that consent cannot be given by children under the age of 18. Children are generally considered unable to provide informed consent because they do not have the ability and/or experience to anticipate the implications of an action. Mistaken belief regarding the age of the child a is also not a defense. There are also instances

where informed consent from an adult might not be possible due to cognitive impairments and/or physical, sensory, or intellectual disabilities.

Informed Assent: Informed assent is the expressed willingness to participate in services. For younger children who are by definition too young to give informed consent, but old enough to understand and agree to participate in services, the child's "informed assent" is sought. To provide informed consent, the individual must have the capacity and maturity to know about and understand the services being offered and be legally able to give their consent. Parents are typically responsible for giving consent for their child to receive services until the child reaches 18 years of age. In some settings, older adolescents are also legally able to provide consent in lieu of, or in addition to, their parents. To ensure consent is "informed", service providers must provide the following information to the child:

- Giving the child all the possible information and options available to them so they can make choices.
- Informing the child that they may need to share their information with others who can provide additional services.
- Explaining to a child what is going to happen to them.
- Explaining the benefits and risks of the service to the child.
- Explaining to the child that they have the right to decline or refuse any part of services.
- Explaining limits to confidentiality

Annexure XXXXXIV: CODE OF CONDUCT FOR CONTRACTOR'S PERSONNEL

We are the Contractor, [*enter name of Contractor*]. We have signed a contract with [*enter name of Employer*] for [*enter description of the Works*]. These Works will be carried out at [*enter the Site and other locations where the Works will be carried out*]. Our contract requires us to implement measures to address environmental and social risks related to the Works, including the risks of sexual exploitation, sexual abuse and sexual harassment.

This Code of Conduct is part of our measures to deal with environmental and social risks related to the Works. It applies to all our staff, labourers and other employees at the Works Site or other places where the Works are being carried out. It also applies to the personnel of each subcontractor and any other personnel assisting us in the execution of the Works. All such persons are referred to as "**Contractor's Personnel"** and are subject to this Code of Conduct.

This Code of Conduct identifies the behaviour that we require from all Contractor's Personnel.

Our workplace is an environment where unsafe, offensive, abusive or violent behaviour will not be tolerated and where all persons should feel comfortable raising issues or concerns without fear of retaliation.

REQUIRED CONDUCT

Contractor's Personnel will:

1. Carry out his/her duties competently and diligently.
2. Comply with this Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Personnel and any other person.
3. Maintain a safe working environment including by:
    a. ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health.
    b. wearing required personal protective equipment.
    c. using appropriate measures relating to chemical, physical and biological substances and agents; and
    d. following applicable emergency operating procedures.
4. Report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health.
5. Treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children.
6. Not engage in Sexual Harassment, which means unwelcome sexual advances, requests for sexual favours, and other verbal or physical conduct of a sexual nature with another Contractor's or Employer's Personnel.
7. Not engage in Sexual Exploitation, which means any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another.
8. Not engage in Sexual Abuse, which means the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.

9. Not engage in chasing or hunting or capture of wildlife including birds and fishing and, refrain from acquiring wildlife meat, skins, feathers, or any similar products derived from wildlife.
10. Not engage in encroaching upon or degrading of forests as well as the collection and harvesting of forest resources such as firewood, herbs, timber and non-timber forest products among others.
11. Not engage in any form of sexual activity with individuals under the age of 18, except in case of pre-existing marriage- including contact through digital media. Mistaken belief regarding the age of a child is not a defence. Consent from the child is also not a defence or excuse.
12. In responding to any reporting of SEA/SH/VAC, everyone should follow the project SEA/SH GRM procedure and process. Individuals/employees experiencing any forms of GBV, including SEA/SH is supported by facilitating access to specialist services in accordance with the SEA/SH GRM procedure and records will be kept in confidentiality. The Contractor must immediately inform the gender/GBV focal point of any SEA/SH allegations or incidents, ensuring confidentiality. The report should include the type of allegation (sexual exploitation, abuse, or harassment), and the gender and age of the affected person. The Contractor must also notify the focal person of any such incidents occurring on Subcontractors' or suppliers' premises related to the Works. Subcontractors and suppliers are required to promptly inform the Contractor of any SEA/SH incidents.
13. Complete relevant training courses that will be provided related to the environmental and social aspects of the Contract, including on health and safety matters, Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH).
14. Report violations of this Code of Conduct; and
15. Not retaliate against any person who reports violations of this Code of Conduct, whether to us or the Employer, or who makes use of the grievance mechanism for Contractor's Personnel or the project's Grievance Redress Mechanism.

RAISING CONCERNS

If any person observes behaviour that he/she believes may represent a violation of this Code of Conduct, or that otherwise concerns him/her, he/she should raise the issue promptly. This can be done in either of the following ways:

1. Contact [*enter name of the Contractor's Social Expert with relevant experience in handling sexual exploitation, sexual abuse and sexual harassment cases, or if such person is not required under the Contract, another individual designated by the Contractor to handle these matters*] in writing at this address [ ] or by telephone at [ ] or in person at [ ]; or
2. Call [ ] to reach the Contractor's hotline *(if any)* and leave a message.

The person's identity will be kept confidential, unless reporting of allegations is mandated by the country law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. We take all reports of possible misconduct and will investigate and take appropriate action. We will provide warm referrals to service providers that may help support the person who experienced the alleged incident, as appropriate.

There will be no retaliation against any person who raises a concern in good faith about any behaviour prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

CONSEQUENCES OF VIOLATING THE CODE OF CONDUCT

Any violation of this Code of Conduct by Contractor's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.

FOR CONTRACTOR'S PERSONNEL:

I have received a copy of this Code of Conduct written in a language that I comprehend. I understand that if I have any questions about this Code of Conduct, I can contact [*enter name of Contractor's contact person(s) with relevant experience*] requesting an explanation.

Name of Contractor's Personnel: [insert name]
Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: (day month year): _____

ATTACHMENT 1: Behaviours constituting Sexual Exploitation and Abuse (SEA) and behaviours constituting Sexual Harassment (SH).

The following non-exhaustive list is intended to illustrate types of prohibited behaviours.

(1) **Examples of sexual exploitation and abuse** include, but are not limited to:

- A Contractor's Personnel tells a member of the community that he/she can get them jobs related to the work site (e.g. cooking and cleaning) in exchange for sex.
- A Contractor's Personnel that is connecting electricity input to households says that he can connect women headed households to the grid in exchange for sex.
- A Contractor's Personnel rapes, or otherwise sexually assaults a member of the community.
- A Contractor's Personnel denies a person access to the Site unless he/she performs a sexual favour.
- A Contractor's Personnel tells a person applying for employment under the Contract that he/she will only hire him/her if he/she has sex with him/her.
- A Contractor's Personnel dates or has a romantic relationship with a child under 18 years old, keeps secrets with children, or displays favouritism.
- A Contractor's Personnel has inappropriate physical contact with children under 18 years old, including kisses and showing affection of any kind in an isolated area.

- A Contractor's Personnel holds private electronic communication with children under 18 years old, including via social media, as well as transportation of children unless for authorized purposes.
- A Contractor requests sexual favours in return for protection, food, shelter, payment of medical or school fees, or any other form of assistance or promise of assistance.

(1) Examples of sexual harassment in a work context

- Contractor's Personnel comment on the appearance of another Contractor's Personnel (either positive or negative) and sexual desirability.
- When a Contractor's Personnel complaints about comments made by another Contractor's Personnel on his/her appearance, the other Contractor's Personnel comments that he/she is "asking for it" because of how he/she dresses.
- Unwelcome touching of a Contractor's or Employer's Personnel by another Contractor's Personnel.
- A Contractor's Personnel tells another Contractor's Personnel that he/she will get him/her a salary raise, or promotion if he/she sends him/her naked photographs of himself/herself.
- A Contractor's Personnel makes jokes that are uncomfortable, frightening, or hurtful, or name calls with sexual epithets.

Note: This form is to be signed by the contractor's personnel after the contract is awarded.

Annexure XXXXXV: Details of Anganwadi, Primary School, Village Secretariat and Primary Health Centre (PHC)

I. Details of PHC locations
II. Details of Anganwadi workers
III. Details of Primary Schools
IV. Details of Village Secretariats

- Special Committee proposed in discussion with legal team to redress GBV grievances as ICC cannot be expanded to include GBV/SEA/SH incidents outside workplace
- List not exhaustive
- List not exhaustive
- POSH Act defines “sexual harassment” as one or more of the following unwelcome acts or behavior (whether directly or by implication) namely: —(i) physical contact and advances; or (ii) a demand or request for sexual favors; or (iii) making sexually colored remarks; or (iv) showing pornography; or (v) any other unwelcome physical, verbal or non-verbal conduct of sexual nature
- District Legal Service Authority (DLSA) formed at the district level under the Legal Services Authorities Act, 1987 to provide free and legal aid and services.
- List and information not exhaustive

ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY
LETTER OF ACCEPTANCE

MAU61-EE0ENV(CBSI)/1/2025-STG

From:

The Addl. Director (LSE),
APCRDA,
Vijayawada
Andhra Pradesh -520002

To:

VVN Technologies Pvt Ltd.,
H.No: 7-604, Guptha Street,
New StateBank Colony,
Mangalagiri,Guntur Dist.–522503.

Sub: APCRDA - ESMU - LSE - "To conduct a comprehensive baseline data study on the productivity (primary, secondary and tertiary) and water quality during pre-monsoon, monsoon & post monsoon in the entire Krishna River stretch of 22.5 km along Amaravati capital city for this work" - Letter of Acceptance - Reg.

Ref:

1) NIT. No. 107/MAU61-EE0ENV(CBSI)/1/2025-STG/2nd call. Dated: 26.03.2025
2) Price bid opened on Dt. 09.05.2025

@@@

You are hereby informed that your offer for the work "To conduct a comprehensive baseline data study on the productivity (primary, secondary and tertiary) and water quality during pre-monsoon, monsoon & post monsoon in the entire Krishna River stretch of 22.5 km along Amaravati capital city" Your organisation is a successful bidder and your offer TCV:63,85,000.00 only excl GST 18% on the Total lumpsum bid Rs. 66,00,000.00 has been accepted

You are requested to submit the following within 7 days from the receipt of this letter to the tendering authority

1. An irrevocable bank guarantee in favour of "Andhra Pradesh Capital Region Development Authority", towards performance security @ 5%, on the TCV with validity period till 31st July 2026.
2. Original Certificates/documents of the uploaded scanned copies to the tender.
3. One hundred rupees Non judicial e stamp paper.
4. MoU between VVN Technologies Pvt Ltd and Department of Environment Sciences- ANU with time period and the scope of work as per tender.

5. Transaction receipt of online payment of Corpus fund in favour of managing Director, APTS, Vijayawada.

Authorised Representative (Not below the cadre of Director) from your firm to be present at the Office of APCRDA, Vijayawada, Andhra Pradesh for execution of Contract agreement subject to satisfying of the conditions.

Please return this copy duly accepted and signed.

Addl. Director, LSE

APCRDA.

Digitally signed by
M HARI PRASAD
Date: 10-06-2025
17:16:13

Amaravati Development Corporation Limited

54 15 1, Venkateswara Nagar, Sonovision Building, Ring Road, Vijayawada, NTR District, 520008 Andhra Pradesh; website : www.adcl.in , Email: amaravati-adc@ap.gov.in , ccdmc.amaravati@gmail.com

From
Smt. D. Lakshmi Parthasarathy, IAS (R)
Chair-person & Managing Director,
Amaravati Development Corporation
Vijayawada-520003

To
The Commissioner,
APCRDA,
Lenin Centre, Governorpet
Vijayawada

Letter No.207/ADCL/IPD/18 . Dt. 09.05.2025

Sir,

Sub: Sub: APCRDA – LSE – Compliance to EC and Hon'ble NGT conditions – Request to furnish details on specific EC conditions related to the subject ecology for capital city works in Amaravati Capital City area – reg.

Ref: 1. APCRDA Letter MAU61-EE0ENV(OTH)/2/2020-CZLE

This is with reference to the above captioned subject. Subject wise response is given below:

1. **List of tree species, native species considered for greenery works, list of deep-rooted large foliage plantation (of Native) species considered along the trunk roads.**

Tree Species considered for greenery works:

S.No	Name of the trees / Plants	Native	Deep Rooted	Religious	Medicinal Value	Large Foliage
1	Ficus benghalensis	YES	YES	YES	YES	YES
2	Tabebuia avellanedae	YES	YES		YES	YES
3	Anthocephalus cadamba	YES	YES	YES	YES	YES
4	Swietenia mahagoni		YES	YES	YES	YES
5	Bauhinia blackeana		YES	YES	YES	YES
6	Ficus religiosa	YES	YES	YES		YES
7	Swietenia mahagoni		YES	YES	YES	YES
8	Lagerstroemia flos-reginae					YES
9	Spathodea campanulata		YES			YES
10	Cassia fistula	YES	YES		YES	YES
11	Azadirachta indica	YES	YES	YES	YES	YES
12	Ficus religiosa	YES	YES	YES		YES
13	Tamarindus indica	YES	YES	YES	YES	YES
14	Cassia fistula	YES	YES		YES	YES
15	Terminalia catappa	YES	YES		YES	YES

16	Azadirachta indica	YES	YES	YES	YES	YES
17	Jacaranda mimosifolia					YES
18	Ficus religiosa	YES	YES	YES		YES
19	Delonix Regia	YES	YES			YES
20	Millingtonia hortensis	YES	YES			YES
21	Michelia champaca	YES	YES			YES
22	Tabebuia rosea			YES		YES
23	Couroupita guianensis	YES	YES		YES	YES

2. Details of species wise total no. of trees planted and no. of trees survived under greenery works. Girth at breast height and height of the tree, age of the sapling during plantation and year of the plantation

ADCL has undertaken greenery works along the roads. The details of the plantation are given below:

Sl.No.	Species wise name	Planting Done	Survival rate in %	Planting year	Age of the sapling durig plantation	Girth Size in cm	Height in Mtrs
1	*Tabebuia rosea*	2335	75%	2018-19	2 Years	152-170	6-8
2	*Swietenia mahogani*	2484				120-165	8-10
3	*couroupita guianensis*	161				112-140	7-9
4	*Ficus benghalensis*	314				106-148	6-8
5	*Millingtonia hortensis*	1514				168-172	8-11
6	*Spathodea campanulata*	983				108-159	8-11
7	*Tabebuia avellanedae*	313				43-62	4-6
8	*Azadirachta indica*	2755				88-129	8-9
9	*Cassia fistula*	764				49-58	5-7
10	*Anthocephalus cadamba*	729				57-71	5-7
11	*Bauhinia blakeana*	358				40-62	4-6
12	*Ficus religiosa*	2145				112-156	6-8
13	*Tamarindus indica*	475				72-102	4-6
14	*Terminalia catappa*	206				86-120	5-8
	Total	**15626**					

3. **Designs and engineering measures considered for the embankment consolidation, embankment lining for the total length of the canals and in detention ponds under flood works.**

ADCL has considered the following engineering measures for the embankment consolidation and lining works.

- Supplying of 2.5 mm thick, 275 gsm poly-propeline non-woven geotextile (filter fabric) for reservoir, including cost of materials, transportation, etc., complete with all leads and lifts, as directed by Engineer in Charge
- Laying of 2.5 mm thick, 275 gsm poly-propeline non-woven geo-textile (filter fabric) for reservoir etc., complete with all leads and lifts, as directed by Engineer in Charge
- supply of Revet mattress of 0.3 m thickness with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh as per IS 16014:2012 and MORTH 2500, Mesh Type 6x8 (D=60 mm), Zinc coated steel wire and coated with extruded and bonded PVC material, Mesh wire diameter 2.2/3.2mm (ID/OD), mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2/3.2mm(ID/OD), for reservoir, including cost of materials, transportation, etc., complete with all leads and lifts, as directed by Engineer in Charge
- Laying of Revet mattress of 0.3 m thickness with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh as per IS 16014:2012 and MORTH 2500, Mesh Type 6x8 (D=60 mm), Zinc coated steel wire and coated with extruded and bonded PVC material, Mesh wire diameter 2.2/3.2mm (ID/OD), mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2/3.2mm(ID/OD), for reservoir, including cost of materials, transportation etc., complete with all leads and lifts, as directed by Engineer in Charge.

Request you to take note of the above responses for further necessary action.

Yours faithfully,

Chairperson & Managing Director
Amaravati Development Corporation Ltd

Species planted at Priority Roads

Sl.No.	Species wise name	Planting Done	Survival rate in %	Planting year	Age of the sapling durig plantation	Girth Size in cm	Height in Mtrs
1	*Tabebuia rosea*	2335	75%	2018-19	2 Years	152-170	6-8
2	*Swietenia mahagoni*	2484				120-165	8-10
3	*couroupita guianensis*	161				112-140	7-9
4	*Ficus benghalensis*	314				106-148	6-8
5	*Millingtonia hortensis*	1514				168-172	8-11
6	*Spathodea campanulata*	983				108-159	8-11
7	*Tabebuia avellanedae*	313				43-62	4-6
8	*Azadirachta indica*	2755				88-129	8-9
9	*Cassia fistula*	764				49-58	5-7
10	*Anthocephalus cadamba*	739				57-71	5-7
11	*Bauhinia blackeana*	358				40-62	4-6
12	*Ficus religiosa*	2145				112-156	6-8
13	*Tamarindus indica*	475				72-102	4-6
14	*Terminalia catappa*	286				86-128	5-8
	Total	**15626**					

Joint Director
UG&F Wing
ADCL, VJA

TREES PROPOSED FOR GREEN BUFFER

S.no	Name of the trees / Plants	Native	Deep Routed	Religious	Medicinal Value
1	Ficus benghalensis	YES	YES	YES	YES
2	Tabebuia avellanedae	YES	YES		YES
3	Anthocephalus cadamba	YES	YES	YES	YES
4	Swietenia mahagoni		YES	YES	YES
5	Bauhinia blackeana		YES	YES	YES
6	Ficus religiosa	YES	YES	YES	
7	Swietenia mahagoni		YES	YES	YES
8	Lagerstroemia flos-reginea				
9	Spathodea campanulata		YES		
10	Cassia fistula	YES	YES		YES
11	Azadirachta indica	YES	YES	YES	YES
12	Ficus religiosa	YES	YES	YES	

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ADCL, VJA

Contd.....

S.no	Name of the trees / Plants	Native	Deep Routed	Religious	Medicinal Value
13	Tamarindus indica	YES	YES	YES	YES
14	Cassia fistula	YES	YES		YES
15	Terminalia catappa	YES	YES		YES
16	Azadirachta indica	YES	YES	YES	YES
17	Jacaranda mimosifolia				
18	Ficus religiosa	YES	YES	YES	
19	Delonix Regia	YES	YES		
20	Millingtonia hortensis	YES	YES		
21	Michelia champaca	YES	YES		
22	Tabebuia rosea			YES	
23	Couroupita guianensis	YES	YES		YES

Joint Director
UG&F Wing
ADCL, VJA

	AMARAVATI DEVELOPMEN
Name of Work: Package II - World Bank And Asian Development Bank Fu Construction of Krishnaya	
Sl.No.	**Item Description**
4.00	**LINING & ALLIED WORKS**
4.01	Supplying of 2.5 mm thick. 275 gsm poly-propeline non-woven geo-textile (filter fabric) for reservoir, including cost of materials, transportation,etc., complete with all leads and lifts, as directed by Engineer in Charge
4.02	Laying of 2.5 mm thick. 275 gsm poly-propeline non-woven geo-textile (filter fabric) for reservoir etc., complete with all leads and lifts, as directed by Engineer in Charge
4.03	supply of Revet mattress of 0.3 m thickness with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh as per IS 16014:2012 and MORTH 2500, Mesh Type 6x8 (D=80 mm), Zinc coated steel wire and coated with extruded and bonded PVC material, Mesh wire diameter 2.2/3.2mm (ID/OD), mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2/3.2mm(ID/OD), for reservoir, including cost of materials, transportation,etc., complete with all leads and lifts, as directed by Engineer in Charge
4.04	Laying of Revet mattress of 0.3 m thickness with Mechanically Woven Double Twisted Hexagonal Shaped Wire mesh as per IS 16014:2012 and MORTH 2500, Mesh Type 6x8 (D=80 mm), Zinc coated steel wire and coated with extruded and bonded PVC material, Mesh wire diameter 2.2/3.2mm (ID/OD), mechanically edged/selvedged with partitions at every 1m interval and shall have minimum 10 numbers of openings per meter of mesh perpendicular to twist, tying with lacing wire of diameter 2.2/3.2mm(ID/OD), for reservoir, including cost of materials, transportation etc., complete with all leads and lifts, as directed by Engineer in Charge

Amaravati Capital City Development Project
(ACCDP)

Resettlement Policy Framework

Andhra Pradesh Capital Region Development Authority (APCRDA)

Government of Andhra Pradesh, Amaravati

February 2025

TABLE OF CONTENTS

ACRONYMS **4**

EXECUTIVE SUMMARY **5**

I. INTRODUCTION **15**

Financial Assistance from Government of India and Multi-Lateral Agencies 17
Need and Objectives of Resettlement Policy Framework 17
Scope of RPF 17
Principles of RPF 18

II. LAND ASSEMBLY INSTRUMENTS **19**

Land Pooling Scheme (LPS) 20
Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (LARR Act, 2013) 23
Negotiated Settlement Policy 23
Summary of Entitlements 25

III. ASSISTANCE TO LANDLESS LABORERS **28**

IV. INSTITUTIONAL ARRANGEMENT AND IMPLEMENTATION MECHANISM **31**

Institutional Arrangements for LPS / LA / Negotiated Settlement Policy 31
Implementation Mechanism for LPS / LA / Negotiated Settlement Policy 33
Coordination with District Administration for Land Acquisition 33
Census Cum Socio-Economic Survey 35
Resettlement Action Plan (RAP) 35
Valuation of Land and Assets 37
Targeted Support to Vulnerable Groups 37
Time Frames 37
Public Consultation Mechanism 38
Program Information Centers and Communication Strategy 38
Grievance Redressal Mechanism (GRM) 38
Disclosure 40
Monitoring 41
Budget and funding arrangements 41
Other Related Issues 42

ANNEXURES **43**

Annexure 1 - Definitions **43**

Annexure 2 - Land Pooling Scheme (LPS) Annex **47**

Annexure 3 – Entitlement Matrix – Negotiated Settlement Policy **60**

ACRONYMS

AP	Andhra Pradesh
ACCDP	Andhra Pradesh Capital City Development Project
APCRDA	Andhra Pradesh Capital Region Development Authority
APSSDC	Andhra Pradesh State Skill Development Corporation
AIUDP	Amaravati Integrated Urban Development Program
BSO	Board Standing Orders
CA	Competent Authority
CBD	Central Business District
DC	District Collector
DT	Deputy Tahsildar
EC	Encumbrance Certificate
GP	Gram Panchayat
GTP	Gujarat Town Planning
IAY	Indira Awaas Yojana
LA	Land Acquisition
LPOC	Land Pooling Ownership Certificate
LPS	Land Pooling Scheme
MA&UD	Municipal Administration & Urban Development
MIS	Management Information System
MNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MoU	Memorandum of Understanding
NIC	National Informatics Centre
PAP	Project/Program Affected Person
PAF	Program Affected Family
PDF	Program Displaced Family
POT	Prohibition of Transfer
R&R	Resettlement & Rehabilitation
RPF	Resettlement Policy Framework
RSR	Resettlement Register
LARR Act	Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement
SIA	Social Impact Assessment
SWM	Solid Waste Management
TDR	Transferrable Developmental Rights
ULB	Urban Local Body
URDPFI	Urban and Regional Development Plan Formulation and Implementation
VGTM UDA	Vijayawada, Guntur, Tenali, Mangalagiri Urban Development Authority

EXECUTIVE SUMMARY

Background and Context

1. In June 2014, the state of Andhra Pradesh was bifurcated into the successor states of Andhra Pradesh and Telangana, through the Andhra Pradesh Reorganization Act (2014) of the Indian Parliament. A new state administration was set up to govern the new state, and the development of a new administrative center, Amaravati Capital City, was announced. Amaravati was finalized as the site for the new capital city by the Government of Andhra Pradesh (GoAP). The Capital City area was identified by Andhra Pradesh State Government between Vijayawada and Guntur alongside the river Krishna, comprising 24 revenue villages[1] and part of Tadepalli municipality of Guntur district covering an area of 53,748 acres and a population of about 100,000[2]. At the time of the announcement of the Capital City in 2014, the area predominantly was an agricultural field, mainly with commercial crops.

2. The Capital Region is characterized by strong network of transport infrastructure via rail (Vijayawada and Guntur cities have major railway stations), roads (the NH-16 and the NH-65 pass through the region), and a domestic airport near Vijayawada city (proposed to be converted into an international airport). Further, the region is located in proximity to a seaport coming at Machilipatnam.

3. Andhra Pradesh Capital Region Development Authority (APCRDA) was entrusted with the task of Capital City construction, and thus the Amaravati Capital City Development Project (ACCDP) came under implementation. However, the development of the capital city was delayed due to a change in the policy by the succeeding government in 2019, which the farmers vehemently opposed through a long and persistent agitation and legal battles.

4. The new government came in June 2024 and initiated the development of the capital city again. The GoAP has planned Amaravati Capital City Development Project (ACCDP) targeting a population of about 3.5 million by 2050, with an estimated investment of $6.3 billion for infrastructure creation in two phases. Phase I is planned to be implemented over five years (2025-2029) with an estimated investment of $3.64 billion, which is the overarching government program, and comprises three main components: (i) development of the Amaravati Government Complex to enable necessary public functions of the state capital with an investment of ₹10,171 crores ($1.2 billion); (ii) construction of the trunk infrastructure works to provide basic services to the city with an investment of ₹8,845 crores ($1.1 billion); and (iii) delivery of neighborhood basic infrastructure for priority development areas with an investment of ₹10,949 crores ($1.3 billion). The APCRDA sought assistance from several multi-lateral and Govt. of India agencies in this regard.

5. As part of this ACCDP project, the World Bank (under the Program for Results

[1] There are 29 habitations, including 24 villages, one part -urban municipality and 4 hamlets within the perimeter of Amaravati city. Throughout the remainder of the document, these will be referred to as “25 villages”.
[2] Census 2011

- P for R) and the Asian Development Bank (under Results-based Lending -RBL program) are extending funding of $800 million each, and along with GoAP's contribution, this program amounts to $1.785 billion. Likewise, efforts to obtain financial assistance from the Ministry of Housing and Urban Affairs, Government of India, New Delhi, and few other multi-lateral agencies are in advanced stage.

6. The World Bank (WB) and the Asian Development Bank (ADB) Programs are supporting Phase -1 of Amaravati Capital City Development Project known as Amaravati Integrated Urban Development Program (AIUDP) for the World Bank and Amaravati Inclusive and Sustainable Capital City Development Program (AISCCDP) for ADB, collectively referred to as AIUDP. The key focus areas under AIUDP include (a) Strengthened Governance and Financing Framework, (b) Inclusive Socio-economic Growth and Community Development, and (c) Resilient Infrastructure and Sustainable Service Delivery.

Resettlement Policy Framework

7. This Resettlement Policy Framework (RPF) has been prepared for the entire Amaravati Capital City Development Project (ACCDP), which is the mega funding plan comprising several Programs like AIUDP (supported by the World Bank and ADB), HUDCO supported program, etc., - to guide the preparation of investment-specific RAPs for the sub-programs including APCRDA Phase I activities. The RPF includes principles, processes, and institutional arrangements for preparing and implementing all investment-specific Resettlement Action Plans (RAPs) for all investments obtained from multi-lateral agencies and the Government of India. This RPF applies to the entire ACCDP area for the land to be assembled. For the land already assembled, livelihood measures and other benefits continue to be honored as per the APCRDA Act 2014, LPS rules, and the earlier RPF policy where applicable.

8. The present RPF is in conjunction with the RPF disclosed by the APCRDA in 2018 taking into account the recent measures by the Government such as enhancing landless pension from Rs.2500/ per month to Rs.5,000/ per month and resolution of the CRDA Authority to extend Annuity and pension to LPS contributed farmers and landless labourers successively for another five years.

9. The Capital City Development works under Phase 1 are taken up in different packages and can be grouped as sub-programs and accordingly, specific safeguards instruments, including Environmental Management Plans, as well as Resettlement Action Plans (RAPs) are being prepared separately.

10. The Capital Region Development Authority (CRDA), GoAP is guided by four principles in this regard: 1) Land Pooling Scheme (LPS) - shall be the principal method ensuring win-win situation for farmers and the government; ii) Negotiated Settlement Policy - where land pooling is not applicable like in case of properties situated within Gramakantam; iii) LARR Act, 2013 - shall be used very sparingly as the last resort when the above two methods do not succeed; and iv) all the mechanisms used for taking land shall be in accordance with National Laws, and guidelines of multi-lateral agencies, and to ensure minimum displacement to the extent possible, and all such displaced people shall be assisted to improve or at least restore their livelihoods.

Land assembly instruments used in Amaravati

11. **Land Pooling Scheme (LPS) –** The entitlement matrix is provided under Andhra Pradesh Capital Region Development Authority Act, 2014 and Andhra Pradesh Capital City Land Pooling Scheme(Formulation and Implementation) Rules, 2015. The Land Pooling was initiated way back in 2015 and was hugely successful with farmers contributing 34,568.8 acres of land against the target of 37,941.58 acres fixed for Land Pooling for the entire Amaravati. The detailed entitlement matrix is included in Annexure 2.

12. As of 10 February 2025, all LPS farmers had received a Land Pooling Ownership Certificate (LPOC) as proof of the holder's title to that land and registration has been completed for about 82 per cent of them. The registration of remaining land is expected to be completed by end-March 2025 and to expedite this process, APCRDA has opened 11 field offices, and nine additional registration centers.

13. In addition to the market value of their returnable plots, landowners have received annual payments and other benefits from APCRDA since May 2015 as per LPS provisions. Unless they sell their plots, they will continue to receive these additional payments and benefits for a total of fifteen years including extension of five years announced recently vide resolution of 36th meeting of CRDA Authority dated 2nd August 2024 to adequately compensate landowners for their plots.

14. **Negotiated Settlement Policy (NSP) –** The entitlement matrix for Negotiated Settlement Policy is included in Annexure 3. This is made applicable to the properties - structures and vacant lands affected within Gramakantam areas or scattered residential houses in LPS area due to infrastructure works under sub-projects. The provisions under the Negotiated Settlement (NS) Policy includes: (i) land-for-land, and (ii) payment of two times the cost of the structures at the current scheduled rates without deducting the depreciation value. Other benefits include construction grant and transitional support (shifting allowance and subsistence allowance are provided for one year), and one-time grant to artisan/ small traders, etc., and grant for loss of livelihood to PAFs (if not being received under LPS) to help improve or at least restore their living conditions to pre-Capital City standards over time.

15. **Land Acquisition under LARR Act 2013 -** The entitlement matrix for Land Acquisition is included in Annexure 4. The Eminent Domain Doctrine is used very sparingly and so far for the entire Amaravati capital city, only 134.38 acres have been acquired under LARR Act, 2013. A review of the LARR 2013 Act highlighted certain gaps which includes (i) structure valuations are estimated as per the prevailing Standard Schedule of Rates (SSR rates), and depreciated values for structures are paid to affected people; (ii) the cut-off-date for non-titleholders to be eligible for assistance under the 2013 LARR Act is three years preceding the acquisition, and for the title holders it is the date of preliminary notification; and (iii) no assistance to those using/occupying public lands (for example, squatters).

16. To address these gaps, provisions are made under this RPF as (i) compensation of structures will be paid as per the provisions of the LARR Act,2013 but without deducting depreciation value; (ii) the cut-off date for non-title holders is the date of declaration of Capital location i.e., 8th Dec 2014 and in case of title holders, the cut-off date is the date of preliminary notification; and (iii) all those occupying public lands will receive assistance, as per applicable provisions of LPS and NS policies, as follows: (a) those who are dependent on agriculture lands will receive smaller size *returnable plots* and pensions, as per LPS (see Annexure 2); and (b) those residing in public lands in village areas will be provided one-time construction grant as per NS Policy (see Annexure 3).

Requirement of Land Assembly

17. Of the 37,941.58 acres target for total land assembly, for the completion of Amaravati Capital City Development Project, an extent of 34,568.8 acres have been pooled through LPS, and 134.38 acres have been acquired through LARR Act 2013 as of 10th February, 2025. The total area of the AIUDP is 12769 acres, out of which 5059.19 acres is the area required for laying the infrastructure. At the time of preparation of RPF, land assembly for AIUDP works is completed to the extent of 95.6 per cent (4867.991 acres) and only 4.4 per cent (222.895 acres) remains to be assembled.

Entitlement Matrix

18. Under the RPF adopted for the ACCDP, an Entitlement Matrix has been developed wherein several categories of project affected persons are recognized with varying eligibility for the compensation and assistance packages. This entitlement matrix has been developed in accordance with the basic principles adopted in the RPF. A summary of the entitlement matrix is presented in Table A below.

Table A: Entitlement Matrix

	Land Pooling Scheme	Land Acquisition using LARR 2013*	Negotiated Settlement
Land and Asset	• **Returnable urban land** up to 25-30 per cent that of the original plot (of higher value ranging from 1250 sq. yards for dry land and 1450 sq. yds. for irrigated/ jareebu land) • **Returnable urban land** of varying sizes (250 sq.yds to 1000 sq. yds) to the assigned landowners (pre- and post June 18, 1954) and other land occupiers/Sivoi	• Higher of the two values: (i) current government guideline value, and/or (ii) average of highest 50 per cent of sale transactions three years prior to first notification • This value will be multiplied by 1.25 times and 100 Per cent solatium • Add additional amount calculated @ 12 per cent per annum on Market Value for	• Non-agricultural land (residential and commercial) **- Equal Land for land** (within villages/ R1 zone) • Scattered residential structures in Agricultural fields - Equivalent land (up to 500 sq.yds.) in resettlement colony • Two times the estimated value of the house/ structures (as per R&B norms) without deducting depreciation •

	Land Pooling Scheme	Land Acquisition using LARR 2013*	Negotiated Settlement
	jamadars** • **Waiver and exemptions** (fees & capital tax gain)	the period between first notification and date of award • Twice the value of trees and structures affected	
Livelihoods/ Rehabilitation and Resettlement	• **Annuity** (unit cost rate estimated based on returns from agricultural land – for 10 years, 10 per cent annual increase; now extended to another 5 years[3] without further annual increase) • Those losing less than one acre of land will receive annuity payment equivalent to one acre • Agricultural Loan Waiver (one-time) up to Rs. 150,000/ • Facilitate to access interest free loan of up to Rs. 25 lakhs to all the poor families for self-employment • One-time additional payment of Rs. 1 lakh for gardens like lime, sapota/ guava/ amla and jasmine • Sivoijamadars to receive pensions as landless laborers	• One-time resettlement grant/annuity to all affected families/ tenants irrespective of legal status (Rs.5,00,000/) • Subsistence grant Rs.3000/ per month for a period of one year • Onetime Transport cost Rs.50,000/ • Reconstruction grant of Rs.25,000/ (for cattle shed/petty business structures) • Financial assistance to artisans/small traders/ self-employed Rs.25,000/ • Resettlement allowance Rs. 50,000/ • Harvesting of standing crops and damages for crop loss. • Provision of IAY Housing to PDF	• One-time construction grant as per GoAP norm or minimum Rs. 1,50,000/ • Transportation/relocation grant (Rs. 72,217/) • Reconstruction of cattle sheds/petty shops (Rs. 36,108) • One-time grant for artisans, small traders, others (Rs. 36,108/) • Loss of livelihood grant to all PAFs who are not receiving CRDA pension (Rs. 5000/per month for 10 years. • One-time resettlement allowance to all PAFs (Rs.72,217/) • Subsistence grant to all PDFs @Rs.4333/ per month for a period of 12 months. • Compensation to be paid within two months of signing the Negotiated Agreement
Other Benefits	• **Free Education and Health** facilities to all those residing in capital city villages as on December 8, 2014 (both BPL and APL families). • **MNREGA employment of 365 days (as per applicability of the Act and demand and eligibility of the individual)** • **Training / skill development for** economic empowerment		
Safety nets (Statewide)	• **Social Security Pensions** (old age, widows, disabled) based on eligibility • **Affordable housing** to homeless		

[3] announced recently vide resolution of 36th meeting of CRDA Authority dated 2nd August 2024 to adequately compensate landowners for their plots.

	Land Pooling Scheme	Land Acquisition using LARR 2013*	Negotiated Settlement

Note:
* Livelihood and resettlement amount as per the G.O.Ms.No.350, Revenue (Land acquisition) Department, dated:01.08.2019
** Sivoijamadars are paid monthly pensions (same as landless) instead of Annuity payments. Note-Sivoijamadar is one who has been in occupation of the land at the time of consideration for its assignment provided he had been in continuous occupation of the land from the fasli immediately preceding the one in which the assignment is considered.
Note : Inflation indexation for benefits under LARR Act is under consideration of GoAP.

Measures for Landless laborers

19. Landless Agricultural laborers working in the capital city area in 2014-15 lost their primary source of income as land was assembled for the development of Amaravati. For this RPF, all landless families registered with APCRDA for pension by July 15, 2018, are considered as Program Affected Persons (PAPs) for the provision of livelihood restoration measures. The payment of pension and other livelihood-related benefits will be monitored for the list of registered landless families as per this RPF. As of July 15, 2018 the total number of landless households was 21,374. As of 1st, February 2025 landless pensions are paid to 17,164 families. The decline in the number of beneficiaries is mainly due to employment opportunities obtained by members of these families, cases of death without legal heirs, and those who were found to have owned land. The establishment and functioning of the Government Secretariat, High Court, and four leading educational institutions offered employment opportunities in service activities ranging from drivers to office assistants including sanitation workers, etc.

20. Registered Landless labourers as mentioned above working in the Capital City area are eligible to receive a combination of livelihood restoration benefits that includes:

(i) Payment of pensions @ Rs. 2,500 per month per family for a period of 10 years as per the initial policy and is now extended to 15 years (until 2029-30) with enhancement from Rs.2500 to Rs.5000/ per month applicable from February, 2024 onwards
(ii) Access to skill upgrading and training opportunities;
(iii) Free access to medical and educational benefits and
(iv) Facilitate access to Interest free loans for self-employment for poor people
(v) NREGA employment of 365 days (as per applicability of the Act and demand and eligibility of the individual)

21. It is pertinent to note that 5,048 landless families are getting Social Security pension of state government @Rs.4000/ per month in addition to landless pension of CRDA. Further, of the vulnerable families which were identified in 2018- basing on criteria like women headed families, single women, SC/ST families, disabled, and chronic disease affected- many have been covered with both these pensions.

22. **Most vulnerable among landless**: Following typologies of landless households are recognized as vulnerable as those facing the highest risk: (i) families headed by women; (ii) households where family members have physical disabilities; (iii) families with members suffering from chronic diseases; (iv) households with aging family members who are unable to work (over 60 years old); (v) families with no alternative sources of income other than APCRDA pension; and (vi) families of Scheduled Castes/Scheduled Tribes whose sole source of income is APCRDA pension. Following these criteria, 857 vulnerable households were identified in the year 2018 and were provided with special assistance through social security pensions, the allocation of TIDCO houses, and skill development training to facilitate employment. Regular monitoring through the network of social facilitators to provide additional opportunities and safety networks has yielded good results. The efforts will continue to identify new potential vulnerable families and additional assistance, will be prioritized to them.

Consultation and Communications

23. **Consultations**: Since 2014, extensive consultations have occurred following each phase of the Capital City's development, starting with the Master Plan preparation. Initially informal, door-to-door conversations in villages, and community meetings at the start of the LPS evolved into structured consultations with hundreds of stakeholders. Program Information Centers (PICs) were established in every village for ongoing, on-demand consultations. These have been conducted in person, in writing, and by phone, in both English and Telugu. A communications campaign utilizing printed materials, newspapers, radio, videos, the internet, and social media has supported these consultations. They have focused on various milestones throughout the Capital City's evolution:

i. *Master Plan preparation and notification* - extensive consultations took place during the timeline of preparation of the draft Concept Plan and until the notification of the final Master Plan in February 2016;

ii. *Announcement of Capital City Development Program and of LPS* - The official start of the LPS was January 1, 2015. Pre-LPS consultations started in September 2014, and hundreds of distinct events were carried out by APCRDA to inform residents of the capital city area of the development of the new city. Efforts were made to organize consultations at different times (daytime and evening). Consultations continued in 2015. During consultations, the various steps of the process were explained to landowners. Based on the feedback from consultations, APCRDA revised the program's entitlement matrix, including, *returnable plot* sizes, and inclusions of various categories of impacted people. As a result of the consultations, some farmers who had initially opted out have joined the LPS. Consultations also resulted in changes in the design of the program, for example: (a) livelihood restoration benefit packages; (b) the need for different packages (compensation values) for dry lands and lands irrigated with ground water (*Jareebu*), which was petitioned by farmers; and (c) during consultations and in the early days of the LPS, APCRDA organized travel to

other places in India and abroad (e.g. Mumbai, Gujarat, Singapore) for select farmers to learn from other previous similar experiences and have an informed understanding of all the challenges, opportunities and risks of the LPS.

iii. *Roll out of LPS* –Extensive consultations with farmers and landless workers took place during the process of joining LPS, while layouts for returnable plots were agreed upon and until the *returnable plots* were allotted and accepted by the farmers. Nearly 30,000 farmers have joined the LPS as of mid-2018, and were consulted at different periods in time, in person if they reside in the area, or via absentee communications if they lived away.

iv. *Consultations on Social Impact Assessment (SIA) under the LARR Act 2013.* As part of the land acquisition process for capital city development under the LARR Act 2013, the district administration has conducted consultations and public hearings on village-specific SIAs in every affected village. Consultations were held by independent consultants. The minutes of these consultations are disclosed on the APCRDA website. All those going through Land Acquisition procedures, as per the LARR Act, are informed and notified multiple times during the process.

v. *Regular grievance redress meetings* - ACPRDA conducts regular weekly grievance redress meetings to resolve landowners' concerns regarding the LPS and other aspects of the development of Amaravati City.

vi. *Program Information Centers (PICs)- They* are established at the office of each competent authority and open to the public. Grievance logs and documentation are maintained, including descriptions of the Program. Information on safeguards documents will be available for consultation at the PICs as well as online, once the safeguards instruments have been finalized and disclosed (in English and Telugu).

vii. *Safeguard instruments* - Additional rounds of consultations have been carried out as pre-requisite for the World Bank-ADB assistance at present and more specifically to finalize safeguards instruments and to strengthen the existing systems. Separate consultations have been held with multiple stakeholders, in preparation of the Environmental and Social Systems Assessment (ESSA)- which is adopted as common document by World Bank and ADB for AIUDP program- during Sep-Oct 2024 and multi-stakeholder consultation on draft ESSA was organized on 2nd November 2024.

viii. Separate rounds of consultations were held for preparation of this RPF in 2018, and to update the same in November 2024.

24. **Communications campaign –** The communication team at APCRDA aims to significantly strengthen the communications campaign through: (i) increased social media presence and grass-root communications efforts in the local language. ii) production of videos, printed materials (pamphlets, books, posters, banners), radio and TV campaigns (in English and Telugu) that describe the overall Amaravati City Development Project and funding programs in all languages; and (iii) frequent updating of Website including current information.

25. **Grievance Redressal Mechanism (GRM) -** A robust GRM Mechanism for the overall Capital City has been set up by APCRDA. The GRM provides multiple avenues, covering physical, web-based, and weekly public interaction for registering and seeking redress of grievances, all of which are operational. These include: (i) Public Grievance Redressal Management System (PGRMS)- state-wide single-window, online framework for receiving grievances, and complaints, covering all government departments. Complaints are routed to the concerned department, including APCRDA for Amaravati-related grievances; (ii) a physical system in which designated officials, i.e. Competent Authority (CA) at various zonal offices throughout the city, can be approached by citizens to address grievances. At present, there are 11 offices of Competent Authority monitoring all 26 LPS units of the Capital City. Every Friday, a grievance redressal meeting is held at APCRDA, Thulluru office with the Additional Commissioner, CRDA, and CAs to address public grievances; and (iii) separate online system 'Parishkaram" being operated by APCRDA through their portal.

26. Additionally, Program Information Centers (PICs) are revived at CA offices with a Social Facilitator as a contact point to attend, inter alia, public grievances and provide information. They are equipped with brochures, documents, and pamphlets (all in English and Telugu) presenting information about the project and the GRM.

27. The multiple channels for grievance redressal that have been set up by APCRDA provide adequate avenues for citizens of the Capital City area to express their grievances. They will be used as the Project-level GRM to address issues of PAPs. The GRM will have an integrated database, documentation, reporting, and feedback mechanism. Standard operating procedures for GRM, including procedures for communication and information disclosure will reinforce the GRM. Participatory systems for grievance redressal with gender and social inclusion features will contribute to GRM's effectiveness.

Implementation Mechanism:

28. The Commissioner, APCRDA assisted by the Additional Commissioners and Directors will supervise the Competent Authorities for Land Pooling and Land Acquisition. The Competent Authority, Tahsildars, Deputy Inspector of Surveys, Surveyors, Deputy Tahsildars, and Computer Operators are formed into one unit as Competent Authority Office to work under the administrative and functional control of the District Collector, Guntur who is the appropriate authority for Land Acquisition and the Joint Collector, Guntur who is the Program Administrator for implementing R&R policy. In Amaravati, 11 Competent Authority Offices have been set up to oversee the land assembly for the Amaravati capital city.

29. An Environmental and Social Management Unit (ESMU) is established in APCRDA to manage the environmental and social aspects of the program and to ensure compliance with the conditions imposed by the Ministry of Environment and Forests (MoEF & CC), SEIAA, AP, and APPCB. The unit is also responsible for ensuring that state and national laws relating to the environment, social, gender, and labour safety and complied with scrupulously during the execution of works in the capital city.

30. The ESMU is structured to oversee and coordinate various aspects critical to the program's sustainability and social safeguards, including:

- **Environment Management:** Ensuring adherence to environmental regulations and impact mitigation strategies.
- **Occupational Health and Safety (OHS):** Implementing OHS standards across all project activities to ensure worker safety and health.
- **Gender Inclusion:** Promoting gender equity in project benefits and safeguarding women's rights during resettlement and livelihood restoration.
- **Livelihood Restoration:** Facilitating skill development programs, financial support, and income restoration strategies for affected persons, including vulnerable groups.
- **Social Safeguards:** Overseeing the fair and transparent implementation of resettlement and compensation measures for all project-affected persons (PAPs).
- **Land Management:** Coordinating land assembly instruments like the Land Pooling Scheme (LPS), Negotiated Settlement Policy (NSP), and land acquisition under the LARR Act, 2013.
- **Grievance Redress Mechanism (GRM):** Managing a multi-channel GRM with physical, digital, and community-level access points for timely resolution of public grievances.

31. This policy framework will be updated from time to time based on the implementation experience, as well as on new impacts and/or required changes in the policy provisions to address those impacts.

I. INTRODUCTION

1.1 In June 2014, the erstwhile state of Andhra Pradesh was bifurcated into the successor states of Andhra Pradesh and Telangana through the enactment of the Andhra Pradesh Reorganization Act (2014). This necessitated the development of a new administrative center (Capital City) as a top priority for the new state. The Government of Andhra Pradesh (GoAP) initiated the development of Amaravati Capital City and entrusted the task to Andhra Pradesh Capital Region Development Authority (APCRDA) under section 43 (5) of the APCRDA Act, 2014, vide G.O. Ms. No. 257, MA & UD (M2) Department, dated: 30-12-2014.

1.2 The Amaravati Capital City Development Project (AICCDP) is a large-scale initiative aimed at developing a world-class city with a focus on sustainability, economic growth and inclusivity. The Capital City area was identified by the state government between Vijayawada (NTR district) and Guntur (Guntur District) alongside the river Krishna, comprising 24 revenue villages[4] and part of Tadepalli municipality of Guntur district covering an area of 53,748 acres and a population of about 100,000[5]. At the time of the announcement of the Capital City in 2014, the area predominantly was an agricultural field, mainly with commercial crops.

1.3 A Concept Master Plan for the Capital City was first published in July 2015, prepared with support from the Government of Singapore. The Concept Master Plan was widely consulted with landowners and other stakeholders. Building on the feedback received, a draft Master Plan was notified in December 2015. The preparation process of the Master Plan, as per the APCRDA Act, is legally binding.

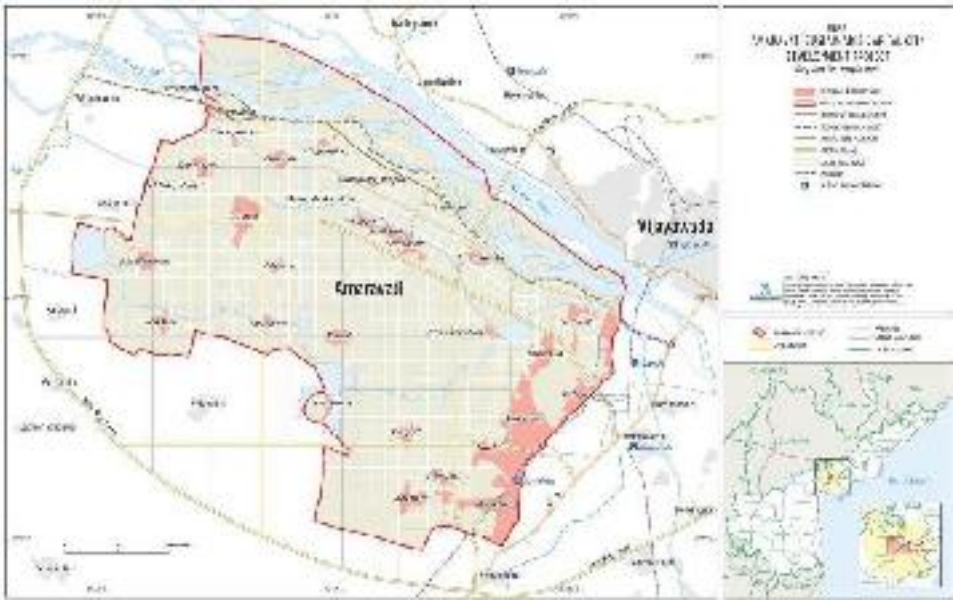
1.4 The final Master Plan was published on February 23, 2016. Revisions to the Master Plan were carried out following the process outlined in the Act. All processes around Master Plan implementation were widely circulated, and publicized amongst the stakeholders to ensure that implementation was in accordance with the notified Master Plan and any deviations were brought to the notice of concerned for duly addressing them.

1.5 The Master Plan for the Amaravati Capital City covering an area of 217.23 km^2 includes settlement hierarchy, commercial centers hierarchy, and road hierarchy. The road network gives free access and transport to towns, neighborhoods, educational, medical, and community service centers, etc.

[4] There are 29 habitations, including 24 revenue villages, one-part urban municipality and 4 hamlets within the perimeter of Amaravati city. Throughout the remainder of the document, these will be referred to as “25 villages”.

[5] Census 2011

Fig.1: Map of Villages in the Amaravati Capital City (Source: APCRDA data-GIS Section)



1.6 The Amaravati Capital City Development project (AICCDP) is slated to be implemented in two phases based on the readiness of land availability and the strategic importance of the investments for long-term development. Phase I consists of the construction of public buildings called Amaravati Government Complex, Trunk Infrastructure (road corridors with utility pipelines), flood mitigation works and LPS Works (neighborhood infrastructure that includes secondary and tertiary road networks in proposed townships with utility connections and public spaces and common community facilities).

1.7 The objective of the Phase I works is to facilitate the initial institutional, socio-economic, and infrastructural development of Amaravati. The program envisions establishing a robust foundation to achieve the long-term development aspirations of Amaravati as an economically vibrant, inclusive, and sustainable metropolis. During 2017-19, some major infrastructure works were grounded including setting up of transient structures to accommodate Government Secretariat, Legislative Assembly and High Court of Andhra Pradesh. However, the change in succeeding Government policy on capital location in 2019 halted the capital development effort. With the change of government in June, 2024, the capital city development effort started again with support from the Government of India.

Financial Assistance from Government of India and Multi-Lateral Agencies

1.8 The funding for Phase-I program is supported by Government of India, the World Bank, Asian Development Bank through 'Amaravati Integrated Urban Development Program (AIUDP)'. The World Bank under 'Program for Results' and Asian Development Bank under 'Results Based Lending' policy both extended $800 million each and with GoAP's contribution the total investment amounts to $1.785 billion for this program.

1.9 While this program is known as Amaravati Integrated Urban Development Program (AIUDP) for the World Bank and as Amaravati Inclusive and Sustainable Capital City Development Program (AISCCDP) for ADB, it is collectively referred to as AIUDP. The key focus areas under AIUDP include (a) Strengthened Governance and Financing Framework, (b) Inclusive Socioeconomic Growth and Community Development, and (c) Resilient Infrastructure and Sustainable Service Delivery.

Need and Objectives of Resettlement Policy Framework

1.10 The Amaravati Capital City Development Project (ACCDP), encompassing various programs such as AIUDP, HUDCO and other programs, requires substantial land resources and would result in different impacts on people and their assets. APCRDA has adopted Land Pooling Scheme and Negotiated Settlement Policy as primary options for mobilizing the required land, with land acquisition under LARR Act 2013 being considered only as a last resort. A Resettlement Policy Framework (RPF) is prepared to delineate the principles, objectives, and processes for land mobilization, compensation and other assistance measures for project affected people. The objective of resettlement policy is to appropriately identify, address and mitigate adverse socio-economic impacts that may occur due to the implementation of programs that involve land assembling/ involuntary acquisition of land and subsequent resettlement of affected families. The RPF articulates the principles for avoiding, minimizing, and mitigating adverse social impacts that may arise during the execution of proposed interventions. It also outlines consultations, censuses, and socio-economic surveys, along with the preparation and administration of mitigation plans. The RPF is developed in accordance with national and state laws, as well as the general guidelines of multilateral agencies. It will be reviewed and updated periodically to ensure compliance with all relevant regulations.

Scope of RPF

1.11 This RPF is in conjunction with the RPF disclosed by the APCRDA in 2018 incorporating recent measures by the Government. The notable changes are increasing the pension amount for the landless families and extension of pension and annuity from the existing ten years to another five years. It is aimed to cover the entire Amaravati Capital City Development Project (ACCDP) comprising several Programs like AIUDP. For the land already assembled, livelihood measures and other benefits

continue to be honored as per the APCRDA Act 2014, LPS rules, and the earlier RPF policy as applicable.

The Resettlement Policy Framework ensures: a) thorough consultation with local self-government institutions, affected individuals, and other stakeholders; b) an informed and transparent process for implementing land assembly instruments for infrastructure development; c) minimizes disruption to landowners and other affected families; d) equitable compensation to affected families whose land has been or will be acquired, ensuring the replacement cost of lost assets; e) adequate provisions for the rehabilitation and resettlement of affected persons; and f) assistance to affected people in their efforts to enhance or at least restore their livelihoods and standards of living.

Principles of RPF

1.12 This policy framework clarifies the resettlement principles to prepare and implement Resettlement Action Plans (RAP) for sub-programs in accordance with the provisions of national and state laws and the safe guards policy requirements of the financing institutions. The following are the agreed guiding principles for mitigating the impacts of land assembly and land acquisition practices:

a) Aim to cause the least disturbance to the owners of the land and other affected families and provide just and fair compensation to the affected families and rehabilitation and resettlement to project affected families.

b) RAP(s) will be prepared based on the data collected from the census, inventory of laws and socio economic survey, carried out for affected persons (irrespective of land assembly instrument used)

c) Meaningful Consultations[6] must be held with all stakeholders, particularly with vulnerable groups.

d) The resettlement plans will comply with the principles outlined in this RPF adopted for the project.

e) No physical displacement/forced evictions shall take place without extending entitlements outlined in this RPF for LPS/NSP/LARR Act PAPs and following the due process.

f) Vulnerable landless families will be identified and provided additional support in their efforts to improve their living standards under ongoing programs of State/ Central government through line departments and other support as needed.

[6] Meaningful consultations would entail open and transparent stakeholder meetings, providing an opportunity for individuals to express their concerns, elucidating the advantages of the project, and addressing the issues raised by the affected parties.

II. LAND ASSEMBLY INSTRUMENTS

2.1 The land requirements for Capita City and the assembling status are presented in Table-1 below. Of the 37,941.58 acres target for total land assembly, for the completion of Amaravati Capital City Development Project, an extent of 34,568.8 acres have been pooled through LPS, and 134.38 acres has been acquired through LARR Act 2013 as of 10th February, 2025. The total area of the AIUDP is 12769 acres, out of which 5059.19 acres is the area required for laying the infrastructure. However, at the time of preparation of RPF land required for AIUDP works is completed to the extent of 95.6 per cent (4867.991 acres) and only 4.4 per cent (222.895 acres) remain to be assembled.

Table 1: Overall land assembly situation of the Amaravati capital city

		Extent in Ac. Cts
1)	Geographical Extent as per Implemented RSR	53749.49
2)	Government. Lands / Village Sites/ Extended Habitation etc.,	15807.91
3)	Target for land assembly	37941.58
4)	Procured under LPS	34,568.8
5)	Award Extent	134.38
6)	Balance to be assembled	3238.4

2.2 Government of Andhra Pradesh, through CRDA, has adopted three land assembly mechanisms to assemble the land needed for the development of the Capital City:

(i) ***Land Pooling Scheme (LPS)*** - Innovative scheme whereby landowners voluntarily surrender their agricultural land (within villages of Capital City but outside of Gramakantam area) in return for a smaller plot of urban, serviced land (returnable plot). The value of the returnable plot is expected to be higher than that of the land relinquished and continue to increase further in value as the development of the Capital City progresses.

(ii) ***Negotiated Settlements*** - Land assembly mechanism applicable primarily for land and assets located within existing village boundaries (within the perimeter of the Capital City), where LPS does not apply. The government and landowners agree on a compensation package that is consistent with the provisions of the 2013 LARR Act, in which the compensation involves a land-for-land exchange rather than cash, along with other compensations intended to cover the costs of construction of replacement housing and for relocation.

(iii) ***Land Acquisition through 2013 LARR Act*** – Follows the land acquisition through eminent domain, following the provisions of the LARR Act 2013 and by which compensation along with R&R for lands acquired (replacement value and livelihood support) is provided.

Land Pooling Scheme (LPS)

2.3 The Government of Andhra Pradesh in exercise of powers conferred under Section-43(5) of Andhra Pradesh Capital Region Development Authority (APCRDA) Act, 2014 directed APCRDA to undertake development through Land Pooling Scheme (LPS) in the Capital City area and notified the same. The LPS is mainly adopted for the development of the Capital City area wherein the land parcels owned by individuals or group of owners are legally consolidated by transfer of ownership rights to APCRDA, which later transfers the ownership of *returnable plots* through Land Pooling Ownership Certificates (LPOCs) to the landowners for undertaking the development of such areas. (Refer Annexure 2).

2.4 By 10th February 2025, all LPS farmers had received a Land Pooling Ownership Certificate (LPOC) as proof of the holder's title to that land and registration has been completed for about 82 per cent of them. These registrations are free of any registration charges to the farmers. The registration of remaining land is expected to be completed by End-March 2025 and to expedite this process, APCRDA has opened 11 field offices and three additional registration centers.

2.5 The LPS is an option that landowners can choose voluntarily. Landowners are at liberty to decide not to join the LPS and to opt for Land Acquisition, under the provisions of the 2013 LARR Act. No physical displacement results from the LPS as the land parcels pooled are outside habitation areas, and mainly utilized for agricultural activities.

2.6 In return for contributing their land, landowners participating in the LPS are entitled to a combination of benefits that include: (i) *returnable plots* of urban nature within the Amaravati City perimeter; (ii) *Annuity payments* for a period of ten years which is now extended to fifteen years; and (iii) *other benefits* including one-time waiver of agricultural loans, skill training, Facilitation to access interest free loans for Self-Employment for poor people, NREGA employment of 365 days (as per applicability of the Act and demand and eligibility of the individual) , and educational and health benefits. The entitlement matrix for the LPS is presented in Table-2.

2.7 *Returnable urban plots* are allotted in and around the same village where landowners have given up their agricultural lands under LPS. Landowners were entitled to choose the type of *returnable plot* they wished to receive from a broad menu of residential and commercial land plot options.[7] The process of selection and allotment of *returnable plots,* to date, involved multiple stages: (i) draft LPS layouts/maps were prepared by the APCRDA showing the location of *returnable plots* were shared with all participants of the LPS.

2.8 The entitlement matrix under land pooing scheme is presented below.

[7] Landowners chose their *returnable plots* from multiple alternatives. Specifically, these alternatives included: (i) single plots; (ii) multiple plots of smaller areas adding up to the total returnable area; (iii) plots in residential areas; (iv) plots in commercial areas; or (v) combinations of all the above options. Landowners can also decide to merge plots with others (such as family members for example), in both residential and commercial areas.

Table 2. Entitlements under LPS

Land		Category (Square Yards)/Acre			
		Dry Land		Jareebu/ Semi-Urban land	
		Residential	Commercial	Residential	Commercial
1	Private Land	1,000	250	1,000	450
2	Assigned Land				
(a)	Ex-serviceman/political sufferer	1,000	250	1,000	450
(b)	Assignments before June 18, 1954	1,000	250	1,000	450
(c)	Assignments After June 18, 1954	800	100	800	200
(d)	Resumed lands - Sivoijamadar occupation**	500	50	500	100
(e)	Un-objectionable government lands - Eligible Sivoijamadar**	500	50	500	100
(f)	Objectionable government lands - Eligible Sivoijamadar**	250	0	250	0
3	Yearly payment of annuity to all landowners losing land for 10 years* (extended to another 5 years without further yearly enhancement)	INR 30,000 per acre (with a yearly increase of INR. 3,000) (Rs.57000/acre for the year 2024-25-10th Year)		INR 50,000 per acre (with a yearly increase of INR. 5,000) Rs.95000/acre for the year 2024-25-10th Year)	
4	One-time additional payment for garden such as lime/sapota/guava (INR)	100,000			
5	Agricultural laborer/ agricultural tenants (residing in the LPS villages as on December 8, 2014)	INR 2,500 per month/10 years - enhanced to Rs.5000/- from Feb 2024 and extended for another 5 years up to 2029-30			

Note:
* Those losing less than 1 acre of land will receive the annuity equivalent to one acre.
** These three categories of people are paid monthly pensions instead of Annuity payments.

2.9 *Annuity payment*s are the second component of the compensation package that landowners who have contributed their land to LPS will receive from APCRDA. Annuity payments were proposed to continue for ten years and now extended by another five years and are proportional to the land that was contributed to the LPS. Annuity payment amounts at the rate of Rs. 30,000/and Rs.50,000 per acre for dry land and *Jareebu*[8]/semi-urban land respectively, are paid with an addition of Rs.3,000/and Rs.5000/ every year towards inflation upto ten years. In 2024-25 the annuity stands at Rs. 57,000 per acre for dry land and Rs. 95,000 per acre for Jareebu/ semi-urban land.

2.10 This amount was estimated to be sufficient to improve or at least restore pre-

[8]*Jareebu* lands refer to multi-crop land with access to underground percolated water

program livelihood levels during the interim period of 10 years (extended to another five years now), which is the estimated period to reap the benefits of returnable plots and other benefits as contemplated under LPS. In the 36th meeting, it is resolved by the Andhra Pradesh Capital Region Development Authority Committee to extend annuity for LPS farmers for another five years. During 2015-16 and 2023-24, a total amount of Rs. 1539.47 crore is paid towards annuity to LPS farmers.

2.11 *Other benefits** that LPS participants receive:

a) Loan Waiver: One-time agricultural loan waiver upto Rs. 1,50,000/
b) Education and Health: Free education and health facilities to all those residing as on December 8, 2014.
c) Facilitating access to avail interest free loan of up to 25 lakhs for self-employment for poor people
d) NREGA employment of 365 days (as per applicability of the Act and demand and eligibility of the individual) and
e) skill development to enhance the skills.

2.12 As of 10th February 2025, the results achieved under various livelihood restoration initiatives is presented in Table 3. below:

Table 3 – Progress on implementation of livelihood Measures

People trained in skill development institution set up in July 2016	2881
Number of people gainfully employed (Trained & Non Trained)	*2049*
Agricultural loan waivers awarded (for land owners)	19709
Amount availed by 7452 students under Fee reimbursement	42.02 Cr
Amount availed by 8311 beneficiaries under Free Health Scheme	23.62 Cr
No. of TIDCO Houses to shelter less families	5024
Number of health cards issued	38,438

*The skill development courses, free education, and free health are universally applicable to all residents of Capital City Villages. The exclusive benefits are Annuity, returnable plots and one-time loan waiver to LPS farmers and pensions to landless labourers.

2.13 As a result of consultations prior to the start of LPS in 2015, adjustments were made to its design to reflect feedback from residents of the Capital City area. The notable changes are differentiation of compensation based on type of land (Dry/Jareebu/Semi-Urban), modus operandi of lottery system and demarcation of habitations.

2.14 The outcomes of LPS will be monitored over time to elicit the impact on LPS families.

Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (LARR Act, 2013)

2.15 APCRDA may acquire any movable or immovable property by purchase, exchange, gift, lease, mortgage, negotiated settlement as per Section-124 of APCRDA Act, 2014. Any land required in the development plan shall be deemed to be the land needed for public purpose within the meaning of the LARR Act, 2013. Lands falling under acquisition shall also be included in the development scheme.

2.16 The LARR Act provides for a transparent process and fair compensation in land acquisition for public purpose and provides for rehabilitation and resettlement (R&R) of landowners and those affected by land acquisition. It requires social impact assessments for Programs involving land acquisition. The compensation for land will be the higher of two values: (i) current government guideline value, and/or (ii) average of highest 50 per cent of sale transactions three years prior to first notification. This value will be multiplied by 1.25 times and 100 per cent solatium[9] will be added. In addition, amount calculated @ 12 per cent per annum on Market Value for the period between first notification and date of award, will be paid. Twice the value of trees and structures would be added.

2.17 Steps need to be taken to update basic rates of land under LARR Act as per the provisions of Section 26. The Sub-Registrar Office rates (e.g. guideline rates) should be updated for all the lands covered by Land Acquisition Notifications. The revised basic land values or the average sale price (prior to notification), whichever is higher, will be taken as market value (per the provisions of Section 26 of the LARR Act 2013). Compensation will be finalized by adopting updated land value.

Negotiated Settlement Policy

2.18 As per Section 107 of the 2013 LARR Act, State Governments may enact any law/policy[10] to enhance or add to the entitlements covered under the Act, which

[9]Additional amount paid to "solace" recipient for compulsory land acquisition. Corresponds to 100 per cent of the compensation amount.

[10]In July 2018, the Andhra Pradesh Legislature modified several aspects of the LARR Act as it applies in the State, under the Right to Fair Compensation and Transparency in Land Acquisition,

confers higher compensation than that payable under LARR Act, or make provisions for rehabilitation and resettlement which is more beneficial than that provided in LARR Act. In line with this provision, Section 124 of the APCRDA Act, 2014 was incorporated to acquire property by Negotiated Settlement, if any development scheme falls in the habitation areas.

2.19 The Negotiated Settlement Policy will be applied primarily for the acquisition of village sites/ habitation lands in the villages. Non-title holders (e.g. occupants of government lands) will be offered similar benefits as per policy. The following guidelines apply to various categories of land and assets when the Negotiated Settlement Policy[11]is used (for details refer to Annexure 3):

i. Non-agricultural land (residential and commercial uses)
   a) Equal land-for-land compensation, where the location of exchanged land can be negotiated between the landowner and APCRDA. Typically, the land will be located within the same village as the original land
   b) Compensation for structure amounts to two times the estimated value of the house/ structures (as per Public Works Department norms), and without deducting depreciation values.

ii. Scattered residential structures (isolated houses on agricultural land)
   a) Compensation for structure. Compensation amounts to double the structure value
   b) Equivalent land (up to 500 sq. yds.) will be provided in resettlement colony[12]. The rest of the land, if any, will be assembled through LPS.
   c) Resettlement site is within capital city area, mostly within same village and close to existing residence.
   d) In case of partially affected structures, the house owner will be provided an option for acquisition of whole house/structure.
   e) Compensation will be paid within two months of signing the Negotiated Agreement.

iii. Other benefits
   a) One-time construction grant as per GoAP norms or minimum Rs. 1,50,000/
   b) Transportation/relocation grant (Rs. 72,217/)
   c) Reconstruction of cattle sheds/petty shops (Rs. 36,108/)
   d) One-time grant for artisans, small traders, others (Rs. 36,108/)
   e) Loss of livelihood grant to all PAFs who are not receiving CRDA pension (Rs. 5000/per month for 10 years)

Rehabilitation and Resettlement (Andhra Pradesh Amendment) Act, 2018. The Act provides for (a) waiver of the social impact assessment required by LARR Act, and (b) waiver of the LARR Act's restrictions on the acquisition of multi-crop land.

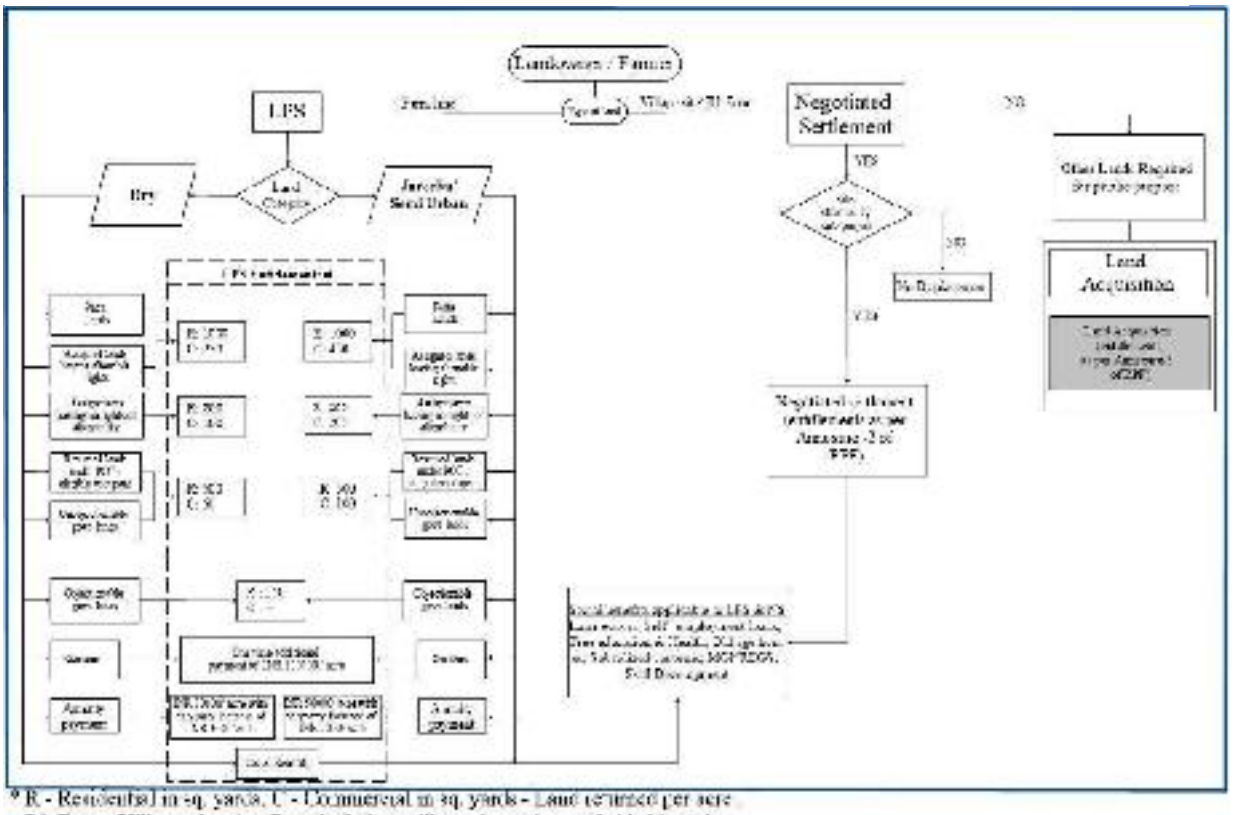
[11] Resettlement sites will be allotted through lottery to these PDFs.

[12] A resettlement colony is a parcel of land owned by APCRDA that has been zoned for residential purposes, and ownership is transferred to affected people under Negotiated Settlement Policy

f) One-time resettlement allowance to all Program Affected Families Rs.72,217/
g) Subsistence grant to all Program Displaced Families @Rs.4333/per month for a period of 12 months.

The above land assembling mechanisms are presented schematically in Figure 2.

Fig.2 – Land Pooling Scheme, Land Acquisition and Negotiated Settlement Policy – At a glance



* R - Residential in sq. yards, C - Commercial in sq. yards - Land returned per acre
R1 Zone Village planning Zone including village site and extended habitation,
PO.. Prohibition of transfer
LPS entitlements as per Annexure - 2 of RPF
% Consents of Government lands will be assisted as per Negotiated Settlement Policy

Summary of Entitlements

2.20 This entitlement matrix has been developed in accordance with the basic principles adopted in the RPF. A summary of the entitlement matrix is presented in Table 4 below.

Table 4: Entitlement Matrix

	Land Pooling Scheme	Land Acquisition using LARR 2013*	Negotiated Settlement
Land and Asset	• **Returnable urban land** up to 25-30 per cent that of the original plot (of higher value ranging from 1250 sq. yards for dry land and 1450 sq. yds. for irrigated/ jareebu land (Refer Table 3 above for details) • **Returnable urban land** of varying sizes (250 sq.yds to 1000 sq. yds) to the assigned landowner (pre and post June 18, 1954) and other land occupiers/Sivoi jamadars** (Refer Table 2 above for details) • **Waiver and exemptions** (fees & capital tax gain)	• Higher of the two values: (i) current government guideline value, and/or (ii) average of highest 50 per cent of sale transactions three years prior to first notification • This value will be multiplied by 1.25 times and 100 per cent solatium to be added • Add additional amount calculated @ 12 per cent per annum on Market Value • Twice the value of trees and structures affected	• Non-agricultural land (residential and commercial) **- Equal Land for land** (within villages/ R1 zone) • Scattered residential structures in Agricultural fields - Equivalent land (up to 500 sq.yds.) in resettlement colony • Two times the estimated value of the house/ structures (as per PWD norms) without deducting depreciation
Livelihoods/ Rehabilitation and Resettlement	• **Annuity** (unit cost rate estimated based on returns from agricultural land – for 10 years, 10 per cent annual increase; now extended to another 5 years[13] without further annual increase) • Those losing less than one acre of land will receive annuity payment equivalent to one acre • Agricultural Loan Waiver (one-time) of up to Rs. 150,000	• One-time resettlement grant/annuity to all affected families/ tenants irrespective of legal status (Rs. 5,00,000) • Subsistence grant Rs. 3000/ per month for a period of one year • Onetime Transport cost Rs.50,000/ • Reconstruction grant of Rs.25,000/ (for cattle shed/petty business structures) • Financial assistance to artisans/small traders/ self-employed	• One-time construction grants as per GoAP norm or minimum Rs. 1,50,000/ • Transportation/relocation grant (Rs. 72,217/) • Reconstruction of cattle sheds/petty shops (Rs. 36,108) • One-time grant for artisans, small traders, others (Rs. 36,108/) • Loss of livelihood grant to all PAFs who are not receiving CRDA pension (Rs. 5000/per month for 10 years. • One-time resettlement allowance to all PAFs

[13] announced recently vide resolution of 36th meeting of CRDA Authority dated 2nd August 2024 to adequately compensate landowners for their plots.

	Land Pooling Scheme	Land Acquisition using LARR 2013*	Negotiated Settlement
	• Facilitate access to interest free loan of up to Rs. 25 lakhs to all the poor families for self-employment. • One-time additional payment of Rs. 1 lakh for gardens like lime, sapota/ guava/ amla and jasmine • Sivoi jamadars to receive pensions same as landless laborers.	Rs.25,000/ • Resettlement allowance Rs. 50,000/ • Harvesting of standing crops and damages for crop loss. • Provision of IAY Housing to PDF	(Rs.72,217/) • Subsistence grant to all PDFs @Rs.4333/ per month for a period of 12 months. • Compensation to be paid within two months of signing the Negotiated Agreement
Other Benefits	• **Free Education and Health** facilities to all those residing in capital city villages as on December 8, 2014 (both BPL and APL families). • **MNREGA employment of 365 days (as per applicability of the Act and demand and eligibility of the individual)** • **Training / skill development** for economic empowerment		
Safety nets (Statewide)	• **Social Security Pensions** (old age, widows, disabled) based on eligibility • **Affordable housing** to homeless		

Note:
* Livelihood and resettlement amount as per the G.O.Ms.No.350, Revenue (Land acquisition) Department, dated:01.08.2019
** SivoiJamadars are paid monthly pensions (same as landless) instead of Annuity payments.
Note-Sivoijamadar is one who has been in occupation of the land at the time of consideration for its assignment provided he had been in continuous occupation of the land from the fasli immediately preceding the one in which the assignment is considered.
Note : Inflation indexation for benefits under LARR Act is under consideration of GoAP.

III. ASSISTANCE TO LANDLESS LABORERS

3.1 As agricultural land has been taken over for capital construction, agriculture as a source of livelihood ceased to exist in the capital city villages. Landless labourers working in the Capital City area lost their primary source of income as land was assembled by APCRDA for the development of Amaravati. As such, most landless labourers have been directly impacted by the capital city development Program. APCRDA, therefore, has agreed that for purposes of this RPF, all landless families registered with APCRDA for pension by July 15, 2018, will be considered Program affected persons (PAPs), for the provision of livelihood restoration measures. Based on eligibility, the pension payment stood to 17,164 landless labourers as of 1st February 2025, and they are given an enhanced pension of Rs.5,000/ per month.

3.2 Livelihood restoration packages have been uniformly extended to all the identified and registered landless labourers within Amaravati City since April 2015. As of May 2015, approximately 15,000 landless families were registered with APCRDA as residents of the Capital City area (families who resided in the area by December 2014). Subsequently, the number of landless families registered has increased to 21,374 as APCRDA has allowed registration of additional labourers including, for example, cases of family members of original residents getting married and establishing a separate family. Unregistered landless families who wish to enrol in livelihood restoration programs need to demonstrate that they lived in the Capital City before December 2014. Proof of residence for registration includes Ration Cards, Aadhar Cards, and Voter Id Cards.

3.3 The registered landless labourers working in the Capital City area are eligible to receive a combination of livelihood restoration benefits that includes:

(i) Payment of pensions @ Rs. 2,500 per month per family for a period of 10 years, which is now extended for another five years and enhanced to Rs.5,000/ per month from Feb 2024.
(ii) Access to skill upgrading and training opportunities.
(iii) NREGA employment of 365 days (as per applicability of the Act and demand and eligibility of the individual)
(iv) Free access to medical and educational benefits in designated facilities and
(v) Facilitate Access to avail Interest free loans of upto Rs.25.00 lakhs for self-employment for poor people.

3.4 **Most Vulnerable**: APCRDA has established a methodology to identify the most vulnerable among the landless families, i.e. households for whom the package of livelihood restoration benefits – either by design or by nature of benefits – are not sufficient to help them restore their livelihoods to pre-Capital City standards, and who may need additional assistance.

3.5 The indicators used for identifying most vulnerable landless families include- women-headed households including (i*) families headed by women*; (ii*) households where family members have physical disabilities*; (iii*) families with members suffering from chronic diseases*; (iv) *households with aging family members who are unable to work (over 60 years old*); (v) *families with no alternative sources of income other than APCRDA pension*; and (vi) *families of Scheduled Castes/Scheduled Tribes whose sole source of income was APCRDA pension*. In June - July 2018, APCRDA identified 857 such families in the Capital City area and provided special assistance through social security pensions, the allocation of TIDCO houses, and skill development training to facilitate employment.

3.6 The change in government policy regarding the location of the Capital in 2019 has significantly altered the scenario. Landless families, who were previously finding alternative employment in the construction and service sectors related to Capital City development, faced difficulties due to the stoppage of construction works. Over time, these families have managed to secure alternative livelihood opportunities. The policy shift has adversely affected their livelihoods in the absence of agricultural work, as the lands remained fallow for five years. Some villages near Vijayawada, which are traditionally urban-oriented, have relied on non-agricultural employment in the informal sector and experienced limited impact.

3.7 The extraction of sand from the Krishna River has provided some relief and employment to the villages located along its banks, while other villagers have found work in agricultural operations of nearby villages, often commuting or migrating for employment. The establishment and functioning of the Government Secretariat, High Court, and four leading educational institutions have created job opportunities in service activities ranging from drivers to office assistants, including sanitation work.

3.8 As of February 1st, 2025, landless pensions are being paid to 17,164 families. The decline in the number of beneficiaries is primarily due to employment opportunities secured by family members, deaths without legal heirs, and those who were found to own land. Notably, 5,048 landless families receive Social Security pensions from the state government at a rate of Rs.4000 per month, in addition to the landless pension provided by CRDA. Furthermore, the most vulnerable families identified in 2018 have largely been covered by both CRDA as well as social security pension schemes.

3.9 Skill training for those eligible including vulnerable households –With the establishment of the Government Secretariat, High Court, and educational institutions, 2572 individuals have already gained employment in SRM/VIT, High Court/IGC and other Institutions. The skill development program conducted during 2017-19 focused on women and youth and will continue to benefit landless families and others. This program aims to enable these groups to access employment and service opportunities associated with the resumption of capital construction works and city development processes. The goal is to empower landless families to achieve wage employment or start their own small businesses or enterprises for improved livelihoods. Focus areas for skill development initiatives will include emerging sectors in the new capital city such as construction, horticulture, fashion and apparel, food processing, electronics, health, and education. the program will be tailored to the skills,

interests, and market demands of the beneficiaries. The social facilitators and ESMUs/PGMC will be involved in designing, implementing, and monitoring the program.

3.10 SHGs, coordinated by APCRDA, will continue to receive training to establish women-owned enterprises. This includes conducting customized Entrepreneurship Development Programs in areas such as fashion, apparel, and food processing to help them take advantage of emerging economic opportunities in the capital city.

IV. INSTITUTIONAL ARRANGEMENT AND IMPLEMENTATION MECHANISM

Institutional Arrangements for LPS / LA / Negotiated Settlement Policy

4.1 APCRDA, through district administration, will manage all impacts related to the land required for the Program using the following institutional arrangements.

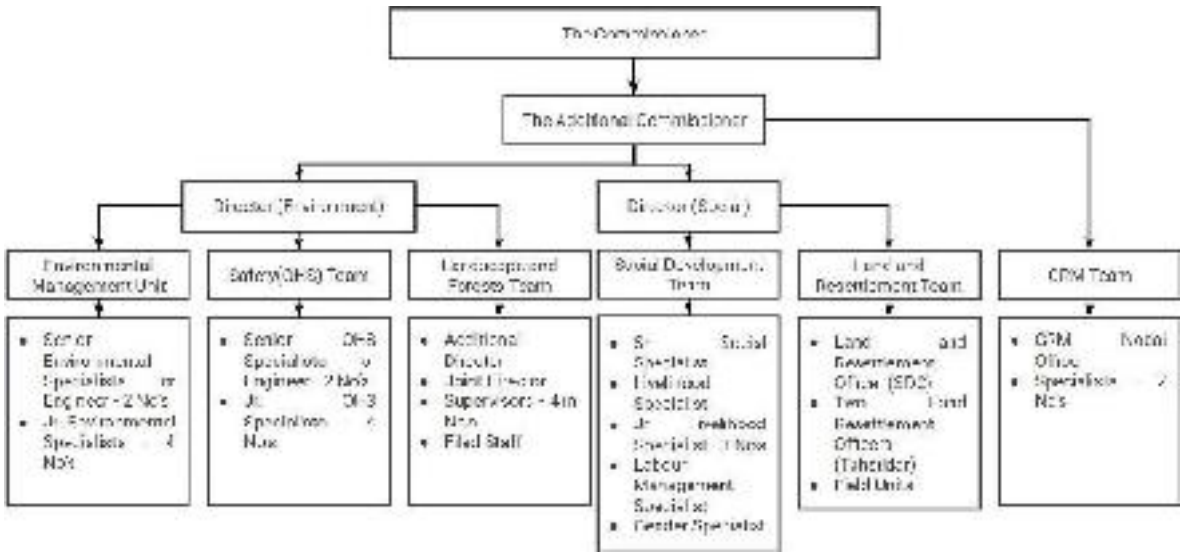
4.2 **Andhra Pradesh Capital Region Development Authority (APCRDA)**: The Government vide G. O. Ms. No. 255, MA & UD (M2) Department, dated 30-12-2014 constituted the Andhra Pradesh Capital Region Development Authority with Chief Minister of Government of AP as Chairman, Minister for MA & UD Department as Vice-Chairman and nine other members consisting of ministers and senior officers. The Authority inter alia passes resolutions for the acquisition of lands and prescribes rules/ regulations for implementation of LPS/ Negotiated Settlement Policy under the Act.

4.3 **Supporting Staff for LPS/ LA implementation**: The Government approved the APCRDA staffing pattern as per G.O. Ms. No. 81, MA & UD (M2) Department, dated 16-04-2015, for implementation of AP Capital City Development Program, including land acquisition.

4.4 **The Commissioner, APCRDA and two Additional Commissioners assisted by Directors** will supervise the Competent Authorities for Land Pooling, Negotiated Settlement and Land Acquisition. The Authority/Commissioner, APCRDA will be the approving authority for RAPs and other safeguard-related documents for the Program.

4.5 **The Competent Authority (11 Units) will work under,** administrative and functional control of the District Collector, Guntur who is the appropriate authority for Land Acquisition and the Joint Collector, Guntur who is the Program Administrator for implementing R&R policy.

4.6 **Environmental and Social Management Unit (ESMU)** in APCRDA: The Government vide G.O.MS.No. 112, MA & UD (CRDA.2) department, dated 29-10-2024 established the Environmental and Social Management Unit (ESMU). This unit is responsible for managing the environmental and social aspects of the Programs supported by the World Bank and Asian Development Bank for the development of Amaravati Capital City. The structure of the Environmental and Social Management Unit (ESMU) is provided below:



4.7 The primary responsibilities of the ESMU include the following:

a. *Statutory Compliance Management*: Environment clearance, Consent obtained for the entire Amaravati capital city and its interlinked Programs, land assembling. The unit shall ensure that the compliance of the conditions is submitted periodically to the Ministry of Environment and Forests (MoEF&CC), SEIAA, AP, and APPCB.

b. *Implementation Monitoring of Environmental and Social Safeguards*: The environmental and social safeguards are to be integrated typically at the planning and design stage and shall be complied with during the construction and operational stages.

c. *Guiding Departments*: The ESMU shall provide the necessary training and capacity building on environmental and social management plans to the relevant departments.

4.8 The implementation of the AIUDP involves a collaborative framework with multiple entities working alongside **ESMU**. The **Program Management Consultant (PgMC)** provides strategic guidance, policy alignment, and technical expertise for planning and policy compliance, including support for safeguard frameworks and capacity-building efforts.

4.9 The **Project Management Consultant (PMC)** is responsible for the day-to-day operational management of the project, ensuring timely execution, quality assurance, and proper coordination between contractors, APCRDA, and the community. They manage project documentation, monitor progress, and ensure that safeguard measures, including those related to gender, social inclusion, and livelihood restoration, are effectively implemented.

4.10 **Contracting agencies** are responsible for the on-ground execution of infrastructure works, ensuring compliance with environmental and social standards. They maintain workforce welfare, adhere to safety protocols, and regularly report progress to the PMC and ESMU. This multi-tiered structure ensures effective project delivery with transparency and accountability.

Implementation Mechanism for LPS / LA / Negotiated Settlement Policy

4.11 **Implementation Mechanism for LPS:** The LPS unit headed by Competent Authority/ Special Deputy Collector will supervise the Land Pooling Process as per the provisions of A.P Land Pooling Scheme (Formulation & Implementation) Rules 2015. The process includes several steps and various agreements and consultations. The key steps include notification of the Land Pooling scheme, holding consultations and hearing objections/suggestions, invitation to participate in LPS, execution of development agreement, formulation of redevelopment schemes, allotment of re-developed plots, and registration of redeveloped plots in favor of landowners, and surrendered land in favor of APCRDA. As per Section 57(4) of the APCRDA Act 2014, the Land Pooling Ownership Certificate (LPOC) shall be the conclusive evidence of the title of the property in respect of the reconstituted plot/ land and shall be eligible for transfer of rights of the property in accordance with the provisions of the Registrations Act 1908.

4.12 **Implementation Mechanism under LA R&R Act, 2013.** The land acquisition process under the LARR Act, 2013, begins with a Social Impact Assessment (SIA) study, which documents the impacts and assesses the land acquisition requirements. After a public hearing, expert review, and government approval of the SIA report, the land acquisition process begins. The detailed steps and procedures for land acquisition and the entitlement matrix are outlined in Annexure 4.

Coordination with District Administration for Land Acquisition

4.13 Administrative Roles of the Officers / Authorities for Land Acquisition. The following officers will have the required administrative powers to deal with the land acquisition and related activities:

Table 5: Administrative Roles of the Officers / Authorities for Land Acquisition

Officers	Roles and Powers
Government	• Notify District Collector as appropriate Government. • Designates Special Deputy Collectors as Collector (LAO) under the Act.
Commissioner, APCRDA	• Requisition Authority on behalf of APCRDA / Government.
Commissioner, R&R	• Selection of SIA Team and Terms of reference • Approval of R&R Scheme.

District Collector	• Notify 4(1) Notification for commencement of SIA. • Appointment of Expert Group. • Decision on Acquisition of Land u/s 8(2) • 11(1) PN Notification • Decision on objections against 11(1) Notification • Review of draft R&R Scheme with Program Level R&R Committee • Publication of Declaration u/s 19 • Approval of preliminary valuation • Approval of draft Compensation Award
Competent Authority/Land Acquisition Officer	• Assist Social Impact Assessment agency in conducting SIA • Submission of report u/s 8(2) • Conduct of Grama Sabha u/s 11(2) • Conduct of Survey u/s 12 and 20 • Hearing of Objections on 11(1) PN Notification • Assist Program Administrator for conducting SES and preparation of R&R Scheme • Conduct of Award Enquiry u/s 21 • Preparation of valuation statements u/s 26 to 30 • Passing of LA R&R Award u/s 23 and Individual Compensation Awards u/s 30(2) and Individual R&R Awards u/s 31(1) • Passing consent Awards as per State Level Negotiation Committee • Payment of compensation, R&R benefits and providing rehabilitation entitlements • Taking possession • References to LA R&R Authority and Depositing Amounts in disputed cases.
R&B Department	• Preparation of estimates for Residential Houses / Structures
Horticulture / Forest / Sericulture Departments	• Estimation of Trees and Topes
Ground Water Department	• Estimation of Well value
Any other Department	• As per requisition of District Collector.

4.14 **Implementation Mechanism for Negotiated Settlement.** Section-124 of APCRDA Act, 2014 enables the Authority to acquire any property by way of a negotiated settlement, and in cases where the negotiated settlement fails the provisions of LA R&R Act, 2013 would be made applicable as per the requirement of the development plan.

i. Once the Negotiating committee and affected family negotiate on the package offered by APCRDA, the agreed-upon assistance will be documented in the negotiated agreement.
ii. The negotiated settlement policy is estimated to meet or exceed the provisions of the LA R&R Act as an equal amount of land is allotted in the village site/

habitation or a developed Rehabilitation Centre, and this option is offered as optional.

4.15 Interested individuals have the option to choose a negotiated settlement policy rather than land acquisition (LA). The Competent Authority representing the APCRDA will engage in a negotiated settlement through a negotiation process conducted by a committee formed by the APCRDA, which includes members from land administration and technical expertise.

Census Cum Socio-Economic Survey

4.16 During Jan-Feb 2015 census survey was conducted in all the Capital City Villages and the data relating to 38963 households was captured and treated as baseline data for extending entitlements and benefits from the CRDA and the government. It is proposed to monitor the impact of capital development process on these households periodically through sample studies and also through collection of additional details from all the households. As part of this, in 2024 Skill Census is conducted of all the households to elicit the data relating to the skill needs of the existing population. The CRDA will conduct a Socio-Economic survey of all project affected families to capture the revised base-line data of March 2025 and to monitor the impact of capital development on all the families through sample studies over time.

Resettlement Action Plan (RAP)

4.17 It is proposed to prepare and disclose Resettlement Action Plan for each of the sub-programs taken up as part of Amaravati Capital City Development Program with particular reference to those funded by any of the multilateral agencies. These resettlement plans will comply with the principles outlined in this RPF. RAPs will apply to all affected persons, regardless of the land assembly tool employed with special emphasis on those families affected under LARR Act and Negotiated Settlement Policy. The idea is that while LPS contributors have received land with higher economic value compared to pre-project conditions, on the other hand, the other two categories need to be monitored with the aim of restoring their financial position to pre-project status and, if possible, improving their economic situation further. The resettlement action plan outlines the land assembly procedures, related entitlements, implementing and monitoring mechanisms.

4.18 The plan should be adjusted to the nature and scale of impacts, presenting impacts and mitigation measures by sub-programs if multiple contracts are involved.

4.19 Compensation payments and entitlements will be disbursed prior to physical displacement and before transferring the corresponding land parcels to contractors. For LPS, the equivalent milestone for compensation is the allotment of returnable plots

to landowners. The payment of compensation and entitlements along with the completion of returnable plots allotment in case of LPS, will be certified by Competent Authorities of the respective LPS units before handing over the lands to the contractors.

4.20 The payment of compensation and R&R assistance under the Land Acquisition Act and Negotiated Settlement policy will be certified by the District Collector/ Joint Collector, Guntur who is the competent authority for the land acquisition. As needed, the land handover to the contractors will be provided in two or three milestones to enable the completion of land acquisition in a phased manner. This measure is to ensure adherence to this RPF and to eliminate any impediments in the execution of the Program once the land is handed over to the contractor.

4.21 The following category of people are expected to have impacts associated with the lands required for the Program:

i. Those who have formal rights to land including customary and statutory rights of occupancy recognized by law such as those landowners with formal titles.

ii. Those who do not have formal legal rights to land at the time the census begins but have a claim to such land or assets provided that such claims are recognized by law or recognized through a process identified in the resettlement and compensation plan.

iii. Those who have no claim to land that they are occupying or using, such as squatters, encroachers, etc.

iv. Those covered under first two categories above are to be provided compensation for land they lose, and other assistance as per the policy. Persons covered under 3rd category above are to be provided with resettlement assistance in lieu of loss of structure and or livelihood on the land they occupy or use, and other assistance, as necessary, to achieve the objectives set out in this policy, if they occupy or use the Program area prior to the cut-off date as on the date of conduct of Socio Impact Assessment or Socio-Economic Survey. All persons included are to be provided with compensation for the loss of structures and trees other than land.

4.22 All affected persons irrespective of their status or whether they have formal titles, legal rights or not, are eligible for assistance if they occupied the land before the entitlement cut-off date. The entitlement cut-off date refers to the time when the declaration of Capital was done by the Government i.e., 8th December 2014.

4.23 Local Communities (villages, communes etc.,) permanently losing land and/or access to assets under customary rights will be eligible for compensation/R&R benefits. The respective Panchayats or Grama Sabhas will be consulted during the process of Socio-Economic Survey and preparation of R&R Scheme.

Valuation of Land and Assets

4.24 **Land**: The compensation for land will be the higher of two values: (i) current government guideline value, and/or (ii) average of highest 50 per cent of sale transactions three years prior to first notification. This value will be multiplied by 1.25 times and 100 per cent solatium will be added. In addition, amount calculated @ 12 per cent per annum on Market Value for the period between the first notification and date of compensation award, will be paid.

4.25 **Structures/other assets** - According to the LA R&R Act 2013 and Negotiated Settlement Policy, structure valuations are estimated using the prevailing Standard Scheduled Rates (SSR rates) for constructions existing as of the cut-off date without deducting depreciation value. These rates are updated annually per Public Works Department (PWD) norms. The salvage value is paid to the affected people.

4.26 **All other losses** will be valued, keeping the principles of replacement value. All unit costs are referenced in the Entitlement Matrix and compensation will be paid as per the RPF.

4.27 The matrix will be updated every year subsequently. No income tax will be deducted for payment of compensation and R&R assistance. No registration fee would be collected for the documents during the process of LPS/ Negotiated Settlement/ LA. The Entitlements for Land Pooling Scheme and Negotiated Settlement Policy are provided in Annexure 2 and Annexure 3 respectively.

Targeted Support to Vulnerable Groups

4.28 Vulnerable families will be identified periodically based on defined indicators, and targeted efforts will be undertaken to enhance their well-being. Social Facilitators will monitor these families at the village level, coordinating and facilitating access to benefits from various government programs. At present, along with livelihood measures for landless, special assistance provided to vulnerable families through *(i) social security pensions, (ii) allocation of TIDCO houses, and (iii) skill development training to facilitate employment.*

Time Frames

4.29 The following timeframes are being proposed by APCRDA:

i. the inventory of losses shall be completed before the commencement of RAP preparation.
ii. civil works shall commence only after compensation, resettlement, and rehabilitation activities have been completed for the corresponding stretches/ parcels of land.

Public Consultation Mechanism

4.30 Public consultation and participation are essential because they provide an opportunity to inform the stakeholders about the proposed program. CRDA will ensure that it will be a continuous process throughout the implementation of the program. Providing an opportunity for people to present their views and allowing consideration and discussion of sensitive social mitigation measures and trade-offs.

Program Information Centers and Communication Strategy

4.31 Program Information Centers (PICs) have been established in the villages at the office of Deputy Collector/Competent Authority[14] (CA) offices. The CA will be designated as Program Information Officer to provide the required information on the overall Capital City Program in the form of printed documents, information available on the website, etc. Social Facilitators of the respective villages will be trained as information assistants so that they can be more accessible to the villagers to seek the required information.

Grievance Redressal Mechanism (GRM)

4.32 There already exist multiple channels for public grievance management, and all of these would remain operational for ACCDP and the proposed AIUDP. A brief description of the existing grievance redress arrangements as well as the proposed strengthening of the GRMs is as follows:

1. 'Meekosam' ('for you' in English):

4.33 This is a statewide single-window, online framework for receiving grievances, and complaints, covering all government departments. Complaints are routed to the department concerned, including APCRDA for Amaravati-related grievances/ complaints. In addition to reporting complaints, people can also give suggestions to the government directly through this web portal. All the reports and suggestions will be accessible to the respective departments and the office of the Chief Minister: https://meekosam.ap.gov.in

4.34 The main features of the 'Meekosam' system include:

- The recording of grievances is based on the Aadhar number.
- The person who posted grievance or suggestion can track the progress of his/her application.

[14]There are 11 CA units in Capital City area, they report to District Collector, as all CAs are under the functional and administrative control of District Collector..

- An acknowledgment of receipt of the complaint will be received via SMS/ e-mail once a grievance is registered.
- The grievance will be registered, tracking ID issued, categorized, and forwarded to the department concerned.
- Grievances will be escalated to higher authorities if the grievance is not addressed within a certain time frame.

4.35 Each Competent Authority Unit is separately registered in the Meekosam portal to ensure that the grievance is expeditiously addressed by the concerned officer. The progress of redressal is monitored by Commissioner APCRDA at the organization level and by Hon'ble CM at the state level, during regular review meetings.

2. PARISHKARAM APCRDA Grievance Redressal Mechanisms

4.36 APCRDA has its own GRM that includes: (i) Approaching Competent Authority in the field/additional commissioner during weekly public interaction/Representation to Commissioner, APCRDA and (ii) an online system through the portal:
https://crda.ap.gov.in/APCRDA/Userinterface/Admin/GrievanceRedressalSystem.aspx

4.37 Any citizen who wishes to register a grievance with CRDA can enter the details of the problem in the *Parishkaram* app by registering through his/her mobile number. The complaint will be fed to the department concerned in the CRDA and each HOD will be accountable for timely and qualitative disposal. The petitioner can check the status of grievance by using the unique Grievance ID which will be shared with the complainant by SMS message. The status of the grievance will be shared as SMS to the petitioner at every stage.

Strengthening the GRM

4.38 APCRDA will continuously strengthen its existing grievance management system and ensure that it is accessible, effective, and responsive, with defined processes and timelines for resolution. APCRDA will develop standard operating procedures on grievance management and formalize the GRM based on the SOP to ensure accessibility, registration, assessment and resolution of complaints in a time bound manner, including progress tracking and feedback mechanism.

4.39 The GRM will comprise arrangements for grievances received at the field as well as PMU levels. The field-level GRM will cater to grievances received through field unit offices or competent authority office (CAO)/ APCRDA or contractor's office. At the PMU level, a GRM Cell within the ESMU will be established that will report directly to the Additional Commissioner. It will be supported initially by a GRM Nodal Officer, and two support staff and the staffing may be enhanced to four support staff as and when required. All grievances received at the field level will be documented and progress status communicated to the PMU. Further, all grievances

received through online platforms (APCRDA web portal or directed by state PGRMS) will be assessed and referred to the concerned department and offices (e.g. field offices). Grievance registers will be placed at the village level and the staff in the field offices will be responsible for recording verbal grievances for the people who lack literacy or proficiency in electronic media. The grievance unit under the ESMU in the PMU will be responsible for coordinating (with various departments and offices), progress monitoring, documentation, and reporting tasks at the program level. The unit will also monitor the effective functioning of the grievance management systems at the field level including grievance recording and documentation and progress reporting in the program system. Regular public outreach and disclosure meetings will be undertaken. The program will assess any legal issues through the GRM and proactively settle any legacy issues unless these are under legal procedures. The status of grievance redress will be reported through monitoring reports and corrective actions if needed will be developed and implemented.

4.40 The GRM will ensure that grievance data generated through the PGRMS and other channels including grievance data reported by the field offices are integrated into one common database, documentation, reporting, and feedback mechanism, to also facilitate in effective monitoring of program GRM. The proposed system will feed into the web-based program M&E data management system. The Standard operating procedures for GRM, including procedures for communication and information disclosure will reinforce the GRM. Participatory systems for grievance redressal with gender and social inclusion features will be adopted to enhance GRM effectiveness.

3. Right to Information (RTI) Act implementation at APCRDA

4.41 GoAP / APCRDA is also covered by Right to Information (RTI) act-2005, which provides another avenue for Grievance Redressal through receiving applications filed U/s 6(1) and 1st appeals filed U/s 19(1) of the Act. The CRDA U/s 5(1) has designated one First Appellate Authority, Three Public Information Officers and Seven Assistant Public Information Officers to cover all the departments.

Disclosure

4.42 The copies of RPFs & RAPs will be made available at office of (i) Competent Authority to the public at (ii) Office of the District Collectors; (iii) Mandal Revenue Office; and (iv) Office of the Panchayat/ Municipality, the plans are available and certainly before land is acquired for the Program. An electronic version of the RPF as well as the RAPs and other relevant documents will be placed on the official website of the District Collector, Guntur, and APCRDA, after approval and endorsement by the Government of Andhra Pradesh. The RPF and RAPs will be maintained throughout the life of the Program and will be made available in local languages to the public including affected persons.

Monitoring

4.43 Monitoring of involuntary resettlement and implementation of resettlement action plans will be ensured through a robust MIS and database management system and supported by adequate reporting arrangements established for the project. Arrangements will be equipped with AIUDP (and similar supported programmes) specific monitoring and reporting requirements. A number of Objectively Verifiable Indicators (OVIs) shall be used to monitor the implementation of RAPs and its outcomes. The indicative indicators are included in the RAPs. The concurrent monitoring will be focused on: progress in compensation payments, delivery of R&R assistance, delivery of LPS returnable plots, coordination with civil works, implementation of social development schemes, grievances handled, timely payment of annuities and pensions, consultations, compliance with RPF/RAP provisions, timely handover of land to the contractors, delay in implementation from RAP time-table, etc. The impact evaluation will focus on documenting the changes in income, poverty levels, ownership of assets, creation of employment opportunities and ways of spending compensation amount, how returnable plots are being used, etc. Sample studies and surveys will be undertaken for comparison purposes.

Budget and funding arrangements

4.44 The government of Andhra Pradesh/APCRDA, the requisitioning authority for acquiring lands required for the project, shall make arrangements for: fund required for land acquisition, land pooling units, and Negotiated settlement; payment of annuity; payment of pension through Capital Region Social Security Fund; payment of compensation, R&R cash benefits under LAR&R Act, non-title holders eligible for benefits under LAR&R Act and other benefits and entitlements under LPS and NS.

4.45 The resettlement plan shall contain budget estimates covering benefits and entitlements to all affected persons. The budget shall provide resettlement cost estimates for each land assembly instruments, with information on its sources. These will include costs of consultations, awareness raising and public outreach activities, GRM besides costs for land assembly and entitlements as per the entitlement matrix. All expenditures related to the implementation of RAPs will be me out funds of the Program or General Funds that are already in place for LPS or land acquisition.

4.46 The payments shall be through bank transfers into the accounts of Awardees/ beneficiaries (women in case of pensions). The LAR&R Authority will act as the Grievance Redressal Mechanism to deal with complaints related to compensation and R&R benefits under LAR&R Act 2013.

Other Related Issues

4.47 The Citizen's Committee to be constituted by APCRDA will also monitor the implementation progress and also take up with district administration on timely implementation of the Program.

4.48 Periodic evaluations will be made to determine whether the PAPs have been paid in full before implementation of the sub Program activities.

4.49 The objective of the evaluation is to determine whether affected people have received full compensation and assistance; and whether they have improved their living standards compared to the baseline situation.

4.50 The Environment and Social Management Unit is set up to strengthen the system within the CRDA to monitor the impact of different programs. The capacity of the social development team will be regularly strengthened to ensure implementation of the Resettlement Policy Framework, Preparation, review and monitoring of RAPs, and focus on livelihood restoration of affected people/ beneficiaries.

4.51 The draft Resettlement Policy Framework (RPF) is disclosed on the website of CRDA, to notify the general public of its publication. Comments and suggestions on the draft documents are being solicited. Public consultations will be held to discuss the draft and focus group meetings will be held for consultation of the draft RAPs along with RPF. These focus groups target LPS/LA Farmers, and NSP affected families with a focus on women, and vulnerable people.

ANNEXURES

Annexure 1 - Definitions

Unless the context dictates otherwise, the following terms shall have the following meanings: -

1. 'Agriculture' includes food crops and cash crops such as horticulture, farming, raising of crops, fruits, vegetables, grass, fodder, trees or any other kind of cultivation, breeding and keeping of live-stock, including horses, donkeys, mules, pigs, fish, poultry and bees; and the use of land for any purpose which is ancillary to the farming of land or any other agricultural purposes, but does not include the use of any land attached to a building for the purpose of a garden to be used along with such building and the expression 'agricultural' shall be construed accordingly;

2. 'Authority' means the Andhra Pradesh capital region development authority constituted under section 4 (1) of this Act and includes Commissioner or Competent Authority not below the rank of Deputy Collector appointed by Government to discharge certain functions under this Act or rules or standing orders made there under;

3. 'Capital City area' means area within capital region identified and notified by the Government of Andhra Pradesh as the Capital City area for the State of Andhra Pradesh under section 3 (3) of this Act;

4. 'Development plan' means a comprehensive plan for the development or redevelopment or improvement of a local area within the jurisdiction of the Authority covering the whole or part thereof

5. 'Development Program or Program' means plans conceived within the framework of approved development plan, containing detailed working layouts with all supporting infrastructure and documents including cost of development, source of finance and recovery instruments for their execution;

6. 'Development scheme' means the method of securing land required for a development plan by means of land acquisition or land pooling or any other means, and the details of implementation of the plan in the secured land.

7. 'Infrastructure plan' means a plan showing existing and proposed major infrastructure facilities

8. 'Land pooling scheme' means assembly of small land parcels under different ownerships voluntarily into a large land parcel, provide it with infrastructure in a planned manner and return the reconstituted land to the owners, after deducting the land required for public open spaces such as parks and play grounds, social housing for economically weaker sections, social amenities such as school, dispensary and other civic amenities, road network, and other

infrastructure as specified under the Act as well as such extent of land in lieu of the cost of development towards the provision of infrastructure and amenities and other costs and expenses to be incurred for the scheme and external trunk infrastructure;

9. 'Master plan' means a land use, infrastructure and transportation plan, indicating the location of residential, commercial, transportation, green/open, mixed use, utilities, social infrastructure, industrial, agricultural areas and ecologically fragile areas, prepared for the whole of the capital region or part thereof and could be at the concept level for a 20-year period reviewed every five years having a low level of detail or at a detailed level for up to ten-year period;

10. 'Occupier' includes: -
    a. a tenant,
    b. an owner in occupation of, or otherwise using his land,
    c. a rent-free tenant of any land,
    d. a licensee in occupation of any land, and
    e. any person who is liable to pay to the owner charges for the use and occupation of any land.

11. 'Census' means a field survey carried out to identify and determine the number of Program Affected Persons (PAP), their assets, and potential impacts.

12. 'Compensation' means the payment in kind, cash or other benefits / entitlements given in exchange for the taking of land, or loss of other assets, including fixed assets thereon, in part or whole.

13. 'Cut-off date' - Under the LA R&R Act, 2013 the compensation is payable basing on the market value as on 11(1) notification and till award interest is payable. Regarding R&R under LA R&R Act, 2013 the cut-off date shall be 3 years prior to date of Award.

14. 'Program affected persons' (PAPs) means persons who, for reasons of the involuntary taking or voluntary contribution of their land and other assets under the program, result in direct economic and or social adverse impacts, regardless of whether or not the said Program affected persons are to be physically relocated. These people may have their:

    a. Standard of living adversely affected, whether or not the Program Affected Person must move to another location;

    b. right, title, interest in any house, land (including premises, agricultural and grazing land) or any other fixed or movable asset acquired or possessed, temporarily or permanently, adversely affecting livelihood.

    c. access to productive assets adversely affecting livelihood.

    d. business, occupation, work or place of residence or habitat adversely affecting livelihood.

15. "Involuntary Displacement" 'Means the involuntary taking of land resulting in direct or indirect economic and social impacts caused by:
    a. Loss of benefits from use of such land;
    b. relocation or loss of shelter;
    c. loss of assets or access to assets; or
    d. Loss of income sources or means of livelihood, whether or not the Program affected person has moved to another location.
16. 'Involuntary Land Acquisition' is the taking of land by the government or other government agencies for compensation, for the purposes of a public Program against the will of the landowner.
17. 'Land' refers to agricultural and/or non-agricultural land and any structures thereon whether temporary or permanent and which may be required for the Program.
18. 'Land acquisition' means the taking of land, buildings or other assets thereon for purposes of the Program.
19. 'Resettlement Assistance' means the provision of development assistance in addition to compensation such as land preparation, credit facilities, training, or job opportunities, needed to enable Program affected persons to improve their living standards, income earning capacity and production levels; or at least maintain them at pre-Program levels.
20. 'Resettlement and Compensation Plan', also known as a 'Resettlement Action Plan (RAP)' or 'Resettlement Plan' - is a resettlement instrument (document) to be prepared when the locations affected by sub-programs of capital city development are identified. In such cases, land acquisition leads to physical displacement of persons, and/or loss of shelter, and/or loss of livelihoods and/or loss, denial or restriction of access to economic resources. RAPs are prepared by the party impacting on the people and their livelihoods. RAPs contain specific and legally binding requirements to be abided by to resettle and compensate the affected party before implementation of the Program activities causing adverse impacts.
21. 'Rehabilitation Assistance' means the measures to ensure that Program affected persons who may require to be physically relocated are provided with assistance such as moving allowances, residential housing or rentals whichever is feasible and as required, for ease of resettlement during relocation,
22. 'The Resettlement Policy Framework (RPF)' has been prepared as an instrument to be used throughout the WB-ADB assisted Program implementation. The RPF will be publicly disclosed in impacted areas to set out the resettlement and compensation policy, organizational arrangements and design criteria to be applied to meet the needs of the people who may be affected by the program. The Resettlement Action Plans ("RAPs") for each of the sub-Programs will be prepared consistent with the provisions of this RPF.

23. 'Vulnerable Groups': among the landless households, the following are recognized as vulnerable under the Program: (i) families with woman as head of household including *inter alia* single women, widows; (ii) households where family members have physical disabilities; (iii) families with chronic diseases; (iv) households with aging family member who can no longer work (over 60 years old); (v) families with no alternative sources of income other than APCRDA pension; and (vi) families of Scheduled Castes/Scheduled Tribes whose sole source is APCRDA Pension.

24. Amaravati Integrated Urban Development Program (AIUDP) – The program, funded by world bank/Asian development bank, consist of course of program viz., AGC Complex, LPS Works, Flood Mitigation works and Trunk Infrastructure works.

25. Amaravati capital City Development Project (ACCDP) - The project aims at development of infrastructure for the Capital City and to establish governance structures. Several programs like AIUDP, HUDCO, KFF etc., are part of this larger entity to mobilise the needed finances.

All other words used shall have the meaning specifically mentioned under any law or policy of the Government of Andhra Pradesh.

Annexure 2 - Land Pooling Scheme (LPS) Annex

1. This Annex has the following key sections:
   - Section I: Background
   - Section II: Description of LPS policy, processes& regulations
   - Section III: Consultations held for LPS & Grievance Redress Mechanisms
   - Section IV: Entitlements under LPS

Section I: Formation of New State of Andhra Pradesh

1.1 The Andhra Pradesh Re-Organisation Act, 2014 (central Act 6 of 2014) came into force on June 2, 2014. The New Government of Andhra Pradesh took the recommendations of the expert committee, opinions of experts of urban development, various public organizations and after considering all aspects of public welfare, accessibility to all parts of the state, advantages and disadvantages, identified and finalized the location of Capital City area between Vijayawada and Guntur cities on the banks of River Krishna. The AP Assembly passed resolution on September 3, 2014 to establish Green Field Capital City as a livable environmentally sustainable people's Capital

1.2 To make the Capital City a world-class People's Capital, Government of Andhra Pradesh signed a Memorandum of Understanding (MoU) with the Government of Singapore on December 8, 2014. According to the MoU Singapore Government prepared master plans at three stages viz., 1) Capital Region Concept Master Plan, 2) Capital City Master Plan, and 3) Seed Capital Area Detailed Master Plan.

1.3 Based on the recommendations of the technical committee and the opinion of the public representatives, modifications to the draft Master Plan were made. The detailed master plan was notified in Gazette No:18 dt. 23-02-2016 and published in two newspapers (Eenadu and Times of India) on February 24, 2016 as well as in the website of APCRDA as required u/s 39(6) of the Act.

Section II: LPS policy, process & regulations

2.1 LPS Policy &Regulatory Framework

a. The Government has notified the Capital City area vide G.O.Ms.No. 254, MA & UD (M2) Department, dated: 30-12-2014 in exercise of powers u/s 3(3) of the AP CRDA Act, 2014. The Government have constituted AP CRDA as per the provisions contained under Section 4(1) of the AP CRDA Act, 2014 and in exercise of powers under Section 43(5) directed AP CRDA to undertake development schemes as provided in Chapter IX of the AP CRDA Act, 2014 through voluntary Land Pooling Scheme in the Capital City area.

b. As per Section 107 of the LA R&R Act, 2013 the State Government may enact any law or policy. Land Pooling Scheme is one such policy. The landowner may opt for such policy as contemplated u/s 108 of the LA R&R Act, 2013. The State Government has formulated Andhra Pradesh Capital City Land Pooling Scheme (Formulation and Implementation) Rules, 2015 and notified vide G.O.Ms.No.1, MA & UD (M2) Department, dated: 01-01-2015.

c. On December 30, 2014, the APCRDA Act was enacted, and the Land Pooling Scheme (Formulation & Implementation) Rules were notified. The land pooling scheme came into existence from January 1, 2015, and in a span of 60 days, agreements covering an extent of over 30,000 acres were received from over 25,000 farmers which has never been accomplished anywhere in the world.

2.2 LPS Process Steps for Participation

a. The Land Pooling Scheme is implemented in a systematic manner. Public consultations or 'Grama Sabha' were held in villages to make people aware about the Land Pooling Scheme, Delineation of village boundaries and Capital City Master plan process. Voluntary Development Agreements were signed between Competent Authorities and Landowners coming forward to join the LPS.

b. The implementation consists of two parts:

- ***Extending returnable plots and other benefits***
- ***Implementation of the development plan and registration of plots with transferable rights.***

c. **LPS Notification:** By means of Government Order, Municipal Administration and Urban Development Department appointed local Competent Authorities in the envisaged Capital City Area of 217.23 sq. km, comprising 24 Revenue Villages, which have been notified for LPS, expressing the Government's intent to begin the development of the New Capital City.

d. **Demarcation of Existing Village Sites/ Habitations:** Keeping in mind, the concerns of people in the existing villages and considering the complete resettlement of existing villages would be challenging and difficult, the existing village settlements are exempted from Land Pooling, thus avoiding physical displacement. Public consultations or 'Grama Sabha' were held in villages to make people aware about the Capital City Master plan process, Land Pooling Scheme and Delineation of village boundaries. Voluntary Development Agreements were signed between Competent Authorities and Land owners coming forward to join the LPS.

e. LPS Consent, Agreement and Plot Options:

i. Of the 26 LPS units, each LPS unit consists of one Special Deputy Collector and one Tahsildar with supporting staff. The LPS unit staff assists the landowners in preparation of revenue records, maps, and agreements with Authority, concluding the required plot counts.
ii. Declaration of intention to undertake LPS
iii. Declaration of final area for LPS in Form 9.5
iv. Landowner after finalizing objection in Form 9.2 participates in LPS in Form 9.3 and enters agreement of development with APCRDA in Form 9.14 to enable the Authority to proceed further for planning, allotment and development of LPS layouts.
v. Land owners are given 498 varieties of residential categories, 493 varieties of commercial categories - 991 varieties of category options for selection of the size of the plot required
vi. The plot codes are opted by the land owners in Form 9.18
vii. The Competent Authority checks the options given by the landowner with the revenue records and forwards the data of the required plots and category to the - Estates and Planning departments of CRDA. Ownership information is kept confidential. Size, category of the plot and number of plots to be planned are only shared.

2.3 LPS layout Preparation

a. Accordingly, Draft Layouts were prepared and notified for each village in Form 9.20 uploaded in APCRDA website, notified in the district gazette and given 30 days' time for filing objections/suggestions.
b. After compiling the received objections/suggestions by the Competent Authority, several consultation meetings were held both at villages and in APCRDA office.
c. Accordingly, Final LPS Layout was prepared and notified for each village in form 9.22, the final layout maps are displayed at the village panchayat office, uploaded in APCRDA website, notified in the district gazette.

d. The lottery date was announced after few days and the returnable plots were allotted to the landowners through lottery.

2.4 LPS Lottery process: Lottery is the most important milestone in the entire LPS process, as the farmer will get the returnable residential/ commercial plot allotted through this process.

2.5 LPS Layout Peg Marking

a. The returnable plots to the landowners are marked on land by using a DGPS equipment (Differential Global Positioning System) and pegs are marked on the boundaries.
b. Digital coordinates are included in the ownership details, making it easy for digital cadaster
c. Awareness sessions are conducted with respective returnable plot owners, village-wise before proceeding for peg marking.

2.6 Allotment, LPOC and Plot Registrations:

a. As per Section 57(4) of the APCRDA Act 2014, the land pooling ownership certificate (LPOC) shall be the conclusive evidence of the title of the property in respect of the reconstituted plot / land and shall be eligible for transfer of rights of the property in accordance with the provisions of the Registrations Act 1908.
b. Government of Andhra Pradesh (GoAP) bears all the costs incurred for registration of farmer's land to CRDA as well as registration of returnable plots to farmers by CRDA.
c. Government also bears the cost of registration if the allottee registers the plot to his own family member (i.e. spouse or children)
d. CRDA has opened help desk/ facilitation center in the Sub Registrar's office to ease the registration process for the farmer/landowner.
e. Registration documents are prepared by Competent Authorities to reduce the burden on farmers/landowners and fasten the registration process.
f. Each registration document is provided with the following for clear understanding.
    i. Plot dimensions derived from DGPS measurements.
    ii. Cadastral correlation for enabling encumbrances verification (EC)
    iii. Site plan, Block plan, Colony plan explaining physical features

2.7 Infrastructure in LPS layouts: The Government has prepared plans to develop infrastructure for the Land Pooling Scheme layouts, the detailed designs of which have been finalized. Developing LPS infra is a commitment as part of LPS process under the Act.

2.8 Land Pooling Process: The land pooling process duly follows rules prescribed in Land Pooling Scheme (Formulation & Implementation) Rules notified on 30th December 2014. The process, rules, and forms employed are provided below:

Table

Item	Rule	Form No.
Notifications of declaration of intention to undertake "Land Pooling Scheme" (Publication in GP/ Locality / News Papers / Gazette / Website)	6(2)	9.1
Conduct of stakeholders' consultations to explain the details of Land Pooling Scheme.		
Inviting objections and suggestions / enquiry and publication of final area for Land Pooling Scheme.	6(2)(i)	9.2
Disposal of Objections and Suggestions with the approval of Commissioner / Appellate Authority.	7(1)	9.4
Notification of finalized area for preparation of Development Scheme (Publication in GP/ Locality / News Papers / Gazette / Website).	7(2)	9.5
Inviting participation of landowners in proposed LPS by receiving irrevocable consent applications.	6(2)(ii)	9.3
Official Receipt of application with documents	8(2)	9.7
Individual Notices of enquiry and production of records for verification of ownership	8(1)	9.6
Publication of list of claims of landowners after verification inviting objections if any	8(3)	9.8
Verification to be caused by District Collector for certain categories of lands like Assignments / Classification of lands	8(4)	9.9
Orders confirming Landownership by Competent Authority	8(5)	9.10
Any person may contest the decision in competent Civil Court	Section 50 APCRDA Act,2014	
Development Agreement cum Irrevocable General Power of Attorney between landowner and AP CRDA	8(8)	9.14

2.9 Development Scheme Process

Item	Rule	Form No.
Conduct of Survey	9(2)(e)	9.15, 9.16
Certification of area statement / final base map and preparation of list of landowners.	9(3)	9.17
Application for Joint allotment of final plots	9(6)(i)	9.18
Statement of consultations made u/s 56 read with section 44	9(7)	9.19
Notification of Draft Land Pooling Development Scheme calling for objections and suggestions within 30 days (Publication in GP/ Locality / News Papers / Gazette / Website)	10(1)	9.20
Form of Objections / Suggestions	10(2)	9.21
Notification of Final Land Pooling Development Scheme (Publication in GP/ Locality / News Papers / Gazette / Website)	10(4)	9.22
Taking procession of land from landowners	10(4)	9.23
Conduct of lottery	Giving Provisional Allotment Certificate on the Spot	

Item	Rule	Form No.
Land Pooling Ownership Certificate with transferrable rights	11(4)	9.24
Details of LPOCs and land contributed by Landowners for availability on website	11(6)	9.25
Registration of LPOC	11(4)	
Handing over of physical possession of reconstituted plots	12(4)	9.28
Publication of reconstituted plots after carrying out mutations in land records.	13(2)	9.30

NB:- All the Land Pooling Scheme is being implemented in the Online System.

Section III: Consultations

3.1 Process of consultations, grievances, objections, and suggestions - A systematic program of consultations, grievance redressal, obtaining and resolving objections and suggestions was put in place to ensure that the issues are continuously attended to for resolving various issues around LPS. The entitlements to farmers under LPS were enhanced taking into account the feedback gathered through census survey and consultation process.

3.2 Announcement of Land Pooling Package and Enactment of Rules -With inputs from the cabinet sub-committee, representations from individual farmers, groups of farmers, village elders, learnings and recommendations from the above referred workshop, on December 7, 2014 the government has announced the Land Pooling Policy consisting of a package which will take care of long term interests of farmers and other stakeholders**.** On 30th December 2014, the APCRDA Act was enacted and the Land Pooling Scheme (Formulation & Implementation) Rules were notified. The land pooling scheme came into existence from January 01, 2015 and in a span of 60 days, agreements covering an extent of over 30000 acres were received from over 25000 farmers which has never been accomplished anywhere in the world.

Section IV: Entitlements under LPS

4.1 The land pooling mechanism is mainly adopted for development of the Capital City area wherein the land parcels owned by individuals or group of owners are legally consolidated by transfer of ownership rights to the Authority, which later transfers the ownership of a part of land back to the landowners for undertaking development of such areas**.** The Land Pooling Scheme is an option and people can join voluntarily as, if the landowner prefers compensation / R&R benefits under LAR&R Act, they are at liberty to opt for Land acquisition. As such there is no physical displacement arising out of land pooling scheme as the lands are outside habitation areas and are mainly utilized for agriculture. Extensive consultations were held to finalize the Land Pooling Scheme and the scheme benefits have been modified on three different occasions benefitting the landowners, based on consultations. The Government of India has also extended tax benefit by way of exemption from Capital

Gains Tax for the first sale of land. The land pooling scheme duly considered type of lands (dry, *Jareebu*), ownership status (patta lands, assigned lands, eligible occupants in resumed POT lands, encroachments, etc.) use of the land (agriculture/ gardens) as outlined in the entitlement matrix below.

4.2 Entitlement Matrix for Land Pooling Scheme

Land Categories	Category (in Sq. Yards) / Acre			
	Dry lands		*Jareebu* lands/Semi-urban	
	Residential	Commercial	Residential	Commercial
A) Private lands	1,000	250	1,000	450
B) Assigned lands				
Ex-Serviceman / Political Sufferer	1,000	250	1,000	450
Assignments before June 18, 1954	1,000	250	1,000	450
Assignments After June 18, -1954	800	100	800	200
Resumed lands – eligible Sivoijamadar occupation **	500	50	500	100
Un-Objection able Gouvernement lands – Eligible Sivoijamadar **	500	50	500	100
Objectionnable Govt. Lands – Eligible Sivoijamadar **	250	0	250	0
C) Yearly payment of Annual payment to all land owners losing land* for 10 years (extended to another 5 years without yearly enhancement)	Rs.30,000/acre (Rs.57000/acre for the year 2024-25-10th Year)		Rs.50,000/acre (Rs.95000/acre for the year 2024-25-10th Year)	
D) Yearly increase	Rs.3,000/acre		Rs.5,000/acre	
E) One-time additional payment for gardens(Rs.)	100,000			
(F) Agricultural labourer/Agricultural Tenants (residing in LPS villages as on December 08, 2014)	Rs.2,500 /per month/10 years enhanced to Rs.5000/- from Feb 2024 and extended for another 5 years up to 2029-30			

*In case of those losing less than one acre of land will receive the Annual payment equivalent to one acre.

** These three categories of people are paid monthly pensions instead of Annual Payment, while the rest of the categories are paid Annual payment

4.3 Other Benefits. In addition to above entitlements, the farmers who have joined or those registered for pensions can access to the following additional benefits.

a) Loan Waiver: One-time agricultural loan waiver of up to Rs. 150,000 is

available to all farmers who have outstanding agricultural loans.

b) To facilitate access to interest free loan of up to Rs. 25 lakhs to all the poor families for self-employment
c) MNREGA employment of 365 days (as per applicability of the Act and demand and eligibility of the individual)
d) Education and Health: Free education and health facilities are available to all those residing in capital city villages as on December 8, 2014 and
e) Establishment of skill development institution to provide training to enhance the skills of needy persons.

4.4 The following additional details with regard to the aforesaid entitlement matrix may be noted:

- All dry landowners are entitled to developed returnable plots of 1,000 sq. yd. Residential and 250 sq. yd. Commercial Plot in lieu of compensation and annual payment of Rs. 30,000/ per acres with an annual increase of Rs. 3,000/ for a period of 10 years in lieu of subsistence allowance, and stands as Rs. 57,000/ per acre in 2024-25 – the 10th year. The annuity is now extended by another five years without further enhancement of the amount.
- All *Jareebu*/ semi-urban landowners are entitled to developed returnable plots of 1,000 sq. yd. Residential and 450 sq. yd. Commercial Plot in lieu of compensation and annual payment of Rs. 50,000/ per acres with an annual increase of Rs. 5,000/ for a period of 10 years in lieu of subsistence allowance and stands t Rs. 95,000/ per acre in 2024-25 – the 10th year. The annuity is now extended by another five years without further enhancement of the amount.
- In case of those losing less than one acre of dry/ *Jareebu*/ semi-urban land will receive annual payment equivalent to one acre i.e., Rs.30,000/ Rs.50,000 with annual increase.
- Returnable plots/ annual payment would be made to the religious/Wakf institutions under Land Pooling scheme treating the lands as Private Lands in case of lands belonging to Endowment/ Wakf departments.
- All the assigned lands which are having transferrable rights would be resumed for public purpose and *patta* package equal to dry/*Jareebu*/semi-urban would be extended to all the eligible assignees.
- All the assigned lands which are not having transferrable rights would be resumed for public purpose and assignment package of 800 sq. yd. residential, 100 sq. yd. commercial for dry and 800 sq. yd. residential, 200 sq. yd. commercial for *Jareebu*/semi-urban would be extended to all the eligible assignees in lieu of payment of exgratia.
- All the landless poor persons who purchased assigned lands without authorization were treated as encroachers and were extended with 500 sq. yd. residential, 50 sq. yd. commercial for dry lands and 500 sq. yd. residential, 100 sq. yd. commercial for *Jareebu*/semi-urban in lieu of ex-gratia and no annual payment was made as it is a violation under Act 9/77. However, this was latter rescinded through Govt orders and further orders from the Government on the subject are awaited.

- All the landless poor persons who purchased/ occupied un-objectionable Govt. lands without authorization will be treated as encroachers and would be extended with 500 sq. yd. residential, 50 sq. yd. commercial for dry lands and 500 sq. yd. residential, 100 sq. yd. commercial for *Jareebu*/semi-urban in lieu of exgratia along with annual payment.
- All the landless poor persons who purchased / occupied objectionable Govt. lands without authorization will be treated as encroachers and would be extended with 250 sq. yd. residential, 0 sq. yd. commercial for dry lands and 250 sq. yd. residential, 0 sq. yd. commercial for *Jareebu*/semi-urban in lieu of exgratia and no annual payment will be made as the lands are prohibited for assignment instead pensions will be provided to these people for 10 years.
- The annual payment of Rs. 30,000/-& Rs.50,000/- for "dry and Jareebu lands Respectively" is the minimum net agricultural loss estimated by the landowners during consultations. The average yield multiplied by minimum support price deducting the expenditure for predominate crops is arrived to fix annuity Payment. This is now extended from existing 10 Years to another five years.
- One-time additional payment of Rs. 1.00 lakh is extended for gardens like lime, sapota / guava / amla and jasmine is the average estimated loss as expressed by the landowners during consultations.
- All the landless families residing as on December 8, 2014 are extended pension of Rs 2,500 /- per month for a period of Ten years as a measure of livelihood support during the estimated interregnum period converting from agriculture labour to non-agriculture labour along with necessary skill development trainings. This is now extended to another five years along with enhancement upto Rs.5000/- per month.
- Onetime agricultural loan waiver of Rs. 150,000/-, loans for self-employment, free education /free medical facilities, old age homes subsidized canteens, wage employment under MGNREGA, skill development trainings are part of resettlement.
- All Project displaced families include families residing in the houses and also includes affected families without homestead land residing in the Program area would be rehabilitated in the resettlement colony.
- As all the landless families residing in the Program area are treated as Project affected families, all the artisans / small traders/ tenants / irrespective of legal status / agricultural labour / labour / destitute viz., old age / widows / women divorcee / women deserted by families are treated as affected families.
- It is estimated that the value of the developed residential / commercial plots with Capital City infrastructure along with other social benefits under Land Pooling Scheme are estimated more valuable than the compensation / R&R entitlements under LA R&R Act, 2013.

4.5 List of Relevant LPS GOs: The Government Orders for the land pooling scheme is presented in the Table below and can be accessed online at www.aponline.gov.in

Sl.No	G.O.No.	Subject	Issued by Department	Date of issue of G.O.
1	G.O.Ms.No.1	Municipal Administration & Urban Development Department – The Andhra Pradesh Capital City Land Pooling Scheme (Formulation and Implementation) Rules, 2015 - Notification – Issued.	Municipal Administration & Urban Development (M2) Department	01.01.2015
2	G.O.Ms.No. 43	Municipal Administration & Urban Development Department – The Andhra Pradesh Capital City Land Pooling Scheme (Formulation and Implementation) Rules, 2015 - Amendments – Issued.	Municipal Administration & Urban Development (M2) Department	09.03.2015
3	G.O.Ms.No.59	Municipal Administration & Urban Development Department – The Andhra Pradesh Capital City Land Pooling Scheme (Formulation and Implementation) Rules, 2015 - Amendment – Issued.	Municipal Administration & Urban Development (M2) Department	20-03-2015
4	G.O.Ms.No.61	Municipal Administration & Urban Development Department – The Andhra Pradesh Capital City Land Pooling Scheme (Formulation and Implementation) Rules, 2015 - Amendment – Issued.	Municipal Administration & Urban Development (M2) Department	24-03-2015
5	G.O.Rt.No.72	MA& UD Department – Capital City Development & Management Corporation – Appointment of Chairman & Managing Director and certain Board of Directors- Modification - Orders –Issued	Municipal Administration & Urban Development (CRDA2) Department	19-02-2016
6	G.O.Ms.No.79	Municipal Administration & Urban Development Department – The Andhra Pradesh Capital City Land Pooling Scheme (Formulation and Implementation) Rules, 2015 - Amendment – Issued.	Municipal Administration & Urban Development (M2) Department	15-04-2015
7	G.O.Ms.No.176	Municipal Administration & Urban Development	Municipal Administration	31-07-2015

Sl.No	G.O.No.	Subject	Issued by Department	Date of issue of G.O.
		Department– Scheme for payment of pensions to eligible landless families in Capital City area through "Capital Region Social Security Fund" - Administrative sanction - Accorded – Orders - Issued.	& Urban Development (M2) Department	
8	G.O.Ms.No.493	Registration and Stamps Department- Indian Stamp Act, 1899-Reduction of Stamp Duty under section 9 of the Indian Stamp Act, 1899 payable on Development Agreement-Cum-Irrevocable Power of Attorney prescribed under Sub Rule (8) of Rule (8) of the A.P. Capital City Land Pooling Scheme (Formulation and Implementation) Rules, 2015 framed under Andhra Pradesh Capital Region Development Authority Act - 2014 - Notification – Orders - Issued.	Revenue (Registration. I) Department	31-12-2015
9	G.O.Ms.No.494	Registration & Stamps Department – Registration Act, 1908–Section 78–Table of Fees–Exemption of Registration Fee on instruments executed by or on behalf of or in favor of the Authority under the Andhra Pradesh Capital Region Development Authority Act, 2014 (Act 11 of 2014)-Amendment – Orders – Issued.	Revenue (Registration. I) Department	31-12-2015
10	G.O.Ms.No.30	MA&UD – APCRDA– Payment of pension to eligible landless families in Capital City Area through "Capital Region Social Security Fund" - Operational Guidelines – Orders - Issued.	Municipal Administration & Urban Development (CRDA2) Department	10-02-2016
11	G.O.Ms.No.41	RULES — The Andhra Pradesh Capital City Land Pooling Scheme (Formulation and Implementation) Rules, 2015 - Amendment — Notification - Issued.	Municipal Administration & Urban Development (CRDA.2) Department	17-02-2016

Sl.No	G.O.No.	Subject	Issued by Department	Date of issue of G.O.
12	G.O.Ms.No.125	MA&UD – APCRDA - Amaravati Capital City - Land Pooling Scheme – Welfare of the Farmers and other Landless Poor- Free education to the Children of the all the residents residing as on 08.12.2014 - Implementation of Free Education – Orders –Issued.	Municipal Administration & Urban Development (CRDA.2) Department	16-05-2016
13	G.O.Ms.No.52	Health, Medical and Family Welfare – Free Medical Facilities to the residents of the Amaravati Capital City who are residing as on December 8, 2014 – Implementation of free health facilities – Orders - Issued.	Municipal Administration & Urban Development (CRDA.2) Department	12-05-2016
14	G.O.Ms.No.165	RULES – The Andhra Pradesh Capital City Land Pooling Scheme (Formulation and Implementation) Rules, 2015 - Amendment – Notification - Issued.	Municipal Administration & Urban Development (CRDA.2) Department	25-06-2016
15	G.O.Ms.No.207	Rules – AP Capital City Land Pooling Scheme (Formation & Implementation) Rules, 2015 – Notification – Issued.	Municipal Administration & Urban Development (CRDA.2) Department	08-08-2016
16	G.O.Ms.No.153, Department, dt. 19-04-2017	Negotiated Settlement Policy	G.O.Ms.No.153, MA & UD (CRDA-II) Department.	19-04-2017
17	G.O.Ms.No 226	Land Pooing Scheme (Formulation & Implementation) Rules 2015-Amendment-Notification	MA & UD	15-06-2017
18	G.O.Ms.No 227	Land Pooing Scheme (Formulation & Implementation) Rules 2015-Allotment of returnable plots-Amendment - Notification	MA & UD	15-06-2017
19	G.O.Ms.No 228	Amaravati Land Allotment Rules, 2017 – Notification – Orders	MA&UD	15-06-2017

Sl.No	G.O.No.	Subject	Issued by Department	Date of issue of G.O.
20	G.O.Ms.No 362	The Government Shall provide pension of Rs.2500/- per month per family for a period of 10 Years	MA&UD	14-11-2018
21	G.O.Ms.No 420	Negotiated Settlement Policy	Municipal Administration & Urban Development (CRDA2) Department	31-12-2018

Annexure 3 – Entitlement Matrix – Negotiated Settlement Policy

Background

1. While executing the construction of Capital City Development Program, it is found that certain priority roads are coming in the area exempted under Land Pooling Scheme as per Rule 5(4) read with Schedule III (ii), while demarcating the village sites / extended habitations. As the Land Pooling Scheme is not applicable in the exempted area and as the process of Land Acquisition under LA R&R Act, 2013 is time consuming, it is proposed to acquire the area required as per Master Plan / development plan within the village planning zone (R1 Zone) and also certain scattered houses within Land Pooling Scheme existing outside R1 Zone through Negotiated Settlement as per Section 124 of AP CRDA Act, 2014. In this regard, to expedite procurement of land in R1 Zone and to acquire Scattered houses outside R1 Zone a separate package under Negotiated Settlement Policy as per the APCRDA Authority Resolution No.92/2016 dt.07.12.2016 has been formulated and notified vide G.O.Ms.No.153, dt. 19-04-2017 and G.O.Ms.No. 420 dt.31-12-2018. This is a state government policy applicable across Capital City to ensure that the PAPs are compensated as per Negotiated Settlement and the procurement of land / structures is expedited.

2. The landowners willing to opt for negotiated settlement may file their claim before the negotiation committee. The word negotiation is used as per Section 124 of the AP CRDA Act, 2014 which says that the authority may acquire any movable or immovable property by purchase, exchange, gift, lease, mortgage, negotiated settlement or by any other means permissible under any law.

Entitlement Matrix

SL No	Property Type	Description	Proposed Compensation
1	Residential use in R1 Zone	House / Residential Plot Excluding Common area	(1) Double the Structure Value (2) Nearest Standard plot in RH Colony equal to plinth area of structure/house site with applicable zoning regulations for R1 zone
2	Non-Agriculture /other use in R1 Zone	As is land use i.e., baron, hayricks etc.,	(1) Double the Structure Value (2) Land to land for same land use
3	Commercial / Industrial use in R1 Zone or Scattered	Existing structures like shops or Commercial /	1) Double the Structure Value (2) Nearest standard plot as per Plot Allotment Policy in

SL No	Property Type	Description	Proposed Compensation
	commercial / Industrial Structures outside R1 Zone	Industrial Structures excluding common area	RH center equal to plinth area of structure, without any amalgamation of plots. The FSI shall be as per Zoning Regulations.
4	Scattered residential Houses in LPS area other than R1 Zone / Lanka Lands	Residential Houses that are constructed and the owner is living in the agricultural fields.	Two times of compensation of the structure value without deducting depreciation values. Allotment of residential entitled nearest standard plot subject to maximum of 500 square yards in RH Colony. The FSI shall be as per Zoning Regulations.

Other Benefits

a)	Housing Unit for Residential House.	One time construction grant as per GoAP norms or minimum Rs.1,50,000/
b)	Transportation cost for displaced family	Rs.72217/-(Rs.50000/ adjusted with inflation index*)
c)	Re-construction of cattle shed / petty shop	Rs.36108/-(Rs.25000/ adjusted with inflation index*)
d)	One-time grant for artisan/ small traders / certain others	Rs.36108/-(Rs.25000/ adjusted with inflation index*)
e)	Loss of Livelihood grant to Project affected families	Rs.5,000/- per month for a period of 10 years if not receiving CRDA pension under LPS
f)	One time resettlement allowance to all Project affected families	Rs.72217/-(Rs.50000/ adjusted with inflation index*)
g)	Subsistence grant to all Project displaced families	Rs.4333/ per month for a period of 12 months/-(Rs.3000/ adjusted with inflation index*)
Note: * adjusted with inflation index as on 1st December 2024.		

Annexure 4 – Entitlement Matrix: Land Acquisition

LARR Act 2013 and additional provisions

1. The LARR Act 2013 provides for a transparent process and fair compensation in land acquisition for public purpose and provides for rehabilitation and resettlement of landowners of those affected by land acquisition. This Act came into effect on January 01, 2014 and the earlier Land Acquisition Act, 1894 stands repealed. The LARR Act requires social impact assessments for Programs involving land acquisition. The Act provides compensation which is inclusive of market value of the land including all assets attached to land. Interest @ 12 per cent on market value of the land is payable from the date of first notification until passing of Compensation Award, to adjust the price to the date of compensation award. In addition, 100 per cent solatium is added to the final compensation amount. Basic rates of the lands are updated as per the provisions of Section 26 of LAR&R Act 2013. The revised government guideline rate or the average sale price, whichever is higher, is taken as the market value. Awards are to be passed duly adopting the updated values. During 2016-18, under LARR Act 2013, the CRDA has acquired 134.38 acres of land following the procedure prescribed under the Act.

2. LARR Process

a) Consultation with Grama Panchayat[15] to fix date, time for conduct of Grama Sabha[16] to explain intention of the Government and need for conduct of SIA.
b) Publication of SIA Notification in GP/Locality/News Papers / Gazette / Website
c) SIA Team Selection by Commissioner, R&R in consultation with District Collector.
d) EPTRI, Hyderabad, Gachibowli was selected by Commissioner, R&R as an Independent Agency for conduct of SIA
e) Draft SIA placed before Grama panchayat / Grama Sabha for conduct of Public Hearing for Social Impact Assessment.
f) Publication of Final SIA and Minutes of the Public Hearing in GP/Locality/ Website.
g) Expert Committee appointed by appropriate Government / District Collector
h) Publication of Expert Opinion / Recommendations in GP / Locality / Website.
i) Publication of Decision of appropriate Government / District Collector after examining SIA report, Minutes of the Public Hearing, Expert Opinion, LAO report, in G.P / Locality / Website
j) Notification by District Collector authorizing the Land Acquisition Officer for acquiring the lands.
k) Publication in G.P / Locality / News Papers / Gazette / Website.

[15] Rural local body
[16] Meeting at the village level

l) Conduct of Grama Sabha explaining the contents of the notification, provision for filing objections within 60 days duly fixing the hearing date and information to landowners regarding conduct of preliminary survey requesting them to be present in conduct of survey and informing the prohibitive clause imposed on alienation of lands covered by notification.
m) Notice calling for objections on the preliminary notification on the area and suitability of land proposed to be acquired, justification offered for public purpose, the findings of the Social Impact Assessment report.
n) 60 days for filing objections and on enquiry by Land Acquisition officer, District Collector to take decision.
o) Appointment of Joint Collector as Program Administrator.
p) Conduct Socio Economic Survey to identify the affected families having lands and immovable properties, identifying livelihood losers' dependent on the lands being acquired. Ex: Tenants, Agriculture labor etc.,
q) To enumerate the amenities and infra structural facilities which are affected are like to be affected due to acquisition and details of common property resources etc.
r) Preparation of draft R&R Scheme by the Program Administrator in consultation with the affected families and place it before Gram panchayat for conduct of Public Hearing.
s) The draft R&R Scheme and a specific report on the claims and objections raised in the public hearing to be place before Program level R&R Committee to be reviewed by the District Collector and shall be submitted to the Commissioner, R&R for approval of the Scheme duly incorporation the suggestions and views of the Program level R&R Committee.
t) The Commissioner, R&R shall approve the R&R Scheme and cause publication in GP / Locality and website.
u) The District Collector to make publication of declaration along with summary of R&R Scheme and declaration of an area identified as the resettlement area in cases of physical displacement of affected families
v) Publication in GP / Locality / Gazette / News Papers / Website
w) Award Enquiry notices to be issued, conduct enquiry into the ownership, apportionment and interests if any and into the R&R entitlements.
x) Draft Award of LA and R&R shall be approved by District Collector and Program Administrator.
y) LAO to pronounce LA R&R Award and shall pass individual LA Awards and individual Compensation Awards.
z) Compensation, R&R cash benefits shall be paid before taking lands and rehabilitation measures to be completed before physical displacement of PDF.

3. Dissatisfied with the Market Value fixed by Land Acquisition Officer, the Interested person may make an application for Negotiations before the Negotiation Committee and on merits the Committee and the same would be incorporated in the Consent Award u/s 23 A as per provisions of LARR Act 2013.

4. Dissatisfied with the Award made, any Awardee / interested party having claim on compensation /R&R Entitlement may approach LA R&R Authority and make a reference under section 64 of the LA R&R Act, 2013. The LA R&R Authority was constituted vide G.O.Ms.No.91, Revenue (Land Acquisition) Department, dt. 03-03-2017.

Entitlement Matrix: Compensation and R&R Assistance under Land Acquisition Act

Sl. No	Impact Category	Eligibility	Entitlement	Remarks
a)	Loss of land	*Patta*/ Temple Land/ Assigned/residential/commercial/industrial land in Rural and Urban areas	Higher of basic value or three-year average of 50 per cent higher value sale transactions -Add value of multiplier (1.0/1.25 times for urban and rural) -Add value of structures --Add Solatium 100 Per Cent -Add additional amount calculated @ 12 per cent per annum on Market Value	Basic values of land are updated prior to passing the award.
b)	Loss of Trees / Topes	Affected area	Estimated value as per Horticulture / Forest Department plus 100 per cent solatium.	
c)	Resident House owner irrespective of legal status	Physical displacement in Rural area	Constructed house not less than IAY specifications or equivalent cost if opted by displaced family.	Prevailing Unit values as per AP Housing Department Transportation cost of Rs.50, 000/- for DPs. Subsistence grant 12 months × INR 3,000/- One-time Resettlement grant of INR 50,000.
		Physical displacement in Urban area	House with not less than 50 Sq. m. in plinth area or not less than INR 1.50 Lakhs if opted by displaced family.	
	Affected family without homestead land residing in the area as on the date of census survey.		Constructed house with not less than IAY specifications	Prevailing Unit values as per AP Housing Department

Sl. No	Impact Category	Eligibility	Entitlement	Remarks
d)	Cattle shed / Petty shop	Shifting from affected area to rehabilitation center	reconstruction grant	INR 25,000/-
e)	Artisan / Small trader / Self employed	Non-Agriculture/ commercial / industrial / institutional structure in affected area.	Financial assistance.	INR 25,000/-
f)	All Affected families with legal title	Loss of livelihood	One-time resettlement grant / Annual payment	INR 500,000 or 2,000 X 12 M X 20 Y
g)	Crop	Crop Cut down during survey	Damages	Gross income calculated on average yield multiplied by minimum support price. Net crop loss shall be 50 per cent of the gross income.
		Standing Crop	Standing crop allowed. Damages if required.	
h)	Unidentified impacts			R&R assistance as per the principles of this RPF

Note : Inflation indexation for benefits under LARR Act is under consideration of GoAP.

GOVERNMENT OF ANDHRA PRADESH
ABSTRACT

Municipal Administration & Urban Development Department – APCRDA – Establishment of Environmental and Social Management Unit (ESMU) in Andhra Pradesh Capital Region Development Authority for managing the Environment and Social aspects of the program funded by the World Bank and Asian Development Bank for the Development of Amaravati Capital City – Orders – Issued.

MUNICIPAL ADMINISTRATION & URBAN DEVELOPMENT (CRDA.2) DEPARTMENT

G.O.MS.No. 112 **Dated: 29-10-2024**

Read :-

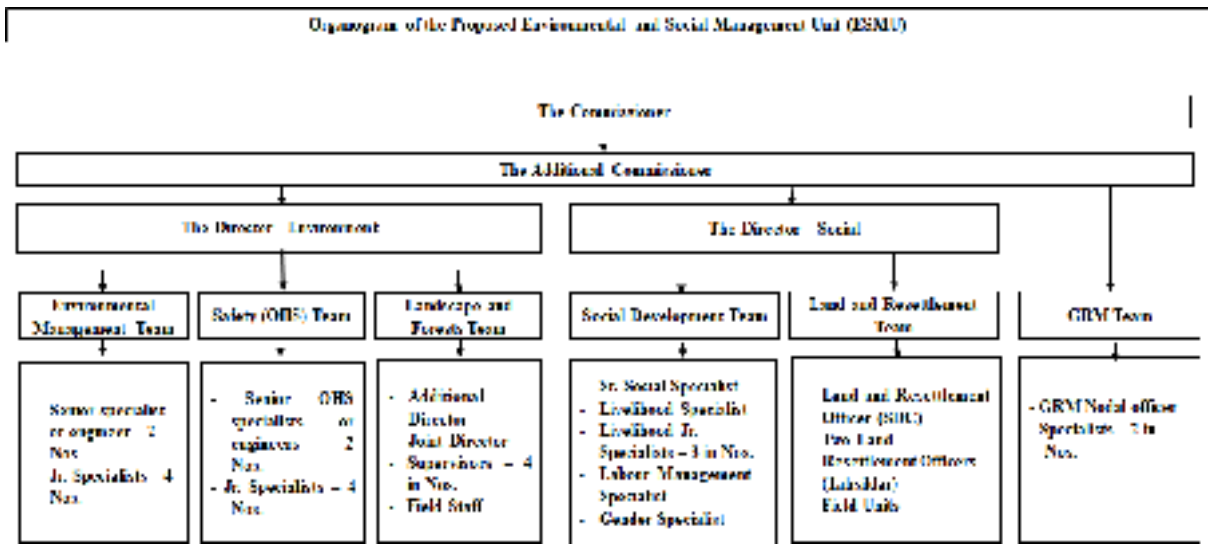
From the Commissioner, APCRDA, Rc.No. MAU61-OPES0SERV (ESTL)/43/2024-OM, dt.21.10.2024.

***

ORDER:

In the reference read above, the Commissioner, Andhra Pradesh Capital Region Development Authority has informed that the Andhra Pradesh Capital Region Development Authority has submitted a Project Proposal through PPR ID T-12403 – "The Amaravati Inclusive and Sustainable Capital City Development Program" to the Department of Economic Affairs, seeking financial assistance of INR 15,000 crore (USD 1.786 billion).

2. The Commissioner, APCRDA has informed that the proposed developmental activities will have environmental and social impacts, requiring thorough screening, evaluation, and mitigation through an Environmental and Social Management Plan. Statutory clearances and permissions must be obtained from various Central, State, and local agencies, with compliance monitored and reported periodically. These clearances are essential for initiating developmental activities. Given the scale of development and MDB safeguard requirements, there is a need for a dedicated Environment and Social Management Unit (ESMU) to oversee compliance, conduct studies, and monitor safeguards. The ESMU will guide departments in implementing environmental and social safeguards for MDB-funded projects. He has informed that the structure of the proposed ESMU will be as below :-



3. The Commissioner, Andhra Pradesh Capital Region Development Authority has further informed that the matter was placed in the 38th APCRDA Authority Meeting, wherein it was resolved to establish the Environmental and Social Management Unit (ESMU) and meet all its expenditure from the APCRDA Authority funds and the Commissioner, APCRDA was authorized to carry out all the necessary acts and deeds for implementing the decision of the Authority.

4. The Commissioner, APCRDA has therefore requested the Government for issue of necessary orders for constitution of the Environmental and Social Management Unit (ESMU) in APCRDA for managing the Environment and Social aspects of the program funded by the World Bank and Asian Development Bank for the Development of Amaravati Capital City.

5. After careful examination, Government hereby accord permission to the Commissioner, APCRDA, to take all necessary steps and actions to establish the Environmental and Social Management Unit in Andhra Pradesh Capital Region Development Authority for managing the Environment and Social aspects of the program funded by World Bank and Asian Development Bank for the Development of Amaravati Capital City.

6. The Commissioner, APCRDA, Vijayawada shall take necessary action in the above matter, accordingly.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA RADESH)

G ANANTHA RAMU
SPECIAL CHIEF SECRETARY TO GOVERNMENT (I/c)

To
The Commissioner, Andhra Pradesh Capital Region Development Authority, Vijayawada.

Copy to:-
P.S to Hon'ble Minister for MA&UD Department.
P.S to Chief Secretary to Government of Andhra Pradesh.
P.S to Special Chief Secretary to Government, MA&UD Dept.,
Sf/Sc.

//FORWARDED :: BY ORDER//

SECTION OFFICER

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
1		**Roads**		
2	210627.90	Earthwork excavation in all types of Soil including marshy soil by mechanical means including trimming bottom and side slopes in accordance with requirements of lines , grades and cross sections etc and disposal with all lifts and lead upto 1 KM complete for finished item of work for trench cutting in all types of soil including marshy soil as per MoRTH specification 301 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge for ROAD works.	Earth Work	2,87,35,964.40
3	155186.80	Forming embankment with borrowed selected earth from approved quarries outside road boundary including conveyance, with all lead and lifts including pre-watering of soil at borrow area, removal of top soil, excavation of soils at borrowed area, conveyance of soil, depositing the soil on the embankment, spreading soil, breaking clods, sectioning, grading and consolidation with 8 to 10 Tonnes Vibratory Road Roller in layers @ OMC to meet requirement of table 300-1 and 300-2 of MoRTH or as per latest revisions and specifications , including all hire and operational charges of T&P charges, complete for finished item of work, satisfying the Free Swell Index value less than 50%, soaked CBR value not less than 6% and other reqirements, confirming to MoRTH specification 305 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	Embankment	22,18,64,360.49
4	78326.00	Providing & laying Sand bedding ,filling as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand filling	2,67,65,560.72
5	214500.40	Forming Subgrade with borrowed selected earth from approved quarries outside road boundary including conveyance, with all lead and lifts, including pre-watering of soil at borrow area, removal of top soil, excavation of soils at borrowed area, conveyance of soil, depositing the soil on the embankment, spreading soil, breaking clods, sectioning, grading and consolidation with 8 to 10 Tonnes Vibratory Road Roller in layers @ OMC to meet requirement of table 300-1 and 300-2 of MoRTH or as per latest revisions and specifications , including all hire and operational charges of T&P charges, complete for finished item of work, satisfying the Free Swell Index value less than 50%, soaked CBR value not less than 8% and other reqirements, confirming to MoRTH specification 305 (5th Revision) or as per latest revisions & specifications and as directed by the Engineer in Charge.	Sub Grade	34,17,63,487.32
6	4911.00	Filling in median and Island above road level with approved material brought from borrow pits including conveyance, with all lead and lifts, spread, sloped and compacted, conforming to MoRTH specification 408 or as per latest revisions and specifications and as directed by engineer-in-charge	Median filling	1,09,49,762.04
7	81145.80	Construction of Granular sub-base by providing HBG material confirming to Grading - VI of MoRTH Table 400-1 & 400-2 or as per latest revisions and specifications, including cost and conveyance of all materials to work site and spreading in uniform layers with motor grader or by approved means, on prepared surface mixing by mix in place method using Rotavator / approved means at OMC and compacting with vibratory roller to achieve the desired density (98% of maximum dry density) etc., complete for finished item of work, confirming to MoRTH Specification 401 (5th revision) or as per latest revisions and specifications and as directed by the Engineer-in-charge.	SUB-BASE AND BASE COURSES	17,21,57,306.36
8	55742.60	Providing, Laying, Spreading and compacting graded HBG crushed stone aggregate to Wet Mix macadem specification including cost of all materials and including premixing the material with water at OMC in Mechanical mix plant carriage of mixed material by tipper to site, laying in uniform layers with paver in base courses on well prepared surface and compacting with Vibratory roller to acheive the desired density (98% of maximum dry density) etc., as directed by the Engineer-in-Charge and as per MoRT&H specification 406 (5th revision) for finished item of work with Plant Mix Method and Laying using mechanical paver.	SUB-BASE AND BASE COURSES	16,12,22,649.70
9	240263.00	Providing and applying prime coat with bitumen emulsion (SS-1) on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.85 kg/sqm using mechanical means for finished item of work, conforming to MoRTH Specification 502 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Flexible Pavements	1,85,98,758.83
10	240263.00	Providing and applying tack coat with bitumen Emulsion (Rapid settting) (Bulk) using Emulsion pressure distributor at the rate of 0.275 kgs per sqm on the prepared granular surface, treated with primer, cleaned with mechanical broom for finished item of work, conforming to MoRTH Specification 503 (5th revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Flexible Pavements	39,71,547.39
11	101329.00	Providing and applying tack coat (over Bituminous) with bitumen emulsion (Rapid settting) (Bulk) using emulsion pressure distributor at the rate of 0.25 kgs per sqm on the prepared bituminous surface, cleaned with mechanical broom for finished item of work as per MoRT&H Specification 503 (5th revision) and as directed by the Engineer-in-Charge.	Flexible Pavements	15,53,373.57

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
12	5066.00	Providing and laying of Dense Graded Bituminous Macadam with with 100-120 TPH Batch type HMP producing an average output of 75 Tonne per hour using crushed aggregates of Grading - II as per table 500-10 of MoRT&H Specification 505 (5th revision) premixed with bitumen binder VG 30 grade @ 4.50% of weight of total mixture, transported to site, laid over a previously prepared surface with mechanical paver finisher to the required grade, level and alignment and rolled as per Clauses 501.6 and 501.7 to achieve the desired compaction for finished item of work as directed by the Engineer-in-Charge including hire and operational charges all T&P and all other contingent charges necessary including cost of charges of all materials etc., complete and as per MoRT&H specification No. 505 (5th revision)	Flexible Pavements	4,87,02,700.24
13	3040.00	Providing and Laying Bituminous Concrete with 100-120 TPH Batchtype hot mix plant producing average output of 75 Tonne per Hour using HBG crushed aggregates of Grading-II as per table 500-17 of specification 507 of MoRT&H (5th Revision), premixed with VG 30 @ 5.4 % of mix and filler, transporting the hot mix to work site, laying with mechanical paver finisher to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRT&H Specification 507 (5th Revision) complete for finished item of work in all respects as directed by Engineer-in-Charge	Flexible Pavements	3,27,26,451.20
14	138935.00	Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm aggregates conforming to table 500-19 of MoRTH, using VG-30@22kg/10Sqm grade bitumen and colour pigment to the required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a Smooth wheeled roller 8-10 tonne capacity, and finishing to required level and grade as per MoRTH Specification 508 (5th Revision) or as per latest revisions and specifications complete for finished item of work in all respects and as directed by Engineer-in-Charge	Flexible Pavements	2,68,39,463.30
15	34724.00	Construction of un-reinforced, dowel jointed, pavement quality concrete of M40 grade over a prepared sub base with Cement of 400 kg per cum, coarse and fine aggregate conforming to IS 383, and gradation conforming to table 600-3 of MoRTH, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a electronic sensor slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing and Technical Specification 602 MORTH or as per latest revisions and specifications clauses and as directed by the Engineer-in-charge.	Rigid Pavements	20,28,97,540.60
16	77919.00	Supply, laying and fixing of precast concrete blocks with M-40 grade and thickness not less than 80 mm for paving in Medium traffic areas conforming to IS 15658 or as per latest revisions and specifications in all shapes and designs including all labour charges for laying & fixing of precast concrete blocks for paving of all grades, any thickness, all sizes & shapes for loading & unloading, laying to desired lines and levels complete etc., as directed by the Engineer-in-charge.	Rigid Pavements	7,21,97,407.83
17	2819.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means **upto 3m depth for foundations of structures (Bridges)** as per drawing and technical specification including dewatering, setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the excavated earth to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRTH specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	BRIDGES-Earth Work	4,33,364.87
18	1583.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means **from 3m to 6m depth for foundations of structures (Bridges)** as per drawing and technical specification including dewatering, setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the excavated earth to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRTH specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	BRIDGES-Earth Work	2,78,117.27
19	56.00	Providing and constructing filter media behind abutments, wing walls, retaining walls and return walls complete as per drawings and technical specifications clause 305 and 2504 (5th Revision of Morth specification and as per latest revision and specifications of IRC & MoRTH including cost of materials, transportation and other incidental charges and as directed by Engineer-in-charges.	BRIDGES	1,36,749.76
20	261.00	Providing and constructing Back Fill behind abutments, wing walls, retaining walls and return walls with selected granular material of approved quality complete as per drawings and conforming to technical specification as per relevant IRC codes and MoRTH or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	BRIDGES	4,99,525.29

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
21	141.00	Vibrated cement concrete of M 15 Grade with Cement content of 275 kg/Cum and using 40 MSA HBG crushed stone aggregate conforming to table 1000-1 and fine aggregate conforming to table 1000-2 including cost and conveyance of all materials to site and all labour charges, centering, machine mixing, laying in position, proper Compaction and Vibration and curing including all other incidental and operational charges etc complete for finished item of work as per MoRTH Specification (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge for the Base course in foundation	VCC M15 Grade	9,17,902.95
22	2037.00	Bored cast-in-situ piles of M-35 grade concrete, 1200mm dia, excluding reinforcement complete as per drawing, technical specification section 1100, 1600 & 1700 (5th Revision) and removal of excavated earth with all leads and lifts and as directed by the Engineer in Charge.Minimum quantity of 420 kg cement to be used per cum of concrete.	Bored cast-in-situ M-35 grade RCC piles	2,98,90,754.67
23	1336.00	Supply and placing of Reinforced cement Concrete of M35 grade using approved design Mix corresponding to relevant IS codes with cement content of 422 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20 MSA conforming to MoRT&H 5th edition and as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating, curing, centering, shuttering including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer - in-Charge for Pile caps.	Design Mix RCC M35 Grade	85,73,873.52
24	73.00	Providing and fabrication of MS liners for piles including fabrication and setting out complete as per drawing, conforming to relavent MoRTH specification includig cost and conveyance of all materials, labour charges and all other incidental charges etc., complete and as directed by the Engineer in Charge	MS liners for piles	86,17,647.08
25	41.00	Supplying and Placing of Vibrated reinforced cement concrete M 30 grade using 20mm & 10mm HBG crushed stone aggregate (Coarse aggregate conforming to table 1000-1 and fine aggregate conforming to table 1000-2) including cost, conveyance of all materials to site and labour charges, centering, machine mixing, laying, vibrating, curing etc., including other incidental hire and operational charges of all T&P etc., complete as per approved drawings and as directed during execution but excluding cost of steel and its fabrication charges for finished item as per MoRT&H specification 1500,1600,1700 & 2100 (5th revision) and as directed by the Engineer-in-Charge for Foundation. Minimum quantity of 407 kg cement to be used per cum of concrete.	Design Mix RCC M30 Grade	2,58,946.57
26	226.00	Supply and placing of Vibrated reinforced cement concrete M 35 grade using 20mm & 10mm HBG crushed stone aggregate (Coarse aggregate conforming to table 1000-1 and fine aggregate conforming to table 1000-2) including cost, conveyance of all materials to site and labour charges, centering, machine mixing, laying, vibrating, curing etc., including other incidental hire and operational charges of all T&P etc., complete as per approved drawings and as directed during execution but excluding cost of steel and its fabrication charges for finished item as per MoRT&H specification 1500,1600,1700 & 2200 (5th revision) and as directed by the Engineer-in-Charge for Substructure. Minimum quantity of 422 kg cement to be used per cum of concrete.	Design Mix RCC M35 Grade	15,38,942.48
27	645.00	Supply and placing of Vibrated reinforced cement concrete M 35 - Super structure: Vibrated reinforced cement concrete / Prestressed Cement Concrete using 20mm & 10mm HBG crushed stone aggregate (Coarse aggregate conforming to table 1000-1 and fine aggregate conforming to table 1000-2) including cost, conveyance of all materials to site and labour charges, centering, machine mixing, laying, vibrating, curing etc., including other incidental hire and operational charges of all T&P etc., complete as per approved drawings and as directed during execution but excluding cost of steel and its fabrication charges for finished item as per MoRT&H specification 1500,1600,1700,1800 & 2300 (5th revision) and as directed by the Engineer-in-Charge for Super structure.Minimum quantity of 422 kg cement to be used per cum of concrete for RCC M35.	Design Mix RCC M35 Grade	51,12,611.85
28	828.00	RCC M40 Super Structure: Vibrated reinforced cement concrete / Prestressed Cement Concrete using 20mm & 10mm HBG crushed stone aggregate (Coarse aggregate conforming to table 1000-1 and fine aggregate conforming to table 1000-2) including cost, conveyance of all materials to site and labour charges, centering, machine mixing, laying, vibrating, curing etc., including other incidental hire and operational charges of all T&P etc., complete as per approved drawings and as directed during execution but excluding cost of steel and its fabrication charges for finished item as per MoRT&H specification 1500,1600,1700,1800 & 2300 (5th revision) and as directed by the Engineer-in-Charge for Super structure.Minimum quantity of 430 kg cement to be used per cum of concrete for RCC M40.	Design Mix RCC M40 Grade	66,27,262.32
29	808.00	Providing Constructing, Transporting and placing in position of precast Post Tensioned Concrete "I" girders using M50 grade as per drawing and technical specifications.Minimum quantity of 490 kg cement to be used per cum of concrete.	Design Mix RCC M50 Grade	1,32,00,271.76

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
30	40.30	Supply and placing of Vibrated cement concrete M 15 Grade Concrete under approach slabs using 40mm , 20mm and 10mm size HBG/HBT crushed stone aggregate (Coarse aggregate conforming to table 1000-1 and fine aggregate conforming to table 1000-2) including cost and conveyance of all materials to site and all labour charges for machine mixing, laying in position, Compacting , Vibrating and curing including all other incidental and all other operational charges of T&P required etc., complete as per MoRT&H Specification 1500,1700, 2100 & 2704 (5th Revision) for leveling course.Minimum quantity of 275 kg cement to be used per cum of concrete.	VCC M15 Grade	2,62,350.99
31	84.00	Supply and placing of Vibrated reinforced cement concrete M 30 grade for Approach slab using 20mm & 10mm HBG crushed stone aggregate (Coarse aggregate conforming to table 1000-1 and fine aggregate conforming to table 1000-2) including cost, conveyance of all materials to site and labour charges, centering, machine mixing, laying, vibrating, curing etc., including all other incidental and operational charges of all T&P etc., complete for finished item of work as per Approved drawing including cost of steel and its fabrication charges as per MoRT&H specification 1500, 1600,1700, & 2704 (5th Revision) and as directed by the Engineer-in-Charge.Minimum quantity of 407 kg cement to be used per cum of concrete.	Design Mix RCC M30 Grade	9,23,350.68
32	2150.00	Providing and laying 65mm thick wearing course comprising of 40mm asphalt concrete over 25 mm thick mastic asphalt including cost of prime coat, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, all complete as per Drawings, Technical Specifications clause 507, 516 & sub clause 2702 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge	Wearing Course	29,61,238.00
33	378.00	Construction of RCC railing of M30 Grade in-situ with 20 mm nominal size aggregate, as per MoRTH Standard drawing no SD/202, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications clause 1500, 1600, 1700 & sub clause 2703 MoRT&H (5th Revision) and as directed by the Engineer in Charge.	RCC Railing with M30 grade cast-in-situ	8,44,123.14
34	615.00	Providing Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-40 grade concrete with cement content of 430 Kg/cum including HYSD bars of Fe-500 D grade reinforcement and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MORTH circular No. RW/NH - 33022/1/94-DO III dated 24 June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified as per MORTH Section 2200 & clause 2703 (5th Revision) or as per latest revisions and specifications.	Reinforced cement concrete crash barrier	26,28,454.65
35	180.00	Providing and laying of a strip seal expansion joint catering to maximum horizontal movement in excess of 80 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation and conforming to MoRTH Specifications No. 2600 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	strip seal expansion joint	10,80,000.00
36	58.00	Providing and fixing galvanized Drainage Spouts along with drain pipes of diameter not less than 100mm and the spacing of drainage spouts shall not exceed 10m, the drainge spouts shall be connected with sutiable located runners and down pipes to discharge the surface runoff into drains provided in the ground level complete as per drawing and conforming to MoRTH Specifications No. 2705 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	galvanized Drainage Spouts	1,38,239.52
37	36.00	Providing and fixing **Spherical Bearings** complete as per Drawings, Technical Specifications Section 2000 (5th Revision) and as directed by the Engineer in Charge	Spherical Bearings	30,20,158.80
38	24.00	Providing and fixing **Tar paper Bearings** complete as per Drawings, Technical Specifications Section 2000 (5th Revision) and as directed by the Engineer in Charge	Tar paper Bearings	1,936.80
39	407300.00	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars Fe - 500D grade as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications No. 1600 & 2100 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge -For Foundation	HYSD FE500 Steel	3,75,81,571.00

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
40	26400.00	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars Fe - 500D grade as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications No. 1600 & 2200 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge -For Sub Structure	HYSD FE500 Steel	24,47,544.00
41	273700.00	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars Fe - 500D grade as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications No. 1600 & 2300 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge -For Super Structure	HYSD FE500 Steel	2,61,84,879.00
42	33.90	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting all complete as per drawings, conforming to MoRTH Specifications No. 1800 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge	High tensile steel wires/strands	48,16,350.98
43	42.00	Providing weep holes in Brick masonry/Plain/ Reinforced concrete abutment, wing wall/ return wall with 100 mm dia pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face Complete as per drawing and conforming to MoRTH Specification No. 2706 & 2200 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge	Weep Holes	11,579.40
44	4.00	Providing and painting with Synthetic enamel paints of approved quality on bridges with Bridge No. and Span arrangements as per IRC-7,1971 complete as per drawing, Technical Specifications Section and as directed by the Engineer in Charge	painting with Synthetic enamel paints	161.44
45	1321.00	Providing and Applying enamel paints of approved quality on surface of parapets as per Drawings, Technical specification clause 803 (5th Revision) and as directed by the Engineer in Charge	enamel paints of approved quality on surface of parapets	2,01,888.43
46	378.00	Providing and laying HDPE pipe (160 mm dia) grade PE100 (10Kg/SqCm) Confirming to IS 4984-1995 including transportation to site, unloading, stacking and cost of labour, all incidental charges etc.,, complete for finished item of work as per approved drawings and as directed by engineer in charge	laying HDPE pipe (160 mm dia)	2,80,544.04
47	20.00	Providing and painting of flood gauge on sub-structure to full height and 500 mm width as per the drawings, Technical specification clause 803 (5th Revision) and as directed by the Engineer in Charge	flood gauge	4,043.40
48	89768.00	Construction of cement concrete kerb (A Type Section) with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade on M-15 grade foundation 150 mm thick, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 409	M 20 kerb "A" Type Section	2,23,91,729.92
49	225890.00	Construction of cement concrete kerb(Mountable Type) with top and bottom width 50 and 250 mm respectively, 200 mm high in M 20 grade on M-15 grade foundation 150 mm thick, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 409	M 20 Kerb - Mountable type	5,04,32,201.40
50	115215.00	Providing and Laying kerb "A" Type Section painting with Synthetic enamel paint 1st quality (IS:164) complete as per drawing, Technical Specifications Clause 803 (5th Revision) and as directed by the Engineer in Charge	kerb "A" Type Section painting	1,51,32,338.10

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
51	15618.00	Supplying of hot applied thermoplastic road marking compound, 2.50mm thick including reflectorising glass beads @ 250gms with Reflectorising Glass beads on Bituminous surface at 250gms per Sqm area, thickness of 2.50mm is exclussive of surface applied glass bead as per IRC 35 the material should be of BERGER Compny/ BERGER Equavalent and must comply with the following a) White index for the product should be in the range of 60-70 when measured against standard reference. The applied panel 7/8 number must be submittede for checking up the white index box of any vendor the department engineer may carryout random checking of the appplied products at site against the approved panel. In case of any major deviation, beyond acceptance limit, department reserve the right to cancel or reject the total supplied consignment of the said material and will compell the vendor has to replace the full consignment by the desired material as per approved panel at his own cost and additional demurrages may be claimed due to loss of man days (as per the rules of the department), b) Luminance factor of the material should be in the range of 80-85% at 45 degrees centigrade as per AASTHOM 249. c) Crack resistance: The applied panel cured for 7 days under ambient condition and then should be tested as per BS3262 part-1, 1989 and should pass at the range of 0 degree centigrade to 10 degree centigrage. D) Adhesion : Strong E) Softening point 102 degree centigrade F) Dried film finish : Smooth and uniform G) Night Visison: High as directed by the Engineer-in-Charge and confirming to IS 164-1961 (1st revision reaffirmed in 1986) and clause conforming to IRC 35-2015. - **Lane / Center line / Edge marking / Transverse marking and any other marking**	Lane / Center line / Edge marking / Transverse marking and any other marking	87,46,080.00
52	673.00	Supplying of hot applied thermoplastic road marking compound, 2.50mm thick including reflectorising glass beads @ 250gms with Reflectorising Glass beads on Bituminous surface at 250gms per Sqm area, thickness of 2.50mm is exclussive of surface applied glass bead as per IRC 35 the material should be of BERGER Compny/ BERGER Equavalent and must comply with the following a) White index for the product should be in the range of 60-70 when measured against standard reference. The applied panel 7/8 number must be submittede for checking up the white index box of any vendor the department engineer may carryout random checking of the appplied products at site against the approved panel. In case of any major deviation, beyond acceptance limit, department reserve the right to cancel or reject the total supplied consignment of the said material and will compell the vendor has to replace the full consignment by the desired material as per approved panel at his own cost and additional demurrages may be claimed due to loss of man days (as per the rules of the department), b) Luminance factor of the material should be in the range of 80-85% at 45 degrees centigrade as per AASTHOM 249. c) Crack resistance: The applied panel cured for 7 days under ambient condition and then should be tested as per BS3262 part-1, 1989 and should pass at the range of 0 degree centigrade to 10 degree centigrage. D) Adhesion : Strong E) Softening point 102 degree centigrade F) Dried film finish : Smooth and uniform G) Night Visison: High as directed by the Engineer-in-Charge and confirming to IS 164-1961 (1st revision reaffirmed in 1986) and clause conforming to IRC 35-2015. - **Directional Arrows, Lettering etc. as per drawing No.61 of MORTH Type Designs for Intersections**	Directional Arrows, Lettering etc. as per drawing No.61 of MORTH Type Designs for Intersections	3,76,880.00
53	4725.00	Supplying of hot applied thermoplastic road marking compound, 2.50mm thick including reflectorising glass beads @ 250gms with Reflectorising Glass beads on Bituminous surface at 250gms per Sqm area, thickness of 2.50mm is exclussive of surface applied glass bead as per IRC 35 the material should be of BERGER Compny/ BERGER Equavalent and must comply with the following a) White index for the product should be in the range of 60-70 when measured against standard reference. The applied panel 7/8 number must be submittede for checking up the white index box of any vendor the department engineer may carryout random checking of the appplied products at site against the approved panel. In case of any major deviation, beyond acceptance limit, department reserve the right to cancel or reject the total supplied consignment of the said material and will compell the vendor has to replace the full consignment by the desired material as per approved panel at his own cost and additional demurrages may be claimed due to loss of man days (as per the rules of the department), b) Luminance factor of the material should be in the range of 80-85% at 45 degrees centigrade as per AASTHOM 249. c) Crack resistance: The applied panel cured for 7 days under ambient condition and then should be tested as per BS3262 part-1, 1989 and should pass at the range of 0 degree centigrade to 10 degree centigrage. D) Adhesion : Strong E) Softening point 102 degree centigrade F) Dried film finish : Smooth and uniform G) Night Visison: High as directed by the Engineer-in-Charge and confirming to IS 164-1961 (1st revision reaffirmed in 1986) and clause conforming to IRC 35-2015. - **Pedestrian Crossing at junctions and median openings**	Pedestrian Crossing at junctions and median openings	26,46,000.00
54	173.00	Providing and fixing Village name board size 450x750 mm made out of Type – IV of ASTMD 4956-09 High Intensity Prismatic Retro reflective sheeting and confirming to IRC 67:2012 for full background of Green Colour & White Letters and fixed over 3MM Alluminium Composite Material sheet having minimum 0.30 mm thick Aluminium skin on both sides with back side painted grey colour and fixed over back support frame of M.S angle 25x25x3mm all round and fixing with 35x35x4mm and mounted on a MS angle post of size 75x75x6mm with clear height of not less than 2.1 m from the ground level to the bottom of the board. The signpost should be painted with one coat of red oxide paint and 2 coats of synthetic enamel paint Black and White colour with bands of 30cm of height. The signpost shall be firmly fixed with MS base angle 35x35x4 mm in to the ground by M-15 Concrete foundation of size 450x450x600mm including cost and conveyance of all materials equipment, machinery and labour with all leads and lift, loading charges necessary for satisfactory completion of the work as directed by Engineer –in-Charge	fixing Village name board	9,45,099.00

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55	9.00	Providing & fixing junction boards of size 1500 x 1050 mm made out of Type – IV of ASTMD 4956-09 High Intensity Prismatic Retro reflective sheeting Prismatic Retro reflective sheeting and confirming to IRC 67:2012 for full background of Green Colour & White Letters and fixed over 4MM Alluminium Composite Material sheet having minimum 0.5 mm thick Aluminium skin on both sides with back side painted grey colour and fixed over back support frame of M.S angle 25x25x3mm all round and fixing with 35x35x4mm and mounted on a MS angle post of size 75x75x6mm with clear height of not less than 2.1 m from the ground level to the bottom of the board. The signpost should be painted with one coat of red oxide paint and 2 coats of synthetic enamel paint Black and White colour with bands of 30cm of height. The signpost shall be firmly fixed with MS base angle 35x35x4 mm in to the ground by M-15 Concrete foundation of size 450x450x600mm including cost and conveyance of all materials ,equipment, machinery and labour with all leads and lift, loading charges necessary for satisfactory completion of the work as directed by Engineer -in-Charge.	fixing junction boards	1,86,768.00
56	173.00	Providing & fixing route marker sign boards of size 450X600 mm made out of Type – IV of ASTMD 4956-09 High Intensity Prismatic Retro reflective sheeting Prismatic Retro reflective sheeting and confirming to IRC 67:2012 for full background of Green Colour & White Letters and fixed over 4MM Alluminium Composite Material sheet having minimum 0.5 mm thick Aluminium skin on both sides with back side painted grey colour and fixed over back support frame of M.S angle 25x25x3mm all round and fixing with 35x35x4mm and mounted on a MS angle post of size 75x75x6mm with clear height of not less than 2.1 m from the ground level to the bottom of the board. The signpost should be painted with one coat of red oxide paint and 2 coats of synthetic enamel paint Black and White colour with bands of 30cm of height. The signpost shall be firmly fixed with MS base angle 35x35x4 mm in to the ground by M-15 Concrete foundation of size 450x450x600mm including cost and conveyance of all materials ,equipment, machinery and labour with all leads and lift, loading charges necessary for satisfactory completion of the work as directed by Engineer -in-Charge.	Route marker signs (450mm x 600mm)	6,91,150.57
57	35.00	Providing and fixing Cautionary / Warning sign boards size 600 mm equilateral Triangle made out of Type – IV of ASTMD 4956-09 High Intensity Prismatic Retro reflective sheeting and confirming to IRC 67:2012 for full background of White colour and letters/logos done by screen printing in Black colour, boarders by screen printing in Red colour and fixed over 3MM Alluminium Composite Material (ACM) sheet having minimum 0.30 mm thick Aluminium skin on both sides with back side painted grey colour and fixed over back support frame of M.S angle 25x25x3mm all round and fixing with 35x35x4mm and mounted on a MS angle post of size 75x75x6mm with clear height of not less than 2.1 m from the ground level the bottom of the board. The signpost should be painted with one coat of red oxide paint and 2 coats of synthetic enamel paint Black and White colour with bands of 30cm of height. The signpost shall be firmly fixed with MS base angle 35x35x4 mm in to the ground by M15 Concrete foundation of size 450x450x600mm including cost and conveyance of all materials ,equipment, machinery and labour with all leads and lift, loading changes necessary for satisfactory completion of the work as directed by Engineer -in-Charge.	Cautionary / Warning sign boards size 600 mm	1,37,480.00
58	210.00	Providing and fixing Mandatory / Regulatory sign boards size 600 mm circle made out of Type – IVof ASTMD 4956-09 High Intensity Prismatic Retro reflective sheeting and confirming to IRC 67:2012 for full background of White colour and letters/logos done by screen printing in Black colour, boarders by screen printing in Red colour and fixed over 3MM Alluminium Composite Material sheet having minimum 0.30 mm thick Aluminium skin on both sides with back side painted grey colour and fixed over back support frame of M.S angle 25x25x3mm all round and fixing with 35x35x4mm and mounted on a MS angle post of size 75x75x6mm with clear height of not less than 2.1 m from the ground level to the bottom of the board. The signpost should be painted with one coat of red oxide paint and 2 coats of synthetic enamel paint Black and White colour with bands of 30cm of height. The signpost shall be firmly fixed with MS base angle 35x35x4 mm in to the ground by M-15 Concrete foundation of size 450x450x600mm including cost and conveyance of all materials ,equipment, machinery and labour with all leads and lift, loading charges necessary for satisfactory completion of the work as directed by Engineer -in-Charge.	Mandatory / Regulatory sign boards size 600 mm circle	10,23,330.00
59	521.00	Providing and fixing Mandatory / Regulatory sign boards size 600 Octagon sign board made out of Type – IVof ASTMD 4956-09 High Intensity Prismatic Retro reflective sheeting and confirming to IRC 67:2012 for full background of White colour and letters/logos done by screen printing in Black colour, boarders by screen printing in Red colour and fixed over 3MM Alluminium Composite Material sheet having minimum 0.30 mm thick Aluminium skin on both sides with back side painted grey colour and fixed over back support frame of M.S angle 25x25x3mm all round and fixing with 35x35x4mm and mounted on a MS angle post of size 75x75x6mm with clear height of not less than 2.1 m from the ground level to the bottom of the board. The signpost should be painted with one coat of red oxide paint and 2 coats of synthetic enamel paint Black and White colour with bands of 30cm of height. The signpost shall be firmly fixed with MS base angle 35x35x4 mm in to the ground by M-15 Concrete foundation of size 450x450x600mm including cost and conveyance of all materials ,equipment, machinery and labour with all leads and lift, loading charges necessary for satisfactory completion of the work as directed by Engineer -in-Charge.	Stop sign - Octagon of size 600 mm	19,94,492.20

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60	170.00	Providing and fixing Mandatory (Give-way) sign boards size 600 mm equilateral Triangle made out of Type – IV of ASTMD 4956-09 High Intensity Prismatic Retro reflective sheeting and confirming to IRC 67:2012 for full background of White colour and letters/logos done by screen printing in Black colour, boarders by screen printing in Red colour and fixed over 3MM Alluminium Composite Material (ACM) sheet having minimum 0.30 mm thick Aluminium skin on both sides with back side painted grey colour and fixed over back support frame of M.S angle 25x25x3mm all round and fixing with 35x35x4mm and mounted on a MS angle post of size 75x75x6mm with clear height of not less than 2.1 m from the ground level the bottom of the board. The signpost should be painted with one coat of red oxide paint and 2 coats of synthetic enamel paint Black and White colour with bands of 30cm of height. The signpost shall be firmly fixed with MS base angle 35x35x4 mm in to the ground by M15 Concrete foundation of size 450x450x600mm including cost and conveyance of all materials ,equipment, machinery and labour with all leads and lift, loading changes necessary for satisfactory completion of the work as directed by Engineer -in-Charge.	Mandatory (Give-way) sign boards size 600 mm	6,67,760.00
61	2084.00	Supplying and installation of delineators (Roadway indicators) not less than 800mm high above ground level. The delineator shall have a core and shell construction which shall be made of tough, high impact resistant, injection-molded, thermoplastic outer body. The inner core shall consist of powder coated or painted Mild steel of minimum thickness 1.0mm. The delineator should have top retro-reflective unit consisting of white color micro prismatic non metallic retro-reflective sheeting of minimum exposed area of 125 cm2 and bottom retro-reflective unit consisting of red color micro prismatic non metallic retro-reflective sheeting of minimum exposed area of 35 cm2 confirming to ASTM D4956 type XI standards. The delineators shall be fixed to the ground by inserting the root of the delineator up to the marked portion and by firm concrete filling as per the instructions by engineer in-charge.	delineators (Roadway indicators)	42,68,032.00
62	160.00	Providing and fixing Object markers 48.3mmdia.MS pipe ,keep at 50 cm above ground level with 3MM Alluminium Composite Material sheet having minimum 0.30 mm thick Aluminium skin fully covered with type IV of High intensity Retro reflective sheeting fixed in to trench of 30x30x30cm filled with CC M20 conforming to IRC-67:2012 & MORTH&H specification no 805 and approved drawing etc.,	Object markers 48.3mmdia.MS pipe	1,44,000.00
63	39102.00	Providing and fixing of Moulded Shanks Raised Pavement Markers made of Polycarbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lense face and shall support a load of 16000 kg tested in accordance to ASTM D 4280 TypeH and complying to specifications of Category A of MORTH circular No.RW/NH-33023/10/97 - DO III dt. 11-o6-1997. The height, width and length shall not exceed 50mm, 100mm and 100mm with minimum reflecting area of 13 sqcm on each side and the slope to the base shall be 35 +/- 5 degrees The strength of detachment of the integrated cylindrical shanks (of diameter not less than 19 +/- 2mm and height not less than 30 +/- 2mm) from the body is to be a minimum values of 700kgs. Fixing will be by drilling holes on the road for the twin shanks to go inside without nails and using epoxy resign based adhesive as per manufacturers recommendation and complete as directed bythe Engineer.	Moulded Shanks Raised Pavement Markers	1,31,38,272.00
64	7556.00	Providing, fixing and erecting pedastrian guard rail of 50 mm dia steel pipe railing in 3 rows duly painted on medium weight steel channels (ISMC series) 100 mm x 50 mm, 1.2 metres high above ground, 2 m centre to centre, complete as approved by engineer-in-charge	pedastrian guard rail of 50 mm dia	2,56,77,252.56
65	12836.00	Providing, planting and maintaining the Avenue plantation in 0.6m dia holes, 1M deep dug in the ground, mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench, watering, fixing the tree guard and maintaining the plants for one year as per drawing, IRC SP 21, with neerium/date palm tree/Tabe buia avellandae or equivalent and as approved by the Engineer in Charge	Avenue Plantation - Planting of Trees	3,52,86,805.80
66	98.00	Providing, planting of planters by road side and mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench, watering, fixing the tree guard and maintaining the plants for one year as per drawing, IRC SP 21, with Bigonia/muria exotica/bouganvillea or equivalent and as approved by the Engineer in Charge	Avenue Plantation - Planters	2,73,702.24
67	6912.00	Providing, planting flowering plants and shrubs in median verges and mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench, watering, fixing the tree guard and maintaining the plants for one year as per drawing, IRC SP 21 with allamanda dwarf/tecoma gaudichaudi or equivalent and as approved by the Engineer in Charge	Planting Flowering Plants and Shrubs	6,20,282.88
68	60237.00	Construction of footpath/separator by providing 150mm compacted grannualar sub-base as per cluase 401 of MORTH 25 mm thick cement concrete grade M15, over laid with pre-cast concrete tiles in cement mortar 1:3 including provision of all drainage arrangements but excluding kerb channel including cost and conveyance of all materials and labour and all other incidental charges etc.,	footpath/separator	5,84,71,453.53
69	12247.00	Sand filling in foundation trenches as per drawing including watering, tamping, etc., complete and technical specification Clause 305.3.9 MORD & 304 MORTH.	Sand Filling	41,85,044.84

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70	2578.00	Fabrication, Transportation and supply of hot-dip galvanized Octogonal Pole with BSEN - 10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, including the supply of suitable boards with bakelite sheet and MCB's as per IS specification suitable to withstand the wind speed of 180 KMPH for 9 Mtrs Mounting height Pole having dimensions Bottom 185 mm,. Top 70mm with 3mm thick,base plate 275 x 275 x 20mm and 4 Nos of M24 x 1000 long 'J' bolts along with templates. Including Supply of 1.5M Dragon type decorative galvanised double arm with PU Painted bracket. Makes : Bajaj / Valmont / TRANSRAIL	hot-dip galvanized Octogonal Pole	9,17,00,955.24
71	30.00	Supply, Transporation, installation, testing and commissioning of LED sleek street/post top with a system lumen output of 5000 lumens and a minimum system efficiancy of 110 lm/W. The luminaire shall have a rated system lifetime of 50,000 burning hours at L70. the luminaire should have a color temperature of 5700K and CRI>70. The luminare shall meet IP66 with THD<10% and PF>0.9, IK10 protection.The luminaire shall have closed diffused optics with polycarbonate diffuser board. the total power consumption should not exceed 45W (including driver) with aTubular GRP pole height of 4 mtr. similar to REYTEK MENSA SA 45W led 57K/phillips Make LED city BGP 300 LED 50 757 PSU PC IN S1 as per specification & directed by the departmental authorities. Makes:Wipro/Phillips/Reytek	LED decorative pole	13,95,000.00
72	2608.00	Foundation and erection charges with special T&P, for 9.00Mtrs / 10Mtrs long Octagonal / Conical pole duly erecting on base plate 290mm X 290mm X 16mm thick duly providing 4 Nos foundation bolts with nuts with providing of 0.60Mtr x 0.60Mtrs x 1.40 Mtr size M20 cc work vibrated concreting mixing with necessary steel (15kgs) reinforcement and curing for 7 days as directed by the field engineers during execution including excavation of Earth/BT all labour charges and cost and conveyance of materials etc., complete	erection charges for Octogonal Pole	2,32,33,498.40
73	2578.00	Supply and transportation & fixing of 45W LED Street light Luminaire made of pressure diecast aluminum body with powder coated, having protective toughened glass/polycarbonate diffuser, supply input voltage 120 - 270V AC, P.F > 0.90, high power LEDs having System Efficacy >=120 lumens/watt and junction temperature < 70°C, with Ingress protection IP66, Luminaire performance complies to IS 10322 (Part 5/Sec-3), driver surge protection 4KV, in house additional Surge protection 10 KV with optics distribution, THD<10% at 110 Volts AC, driver efficiency >90%, CCT: 3000K - 5700K, minimum CRI>70, etc., complete with earth connection and not less than two years warranty.. a) Luminaire Make : Wipro(Skyline) / Philips (Greenline Extra) / GE- Venture / Crompton(Nexus / Hawk series) / Bajaj (Edge) / Halonix (Modular/ Lumos Super) / Havells (Endura Series)/Greenlites(HI Lux) /Capart(Premium)/Polycab/Keselec / HPL(City Vision)/Jaquar (Premium) /Eveready /Surya (Pollux) / Fortune Arrt (Leaf) / Rhino(GPSL06) b) LED MAKE :PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG / LG.	45W LED Street light	1,06,00,039.94
74	2006.00	Supply and transportation & fixing of 90W LED Street light Luminaire made of pressure diecast aluminum body with powder coated, having protective toughened glass/polycarbonate diffuser, supply input voltage 120 - 270V AC, P.F > 0.90, high power LEDs having System Efficacy >=120 lumens/watt and junction temperature < 70°C, with Ingress protection IP66, Luminaire performance complies to IS 10322 (Part 5/Sec-3), driver surge protection 4KV, in house additional Surge protection 10 KV with optics distribution, THD<10% at 110 Volts AC, driver efficiency >90%, CCT: 3000K - 5700K, minimum CRI>70, etc., complete with earth connection and not less than two years warranty.. a) Luminaire Make : Wipro(Skyline) / Philips (Greenline Extra) / GE- Venture / Crompton(Nexus / Hawk series) / Bajaj (Edge) / Halonix (Modular/ Lumos Super) / Havells (Endura Series)/Greenlites(HI Lux) /Capart(Premium)/Polycab/Keselec / HPL(City Vision)/Jaquar (Premium) /Eveready /Surya (Pollux) / Fortune Arrt (Leaf) / Rhino(GPSL06) b) LED MAKE :PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG / LG.	90W LED Street light	1,61,47,537.72
75	572.00	Supply and transportation & fixing of 150W LED Street light Luminaire madeof pressure diecast aluminum body with powder coated, having protective toughened glass/polycarbonate diffuser, supply input voltage 120 - 270V AC, P.F > 0.90, high power LEDs having System Efficacy >=120 lumens/watt and junction temperature < 70°C, with Ingress protection IP66, Luminaire performance complies to IS 10322 (Part 5/Sec-3), driver surge protection 4KV, in house additional Surge protection 10 KV with optics distribution, THD<10% at 110 Volts AC, driver efficiency >90%, CCT: 3000K - 5700K, minimum CRI>70, etc., complete with earth connection and not less than two years warranty.. a) Luminaire Make : Wipro(Skyline) / Philips (Greenline Extra) / GE- Venture / Crompton(Nexus / Hawk series) / Bajaj (Edge) / Halonix (Modular/ Lumos Super) / Havells (Endura Series)/Greenlites(HI Lux) /Capart(Premium)/Polycab/Keselec / HPL(City Vision)/Jaquar (Premium) /Eveready /Surya (Pollux) / Fortune Arrt (Leaf) / Rhino(GPSL06) b) LED MAKE :PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG / LG.	150W LED Street light	68,81,554.68
76	0.00	Supply and fixing of suitable feeder piller box made with 14 SWG CRCA sheet including S & F of Legrand / Schnieder / Siemens / ABB / L&T make 40A TP MCB, 6 Nos SP MCB's, bus bars, 6 Sqmm 3 core copper cable for invidual light control, contactor, suitable timer and connectors and provision for energy meter etc., complete for finished item of work and as directed by the Engineer in Charge	Feeder piller box	-
77	70550.00	Supply, transportation and laying of 16 sqmm 4 core XLPE insulated, 1100V grade armoured alluminium cable as per specification confirming to IS:7098 (Part - I)./1554-I. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt	POWER DISTRIBUTION CABLES	1,61,91,225.00

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
78	34800.00	Supply & laying of 3 core, 2.5 Sq mm sheathed copper flexible cable ISI marked, PVC insulated and sheathed FRLS/FRLS-H round copper cable for voltage up to 1100V as per IS 694/1990 and as directed by the Engineer in Charge. as per IS 694/1990. Makes: Finolex / RR kabel / Havells/ Finecab /KEI/Polycab/ Gloster/ Goldmedal/GM// Fortune Arrt/Anchor /Million .	POWER DISTRIBUTION CABLES	53,77,296.00
79	70550.00	Supply and Transportation & laying of Outer dia 63mm and Inner dia 51mm double walled corrugated HDPE duct made as per specification BSEN - 500 86/IS 14930 Part-II. Makes:DURA LINE (Dura Guard) or its equivalent make and as directed by the Engineer in Charge	POWER DISTRIBUTION CABLES	1,23,44,133.50
80	70550.00	Supply and laying of 8 SWG GI wire (0.104 Kg/M) earth wire/strip in horizantal run in ground including revetting, soldering, making connections etc. as required	POWER DISTRIBUTION CABLES	8,01,448.00
81	280.00	Providing independent earthing by excavating a trench to a depth of 2.1 M in all soils, as per size specified in the Data, using 40mm dia 'B' class GI pipe of 2.5 Mtrs length with necessary accessories with hume pipe ring duly providing staggered holes including filling with equal proportion of Salt and Charcoal in layers and all labour charges etc., complete for small quarters.	POWER DISTRIBUTION CABLES	13,21,233.20
82	6900.00	Supply, transportation andd laying of 35 sqmm 3.5 core XLPE insulated, 1100V grade armoured alluminium cable as per specification confirming to IS:7098 (Part - I)./1554-I. Makes: Torent / Universal / Unicab / Havells / Finecab / KEI / Gloster/ Polycab /RR Kabel/ Fortune Arrt	POWER DISTRIBUTION CABLES	23,98,854.00
83	138.00	21Kva Three Phase Smart Streetlight CCMS Web Controller –Wireless Street light monitoring and controlling system with 63A MCB for incoming and 9 Nos of 20Amps SP MCB with 2 outputs with 1 no of buffer SP MCB of 3 Nos, includes inbuilt RF gateway. It uses GSM/GPRS/4G technology to receive commands and send data from and to the web software with 4G with 2G fall back, Micro HDMI port to be provided. MIPI CSI Camera port to be provided. Minimum of Two USB 3.0 ports to be provided. In-built GPS to be provided It should support GPS/GLONASS/BD, Switching Components, Automatic MCB Trip Rectification for nuisance MCB trips, Controller should have SPD of 20kV/10kA for the Panel. Metering: ISI Energy Meter with Class 1.0 accuracy and Complaint to IS:13779. Ability to communicate securely via cellular networks (GSM / GPRS /2G /3G /4G). Ability to send data regarding energy usage, ON/OFF status etc. from controller. Ability to remotely upgrade the CCMS device firmware from central server. Design Life should be More than 10 years. Inbuild Battery backed with RTC based timer for Bypass operation for up to 8 Hours. Enclosure: CRCA Metal Enclosure with IP65 and IK10 with size of 700x500x145mm CRCA 1.2 thickness with Single Door RAL 7035 Powder coating. Test report: Controller should be type- tested with NABL lab and the test report need to be submitted.Communication Charges per panel per annum included for the warranty period of 2 years,including CCMS Software charges, and Supply of Stand for 3 Phase panel, 6.2 feet height, MS powder coated with 5mm Thick and approved byengineer in charge	POWER DISTRIBUTION CABLES	63,89,400.00
84		**Storm Water Drains**		-
85	168858.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means **upto 3mts** depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	2,25,88,134.66
86	4512.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means **3 to 6 mts** depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	6,89,794.56
87	7545.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC 150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) **Single staging from 2.0 to 2.5 Mts.**	Steel shoring and shrutting Single staging from 2.00 to 2.50Mts.	21,27,690.00

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
88	2676.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) **Single staging from 2.50 to 3.00 Mts.**	Steel shoring and shrutting Single staging from 2.50 to 3.00 Mts.	9,04,488.00
89	1372.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) **Double staging from 3.00 to 3.50 Mts.**	Steel shoring and shrutting Double staging from 3.00 to 3.50 Mts.	7,88,900.00
90	486.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) **Double staging from 3.50 to 4.00 Mts.**	Steel shoring and shrutting Double staging from 3.50 to 4.00 Mts.	2,79,450.00
91	215.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) **Double staging from 4.00 to 4.50 Mts.**	Steel shoring and shrutting Double staging from 4.00 to 4.50 Mts.	1,23,625.00
92	151.31	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) **Double staging from 4.50 to 5.00 Mts.**	Steel shoring and shrutting Double staging from 4.50 to 5.00 Mts.	1,04,404.16
93	88.14	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) **Double staging from 5.00 to 5.50 Mts.**	Steel shoring and shrutting Double staging from 5.00 to 5.50 Mts.	60,817.70
94	7.47	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) **Double staging from 5.50 to 6.00 Mts.**	Steel shoring and shrutting Double staging from 5.50 to 6.00 Mts.	5,154.99
95	19040.44	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	65,06,498.47
96	7059.00	Providing Plain cement concrete M15 grade nominal mix using 40 mm MSA with hard granite metal including cost and conveyance of all materials at site, mechanically mixed, all leads, lifts and de-lifts, centering, placeing and compacted by vibration including curing complete as per drawings and technical specifications Clause 802, 803, 1202 & 1203 MORD and 1500, 1700 & 2100 MORTH for Drains and as directed by the Engineer - in-Charge.	Plain Cement Concrete (PCC) - M15	3,56,43,785.19
97	7665.00	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20 MSA conforming to MoRT&H 5th edition and as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating, curing, centering, shuttering including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer - in-Charge **For Storm water Drain Raft**.	Design Mix Concrete M30 Grade	4,17,45,352.95

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
98	7960.00	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20 MSA conforming to MoRT&H 5th edition and as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating, curing, centering, shuttering including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer - in-Charge **For Storm water Drain walls of 0.125 m thick.**	Design Mix Concrete M30 Grade	11,42,34,358.00
99	3789.00	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20 MSA conforming to MoRT&H 5th edition and as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating, curing, centering, shuttering including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer - in-Charge **For Storm water Drain walls of 0.175 m thick.**	Design Mix Concrete M30 Grade	4,45,36,436.46
100	732.00	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20 MSA conforming to MoRT&H 5th edition and as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating, curing, centering, shuttering including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer - in-Charge **For Storm water Drain walls of 0.20 m thick.**	Design Mix Concrete M30 Grade	80,09,983.20
101	1389.00	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20 MSA conforming to MoRT&H 5th edition and as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating, curing, centering, shuttering including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer - in-Charge **For Storm water Drain walls of 0.25 m thick.**	Design Mix Concrete M30 Grade	1,36,21,159.05
102	7578.00	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20 MSA conforming to MoRT&H 5th edition and as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating, curing, centering, shuttering including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer - in-Charge **For Storm water Drain top Slab.**	Design Mix Concrete M30 Grade	4,38,66,313.92
103	2393901.00	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars **Fe - 500/500D/550 grade** as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	Steel	21,89,22,246.45
104	113469.00	Back filling with Sand in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Filling	3,87,74,626.68
105	129256.00	Providing and fixing 100 mm dia perforated PVC pipes 30 cm long for Weep holes including cost of all materials, labour, drilling of required size holes etc.,for the finishes item of work and as directed by the Engineer-in-charge.	Weep Holes	1,80,48,015.28

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
106	5170.24	Laying of a geotextile between RCC walls and backfill at weep holes to prevent escape of the embankment material through the voids as well as to allow free movement of water without creating any uplift head as per Tech Specifications in Section 700 MORTH etc.,for the finishes item of work and as directed by the Engineer-in-charge.	Geo Textile	9,78,157.71
107	2419.00	Manufacture as per BIS:12592 (Part 1&2) Supply & Delivery of **SFRC** manhole covers of **H.D.-20 with 500mm dia** clear opening and frames with ISI marking anywhere in A.P., F.O.R. destination including, loading, unloading & stacking at site complete etc., and as directed by the Engineer-in-charge.	Manhole Covers	54,66,698.10
108	626.00	Manufacture as per BIS:12592 (Part 1&2) Supply & Delivery of **SFRC** manhole covers of **H.D.-20 with 560mm dia** clear opening and frames with ISI marking anywhere in A.P., F.O.R. destination including, loading, unloading & stacking at site complete etc., and as directed by the Engineer-in-charge.	Manhole Covers	15,17,054.66
109	22155.00	Manufacture supply transportation and fixing of encapsulated plastic steps for man holes anywhere in A.P. as per company's standard specification including cost of materials packing as per company's standards, loading, transportation, unloading and stacking at site of work etc, complete and as directed by the Engineer-in-charge.	Encapsulated Plastic Steps	41,78,433.00
110	3045.00	Construction of RCC inlet chamber of size 0.6x0.6x0.6m including excavation, backfilling to reqired compaction, providing and laying sand bedding of 200mm thick, PCC levelling course of 100mm thick using M 15 grade, RCC Raft slab of 100mm thick, RCC side walls of 100mm thick, RCC cover of 100mm thick/RCC grating of 0.6X0.6m size with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete, including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe 500D, concrete placing, vibrating, curing, including providing 160mm dia HDPE pipe connection of 1.0 m length from chamber to the drain Complete etc. for the finishes item of work and as directed by the Engineer-in-charge.	Inlet Chambers	4,19,45,362.20
111		**Outfall Structure**		-
112	758.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means upto **3mts** depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	1,01,397.66
113	31.00	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	10,593.32
114	17.00	Providing Plain cement concrete M15 grade nominal mix using 40 mm MSA with hard granite metal including cost and conveyance of all materials at site, mechanically mixed, all leads, lifts and de-lifts, centering, placeing and compacted by vibration including curing complete as per drawings and technical specifications Clause 802, 803, 1202 & 1203 MORD and 1500, 1700 & 2100 MORTH for Drains and as directed by the Engineer - in-Charge.	Plain Cement Concrete (PCC) - M15	85,839.97
115	35.00	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20 MSA conforming to MoRT&H 5th edition and as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating, curing, centering, shuttering including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer - in-Charge **For Raft**	Design Mix Concrete M30 Grade	1,90,618.05
116	32.00	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20 MSA conforming to MoRT&H 5th edition and as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating, curing, centering, shuttering including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer - in-Charge **For 0.30 m thick side wall**	Design Mix Concrete M30 Grade	2,89,568.64

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
117	5045.00	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars **Fe - 500/500D/550 grade** as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	Steel	4,61,365.25
118	116.00	Providing and constructing 60 cm thick hand packed rough stone riprap over a backing of 45 cm thick graded filter media consisting of sand, 10 mm and 40 mm size graded approved aggregates laid in layers of 15 cm thick each including cost of all materials, machinery, labour, laying to required slopes, wedging with stone chips etc., (IRR-DAW-6-10)	Rough Stone Riprap	2,01,010.60
119		**Water Supply**		-
120	23047.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means **upto 3mts** depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	30,82,997.19
121	20414.00	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	69,75,872.08
122	36874.00	Manufature, Supply and delivery of **150mm dia Centrifugally Cast (Spun) Ductile Iron Pressure Pipes** for Water with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K7 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DI Pipes	7,40,15,705.24
123	1911.00	Manufature, Supply and delivery of **200mm dia Centrifugally Cast (Spun) Ductile Iron Pressure Pipes** for Water with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K7 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DI Pipes	50,77,450.56
124	1492.00	Manufature, Supply and delivery of **250mm dia Centrifugally Cast (Spun) Ductile Iron Pressure Pipes** for Water with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K7 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DI Pipes	52,65,879.72
125	1535.00	Manufature, Supply and delivery of **300mm dia Centrifugally Cast (Spun) Ductile Iron Pressure Pipes** for Water with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K7 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DI Pipes	69,91,479.85
126	303.00	Manufature, Supply and delivery of **350mm dia Centrifugally Cast (Spun) Ductile Iron Pressure Pipes** for Water with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K7 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DI Pipes	17,56,866.72

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
127	411.00	Manufature, Supply and delivery of **400mm dia Centrifugally Cast (Spun) Ductile Iron Pressure Pipes** for Water with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K7 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DI Pipes	28,45,595.49
128	143.50	Manufature, Supply and delivery of **450mm dia Centrifugally Cast (Spun) Ductile Iron Pressure Pipes** for Water with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K7 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DI Pipes	12,01,247.11
129	176.50	Manufature, Supply and delivery of **500mm dia Centrifugally Cast (Spun) Ductile Iron Pressure Pipes** for Water with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K7 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DI Pipes	17,43,179.31
130	38.50	Manufature, Supply and delivery of **600mm dia Centrifugally Cast (Spun) Ductile Iron Pressure Pipes** for Water with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K7 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DI Pipes	5,11,154.88
131	15473.00	Manufature, Supply and Delivery of Centrifugal Cast (spun) Ductile Iron fittings -**DI Double Socket Bends,Tees,Tapers-PN16 below 500 mm dia** size suitable for DI K7 pipes conforming to IS: 9523/2000 having dimensions as per BIS, with zinc coating externally and inside mortar lining (with finishing as per clause 13/IS9523/2000) including transportation to site, unloading & stacking and as directed by the Engineer - in - charge	DI Fittings	23,83,151.46
132	850.00	Manufature, Supply and Delivery of Centrifugal Cast (spun) Ductile Iron fittings -**DI Double Socket Bends,Tees,Tapers-PN16 above 500 mm dia** size suitable for DI K7 pipes conforming to IS: 9523/2000 having dimensions as per BIS, with zinc coating externally and inside mortar lining (with finishing as per clause 13/IS9523/2000) including transportation to site, unloading & stacking and as directed by the Engineer - in - charge	DI Fittings	1,44,347.00
133	7647.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for **150mm dia Pipeline,TEE's,Bend's,Taper's,Flanged socket** per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	8,86,210.83
134	394.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for **200mm dia Pipeline,TEE's,Bend's,Taper's** per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	55,061.50
135	276.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for **250mm dia Pipeline,TEE's,Bend's,Taper's** per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	43,274.04
136	276.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for **300mm dia Pipeline,TEE's,Bend's,Taper's** per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	65,850.84
137	60.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for **350mm dia Pipeline,TEE's,Bend's,Taper's** per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	18,133.20
138	76.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for **400mm dia Pipeline,TEE's,Bend's,Taper's** per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	25,386.28
139	31.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for **450mm dia Pipeline,TEE's,Bend's,Taper's** per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	12,116.04
140	41.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for **500mm dia Pipeline,TEE's,Bend's,Taper's** per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	22,266.28

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
141	14.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for **600mm dia Pipeline,TEE's,Bend's,Taper's** per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	9,607.22
142	56874.00	Lowering CI / DI pipes (all classes) and specials (fittings) of **150mm dia** with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	DI Pipe Laying	61,66,279.08
143	2439.00	Lowering CI / DI pipes (all classes) and specials (fittings) for **200mm dia** with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	DI Pipe Laying	3,84,435.18
144	1492.00	Lowering CI / DI pipes (all classes) and specials (fittings) for **250mm dia** with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	DI Pipe Laying	3,17,736.32
145	1535.00	Lowering CI / DI pipes (all classes) and specials (fittings) for **300mm dia** with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	DI Pipe Laying	4,22,785.05
146	303.00	Lowering CI / DI pipes (all classes) and specials (fittings) for **350mm dia** with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	DI Pipe Laying	1,04,674.38
147	411.00	Lowering CI / DI pipes (all classes) and specials (fittings) for **400mm dia** with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	DI Pipe Laying	1,73,285.82
148	440.00	Lowering CI / DI pipes (all classes) and specials (fittings) for **450mm dia** with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	DI Pipe Laying	2,24,413.20
149	347.00	Lowering CI / DI pipes (all classes) and specials (fittings) for **500mm dia** with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	DI Pipe Laying	2,06,312.32
150	66.00	Lowering CI / DI pipes (all classes) and specials (fittings) for **600mm dia** with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	DI Pipe Laying	52,392.78
151	9479.00	Jointing CI / DI pipes and fittings for **150mm dia** with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997). and as directed by Engineer-in-charge.	DI Pipe Jointing	20,43,008.87
152	407.00	Jointing CI / DI pipes and fittings for **200mm dia** with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997). and as directed by Engineer-in-charge.	DI Pipe Jointing	95,156.60
153	249.00	Jointing CI / DI pipes and fittings for **250mm dia** with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997). and as directed by Engineer-in-charge.	DI Pipe Jointing	65,551.74
154	256.00	Jointing CI / DI pipes and fittings for **300mm dia** with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997). and as directed by Engineer-in-charge.	DI Pipe Jointing	76,636.16
155	51.00	Jointing CI / DI pipes and fittings for **350mm dia** with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997). and as directed by Engineer-in-charge.	DI Pipe Jointing	18,113.16
156	69.00	Jointing CI / DI pipes and fittings for **400mm dia** with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997). and as directed by Engineer-in-charge.	DI Pipe Jointing	26,450.46

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
157	74.00	Jointing CI / DI pipes and fittings for **450mm dia** with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997). and as directed by Engineer-in-charge.	DI Pipe Jointing	32,548.16
158	58.00	Jointing CI / DI pipes and fittings for **500mm dia** with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997). and as directed by Engineer-in-charge.	DI Pipe Jointing	27,678.76
159	11.00	Jointing CI / DI pipes and fittings for **600mm dia** with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997). and as directed by Engineer-in-charge.	DI Pipe Jointing	6,071.89
160	73.77	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20mm and below conforming to MoRT&H 12.8G or as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer-in-Charge **For Thrust Blocks**	Design Mix Concrete M30 Grade	4,01,768.39
161	3808.00	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars **Fe - 500/500D/550 grade** as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	Steel	3,48,241.60
162	15.00	Supply, Delivery of **100mm dia D.I double flanged Sluice Valves (Scour)** for 150 DI conforming to IS- 14846 (with up to date amendments, if any) including gear arrangements for the following dia. as per test pressure having Body, Bonnet, Dome, Stool cover, Wedge, Stuffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ; Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel, including Transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge, etc. complete ISI marked PN 1.6 (MPa) **For Scour valves**	Scour Valve	2,31,857.25
163	2.00	Supply, Delivery of **150mm dia D.I double flanged Sluice Valves (Scour)** for 200 DI & 250 DI conforming to IS- 14846 (with up to date amendments, if any) including gear arrangements for the following dia. as per test pressure having Body, Bonnet, Dome, Stool cover, Wedge, Stuffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ; Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel, including Transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge, etc. complete ISI marked PN 1.6 (MPa) **For Scour valves**	Scour Valve	48,675.06
164	2.00	Supply, Delivery of **200mm dia D.I double flanged Sluice Valves (Scour)** for 300 DI & 350 DI conforming to IS- 14846 (with up to date amendments, if any) including gear arrangements for the following dia. as per test pressure having Body, Bonnet, Dome, Stool cover, Wedge, Stuffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ; Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel, including Transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge, etc. complete ISI marked PN 1.6 (MPa) **For Scour valves**	Scour Valve	71,517.80

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
165	2.00	Supply, Delivery of **250mm dia D.I double flanged Sluice Valves (Scour)** for 400 DI & 450 DI conforming to IS- 14846 (with up to date amendments, if any) including gear arrangements for the following dia. as per test pressure having Body, Bonnet, Dome, Stool cover, Wedge, Stuffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ; Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel, including Transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge, etc. complete ISI marked PN 1.6 (MPa) **For Scour valves**	Scour Valve	91,201.60
166	1.00	Supply, Delivery of **300mm dia D.I double flanged Sluice Valves (Scour)** for 500 DI conforming to IS- 14846 (with up to date amendments, if any) including gear arrangements for the following dia. as per test pressure having Body, Bonnet, Dome, Stool cover, Wedge, Stuffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ; Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel, including Transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge, etc. complete ISI marked PN 1.6 (MPa) **For Scour valves**	Scour Valve	84,658.23
167	1.00	Supply, Delivery of **350mm dia D.I double flanged Sluice Valves (Scour)** for 600 DI conforming to IS- 14846 (with up to date amendments, if any) including gear arrangements for the following dia. as per test pressure having Body, Bonnet, Dome, Stool cover, Wedge, Stuffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ; Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel, including Transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge, etc. complete ISI marked PN 1.6 (MPa) **For Scour valves**	Scour Valve	1,17,774.73
168	30.00	Manufature, Supply and delivery of **1.0 mt length of 100 mm** nominal dia Centrifugally Cast (Spun) Ductile Iron Pressure pipes with Flanged (welded) End for Water, Gas and Sewerage to IS: 8329/2000 for classification K9 with cement mortor lining inside the pipes with outside zinc coating, including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge	DI Flanged Pipes	1,36,965.90
169	4.00	Manufature, Supply and delivery of **1.0 mt length of 150 mm** nominal dia Centrifugally Cast (Spun) Ductile Iron Pressure pipes with Flanged (welded) End for Water, Gas and Sewerage to IS: 8329/2000 for classification K9 with cement mortor lining inside the pipes with outside zinc coating, including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge	DI Flanged Pipes	28,985.04
170	4.00	Manufature, Supply and delivery of **1.0 mt length of 200 mm** nominal dia Centrifugally Cast (Spun) Ductile Iron Pressure pipes with Flanged (welded) End for Water, Gas and Sewerage to IS: 8329/2000 for classification K9 with cement mortor lining inside the pipes with outside zinc coating, including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge	DI Flanged Pipes	38,836.32
171	4.00	Manufature, Supply and delivery of **1.0 mt length of 250 mm** nominal dia Centrifugally Cast (Spun) Ductile Iron Pressure pipes with Flanged (welded) End for Water, Gas and Sewerage to IS: 8329/2000 for classification K9 with cement mortor lining inside the pipes with outside zinc coating, including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge	DI Flanged Pipes	50,828.28
172	2.00	Manufature, Supply and delivery of **1.0 mt length of 300 mm** nominal dia Centrifugally Cast (Spun) Ductile Iron Pressure pipes with Flanged (welded) End for Water, Gas and Sewerage to IS: 8329/2000 for classification K9 with cement mortor lining inside the pipes with outside zinc coating, including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge	DI Flanged Pipes	32,641.30
173	2.00	Manufature, Supply and delivery of **1.0 mt length of 350 mm** nominal dia Centrifugally Cast (Spun) Ductile Iron Pressure pipes with Flanged (welded) End for Water, Gas and Sewerage to IS: 8329/2000 for classification K9 with cement mortor lining inside the pipes with outside zinc coating, including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge	DI Flanged Pipes	41,970.60
174	7111.00	Manufature, Supply and Delivery of Centrifugal Cast (spun) Ductile Iron fittings **- Reducer TEEs with All Flanged ends ,Flange Spigot,Flanged Scoket,Double Flanged Bends & Duck Foot Bend below 500 mm dia** size suitable for DI K7 pipes conforming to IS: 9523/2000 having dimensions as per BIS, with zinc coating externally and inside mortar lining (with finishing as per clause 13/IS9523/2000) including transportation to site, unloading & stacking and as directed by the Engineer - in - charge	DI Specials	10,95,236.22

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175	2991.00	Manufature, Supply and Delivery of Centrifugal Cast (spun) Ductile Iron fittings **- Reducer TEEs with All Flanged ends ,Flange Spigot,Flanged Scoket,Double Flanged Bends & Duck Foot Bend above 500 mm dia** size suitable for DI K7 pipes conforming to IS: 9523/2000 having dimensions as per BIS, with zinc coating externally and inside mortar lining (with finishing as per clause 13/IS9523/2000) including transportation to site, unloading & stacking and as directed by the Engineer - in - charge	DI Specials	5,07,931.62
176	17.00	Lowering, keeping in position and fixing of **100mm dia Scour Valves** for 150 DI (with cap / with hand wheel & Reflex valves) excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Valves	4,472.70
177	2.00	Lowering, keeping in position and fixing of **150mm dia Scour Valves** for 200 DI, 250 DI (with cap / with hand wheel & Reflex valves) excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Valves	891.86
178	2.00	Lowering, keeping in position and fixing of **200mm dia Scour Valves** for 300 DI, 350 DI (with cap / with hand wheel & Reflex valves) excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Valves	1,471.34
179	2.00	Lowering, keeping in position and fixing of **250mm dia Scour Valves** for 400 DI, 450 Di (with cap / with hand wheel & Reflex valves) excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Valves	2,090.94
180	1.00	Lowering, keeping in position and fixing of **300mm dia Scour Valves** for 500 DI (with cap / with hand wheel & Reflex valves) excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Valves	1,488.43
181	1.00	Lowering, keeping in position and fixing of **350mm dia Scour Valves** for 600 DI (with cap / with hand wheel & Reflex valves) excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Valves	2,513.68
182	15.00	Lowering, keeping in position and fixing of Specials **100mm dia Duct foot bend** excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Duck foot Bends	3,946.50
183	2.00	Lowering, keeping in position and fixing of Specials **150mm dia Duct foot bend** excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Duck foot Bends	891.86
184	2.00	Lowering, keeping in position and fixing of Specials **200mm dia Duct foot bend** excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Duck foot Bends	1,471.34
185	2.00	Lowering, keeping in position and fixing of Specials **250mm dia Duct foot bend** excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Duck foot Bends	2,090.94
186	1.00	Lowering, keeping in position and fixing of Specials **300mm dia Duct foot bend** excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Duck foot Bends	1,488.43
187	1.00	Lowering, keeping in position and fixing of Specials **350mm dia Duct foot bend** excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Duck foot Bends	2,513.68
188	30.00	Lowering **100 mm Dia C.I. / D.I. Pipes (all classes) and specials (fittings) with flanged ends** carefully into trench and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Reference to specifications. BIS No.3114/1994)	Lowering of Flanged Pipes	2,613.90
189	4.00	Lowering **150 mm Dia C.I. / D.I. Pipes (all classes) and specials (fittings) with flanged ends** carefully into trench and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Reference to specifications. BIS No.3114/1994)	Lowering of Flanged Pipes	569.28
190	4.00	Lowering **200 mm Dia C.I. / D.I. Pipes (all classes) and specials (fittings) with flanged ends** carefully into trench and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Reference to specifications. BIS No.3114/1994)	Lowering of Flanged Pipes	819.08
191	4.00	Lowering **250 mm Dia C.I. / D.I. Pipes (all classes) and specials (fittings) with flanged ends** carefully into trench and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Reference to specifications. BIS No.3114/1994)	Lowering of Flanged Pipes	1,109.04

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
192	2.00	Lowering **300 mm Dia C.I. / D.I. Pipes (all classes) and specials (fittings) with flanged ends** carefully into trench and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Reference to specifications. BIS No.3114/1994)	Lowering of Flanged Pipes	715.80
193	2.00	Lowering **350 mm Dia C.I. / D.I. Pipes (all classes) and specials (fittings) with flanged ends** carefully into trench and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Reference to specifications. BIS No.3114/1994)	Lowering of Flanged Pipes	902.36
194	34.00	Jointing **100mm dia Scour Valves** for 150 DI D/F Valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	12,987.32
195	4.00	Jointing **150mm dia Scour Valves** for 200 DI & 250DI D/F Valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	2,304.64
196	4.00	Jointing **200mm dia Scour Valves** for 300 DI & 350 DI D/F Valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	2,497.20
197	4.00	Jointing **250mm dia Scour Valves** for 400 DI & 450 DI D/F Valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	3,490.20
198	2.00	Jointing **300mm dia Scour Valves** for 500 DI D/F Valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	1,843.56
199	2.00	Jointing **350mm dia Scour Valves** for 600 DI D/F Valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	2,605.60
200	30.00	Jointing with **100mm dia Double flanged pipe** for valves including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994). -	Jointing of Flanged Pipes	11,459.40
201	4.00	Jointing with **150mm dia Double flanged pipe** for valves including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994). -	Jointing of Flanged Pipes	2,304.64
202	4.00	Jointing with **200mm dia Double flanged pipe** for valves including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994). -	Jointing of Flanged Pipes	2,497.20
203	4.00	Jointing with **250mm dia Double flanged pipe** for valves including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994). -	Jointing of Flanged Pipes	3,490.20
204	2.00	Jointing with **300mm dia Double flanged pipe** for valves including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994). -	Jointing of Flanged Pipes	1,843.56
205	2.00	Jointing with **350mm dia Double flanged pipe** for valves including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994). -	Jointing of Flanged Pipes	2,605.60
206	15.00	Jointing of DI Fittings **100mm dia Duct foot bend** including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Flanged Pipes	5,729.70
207	2.00	Jointing of DI Fittings **150mm dia Duct foot bend** including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Flanged Pipes	1,152.32
208	2.00	Jointing of DI Fittings **200mm dia Duct foot bend** including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Flanged Pipes	1,248.60

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209	2.00	Jointing of DI Fittings **250mm dia Duct foot bend** including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Flanged Pipes	1,745.10
210	1.00	Jointing of DI Fittings **300mm dia Duct foot bend** including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Flanged Pipes	921.78
211	1.00	Jointing of DI Fittings **350mm dia Duct foot bend** including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Flanged Pipes	1,302.80
212	15.00	Supply and delivery of **150 mm dia DI D/F Gate Valves** (Soft Seated) PN-1.6 mpa without by pass Resilient seated soft sealing gate valves with body bonnet of ductile cast iron of grade GGG40/ SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F 4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO inclusive transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work.	Gate Valves	3,65,062.95
213	1.00	Supply and delivery of **200 mm dia DI D/F Gate Valves** (Soft Seated) PN-1.6 mpa without by pass Resilient seated soft sealing gate valves with body bonnet of ductile cast iron of grade GGG40/ SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F 4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO inclusive transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work.	Gate Valves	35,758.90
214	1.00	Supply and delivery of **250 mm dia DI D/F Gate Valves** (Soft Seated) PN-1.6 mpa without by pass Resilient seated soft sealing gate valves with body bonnet of ductile cast iron of grade GGG40/ SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F 4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO inclusive transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work.	Gate Valves	45,600.80
215	1.00	Supply and delivery of **300 mm dia DI D/F Gate Valves** (Soft Seated) PN-1.6 mpa without by pass Resilient seated soft sealing gate valves with body bonnet of ductile cast iron of grade GGG40/ SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F 4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO inclusive transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work.	Gate Valves	84,658.23
216	1.00	Supply and delivery of **350 mm dia DI D/F Gate Valves** (Soft Seated) PN-1.6 mpa without by pass Resilient seated soft sealing gate valves with body bonnet of ductile cast iron of grade GGG40/ SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F 4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO inclusive transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work.	Gate Valves	1,17,774.73
217	1.00	Supply and delivery of **400 mm dia DI D/F Gate Valves** (Soft Seated) PN-1.6 mpa without by pass Resilient seated soft sealing gate valves with body bonnet of ductile cast iron of grade GGG40/ SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F 4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO inclusive transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work.	Gate Valves	1,50,581.06
218	1.00	Supply, Delivery of **450mm dia D.I D/F Gate Valves** PN-1.6 mpaconforming to IS- 14846 (with up to date amendments, if any) including gear arrangements for the following dia. as per test pressure having Body, Bonnet, Dome, Stool cover, Wedge, Stufffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ; Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel.	Gate Valves	2,50,640.37

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219	1.00	Supply, Delivery of **500mm dia D.I D/F Gate Valves** conforming to IS- 14846 (with up to date amendments, if any) including gear arrangements for the following dia. as per test pressure having Body, Bonnet, Dome, Stool cover, Wedge, Stufffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ; Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel.	Gate Valves	3,14,612.72
220	1.00	Supply, Delivery of **600mm dia D.I D/F Gate Valves** conforming to IS- 14846 (with up to date amendments, if any) including gear arrangements for the following dia. as per test pressure having Body, Bonnet, Dome, Stool cover, Wedge, Stufffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ; Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel.	Gate Valves	4,03,189.81
221	15.00	Lowering, keeping in position and fixing 150 mm dia DI valves excluding cost of bolts, nuts, rubber insertion, Butterfly valve and tail pieces complete finished item of work as directed by the Engineer - in - charge.	Lowering of Valves	6,688.95
222	1.00	Lowering, keeping in position and fixing 200 mm dia DI valves excluding cost of bolts, nuts, rubber insertion, Butterfly valve and tail pieces complete finished item of work as directed by the Engineer - in - charge.	Lowering of Valves	735.67
223	1.00	Lowering, keeping in position and fixing 250 mm dia DI valves excluding cost of bolts, nuts, rubber insertion, Butterfly valve and tail pieces complete finished item of work as directed by the Engineer - in - charge.	Lowering of Valves	1,045.47
224	1.00	Lowering, keeping in position and fixing 300 mm dia DI valves excluding cost of bolts, nuts, rubber insertion, Butterfly valve and tail pieces complete finished item of work as directed by the Engineer - in - charge.	Lowering of Valves	1,488.43
225	1.00	Lowering, keeping in position and fixing 350 mm dia DI valves excluding cost of bolts, nuts, rubber insertion, Butterfly valve and tail pieces complete finished item of work as directed by the Engineer - in - charge.	Lowering of Valves	2,513.68
226	1.00	Lowering, keeping in position and fixing 400 mm dia DI valves excluding cost of bolts, nuts, rubber insertion, Butterfly valve and tail pieces complete finished item of work as directed by the Engineer - in - charge.	Lowering of Valves	3,086.24
227	1.00	Lowering, keeping in position and fixing 450 mm dia DI valves excluding cost of bolts, nuts, rubber insertion, Butterfly valve and tail pieces complete finished item of work as directed by the Engineer - in - charge.	Lowering of Valves	4,035.85
228	1.00	Lowering, keeping in position and fixing 500 mm dia DI valves excluding cost of bolts, nuts, rubber insertion, Butterfly valve and tail pieces complete finished item of work as directed by the Engineer - in - charge.	Lowering of Valves	4,678.24
229	1.00	Lowering, keeping in position and fixing 600 mm dia DI valves excluding cost of bolts, nuts, rubber insertion, Butterfly valve and tail pieces complete finished item of work as directed by the Engineer - in - charge.	Lowering of Valves	7,946.02
230	30.00	Jointing 150 mm dia DI valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete finished item of work as directed by the Engineer - in - charge. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	17,284.80
231	2.00	Jointing 200 mm dia DI valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	1,248.60
232	2.00	Jointing 250 mm dia DI valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete finished item of work as directed by the Engineer - in - charge. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	1,745.10
233	2.00	Jointing 300 mm dia DI valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete finished item of work as directed by the Engineer - in - charge. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	1,843.56
234	2.00	Jointing 350 mm dia DI valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete finished item of work as directed by the Engineer - in - charge. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	2,605.60
235	2.00	Jointing 400 mm dia DI valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete finished item of work as directed by the Engineer - in - charge. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	4,012.80

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236	2.00	Jointing 450 mm dia DI valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete finished item of work as directed by the Engineer - in - charge. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	4,677.98
237	2.00	Jointing 500 mm dia DI valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete finished item of work as directed by the Engineer - in - charge. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	5,402.14
238	2.00	Jointing 600 mm dia DI valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete finished item of work as directed by the Engineer - in - charge. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	7,441.94
239	27.00	Supply and delivery of Single Chamber For **80mm dia Air Valves PN-1.6** on 150 DI , 200 DI , 250 DI ,300 DI & 350 DI Air Valve PN-1.6 two in numbers with Body and cover in Ductile Iron of grade SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions. All internal parts such as float, shell etc., all cover bolts, of stainless steel, and Gaskets and seals of EPDM food grade quality Epoxy powder coating (EP-P) inside and outside colour blue. Drilled as per IS:1538, including Transportation etc complete as directed by the Engineer - in - charge.	Air Valve	7,44,047.64
240	3.00	Supply and delivery of Single Chamber For **100mm dia Air Valves PN-1.6** on 400 DI , 450 DI & 500 DI Air Valve PN-1.6 two in numbers with Body and cover in Ductile Iron of grade SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions. All internal parts such as float, shell etc., all cover bolts, of stainless steel, and Gaskets and seals of EPDM food grade quality Epoxy powder coating (EP-P) inside and outside colour blue. Drilled as per IS:1538, including Transportation etc complete as directed by the Engineer - in - charge.	Air Valve	1,07,276.70
241	1.00	Supply and delivery of Single Chamber For **150mm dia Air Valves PN-1.6** on 600 DI Air Valve PN-1.6 two in numbers with Body and cover in Ductile Iron of grade SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions. All internal parts such as float, shell etc., all cover bolts, of stainless steel, and Gaskets and seals of EPDM food grade quality Epoxy powder coating (EP-P) inside and outside colour blue. Drilled as per IS:1538, including Transportation etc complete as directed by the Engineer - in - charge.	Air Valve	68,565.23
242	27.00	Jointing DI Air Valves and Isolated Valves with flanged ends For **80mm dia Air Valves PN-1.6** on 150 DI , 200 DI , 250 DI ,300 DI & 350 DI including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete as directed by the Engineer - in - charge . (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	4,614.30
243	3.00	Jointing DI Air Valves and Isolated Valves with flanged ends For **100mm dia Air Valves PN-1.6** on 400 DI , 450 DI & 500 DI including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete as directed by the Engineer - in - charge . (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	839.82
244	1.00	Jointing DI Air Valves and Isolated Valves with flanged ends For **150mm dia Air Valves PN-1.6** on 600 DI including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete as directed by the Engineer - in - charge . (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	484.39
245	27.00	Supply and delivery of **80mm dia DI D/F Gate Valves (Isolation Valves)** (Soft Seated) PN-1.6 on 150 DI , 200 DI , 250 DI ,300 DI & 350 DI Resilient seated soft sealing gate valves with body bonnet of ductile cast iron of grade GGG40/ SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F 4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO inclusive transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work.	Isolation Valves	3,19,586.04
246	3.00	Supply and delivery of **100mm dia DI D/F Gate Valves (Isolation Valves)** (Soft Seated) PN-1.6 on 400 DI , 450 DI & 500 DI Resilient seated soft sealing gate valves with body bonnet of ductile cast iron of grade GGG40/ SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F 4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO inclusive transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work.	Isolation Valves	46,371.45

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
247	1.00	Supply and delivery of **150mm dia DI D/F Gate Valves (Isolation Valves)** (Soft Seated) PN-16 on 600 DI Resilient seated soft sealing gate valves with body bonnet of ductile cast iron of grade GGG40/ SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F 4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO inclusive transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work.	Isolation Valves	24,337.53
248	15.00	Construction of **RCC Scour Valve chamber of size 1.3x1.2x1.65m for 150mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Scour Valve chambers	6,61,200.00
249	1.00	Construction of **RCC Scour Valve chamber of size 1.4x1.2x1.7m for 200mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Scour Valve chambers	46,705.00
250	1.00	Construction of **RCC Scour Valve chamber of size 1.4x1.2x1.75m for 250mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Scour Valve chambers	47,454.00
251	1.00	Construction of **RCC Scour Valve chamber of size 1.5x1.3x1.80m for 300mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Scour Valve chambers	52,208.00
252	1.00	Construction of **RCC Scour Valve chamber of size 1.5x1.3x1.85m for 350mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Scour Valve chambers	52,972.00
253	1.00	Construction of **RCC Scour Valve chamber of size 1.6x1.3x1.90m for 400mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Scour Valve chambers	55,764.00

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254	1.00	Construction of **RCC Scour Valve chamber of size 1.6x1.3x1.95m for 450mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Scour Valve chambers	56,514.00
255	1.00	Construction of **RCC Scour Valve chamber of size 1.6x1.4x2.00m for 500mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Scour Valve chambers	59,500.00
256	1.00	Construction of **RCC Scour Valve chamber of size 1.7x1.5x2.10m for 600mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Scour Valve chambers	65,535.00
257	15.00	Construction of **RCC Gate Valve chamber of size 1.3x1.2x1.65m for 150mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Gate Valve chambers	6,61,200.00
258	1.00	Construction of **RCC Gate Valve chamber of size 1.4x1.2x1.7m for 200mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Gate Valve chambers	46,705.00
259	1.00	Construction of **RCC Gate Valve chamber of size 1.4x1.2x1.75m for 250mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Gate Valve chambers	47,454.00
260	1.00	Construction of **RCC Gate Valve chamber of size 1.5x1.3x1.80m for 300mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Gate Valve chambers	52,208.00

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261	1.00	Construction of **RCC Gate Valve chamber of size 1.5x1.3x1.85m for 350mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Gate Valve chambers	52,972.00
262	1.00	Construction of **RCC Gate Valve chamber of size 1.6x1.3x1.90m for 400mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Gate Valve chambers	55,764.00
263	1.00	Construction of **RCC Gate Valve chamber of size 1.6x1.3x1.95m for 450mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Gate Valve chambers	56,514.00
264	1.00	Construction of **RCC Gate Valve chamber of size 1.6x1.4x2.00m for 500mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Gate Valve chambers	59,500.00
265	1.00	Construction of **RCC Gate Valve chamber of size 1.7x1.5x2.10m for 600mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Gate Valve chambers	65,535.00
266	23.00	Construction of **RCC Air Valve chamber of size 1.25x0.95x1.70m for 150mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 125mm thick, RCC side walls of 125mm thick, RCC cover slab of 100mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Air Valve chambers	7,59,483.00
267	1.00	Construction of **RCC Air Valve chamber of size 1.3x0.95x1.75m for 200mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 125mm thick, RCC side walls of 125mm thick, RCC cover slab of 100mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Air Valve chambers	34,330.00

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268	1.00	Construction of **RCC Air Valve chamber of size 1.35x0.95x1.80m for 250mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 125mm thick, RCC side walls of 125mm thick, RCC cover slab of 100mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Air Valve chambers	35,636.00
269	1.00	Construction of **RCC Air Valve chamber of size 1.40x0.95x1.85m for 300mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 125mm thick, RCC side walls of 125mm thick, RCC cover slab of 100mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Air Valve chambers	36,952.00
270	1.00	Construction of **RCC Air Valve chamber of size 1.45x0.95x1.90m for 350mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 125mm thick, RCC side walls of 125mm thick, RCC cover slab of 100mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Air Valve chambers	38,273.00
271	1.00	Construction of **RCC Air Valve chamber of size 1.5x0.95x1.95m for 400mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 125mm thick, RCC side walls of 125mm thick, RCC cover slab of 100mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Air Valve chambers	39,604.00
272	1.00	Construction of **RCC Air Valve chamber of size 1.55x0.95x2.0m for 450mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 125mm thick, RCC side walls of 125mm thick, RCC cover slab of 100mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Air Valve chambers	40,938.00
273	1.00	Construction of **RCC Air Valve chamber of size 1.6x0.95x2.05m for 500mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 125mm thick, RCC side walls of 125mm thick, RCC cover slab of 100mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Air Valve chambers	42,276.00
274	1.00	Construction of **RCC Air Valve chamber of size 1.7x0.95x2.15m for 600mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 100mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Air Valve chambers	50,990.00

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275	461.00	Supply and fixing of HSC with following items for - 150 x 1/2" dia connection a)House service connections (Composite strap saddle for DI/CI pipes) composite strap saddle shall be of wrap around design pN-16 rating. Body shall be manufactured using virgin compounded PE 80/PE 100 polymer with stainless steel 304 grade stirrup plate mounted with PE straps (Engineering Plastic) with Nut bolt joint, sealing between the saddle and mains shall be obtained by using an elastomer seal (Underneath projection for self interlocking). b)The Brass Ferrule -1/2" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D20 mm X 1/2" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 20mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	5,76,097.87
276	154.00	Supply and fixing of HSC with following items for - 150 x 3/4" dia connection a)House service connections (Composite strap saddle for DI/CI pipes) composite strap saddle shall be of wrap around design pN-16 rating. Body shall be manufactured using virgin compounded PE 80/PE 100 polymer with stainless steel 304 grade stirrup plate mounted with PE straps (Engineering Plastic) with Nut bolt joint, sealing between the saddle and mains shall be obtained by using an elastomer seal (Underneath projection for self interlocking). b)The Brass Ferrule -3/4" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D25 mm X 3/4" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 25mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	2,50,556.46
277	77.00	Supply and fixing of HSC with following items for - 150 x 1" dia connection a)House service connections (Composite strap saddle for DI/CI pipes) composite strap saddle shall be of wrap around design pN-16 rating. Body shall be manufactured using virgin compounded PE 80/PE 100 polymer with stainless steel 304 grade stirrup plate mounted with PE straps (Engineering Plastic) with Nut bolt joint, sealing between the saddle and mains shall be obtained by using an elastomer seal (Underneath projection for self interlocking). b)The Brass Ferrule -1" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D32 mm X 1" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 32mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	1,72,820.34

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278	31.00	Supply and fixing of HSC with following items for - 200 x 1/2" dia connection a)House service connections (Composite strap saddle for DI/CI pipes) composite strap saddle shall be of wrap around design pN-16 rating. Body shall be manufactured using virgin compounded PE 80/PE 100 polymer with stainless steel 304 grade stirrup plate mounted with PE straps (Engineering Plastic) with Nut bolt joint, sealing between the saddle and mains shall be obtained by using an elastomer seal (Underneath projection for self interlocking). b)The Brass Ferrule -1/2" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D20 mm X 1/2" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 20mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	39,444.40
279	23.00	Supply and fixing of HSC with following items for - 200 x 3/4" dia connection a)House service connections (Composite strap saddle for DI/CI pipes) composite strap saddle shall be of wrap around design pN-16 rating. Body shall be manufactured using virgin compounded PE 80/PE 100 polymer with stainless steel 304 grade stirrup plate mounted with PE straps (Engineering Plastic) with Nut bolt joint, sealing between the saddle and mains shall be obtained by using an elastomer seal (Underneath projection for self interlocking). b)The Brass Ferrule -3/4" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D25 mm X 3/4" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 25mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	37,943.33
280	23.00	Supply and fixing of HSC with following items for - 200 x 1" dia connection a)House service connections (Composite strap saddle for DI/CI pipes) composite strap saddle shall be of wrap around design pN-16 rating. Body shall be manufactured using virgin compounded PE 80/PE 100 polymer with stainless steel 304 grade stirrup plate mounted with PE straps (Engineering Plastic) with Nut bolt joint, sealing between the saddle and mains shall be obtained by using an elastomer seal (Underneath projection for self interlocking). b)The Brass Ferrule -1" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D32 mm X 1" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 32mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	52,144.22
281	11.00	Supply, Erection and Commissioning of WMD System which should be able to control the lfow as per demand to facilitate Uniform Distribution of Water to the Consumers Zone irrespective of its location, elevation and distance from the water source. The system should be able to record, monitor and control the cumulative quantity delivered to the consumers without any external Electric Energy and with minimum recurring cost for Communication with GSM/GPRS/RADIO etc. system will be capable of water quality monitoring and close in the event of water security issues.	Water Management Districts	82,50,000.00
282	2.00	Providing and fixing 100 mm CI Fire Hydrant Stand post type with 65 mm Brass male outlet coupling having One No. each flange riser 300 mm length duck foot bend, 100 mm sluice valve DF (PN16) (Sluice Valve Cost Excluded), Road surface box, 100mm flange / socket tail piece confirming to IS:908-1975	Fire Hydrant Network	46,900.00

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
283	2.00	Supply and delivery of **DI D/F Gate Valves (Soft Seated) PN-1.6(MPa) Resilient seated soft sealing gate valves (Sluice valves)** with body bonnet of ductile cast iron of grade GGG40/ SG400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO, transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work.(As Per SOR 2024-25 PH Item-30.1 Page No: 100). - **100mm Dia**	Sluice Valve for Fire hydrant	30,914.30
284		**Waste Water**		-
285		**GRAVITY MAIN**		-
286	56,463.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means upto 3mts depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	75,53,055.51
287	7382	Earthwork excavation in all type of soils including ordinary rock by mechanical means from 3mts to 6mts depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	11,28,560.16
288	16200	Bailing out water from the pipe line trenches with oil engine driven pump sets, including hire charges, fuel charges and wages for Driver and Helper upto 5HP capacity pumps etc., complete and as directed by the Engineer-in-Charge.	De-watering	11,69,640.00
289	2,118	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	7,23,762.96
290	244.00	Providing and placing Plain Cement Concrete (1:3:6) (cement: fine aggregate: Coarse aggregate) for foundations/leveling course/ under flooring bed using coarse aggregate 40mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including other taxes on all materials and including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete for finished item of work as directed by Engineer-In-Charge	Plain Cement Concrete (PCC) - M10	12,39,932.36
291	18,650.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC 150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) **Single staging from 2.0 to 2.5 Mts.**	Steel shoring and shrutting Single staging from 2.00 to 2.50Mts.	52,59,300.00
292	20,546.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) Single staging from 2.50 to 3.00 Mts.	Steel shoring and shrutting Single staging from 2.50 to 3.00 Mts.	69,44,548.00

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
293	20,143.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) Double staging from 3.00 to 3.50 Mts.	Steel shoring and shrutting Double staging from 3.00 to 3.50 Mts.	1,15,82,225.00
294	15,774.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) Double staging from 3.50 to 4.00 Mts.	Steel shoring and shrutting Double staging from 3.50 to 4.00 Mts.	90,70,050.00
295	12,427.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) Double staging from 4.00 to 4.50 Mts.	Steel shoring and shrutting Double staging from 4.00 to 4.50 Mts.	71,45,525.00
296	7,794.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) Double staging from 4.50 to 5.00 Mts.	Steel shoring and shrutting Double staging from 4.50 to 5.00 Mts.	53,77,860.00
297	2,138.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) Double staging from 5.00 to 5.50 Mts.	Steel shoring and shrutting Double staging from 5.00 to 5.50 Mts.	14,75,220.00
298	190.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) Double staging from 5.50 to 6.00 Mts.	Steel shoring and shrutting Double staging from 5.50 to 6.0 Mts.	1,31,100.00
299	80	Construction of RCC circular manhole of grade M-30, Type- A, 900 mm internal diameter and depth upto 1.65 m as per drawing and fixing (slant portion of 0.64 m and raft 0.3 m) with SFRC cover and frame (heavy duty, HD-20 grade designation) 560 mm internal diameter, total weight of cover and frame to be not less than 182 kg, including excavation, providing and laying sand bedding of 300mm thick, PCC (1:3:6) levelling course of 100mm thick, RCC side wall of 150mm thick with M30 grade design mix concrete corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and Plastering with SRC cement motor 1:3 internal suraface of manhole including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing backfilling with suitable excavated earth. complete for finished item of work and as directed by the Engineer-in-charge	RCC Manholes	15,19,395.20
300	70.00	For Manhole wall vertical portion extra Depth for every 1.0 m depth beyond 0.85 m and inling with SRC cement motor of 1:3. - For Type-A Manhole	RCC Manholes	7,75,105.80
301	8.00	Providing and placing Plain Cement Concrete (1:3:6) (cement: fine aggregate: Coarse aggregate) for foundations/leveling course/ under flooring bed using coarse aggregate 40mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including other taxes on all materials and including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete including overheads & contractors profit complete for finished item of work - For Type-A Manhole haunch concrete	Plain Cement Concrete (PCC) - M10	40,653.52

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
302	117	Construction of RCC circular manhole of grade M-30, Type- B, 1200 mm internal diameter and depth upto 2.29 m as per drawing and fixing (Slant portion of 1.15m and raft 0.3m) with SFRC cover and frame (heavy duty, HD-20 grade designation) 560 mm internal diameter, total weight of cover and frame to be not less than 182 kg, including excavation, providing and laying sand bedding of 300mm thick, PCC (1:3:6) levelling course of 100mm thick, RCC side wall of 150mm thick with M30 grade design mix concrete corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and Plastering with SRC cement motor 1:3 internal suraface of manhole including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing backfilling with suitable excavated earth. complete for finished item of work and as directed by the Engineer-in-charge	RCC Manholes	31,69,601.37
303	129	For Manhole wall vertical portion extra Depth for every 1.0 m depth beyond 1.15 m and inling with SRC cement motor of 1:3. - For Type-B Manhole	RCC Manholes	18,82,219.65
304	23	Providing and placing Plain Cement Concrete (1:3:6) (cement: fine aggregate: Coarse aggregate) for foundations/leveling course/ under flooring bed using coarse aggregate 40mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including other taxes on all materials and including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete including overheads & contractors profit complete for finished item of work - For Type-B Manhole haunch concrete	Plain Cement Concrete (PCC) - M10	1,16,878.87
305	616	Construction of RCC circular manhole of grade M-30, Type- C, 1500 mm internal diameter and depth upto 5 m as per drawing and fixing (Slant portion of 1.5 m and raft 0.33 m) with SFRC cover and frame (heavy duty, HD-20 grade designation) 560 mm internal diameter, total weight of cover and frame to be not less than 182 kg, including excavation, providing and laying sand bedding of 300mm thick, PCC (1:3:6) levelling course of 100mm thick, RCC side wall of 150mm thick with M30 grade design mix concrete corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and Plastering with SRC cement motor 1:3 internal suraface of manhole including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing backfilling with suitable excavated earth. complete for finished item of work and as directed by the Engineer-in-charge	RCC Manholes	2,58,82,638.32
306	1,483.00	For Manhole wall vertical portion extra Depth for every 1.0 m depth beyond 1.5 m and inling with SRC cement motor of 1:3. - For Type-C Manhole	RCC Manholes	3,30,28,367.56
307	194.00	Providing and placing Plain Cement Concrete (1:3:6) (cement: fine aggregate: Coarse aggregate) for foundations/leveling course/ under flooring bed using coarse aggregate 40mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including other taxes on all materials and including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete including overheads & contractors profit complete for finished item of work - For Type-C Manhole haunch concrete	Plain Cement Concrete (PCC) - M10	9,85,847.86
308	121	Construction of RCC circular manhole of grade M-30, Type- D, 1800 mm internal diameter and depth upto 8 m as per drawing and fixing (Slant portion of 2 m and raft 0.4 m) with SFRC cover and frame (heavy duty, HD-20 grade designation) 560 mm internal diameter, total weight of cover and frame to be not less than 182 kg, including excavation, providing and laying sand bedding of 300mm thick, PCC (1:3:6) levelling course of 100mm thick, RCC side wall of 150mm thick with M30 grade design mix concrete corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and Plastering with SRC cement motor 1:3 internal suraface of manhole including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing backfilling with suitable excavated earth. complete for finished item of work and as directed by the Engineer-in-charge	RCC Manholes	76,00,864.26
309	466.00	For Manhole wall vertical portion extra Depth for every 1.0 m depth beyond 2 m and inling with SRC cement motor of 1:3. - For Type-D Manhole	RCC Manholes	1,22,34,280.12
310	77.00	Providing and placing Plain Cement Concrete (1:3:6) (cement: fine aggregate: Coarse aggregate) for foundations/leveling course/ under flooring bed using coarse aggregate 40mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges but including other taxes on all materials and including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete including overheads & contractors profit complete for finished item of work - For Type-D Manhole haunch concrete	Plain Cement Concrete (PCC) - M10	3,91,290.13

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
311	10,000.00	Manufacture supply transportation and fixing of encapsulated plastic steps for man holes anywhere in A.P. as per company's standard specification including cost of materials packing as per company's standards, loading, transportation, unloading and stacking at site of work etc, complete and as directed by the Engineer-in-charge.	Encapsulated Plastic Steps	18,86,000.00
312	53.00	Providing sand cast iron drop connection externally for 60 cm drop from branch sewer line to main sewer manhole including inspection and cleaning eye with chain and lid, sand cast iron drop pipe and bend encased allround with cement concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) with all centering and shuttering required, cutting holes in walls and making good with brick work in cement mortar 1:4 (1 cement : 4 coarse sand) plastered with cement mortar 1:3 (1 cement : 3 coarse sand) on inside of the manhole wall, lead caulked joints between sand cast iron pipes and fittings, stiff cement mortar 1:1 (1 cement : 1 fine sand) joints between sand cast iron tee and S.W. pipe, making required channels complete as per standard design and specifications 150 mm dia sand cast iron drop connection For depths up to 60 cm	Drop Connection	8,39,576.71
313	52.00	Providing sand cast iron drop connection externally for 60 cm drop from branch sewer line to main sewer manhole including inspection and cleaning eye with chain and lid, sand cast iron drop pipe and bend encased allround with cement concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) with all centering and shuttering required, cutting holes in walls and making good with brick work in cement mortar 1:4 (1 cement : 4 coarse sand) plastered with cement mortar 1:3 (1 cement : 3 coarse sand) on inside of the manhole wall, lead caulked joints between sand cast iron pipes and fittings, stiff cement mortar 1:1 (1 cement : 1 fine sand) joints between sand cast iron tee and S.W. pipe, making required channels complete as per standard design and specifications 150 mm dia sand cast iron drop connection for depths beyond 60 cm of sand cast iron drop connection complete	Drop Connection	2,15,244.64
314	12,379	Manufacture, supply, & delivery of 200mm (ID) dia, SN 8 Class (DWC) structured wall polyethylene/polypropylene piping system with non smooth external annular corrugated and smooth internal surface (Double Wall) for non pressure sewage & Drainage application pipes of standard length 6 m, grade conforming to IS 16098 (part-II: 2013), including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DWC Pipe	74,54,138.64
315	567	Manufacture, supply, & delivery of 250mm (ID) dia, SN 8 Class (DWC) structured wall polyethylene/polypropylene piping system with non smooth external annular corrugated and smooth internal surface (Double Wall) for non pressure sewage & Drainage application pipes of standard length 6 m, grade conforming to IS 16098 (part-II: 2013), including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DWC Pipe	5,31,460.44
316	475	Manufacture, supply, & delivery of 300mm (ID) dia, SN 8 Class (DWC) structured wall polyethylene/polypropylene piping system with non smooth external annular corrugated and smooth internal surface (Double Wall) for non pressure sewage & Drainage application pipes of standard length 6 m, grade conforming to IS 16098 (part-II: 2013), including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DWC Pipe	6,04,432.75
317	352	Manufacture, supply, & delivery of 400mm (ID) dia, SN 8 Class (DWC) structured wall polyethylene/polypropylene piping system with non smooth external annular corrugated and smooth internal surface (Double Wall) for non pressure sewage & Drainage application pipes of standard length 6 m, grade conforming to IS 16098 (part-II: 2013), including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DWC Pipe	7,47,859.20
318	857	Manufacture, supply, & delivery of 500mm (ID) dia, SN 8 Class (DWC) structured wall polyethylene/polypropylene piping system with non smooth external annular corrugated and smooth internal surface (Double Wall) for non pressure sewage & Drainage application pipes of standard length 6 m, grade conforming to IS 16098 (part-II: 2013), including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DWC Pipe	28,23,677.88
319	17,355.00	Lowering, Laying, Jointing and testing of 200 mm (ID) of DWC Pipes in ready made trenches true to alignment and level and perfect jointing including cost of rubber rings and cost of water for testing, all labour, all leads in lifts etc., complete for finished item of work as per drawing/specification etc., and as directed by the Engineer in charge.	DWC Pipe Laying & Jointing	23,85,791.85
320	957.00	Lowering, Laying, Jointing and testing of 250 mm (ID) of DWC Pipes in ready made trenches true to alignment and level and perfect jointing including cost of rubber rings and cost of water for testing, all labour, all leads in lifts etc., complete for finished item of work as per drawing/specification etc., and as directed by the Engineer in charge.	DWC Pipe Laying & Jointing	2,06,587.59

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
321	475.00	Lowering, Laying, Jointing and testing of 300 mm (ID) of DWC Pipes in ready made trenches true to alignment and level and perfect jointing including cost of rubber rings and cost of water for testing, all labour, all leads in lifts etc., complete for finished item of work as per drawing/specification etc., and as directed by the Engineer in charge.	DWC Pipe Laying & Jointing	1,35,997.25
322	352.00	Lowering, Laying, Jointing and testing of 400 mm (ID) of DWC Pipes in ready made trenches true to alignment and level and perfect jointing including cost of rubber rings and cost of water for testing, all labour, all leads in lifts etc., complete for finished item of work as per drawing/specification etc., and as directed by the Engineer in charge.	DWC Pipe Laying & Jointing	1,81,966.40
323	857.00	Lowering, Laying, Jointing and testing of 500 mm (ID) of DWC Pipes in ready made trenches true to alignment and level and perfect jointing including cost of rubber rings and cost of water for testing, all labour, all leads in lifts etc., complete for finished item of work as per drawing/specification etc., and as directed by the Engineer in charge.	DWC Pipe Laying & Jointing	6,45,552.39
324	199.00	Manufacture, Supply and Delivery of 600mm dia ID RCC NP3 class with HAC inlined Socket and Spigot pipes conforming to B.I.S. 458/2003 including loading transportation to site, unloading and stacking etc., and as directed by Engineer-in-charge.	RCC Pipe	9,99,151.14
325	85.00	Manufacture, Supply and Delivery of 600mm dia ID RCC NP4 class with HAC inlined Socket and Spigot pipes conforming to B.I.S. 458/2003 including loading transportation to site, unloading and stacking etc., and as directed by Engineer-in-charge.	RCC Pipe	4,33,919.90
326	284.00	Lowering & Jointing of 600mm dia (ID) RCC NP3 & NP4 class with HAC inlined S/S pipes carefully into the readymade trenches laying them true to alignment and gradient, jointing with rubber rings and testing including filling with water with a water lead up to 500 meters including cost of rubber rings as per BIS No. 783/1985 as directed by Engineer-in-charge	RCC Pipe Laying & Jointing	1,36,467.68
327	53,523.00	Providing & laying Sand bedding in foundations & filling in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	1,82,89,879.56
328	29,828.00	Providing barricading, hoarding, lighting and watching etc., arrangements with casurina ballies and tape as per the design duly excavating pits and its removal after the function is over including the cost of barricading materials as per the schedule given by the departmental authorities completed for finished item of work and as directed by Engineer-in-charge.	Barricading	56,06,470.88
329		**PUMPING MAIN**		-
330	203	Earthwork excavation in all type of soils including ordinary rock by mechanical means upto 3mts depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	27,155.31
331	183	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	62,534.76
332	150	Manufature, Supply and delivery of Centrifugally Cast (Spun) Ductile Iron Pressure 350mm dia Pipes for Sewerage with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K9 Push-On -Joint (Rubber Gasket D Jointing) with HAC (high alumina cement mortor) lining inside the pipes with out side zinc coating, including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DI Pipes	10,66,296.00
333	20	Manufature, Supply and delivery of Centrifugally Cast (Spun) Ductile Iron Pressure 600mm dia Pipes for Sewerage with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K9 Push-On -Joint (Rubber Gasket D Jointing) with HAC (high alumina cement mortor) lining inside the pipes with out side zinc coating, including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DI Pipes	3,11,489.80

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
334	150	Lowering CI / DI pipes of 350mm dia (all classes) and specials (fittings) with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	DI Pipe Laying	51,819.00
335	20	Lowering CI / DI pipes of 600mm dia (all classes) and specials (fittings) with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	DI Pipe Laying	15,876.60
336	25	Jointing CI / DI of 350mm dia pipes and fittings with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997). and as directed by Engineer-in-charge	DI Pipe Jointing	8,879.00
337	4	Jointing CI / DI of 600mm dia pipes and fittings with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997). and as directed by Engineer-in-charge	DI Pipe Jointing	2,207.96
338	25	Manufacture, supply and delivery of S.B.R. Quality Rubber for 350mm dia pipes as per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	7,555.50
339	4	Manufacture, supply and delivery of S.B.R. Quality Rubber for 600mm dia pipes as per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	2,744.92
340		**PLOT CONNECTION**		-
341	9357.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means upto 3mts depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	12,51,685.89
342	9048.00	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	30,91,882.56
343	10260.00	Manufacture, Supply, & Delivery of (S25) 160 mm dia (OD) Unplasticised Non-pressure polyvinyl chloride(PVC-U) pipes of dark (any shade of brown) for use in underground drainage & sewerage system conforming to IS 15328/2003) with Elastomeric seal Ring Joints (Ringtite PVC Pipes) as per specification, including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	UPVC Pipe	35,55,397.80
344	10260.00	Lowering, laying, jointing and testing of Pipe Series (S25) OD 160mm dia. to un-plasticized Non-Pressure Polyvinyl Chloride (U-PVC) pipes of dark (any shade of Brown) hydralic test pressure including cost of water with minimum water lead of 500m for UPVC pressure pipes in ready made trenches true to alignment and gradient including all sundries but excluding cost & conveyance of pipes from source of supply and jointing materials as per BIS No. 7634 - Part III - 1975	UPVC Pipe Laying & Jointing	4,28,868.00
345	5130.00	Manufacture, supply, & delivery of 160mm dia, SN 8 Class (DWC) structured wall polyethylene/polypropylene piping system with non smooth external annular corrugated and smooth internal surface (Double Wall) for non pressure sewage & Drainage application pipes of standard length 6 m, grade conforming to IS 16098 (part-II: 2013), including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DWC Pipe	22,43,964.60
346	5130.00	Lowering, Laying, Jointing and testing of 160 mm dia DWC Pipes in ready made trenches true to alignment and level and perfect jointing including cost of rubber rings and cost of water for testing, all labour, all leads in lifts etc., complete for finished item of work as per drawing/specification etc., and as directed by the Engineer in charge.	DWC Pipe	5,12,897.40

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
347	1026.00	Construction of RCC Inspection chamber of size 0.6x0.6x0.6m with M30 grade design mix concrete corresponding to IS 4926 & 456 with cement content of 400 kg/cum including excavation, laying of sand bed 150mm thick, PCC (1:3:6) levelling course of 100mm thick, RCC raft slab of 100mm thick, RCC side wall of 100mm thick and RCC cover slab of 100mm thick, including cost and conveyance of all materials, labour charges, centering, HYSD Reinforcement of FE-500D, concrete placing, vibrating,curing, including providing and fixing of 24 X 24 HD 20 manhole covers and frames with ISI marking etc., and backfilling with suitable excavated earth to the required compaction complete for finished item of work and as directed by Engineer in charge for the finished item of work.	Inspection Chamber	69,42,162.24
348	513.00	Construction of RCC Inspection chamber of size 0.6x0.6x0.8m with M30 grade design mix concrete corresponding to IS 4926 & 456 with cement content of 400 kg/cum including excavation, laying of sand bed 150mm thick, PCC (1:3:6) levelling course of 100mm thick, RCC raft slab of 100mm thick, RCC side wall of 100mm thick and RCC cover slab of 100mm thick, including cost and conveyance of all materials, labour charges, centering, HYSD Reinforcement of FE-500D, concrete placing, vibrating,curing, including providing and fixing of 24 X 24 HD 20 manhole covers and frames with ISI marking etc., and backfilling with suitable excavated earth to the required compaction complete for finished item of work and as directed by Engineer in charge for the finished item of work.	Inspection Chamber	41,67,355.50
349		**IPS-1**		-
350	916.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means upto 3mts depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	1,22,533.32
351	742.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means 3 to 6 mts depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	1,13,436.96
352	758.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means above 6mtrs depth for trenches as per drawing and technical specification including dewatering, setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the suitable excavated earth to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	1,43,201.36
353	49.00	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	16,744.28
354	16.00	Providing and placing Plain Cement Concrete (1:3:6) (cement: fine aggregate: Coarse aggregate) for foundations/leveling course/ under flooring bed using coarse aggregate 40mm size hard , machine crushed granite metal from approved quarry including cost and conveyance of all materials like cement, sand, coarse aggregate, water etc. to site,excluding seigniorage charges other taxes on all materials and including all charges for machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete finished item of work as directed by Engineer-in charge.	Plain Cement Concrete (PCC) - M10	81,307.04
355	154.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge For - Foundations & Footings (IPS)	Design Mix Concrete M30 Grade	12,20,791.88
356	137.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge For - Circular Walls (IPS)	Design Mix Concrete M30 Grade	16,38,685.77

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
357	52.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge For - RCC Stepped Walls (IPS)	Design Mix Concrete M30 Grade	5,70,386.44
358	9.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge For - Beams (IPS)	Design Mix Concrete M30 Grade	1,12,381.74
359	2.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge For - Plinth Beams (IPS)	Design Mix Concrete M30 Grade	20,626.26
360	81.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge For - RCC Screening chamber walls (IPS)	Design Mix Concrete M30 Grade	8,88,486.57
361	12.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - For Slabs of 150mm thick (IPS)	Design Mix Concrete M30 Grade	1,36,853.88
362	4.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - For Columns (IPS)	Design Mix Concrete M30 Grade	48,962.80
363	45720.00	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars Fe - 500/500D/550 grade as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to as per latest revisions and specifications and as directed by the Engineer in Charge.	Steel	41,81,094.00
364	24.00	Providing brick work of 230mm thick in CM (1:6) prop., with traditional size 23 x 11 x 7 cms or Equivalent Size using common burnt clay bricks of class as per Table-1 of IS:1077-1992 Non-Modular or traditional size , including cost & conveyance of all material and labour charges, hire and operational charges etc., centering & scafolding charges etc., complete as per APSS No.501 and directed by engineer-in-charge.	Brick Work	2,08,943.28

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
365	104.00	Plastering with 20mm thick double coat in CM (1:6) 16 mm thick base coat and CM (1:4) of 4mm thick top coat with dubara sponge finish including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work - for External Walls.	Plastering	64,357.28
366	163.00	Plastering in CM (1:4) with 12mm thick including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work. - Internal Plastering for Walls	Plastering	74,246.50
367	58.00	Plastering in CM (1:5) with 20mm thick including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work. - Internal Plastering for ceiling	Plastering	26,773.96
368	265.00	Painting walls with snowcem or other equal and approved Water Proof Cement paint over priming coat, 2 coats (all colours) including cost and conveyance of all materials to work site and all operational, incidental, labour charges, finsihing, scaffolding, lift charges, complete for finished item of work for Extrenal walls & Surfaces and as directed by Engineer-in-charge.	Walls Painting	58,697.50
369	41.00	Painting by providing solvent free epoxy resin primer for protective coatings – Procoat SNC or Zoriprime EPF or Equivalent (Coverage : 3 Kg unit covers about 13m2 for DFT of about 120 micron.)- in three coats for inside of the water tank including cost and conveyance of all materials and labour charges for painting, curing etc complete for finished item of work for Internal walls & Ceiling and as directed by Engineer-in-charge.	Civil work	10,787.51
370	3	Supply & fixing of Rolling shutter made of 80 x 1.25 mm machine rolled CRCA laths, interlocked together through their entire length and jointed together at the ends by end-locks, mounted on specially designed pipe shaft of 50mm dia nominal bore MS B class pipe with brackets, plates, guide channels, stoppers, bottom locking plates and arrangements for inside & outside locking with push-pull operations including cost of hood cover and springs complete, painted with one coat of approved steel primer, locks, ball bearings, all accessories etc complete for finished item of work as per special spn: 1108 and directed by Engineer-in-charge	Rolling Shutter	15,273.27
371	3	MOULDED PVC DOOR – WOOD FREE Providing and fixing 30mm thick Rajshri Brand factory made Moulded door shutter- wood free consisting of frame made out of MS. tubes 19gauge thickness and size of 25mmX25mm for stiles, top and bottom rails. MS. Frame shall have a coat of steel primers. The inner panel shall consist of 25mm thick High density EPS conforming to IS 4671-1984 bounded with 2mm thick termite proof, water proof and fire resistant moulded Pac sheet with 2,4,6 raised panel design in different plain and / or prelam colours after routing to the moulded design on one side and 2mm plain and / or prelam Pac sheet on other side of the EPS. The edge of panel to be sealed with lipping of 10mm wide PVC sheet bottom (made by sticking 2 rigid foam sheet of 5mm thickness using Pac solvent cement) and stiles sides 25mm(5mmX5) thick and 30mm width Pac sheet fitted along Ms. Tube for lock provision for lock height 5mm thick Pac sheet of size 150mmX100mm fixed with upper and lower face of inner side of EPS Panel etc. Complete as per direction of Engineer – in-Charge, manufacture specification and drawing	Door	9,199.41
372	1	Supplying and fixing of Unplasticised Poly Vinyl Chloride (UPVC) sliding windows three track - two glass shutters sliding and one mesh shutter - 80-Series duly manufactured using UPVC reinforced profiles of 80 mm x 52 mm x 2.25 mm for outer frames, 54 mm x 38 mm x 2.25 mm for sliding shutter frames capable of mounting single glazing system structurally reinforced with hot dip galvanized up to 50 microns of minimum thickness of 1.2 mm prefabricated & welded through fusion welding the window sash shall be fitted with 5 mm thick clear float glass of reputed make and mesh shutter frame shall be 52 mm x 21.5 mm x 2 mm fitted with nylon/ polymer mesh on rollers/ pulley duly fixed with EPDM weathering seal resistant accessories like clipping locking system made of aluminium 1 No., per set of sashes and the system is to be installed at the site using anchor fasteners, silicon rubber sealant, easy glazing/ deglazing at site etc., including cost and conveyance of all materials, accessories, labour charges for transportation, erection at site with templates for casement sizing complete for finished item of work	Windows	10,225.35

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
373	4	Supply and fixing of pre-painted steel windows & top hung and fixed louvered ventilators made of pre - painted steel (base steel as per IS 513 of -0.58 mm thick 'D" quality, galvanized as per IS 277 with zinc of 120 GSM) primer coated with epoxy primer of 5-7 microns thick, finish painted with a polyester paint of 12-16 microns thick and back coated with 5-7 microns thick alkyd backer, section for outer frame of 46 x 52 mm section and for shutter of 46 x 46 mm section for mullion 46 x 70 mm, and section for beading should be 18 x 25 mm and section for louvered ventilation of 33 x 56 mm Box section and the windows panelled with 5 mm thick plain float glass & 4 mm pinhead glass for ventilators with Ethyl propylene Diamine monomer Gasket (EPDM) and the sections cut to length mitre joined with corner brocket centre mullions fixed using mullion cap and with handle made of high grade aluminium powder coated and nylon receiver, corner brackets made of CRCA with Zinc Phosphate, Mullion caps made of glass filled nylon, frames fixed to the concrete /masonry wall by means of self expanding screws including 10 mm square guard bars with 6" pitch complete for finished item of work. Windows: Double shutter 4'-0" x 4 '-0" (1219.2x1219.2mm) outer frame section size of 46 x 52 mm shutter frame section size of 46 x 46 mm Mullion section size of 46 x 70 mm.	Windows	30,317.04
374	6	Supply and fixing of pre-painted steel windows & top hung and fixed louvered ventilators made of pre - painted steel (base steel as per IS 513 of -0.58 mm thick 'D" quality, galvanized as per IS 277 with zinc of 120 GSM) primer coated with epoxy primer of 5-7 microns thick, finish painted with a polyester paint of 12-16 microns thick and back coated with 5-7 microns thick alkyd backer, section for outer frame of 46 x 52 mm section and for shutter of 46 x 46 mm section for mullion 46 x 70 mm, and section for beading should be 18 x 25 mm and section for louvered ventilation of 33 x 56 mm Box section and the windows panelled with 5 mm thick plain float glass & 4 mm pinhead glass for ventilators with Ethyl propylene Diamine monomer Gasket (EPDM) and the sections cut to length mitre joined with corner brocket centre mullions fixed using mullion cap and with handle made of high grade aluminium powder coated and nylon receiver, corner brackets made of CRCA with Zinc Phosphate, Mullion caps made of glass filled nylon, frames fixed to the concrete /masonry wall by means of self expanding screws including 10 mm square guard bars with 6" pitch complete for finished item of work. Ventilators: Fixed louvers 4'-0" x 3'-0" (1219.2 x 914.4 mm) (Box section) outer frame section size of 33 x 56 mm Mullion section size of 33 x 56 mm	Ventilators	34,868.46
375	1	Manufacture, Supply and Erection of Electric Hoist monorail of 2Ton Capacity with motor and per direction of Engineer – in-Charge, as per specification and drawing	Monorail	3,60,000.00
376	489.00	Providing, fabricating and fixing in position permanent Stainless steel supports as per details including cost of all materials, machinery, labour, cutting, bending, welding, grinding, lighting, ventilation, drainage and all other ancillary operations etc., complete with initial lead upto 1 km and all lifts as per drawing	Structural steel work	3,83,625.71
377	4581.00	Manufacture, Supply and Delivery of Cast Iron pipes and fittings (spls) confirming to IS:7181/1986, 5531/1988, 3950/1979 & C.I.D joints confirming to IS: 8794/1988 at site of work any where in A.P including loading, unloading transportation to site of work staking at site transit risk and package. and as directed by engineer-in-charge	Cast Iron Pipes & Fittings	4,24,429.65
378	2.00	Supply delivery of **300mm dia PN 1.6 (Mpa) Double Flanged Slant seat Swing Check Valve (NRV)** with body and Disc of Ductile Iron GGG-40/SG-400/15 or GGG-50/SG-500/7 or Equivalent as per IS1865, IS:3896-2 with fully encapsulated in RAL 5005 with Min. Coating thickness of 250powder coating inside and outside color Bluerubber & Fusion bonded Electro Static epoxyVulcanized EPDM microns. The EPDM rubber & Epoxy rubber & Epoxy powder should conform to W 270 standards (Drinking water application) and face to face dimensions as per EN 558-1 / DIN 3202-F6 / IS 5312 & Flange connections as per IS:1538 and including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge for isolated valves	Swing check valve	1,69,936.80
379	2.00	Supply, Delivery of **D.I double flanged Sluice Valves for 350 mm dia** conforming to IS- 14846 (with up to date amendments, if any) including gear arrangements for the following dia. as per test pressure having Body, Bonnet, Dome, Stool cover, Wedge, Stuffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ; Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel, including Transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge, etc. complete ISI marked. - PN 1.6 (MPa) -	Sluice valve	2,35,549.46
380	4.00	Lowering CI / DI pipes (all classes) and specials (fittings) for 350mm dia with flanged ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	Lowering of DI Pipes	1,381.84

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
381	28.00	Lowering CI / DI pipes (all classes) and specials (fittings) for 300mm dia with flanged ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	Lowering of DI Pipes	7,712.04
382	4.00	Jointing CI pipes, fittings and valves for 350mm dia with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994.) and as directed by Engineer -in-Charge	Jointing of DI Pipes	5,220.88
383	28.00	Jointing CI pipes, fittings and valves for 300mm dia with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994.) and as directed by Engineer -in-Charge	Jointing of DI Pipes	25,866.68
384		**Electrical and Mechanical works for IPS**		-
385	2	Design, Manufacture, Supply, Installing, testing & commissoning of Horizontal Centrifugal Pumps of suitable rpm conforming to IS: 6595-1 - Flow (lps):86.6,Head(m):9,Motor((hp)/(kW)):20/14.92	Electrical works	12,77,921.90
386	1	Manufacture, supply, delivery and fixing 2 Tonne Capacity of Chain pully block withsuitable tripple gear arrangments, lifting hooks, load chains, hand chain & locking devices with necessary mounting girder / structure, spur gear travelling trolly and all accessories including cost and coveyance of all materials, labour charges for fixing and other operational charges etc., complete for finished item of work as per approved drawing and as directed by the Engineer-in-Charge	Civil work	36,900.00
387	1.00	Supply installation testing of 3 phase 415 V 4 wire free standing In doortype Floor mounted MCC made out of 14/16 SWG MS sheet after seventank process and painting with epoxy powder coating including allswitchgear as given below. With Suitable rating TPN Al bus bar (at therating of 0.8/sqmm) supported as specified and consisting of theswitchgear as mentioned below. The size of all panel mounting meters 200A TP MCCB as Incomer 1No. Digital Metering AVF with C.T. 200/5A 1 Set. I lamps 3 Nos. 63A TP MCCB - 1N for Lighting and power load, 125A TP MCCB - 1No,MNX 70A Cont -3Nos, 30-50A OLR -1No, A Meter 1No, I Lamps -3Nos, Push Buttons -2Nos, & Timer - 1No., for 20HP Starter 3	Electrical works	1,90,000.00
388	7.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means upto 3mts depth for trenches as per drawing and technical specification including dewatering, setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the suitable excavated earth to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	936.39
389	1.00	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	341.72
390	25.00	Manufacture, Supply, & Delivery of 63 mm dia HDPE PE - 80 Grade (4Kg/Sqcm) Pipes conforming to IS 4984 - 1995 including transportation to anywhere in A.P, unloading & stacking and as directed by Engineer - in - Charge -	HDPE Pipe	2,300.75
391	25.00	Laying and jointing of 63mm HDPE pipes by butt fusion welding as per IS:7634-Part-II/1975 as amended from time to time to the alignment and gradient and testing the pipe line to the required pressure and as directed by the Engineer-in-Charge.	HDPE Laying & Jointing	740.00
392	25.00	Supply & Transportation of 1RX35 Sqmm 3.5 Core XLPE insulated, 1100V grade armoured aluminium cable as per specification confirming to IS:7098 (Part - I) and as directed by engineer-in-charge.	Electrical works	8,700.00

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
393	2.00	Supply and Fixing of single compression brass cable glands for 3.5 core XLPE armoured cable from 25 Sqmm to 50.0 Sq.mm with brass washers completeand as directed by engineer-in-charge.	Electrical works	414.00
394	6.00	Supply and fixing of crimping type copper lugs confirming to I.S specifications for cable of 35 Sq.mm including nuts and bolts with connections. (Feeder piller to PCC Panel)	Electrical works	265.86
395	45.00	Supply and fixing of 10 Sqmm 4 Core XLPE insulated, 1100V grade armoured aluminum cable as per specification confirming to IS:7098 (Part - I)./1554-I (PCC Panel to motors)	Electrical works	8,793.90
396	2.00	Supply and Fixing of Single compression brass cable glands for 3 core XLPE armoured cable from 15 mm to 17 mm dia with brass washers completete. (PCC Panel to motors)	Electrical works	112.00
397	24.00	Supply and fixing of crimping type aluminium lugs confirming to I.S specifications for cable upto 16 Sq.mm including nuts and bolts with connections (PCC Panel to motors)	Electrical works	450.00
398	15.00	Supply & Transportation of 3CX6 Sqmm 4 Core XLPE insulated, 1100V grade armoured alluminium cable as per specification confirming to IS:7098 (Part - I) (PCC Panel to motors)	Electrical works	2,488.20
399	2.00	Supply and Fixing of single compression brass cable glands for 3 core XLPE armoured cable from 15 mm to 17 mm dia with brass washers complete. (PCC Panel to motors)	Electrical works	112.00
400	12.00	Supply and fixing of crimping type aluminium lugs confirming to I.S specifications for cable upto 16 Sq.mm including nuts and bolts with connections. (PCC Panel to motors)	Electrical works	163.56
401	50.00	Supply, transportation & installation of 100mm x 50mm x 1.6mm of Hot Dipped Galvanized Iron perforated cable trays without cover, including horizontal and vertical bends, reducers tees, cross members and other accessories as required and duly suspended from the ceiling/Wall with suspenders etc., complete finished item of work as directed by Engineer-in-charge.	Electrical works	21,189.00
402	4.00	Providing independent earthing for Important equipment with 40mm dia 'B' class 2.5m long G.I pipe and 19mm dia 'B' class G.I pipe of 0.3mtr. long connected with reducer providing G.I funnel with mesh enclosed in C.C.Chamber of 400m x 400m x 400mm with R.C.C. Slab cover duly providing staggered holes filling with salt and charcoal from the bottom of the pipe giving earth connection from electrode through G.I strip of 40 x 6mm x 200mm length with all accessories and labour charges complete, as per IS specifications 732/1982 (Part II) complete finished item of work as directed by Engineer-in-charge.	Electrical works	27,774.25
403	50.00	Supply and laying of following sizes Earth wire/Strip in horizontal /Vertical run in Ground/surface/Recess including, riveting, soldering, saddles, making connection etc as required -25mm x 6mm GI Flat (1.18Kgs/1Mtr)	Electrical works	5,510.50
404	2.00	Supply and fixing of ABC stored pressure squeeze grip type fire extinguishers, 9 kg capacity, IS:15683 : 2006, filled with ABC Mono Ammonium Phosphate base powder-90 complete with discharge hose and wall mounting bracket, 2mm Mild Steel, EPDM Rubbers, Pressure Guage, which work effectively on all class of fires (A, B, C & Electrical fires) with 5 years warranty Including transportation to site, all taxes and all labour charges etc., complete and as directed by the Engineer-in-charge	Electrical works	26,442.76
405	2.00	Supply and fixing of ISI mark (IS:15683) Mono ammonium phosphate powder 90 (MAP) 2 Kg Fire extinguisher, stored pressure type, pressure gauge, gross wt. 3.6 kg, empty wt.1.6 kg, Discharge time minimum 8 sec, controllable discharge mechanism, range min. 2 mts applicable on classes A,B, C & electrically started fire, A rating -2 A, B rating -21 B, can construction: Deep drawn and Co2 mig welding, Valve construction: Forging & Machining, internal coating of can: Epoxy powder coating, External coating of Can:Epoxy polyster powder coating, sheet metal thickness:1.60mm, Helium leak detection tested with 5 years warranty Including transportation, all taxes and all labour charges etc complete and as directed by the Engineer-in-charge	Electrical works	12,883.94

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
406	4.00	Supply and fixing of 4Nos of 9 Ltrs capacity round bottom sand buckets along with bucket sand, Fire buckets with round bottom type enamel painted, white inside & red out side and letter FIRE inblack out side & Handle with mounting bracket etc., complete and as directed by the Engineer-in-charge	Electrical works	6,898.72
407	1.00	Supply of 6mmx1mx2m insulation Rubber mat as per IS 15652:2006 up to 11 kV level complete and as directed by the Engineer-in-charge	Electrical works	570.00
408		**Internal Wiring**		-
409	20	Supply of ISI 25mm outer dia heavy (2.20mm thickness) grade with IS:9537 part 3 regid PVC pipe.	ISI 25mm outer dia PVC pipe.	1,045.20
410	3	Supply of 19/20mm PVC Flexible Pipe	19/20mm PVC Flexible Pipe	57.93
411	10	Supply of PVC Junction Boxes Deep size 25mm.	PVC Junction Boxes Deep size 25mm.	318.10
412	6	Supply of 25mm PVC Flexible Couplings	25mm PVC Flexible Couplings	143.16
413	5	Supply of 25mm dia 1.5mm thick PVC Bends.	25mm dia 1.5mm thick PVC Bends.	68.15
414	4	Supply of 6" x 6" Metal Box	6" x 6" Metal Box	386.28
415	2	Supply of T.W.Deep Box of Size 6" x 6"	T.W.Deep Box of Size 6" x 6"	59.08
416	1	Supply of 4" x 7" Metal Box	4" x 7" Metal Box	82.94
417	2	Supply of T.W.Deep Box of Size 4" x 7"	T.W.Deep Box of Size 4" x 7"	54.54
418	2	Supply of No.8 Screws of 25mm	No.8 Screws of 25mm	2.20
419	75	Supply of 36/0.3mm (2.5 Sqmm) FRLS / HFFR / ZHFR PVC insulated 1100V grade as perIS:694/1990 specification for Copper cable.	36/0.3mm (2.5 Sqmm) FRLS / HFFR / ZHFR PVC insulated Copper cable.	2,816.24
420	12	Supply of 6A 1 Way flush type Swich.	6A 1 Way flush type Swich.	245.40
421	2	Supply of 6A 3/2 pin flush type Socket with shutter.	6A 3/2 pin flush type Socket with shutter.	61.36

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
422	1	Supply of 6-32A 10KA DP MCB, C/D Curve ISI	6-32A 10KA DP MCB, C/D Curve ISI	786.22
423	4	Supply of 6-32A 10KA SP MCB, C/D Curve ISI Mark.	6-32A 10KA SP MCB, C/D Curve ISI Mark.	1,036.16
424	1	Supply of 4 Way SPN DB with IP 20 Protection as per IS:13032 and suitable for 4Nos S.P out goings and for 1 No Incommer etc complete.	4 Way SPN DB	1,255.45
425	7	Supply, Transportation and fixing of **6W** LED Down lighter, suitable for Recessed / Surface mounting made of diecast alluminium body with powder coating, acrylic diffuser with Driver, operating voltage range of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV, THD<10% with high power LED's having efficacy of > 120 lumins / watt, CCT: 3000K - 5700K, minimum CRI > 70, Luminaire performance complies to IS 10322 (Part 5 / Sec-3) etc., complete	6W LED Down lighter	4,151.49
426	2	Supply of 48" (1200mm) Sweep ISI mark Ceiling Fan as per IS 374 - 1979 and, with double ball bearings, power input not more than 50W , air delivery more than 200 cubic meter/min but without Regulator	Ceiling Fan	7,832.62
427	2	Supply of 9" (225mm), Light duty exhaust fan with double ball bearing and wire guard etc complete.	Exhaust fan	3,526.60
428	2.00	Fabrication, Transportation and supply of hot-dip galvanized Octogonal Pole with BSEN - 10025 grade S 355 JO steel plate for shaft, IS 2062 for base plate with door opening arrangement, including the supply of suitable boards with bakelite sheet as per IS specification suitable to withstand the wind speed of 180 KMPH for 7.5 Mtrs height Pole having dimensions Bottom 130 mm,. Top 70mm with 3mm thick, base plate 220 x 220 x 12mm and 4 Nos of M20 x 700 long 'J' bolts along with template.	Electrical works	31,453.18
429	2.00	Supply and transportation of 20 W LED Street light Luminaire made of pressure diecast alluminium body with powder coated, having protective toughned glass/ ploy carbonate, Supply Input voltage 120 - 270 V AC, P.F > 0.90, high power LED's having efficacy >120 lumines/watt, System efficacy >95lm/W and junction temprature < 70°C, with Ingrees protection IP65, Driver surge protection 4KV, external Surge protection ≥ 5KV with optics distribution Type II medium, THD<10% at 110 Volts AC, driver efficiency >90%, CCT: 3000K - 5700K, minimum CRI>70, etc., complete	Electrical works	3,465.26
430	2.00	Fabrication, Transportation and supply of 1.0 Mtr Length Single Arm Bracket made with MS galvanized 40mm / 50mm dia Pipe.	Electrical works	3,476.62
431	2.00	Foundation and erection charges with special T&P,for 9.00Mtrs / 10Mtrs long Octagonal / Conical pole duly erecting on base plate 290mm x290mm x 16mm thick duly providing 4 Nos foundation bolts with nuts with providing of 0.60Mtr x 0.60Mtrs x 1.40 Mtr size M20 cc work vibrated concreting mixing with necessary steel (15kgs) reinforcement and curing for 7 days as directed by the field engineers during execution including excavation of Earth/BT all labour charges and cost and conveyance of materials etc., complete.	Electrical works	13,227.06
432	1.00	Multi Rake Coarse Screen Actual Capacity 7.48 MLD ; SW 900 Screen Real Length- 7573mm ;Bar Spacing -20 mm; Width & height of the filtering mesh Refer Dwg, Inclination angle - 75 Degree; MOC OF SCREEN Material of Mesh;SS 304;Material of Other parts (As per Tender requirement) SS 304;Nominal Power 0.75 kW; Ingress protection IP 55	Multi rack screen	16,40,000.00
433	1	Supply, Installation, Testing aand Commissioning of Packaged two staged Biological Odor Control Unit of flow (340.1cum/h)-The minimum H2S removal efficiency to be 99% or an outlet concentration of 0.1 ppm, whichever is greater. System to be pre-assembled, piped, wired, and factory tested to facilitate installation and start-up at the jobsite.	Odour control unit	54,36,000.00
434	1	Design, provide and install automation SCADA (Supervised Control and Data Acquisition) of sewerage pumps to link all the components (Flow Meters, Level Sensors, Pump controls, screen chambers, etc.,) of the sewerage Intermediate pumping station and all the mentioned components shall be capable to control and monitor the parameters from at SCADA room/Master Control Centre	SCADA	44,98,000.00
435		**REUSE**		-

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
436	13351.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means upto 3mts depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	17,85,963.27
437	13199.00	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	45,10,362.28
438	40397.00	Manufacture, Supply, & Delivery of 50 mm OD HDPE PE - 100 Grade (10Kg/Sqcm) Pipes conforming to IS 4984 - 2016 including transportation to anywhere in A.P, unloading & stacking and as directed by Engineer - in - Charge -	HDPE Pipe	46,81,608.33
439	4719.00	Manufacture, Supply, & Delivery of 75 mm OD HDPE PE - 100 Grade (10Kg/Sqcm) Pipes conforming to IS 4984 - 2016 including transportation to anywhere in A.P, unloading & stacking and as directed by Engineer - in - Charge -	HDPE Pipe	12,70,685.13
440	248.00	Manufacture, supply, & delivery of HDPE PE - 100 Grade fittings i.e., 50 mm Long Necks conforming to IS 4984 - 2016 including transportation to anywhere in AP. and as directed by the Engineer-in-Charge.	HDPE Specials	23,949.36
441	11.00	Manufacture, supply, & delivery of HDPE PE - 100 Grade fittings i.e., 75 mm Long Necks conforming to IS 4984 - 2016 including transportation to anywhere in AP. and as directed by the Engineer-in-Charge.	HDPE Specials	1,612.16
442	30.00	Manufacture, supply, & delivery of HDPE PE - 100 Grade fittings i.e., 50 mm End Caps conforming to IS 4984 - 2016 including transportation to anywhere in AP. and as directed by the Engineer-in-Charge.	HDPE Specials	2,147.40
443	3.00	Manufacture, supply, & delivery of HDPE PE - 100 Grade fittings i.e., 75 mm End Caps conforming to IS 4984 - 2016 including transportation to anywhere in AP. and as directed by the Engineer-in-Charge.	HDPE Specials	316.98
444	60.00	Manufacture, supply, & delivery of HDPE PE - 100 Grade fitting i.e., 50mm x 63mm Reducers conforming to IS 4984 - 2016 including transportation to anywhere in AP. and as directed by the Engineer-in-Charge.	HDPE Specials	5,794.20
445	60.00	Manufacture, supply, & delivery of HDPE PE - 100 Grade fittings i.e., 63mm x 75mm Reducers conforming to IS 4984 - 2016 including transportation to anywhere in AP. and as directed by the Engineer-in-Charge.	HDPE Specials	8,452.80
446	433.00	Manufacture, supply, & delivery of HDPE PE - 100 Grade fittings i.e., 50mm Equal Tee conforming to IS 4984 - 2016 including transportation to anywhere in AP. and as directed by the Engineer-in-Charge.	HDPE Specials	58,541.60
447	6.00	Manufacture, supply, & delivery of HDPE PE - 100 Grade fittings i.e., 75mm Equal Tee conforming to IS 4984 - 2016 including transportation to anywhere in AP. and as directed by the Engineer-in-Charge.	HDPE Specials	1,567.86
448	42.00	Manufacture, supply, & delivery of HDPE PE - 100 Grade fittings i.e., Branch Tee of size 75x75x50mm conforming to IS 4984 - 2016 including transportation to anywhere in AP. and as directed by the Engineer-in-Charge.	HDPE Specials	10,975.02
449	131.00	Manufacture, supply, & delivery of HDPE PE - 100 Grade fittings i.e., 50 mm dia Bends conforming to IS 4984 - 2016 including transportation to anywhere in AP. and as directed by the Engineer-in-Charge.	HDPE Specials	11,014.48
450	131.00	Manufacture, supply, & delivery of HDPE PE - 100 Grade fittings i.e., 50mm M.S.Flange conforming to IS 4984 - 2016 including transportation to anywhere in AP. and as directed by the Engineer-in-Charge.	HDPE Specials	15,478.96
451	14.00	Manufature, Supply and delivery of 100mm dia Centrifugally Cast(Spun) Ductile Iron Pressure Pipes for Water, Gas and Sewerage with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K7 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation and as directed by the Engineer - in - charge.	DI Pipes	19,337.36

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452	153.00	Manufature, Supply and Delivery of Centrifugal Cast (spun) Ductile Iron fittings -DI Double Socket Bends,Tees,Tapers-PN16 below 500 mm dia size suitable for DI K7 pipes conforming to IS: 9523/2000 having dimensions as per BIS, with zinc coating externally and inside mortar lining (with finishing as per clause 13/IS9523/2000) including transportation to site, unloading & stacking and as directed by the Engineer - in - charge	DI Fittings	23,565.06
453	7.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for 100mm dia Pipeline,TEE's,Bend's,Taper's,Flanged socket per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	DI Fittings	556.71
454	58397.00	Laying and jointing of 50mm HDPE pipes by butt fusion welding as per IS:7634-Part-II/1975 as amended from time to time to the alignment and gradient and testing the pipe line to the required pressure and as directed by the Engineer-in-Charge.	HDPE Laying & Jointing	17,28,551.20
455	5155.00	Laying and jointing of 75mm HDPE pipes by butt fusion welding as per IS:7634-Part-II/1975 as amended from time to time to the alignment and gradient and testing the pipe line to the required pressure and as directed by the Engineer-in-Charge.	HDPE Laying & Jointing	1,64,238.30
456	1350.00	Lowering CI / DI pipes (all classes) and specials (fittings) for 100mm dia with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by Engineer -in-Charge	DI Pipe Laying	89,856.00
457	225.00	Jointing CI / DI pipes and fittings for 100mm dia with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997). and as directed by Engineer-in-charge.	DI Pipe Jointing	40,081.50
458	0.21	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20mm and below conforming to MoRT&H 12.8G or as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer-in-Charge For **Thrust Blocks**	Design Mix Concrete M30 Grade	1,143.71
459	12.32	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars Fe - 500/500D/550 grade as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	Steel	1,126.66
460	3056.00	Manufacture, Supply and Delivery of 300mm dia ID RCC NP3 class Socket and Spigot pipes conforming to B.I.S. 458/2003 including loading transportation to site, unloading and stacking etc., and as directed by Engineer-in-charge for road crossing of utilities Rate per meter of effective length)	RCC Pipe Socket and Spigot pipes	46,96,308.00
461	33.00	Supply and delivery of **50mm dia PN 1.6 (MPa) (without bypass) "Resilient Seated Soft Sealing" Gate Valves (Sluice Valves)** for with Body and Bonnet of Ductile Iron GGG-40/SG-400/15 or GGG-50/SG-500/7 or Equivalent as per IS1865, IS:3896-2 and Wedge fully Rubber Lined with food grade quality grade W270 grade EPDM, Replaceable Spindle Nut without gland packing with 3-O ring protection system on the Shaft and Seals of NBR. The Valves should be Vacuum tight and 100% leak proof with face to face dimensions as BS:5163 Type A/IS:14846. All the valves should be with fusion bonded Electrostatic Powder coating both inside and outside (Min 250 Microns)-RAL 5005 with Pocket Less Straight through body Passage conforming to Design standards of DIN-3202F4/BS:5163 Type A Flange drilling as per IS - 1538, including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge.- Scour Valve:	Scour Valve	3,01,910.07

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
462	1.00	Supply and delivery of **100mm dia PN 1.6 (MPa) (without bypass) "Resilient Seated Soft Sealing" Gate Valves (Sluice Valves)** for with Body and Bonnet of Ductile Iron GGG-40/SG-400/15 or GGG-50/SG-500/7 or Equivalent as per IS1865, IS:3896-2 and Wedge fully Rubber Lined with food grade quality grade W270 grade EPDM, Replaceable Spindle Nut without gland packing with 3-O ring protection system on the Shaft and Seals of NBR. The Valves should be Vacuum tight and 100% leak proof with face to face dimensions as BS:5163 Type A/IS:14846. All the valves should be with fusion bonded Electrostatic Powder coating both inside and outside (Min 250 Microns)-RAL 5005 with Pocket Less Straight through body Passage conforming to Design standards of DIN-3202F4/BS:5163 Type A Flange drilling as per IS - 1538, including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge.- Scour Valve:	Scour Valve	15,457.15
463	2.00	Manufature, Supply and delivery of 1.0 mt length of 100 mm nominal dia Centrifugally Cast (Spun) Ductile Iron Pressure pipes with Flanged (welded) End for Water, Gas and Sewerage to IS: 8329/2000 for classification K9 with cement mortor lining inside the pipes with outside zinc coating, including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge	DI Flanged Pipes	9,131.06
464	33.00	Lowering, keeping in position and fixing of **50mm dia Scour Valves** for 50,75mm Diameter Pipe (with cap / with hand wheel & Reflex valves) excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Valves	6,538.29
465	1.00	Lowering, keeping in position and fixing of **100mm dia Scour Valves** for 150 DI (with cap / with hand wheel & Reflex valves) excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Valves	263.10
466	1.00	Lowering, keeping in position and fixing of Specials 100mm dia Duct foot bend excluding cost of bolts, nuts, rubber insertion, sluice valve and tail pieces and as directed by Engineer-in-charge	Lowering of Duck foot Bends	263.10
467	2.00	Lowering **100 mm Dia C.I. / D.I. Pipes (all classes) and specials (fittings) with flanged ends** carefully into trench and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Reference to specifications. BIS No.3114/1994)	Lowering of Flanged Pipes	174.26
468	66.00	Jointing 50mm dia Scour Valves for 50,75mm Diameter pipe D/F Valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	15,810.96
469	2.00	Jointing 100mm dia Scour Valves for 150 DI D/F Valves with flanged ends including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	763.96
470	2.00	Jointing with 100mm dia Double flanged pipe for valves including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994). -	Jointing of Flanged Pipes	763.96
471	1.00	Jointing of DI Fittings 100mm dia Duct foot bend including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994).	Jointing of Flanged Pipes	381.98
472	65.00	Supply and delivery of **Single Chamber For 50mm dia Air Valves** PN-1.6 on 50,75mm Diameter Pipe Air Valve PN-1.6 two in numbers with Body and cover in Ductile Iron of grade SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions. All internal parts such as float, shell etc., all cover bolts, of stainless steel, and Gaskets and seals of EPDM food grade quality Epoxy powder coating (EP-P) inside and outside colour blue. Drilled as per IS:1538, including Transportation etc complete as directed by the Engineer - in - charge.	Air Valve	10,44,881.50
473	2.00	Supply and delivery of **Single Chamber For 80mm dia Air Valves** PN-1.6 on 100 DI Air Valve PN-1.6 two in numbers with Body and cover in Ductile Iron of grade SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions. All internal parts such as float, shell etc., all cover bolts, of stainless steel, and Gaskets and seals of EPDM food grade quality Epoxy powder coating (EP-P) inside and outside colour blue. Drilled as per IS:1538, including Transportation etc complete as directed by the Engineer - in - charge.	Air Valve	55,114.64
474	65.00	Jointing **DI Air Valves and Isolated Valves with flanged ends** For 50mm dia Air Valves PN-1.6 on 50,75mm Diameter Pipe including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete as directed by the Engineer - in - charge . (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	11,108.50

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475	2.00	Jointing **DI Air Valves and Isolated Valves with flanged ends** For 80mm dia Air Valves PN-1.6 on 100 DI including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete as directed by the Engineer - in - charge . (Reference to specifications. BIS No.3114/1994).	Jointing of Valves	341.80
476	65.00	Supply and delivery of 50mm dia DI D/F Gate Valves (Isolation Valves) (Soft Seated) PN-1.6 on 50,75mm Diameter Pipe Resilient seated soft sealing gate valves with body bonnet of ductile cast iron of grade GGG40/ SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F 4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO inclusive transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work.	Jointing of Valves	5,94,671.35
477	2.00	Supply and delivery of 80mm dia DI D/F Gate Valves (Isolation Valves) (Soft Seated) PN-1.6 on 100 DI Resilient seated soft sealing gate valves with body bonnet of ductile cast iron of grade GGG40/ SG 400/12 or equivalent grade as per I.S.3896-part2-1985 and subsequent revisions, wedge fully rubber lined with EPDM food grade quality and seals of NBR and the valves should be of vaccum tight and 100% leak proof with face to face dimensions as per BS5163-89/IS14846-2000/DIN 3202 F 4. All the valves should be with Electrostatic powder coating both inside and outside pocket less body passage. Drilled as per IS:1538/ISO inclusive transportation to work site, loading, unloading (reference to specifications BIS No.3114/1994) for finished item of work.	Jointing of Valves	23,673.04
478	34.00	Construction of **RCC Scour Valve chamber of size 1.3x1.2x1.65m for 50mm,75mm,100mm & 150mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 150mm thick, RCC side walls of 150mm thick, RCC cover slab of 200mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Scour Valve chambers	14,98,702.32
479	67.00	Construction of **RCC Air Valve chamber of size 1.25x0.95x1.70m for50mm,75mm,100mm & 150mm Dia pipe** including excavation, backfilling to reqired compaction, providing and laying sand bedding of 300mm thick, PCC levelling course of 100mm thick using M 10 grade, RCC Raft slab of 125mm thick, RCC side walls of 125mm thick, RCC cover slab of 100mm thick with M30 grade desig mix concrete corresponding to IS 4926 & 456 with cement content of 407 kg/cum concrete , including cost and conveyance of all materials, labour charges, including centering, HYSD Reinforcement of Fe - 500D, concrete placing, vibrating, curing and SFRC Manhole Covers and frame of size 24x24 HD20 confirming to BIS 12592 Complete as per the approved drawing for the finishes item of work as directed by the Engineer-in-charge.	Air Valve chambers	22,12,371.49
480	324.00	Supply and fixing of HSC with following items for - 63 x 1/2" dia connection a)Electro Fusion Ferrule Tapping saddle manufactured from virgin resin of PE-80/PE-100 having blue/black color using food grade compounded raw material with quality assurance certificate from quality agencies like CIPET etc. For usage in drinking water system and having working pressure of 10 bar. b)The Brass Ferrule -1/2" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D20 mm X 1/2" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 20mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	3,25,014.12

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481	324.00	Supply and fixing of HSC with following items for - 63 x 3/4" dia connection a)Electro Fusion Ferrule Tapping saddle manufactured from virgin resin of PE-80/PE-100 having blue/black color using food grade compounded raw material with quality assurance certificate from quality agencies like CIPET etc. For usage in drinking water system and having working pressure of 10 bar. b)The Brass Ferrule -3/4" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D25 mm X 3/4" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 25mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	4,43,215.80
482	324.00	Supply and fixing of HSC with following items for - 63 x 1" dia connection a)Electro Fusion Ferrule Tapping saddle manufactured from virgin resin of PE-80/PE-100 having blue/black color using food grade compounded raw material with quality assurance certificate from quality agencies like CIPET etc. For usage in drinking water system and having working pressure of 10 bar. b)The Brass Ferrule -1" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D32 mm X 1" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 32mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	6,47,309.88
483	29.00	Supply and fixing of HSC with following items for - 75 x 1/2" dia connection a)Electro Fusion Ferrule Tapping saddle manufactured from virgin resin of PE-80/PE-100 having blue/black color using food grade compounded raw material with quality assurance certificate from quality agencies like CIPET etc. For usage in drinking water system and having working pressure of 10 bar. b)The Brass Ferrule -1/2" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D20 mm X 1/2" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 20mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	29,519.10
484	29.00	Supply and fixing of HSC with following items for - 75 x 3/4" dia connection a)Electro Fusion Ferrule Tapping saddle manufactured from virgin resin of PE-80/PE-100 having blue/black color using food grade compounded raw material with quality assurance certificate from quality agencies like CIPET etc. For usage in drinking water system and having working pressure of 10 bar. b)The Brass Ferrule -3/4" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D25 mm X 3/4" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 25mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	40,065.82

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485	29.00	Supply and fixing of HSC with following items for - 75 x 1" dia connection a)Electro Fusion Ferrule Tapping saddle manufactured from virgin resin of PE-80/PE-100 having blue/black color using food grade compounded raw material with quality assurance certificate from quality agencies like CIPET etc. For usage in drinking water system and having working pressure of 10 bar. b)The Brass Ferrule -1" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D32 mm X 1" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 32mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	57,872.40
486	8.00	Supply and fixing of HSC with following items for - 100 x 1/2" dia connection a)House service connections (Composite strap saddle for DI/CI pipes) composite strap saddle shall be of wrap around design pN-16 rating. Body shall be manufactured using virgin compounded PE 80/PE 100 polymer with stainless steel 304 grade stirrup plate mounted with PE straps (Engineering Plastic) with Nut bolt joint, sealing between the saddle and mains shall be obtained by using an elastomer seal (Underneath projection for self interlocking). b)The Brass Ferrule -1/2" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D20 mm X 1/2" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 20mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	9,815.60
487	8.00	Supply and fixing of HSC with following items for - 100 x 3/4" dia connection a)House service connections (Composite strap saddle for DI/CI pipes) composite strap saddle shall be of wrap around design pN-16 rating. Body shall be manufactured using virgin compounded PE 80/PE 100 polymer with stainless steel 304 grade stirrup plate mounted with PE straps (Engineering Plastic) with Nut bolt joint, sealing between the saddle and mains shall be obtained by using an elastomer seal (Underneath projection for self interlocking). b)The Brass Ferrule -3/4" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D25 mm X 3/4" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 25mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	12,834.16

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488	8.00	Supply and fixing of HSC with following items for - 100 x 1" dia connection a)House service connections (Composite strap saddle for DI/CI pipes) composite strap saddle shall be of wrap around design pN-16 rating. Body shall be manufactured using virgin compounded PE 80/PE 100 polymer with stainless steel 304 grade stirrup plate mounted with PE straps (Engineering Plastic) with Nut bolt joint, sealing between the saddle and mains shall be obtained by using an elastomer seal (Underneath projection for self interlocking). b)The Brass Ferrule -1" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D32 mm X 1" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 32mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	17,773.60
489	1083.00	Manufacturing, Supply, Laying and jointing of MDPE Blue Pipe 40mm as per ISO 4427 Rev 1. for conveyance of potable water including fittings and specials with the pressure rating of 40mm will be 4kg/cm. Certificate for compliance of testing these fittings and pipe as per BS-6920 by designated laboratories to be produced etc., complete and as directed by Engineer-in-charge	MDPE Pipe	1,02,885.00
490	5356.00	Supply, laying and fixing of Dripper for each side of 25m ROW, 17 ROW, and 15.6 ROW (consider 9Nos Dripper for every 15m interval) including all material and labour charges and other incidental charges etc., complete and as directed by Engineer-in-charge.	Drippers	6,427.20
491	64902.00	Manufacture, supply,delivery, Laying & Jointing of 16mm PE flexible pipes conforming to including transportation all materials and labour charges and other incidental charges etc., complete and as directed by Engineer-in-charge.	flexible pipes	5,58,157.20
492	1082.00	Supply and fixing of 16mm Start Connector/takeoff including all materials and labour charges and other incidental charges etc., complete and as directed by Engineer-in-charge.	Specials	757.40
493	1082.00	Supply, delivery and fixing of 16mm End Cap including all materials and labour charges and other incidental charges etc., complete and as directed by Engineer-in-charge.	Specials	757.40
494	38.00	Supply and fixing of HSC with following items for - 63 x 1/2" dia connection a)Electro Fusion Ferrule Tapping saddle manufactured from virgin resin of PE-80/PE-100 having blue/black color using food grade compounded raw material with quality assurance certificate from quality agencies like CIPET etc. For usage in drinking water system and having working pressure of 10 bar. b)The Brass Ferrule -1/2" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D20 mm X 1/2" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 20mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	38,118.94

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495	2.00	Supply and fixing of HSC with following items for - 63 x 3/4" dia connection a)Electro Fusion Ferrule Tapping saddle manufactured from virgin resin of PE-80/PE-100 having blue/black color using food grade compounded raw material with quality assurance certificate from quality agencies like CIPET etc. For usage in drinking water system and having working pressure of 10 bar. b)The Brass Ferrule -3/4" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D25 mm X 3/4" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 25mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	2,735.90
496	2.00	Supply and fixing of HSC with following items for - 63 x 1" dia connection a)Electro Fusion Ferrule Tapping saddle manufactured from virgin resin of PE-80/PE-100 having blue/black color using food grade compounded raw material with quality assurance certificate from quality agencies like CIPET etc. For usage in drinking water system and having working pressure of 10 bar. b)The Brass Ferrule -1" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D32 mm X 1" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 32mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	3,995.74
497	10.00	Supply and fixing of HSC with following items for - 75 x 1/2" dia connection a)Electro Fusion Ferrule Tapping saddle manufactured from virgin resin of PE-80/PE-100 having blue/black color using food grade compounded raw material with quality assurance certificate from quality agencies like CIPET etc. For usage in drinking water system and having working pressure of 10 bar. b)The Brass Ferrule -1/2" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D20 mm X 1/2" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 20mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	10,179.00
498	2.00	Supply and fixing of HSC with following items for - 75 x 3/4" dia connection a)Electro Fusion Ferrule Tapping saddle manufactured from virgin resin of PE-80/PE-100 having blue/black color using food grade compounded raw material with quality assurance certificate from quality agencies like CIPET etc. For usage in drinking water system and having working pressure of 10 bar. b)The Brass Ferrule -3/4" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D25 mm X 3/4" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 25mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	2,763.16

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499	2.00	Supply and fixing of HSC with following items for - 75 x 1" dia connection a)Electro Fusion Ferrule Tapping saddle manufactured from virgin resin of PE-80/PE-100 having blue/black color using food grade compounded raw material with quality assurance certificate from quality agencies like CIPET etc. For usage in drinking water system and having working pressure of 10 bar. b)The Brass Ferrule -1" of pressure rating PN 10, The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc., complete as specified and directed by the departmental Engineer in charge c)compression fittings -D32 mm X 1" shall comply with ISO 17885 2015, PN-16 rating and manufactured from virgin resin of PE-80 having blue color. Raw material must be WRAS approved as per BS 6920 for effect on water quality intended for human consumption. Compression fittings should have moulded in SS 304 threaded insert outlet with thread dimension confirming to IS 554/ISO 7 d) MDPE PE 80 blue pipes of 32mm dia as per ISO:4427-2007 Specifications The cost shall include testing of all materials, labor, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking and fixing etc, complete as specified and directed by the departmental Engineer in charge, but excluding all taxes.	House Service Connections	3,991.20
500		**SUMP**		-
501	490.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means upto 3mts depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	65,547.30
502	138.00	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	47,157.36
503	144.00	Providing and placing Plain Cement Concrete - Grade M10 (1:3:6) for foundations/leveling course/ under flooring bed using coarse aggregate 40mm size hard, machine crushed granite metal from approved quarry including cost and conveyance of all materials to site, machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete for finished item of work and as directed by the Engineer-in-Charge.	Plain Cement Concrete (PCC) - M10	7,82,056.80
504	124.85	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge For - Sump Foundations	Design Mix Concrete M30 Grade	9,89,681.82
505	85.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge For - Sump Walls	Design Mix Concrete M30 Grade	8,51,885.30
506	5.93	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge For - Sump Columns	Design Mix Concrete M30 Grade	72,587.35

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
507	9.21	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge For - Sump Beams	Design Mix Concrete M30 Grade	1,15,677.23
508	40.20	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but excluding all applicable taxes (excluding GST on all materials),steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge For - Sump Slab	Design Mix Concrete M30 Grade	4,58,460.50
509	28234.00	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars Fe - 500/500D/550 grade as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	Steel	25,81,999.30
510	458.00	Plastering in CM (1:3) with 12mm thick including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work. - For Internal Plastering	Plastering	2,12,562.38
511	241.00	Plastering in CM (1:3) with 12mm thick including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work. - For Ceiling	Plastering	1,14,576.22
512	699.00	Painting by providing solvent free epoxy resin primer for protective coatings – Procoat SNC or Zoriprime EPF or Equivalent (Coverage : 3 Kg unit covers about 13m2 for DFT of about 120 micron.)- in three coats for inside of the water tank including cost and conveyance of all materials and labour charges for painting, curing etc complete for finished item of work as directed by Engineer-in-charge - For Internal walls & Ceiling	Primer	1,83,913.89
513	545.00	Painting to new walls with 2 coats of water proof cement paint of apporved brand and shade over a base coat of approved cement primer grade I making 3 coats in all to give an even shade after thourughly brushing the surface to remove all dirt and remains of loose powdered materials, including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc. complete for finished item of work as per SS 912 as directed by Engineer-in-charge - For Internal walls	Painting	1,15,376.50
514	545.00	Painting walls with snowcem or other equal and approved Water Proof Cement paint over prime coat, 2 coats (all colours) including cost and conveyance of all materials to work site and all operational, incidental, labour charges, finsihing, scaffolding, lift charges, complete for finished item of work as directed by Engineer-in-charge - For Extrenal walls & Surfaces	Painting	1,20,717.50

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
515	14.83	Manufature, Supply and delivery of 250mm dia Centrifugally Cast(Spun) Ductile Iron Pressure Pipes for Water, Gas and Sewerage with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K9 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation and as directed by the Engineer - in - charge - Sump Intlet & Over Flow	DI Pipes	63,549.22
516	8.5	Manufature, Supply and delivery of 400mm dia Centrifugally Cast(Spun) Ductile Iron Pressure Pipes for Water, Gas and Sewerage with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K9 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation and as directed by the Engineer - in - charge - Sump Outlet Pipe	DI Pipes	69,718.19
517	3.5	Manufature, Supply and delivery of 200mm dia Centrifugally Cast(Spun) Ductile Iron Pressure Pipes for Water, Gas and Sewerage with Socket Spigot Ends confirming to IS: 8329/2000 in Standard Working lengths of 4.0m,5.0m,5.50m & 6.0m for classification K9 Push-On -Joint (Rubber Gasket D Jointing) with cement mortor lining inside the pipes with out side zinc coating, including transportation and as directed by the Engineer - in - charge - Sludge Outlet Pipe	DI Pipes	11,353.86
518	14.83	Lowering of 250mm dia CI, DI pipes (all classes) and specials (fittings) with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by the Engineer - in - charge.	DI Pipe Laying	3,158.20
519	8.5	Lowering of 400mm dia CI, DI pipes (all classes) and specials (fittings) with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by the Engineer - in - charge.	DI Pipe Laying	3,583.77
520	3.5	Lowering of 200mm dia CI, DI pipes (all classes) and specials (fittings) with s/s ends carefully into trenches and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Ref to specifications. BIS No: 3114/1994) and as directed by the Engineer - in - charge.	DI Pipe Laying	551.67
521	3	Jointing of 250mm dia CI, DI pipes and fittings with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997) and as directed by the Engineer - in - charge.	DI Pipe Jointing	789.78
522	2	Jointing of 400mm dia CI, DI pipes and fittings with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997) and as directed by the Engineer - in - charge.	DI Pipe Jointing	766.68
523	1	Jointing of 200mm dia CI, DI pipes and fittings with rubber gasket (push-on-joints), excluding the cost of gasket but including all sundries, filling with water, with a water lead up to 500 meters and testing to required pressure etc complete.(Reference to specifications BISNo.3114/1994/12288/1997) and as directed by the Engineer - in - charge.	DI Pipe Jointing	233.80

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
524	3	Manufacture, supply and delivery of S.B.R. Quality Rubber for 250mm dia as per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge.	Rubber Gasket	470.37
525	2	Manufacture, supply and delivery of S.B.R. Quality Rubber for 400mm dia as per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge.	Rubber Gasket	668.06
526	1	Manufacture, supply and delivery of S.B.R. Quality Rubber for 200mm dia as per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge.	Rubber Gasket	139.75
527	158.00	Providing and Constructing 30 cm thick dry rubble stone pitching including cost of all materials,labour,hand packing,finishing etc.,complete finished (rubble stones : 0.33 cum/sqm)	Rubble stone	96,180.92
528	227.00	Laying of a Poly sheet 125 microns to prevent escape of the embankment material through the voids of the stone pitching/cement concrete blocks as well as to allow free movement of water without creating any uplift head on the pitching as per Tech Specifications in Section 700 & 2504 MORTH	Civil Works	13,229.56
529	106.00	Providing, fabricating and fixing in position permanent Stainless steel supports as per details including cost of all materials, machinery, labour, cutting, bending, welding, grinding, lighting, ventilation, drainage and all other ancillary operations etc., complete with initial lead upto 1 km and all lifts as per drawing	Civil Works	83,158.06
530	1	Supply and fixing water level indicator containing indicator with suitable probe height with chain pulley arrangements and and using 15 standard cable as per site condition including fixing in position encasing the cable inside the reservoir with 4 Kg/Sqcm 200 mm dia PVC pipe conforming to IS 1230 drilling hole in roof slab including all acccessories etc., complete.	Water level Indicator	19,500.00
531	24	Supply & Fixing of Mosquito Mesh in required position as per drawing and as directed as engineer-in-charge	Civil Works	5,164.80
532		**Pump House-1 & 2**		-
533	318.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means upto 3mts depth for strom water drains as per drawing and technical specification including dewatering, setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the suitable excavated earth to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	42,538.86

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
534	73.00	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	24,945.56
535	13.00	Providing and placing Plain Cement Concrete - Grade M10 (1:3:6) for foundations/leveling course/ under flooring bed using coarse aggregate 40mm size hard, machine crushed granite metal from approved quarry including cost and conveyance of all materials to site, machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete for finished item of work and as directed by the Engineer-in-Charge.	Plain Cement Concrete (PCC) - M10	70,602.35
536	26.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but including all applicable taxes (excluding GST on all materials) etc., and overheads & contractors profit complete but excluding steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - For Foundations & Footings (Pump House)	Design Mix Concrete M30 Grade	2,06,107.72
537	16.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but including all applicable taxes (excluding GST on all materials) etc., and overheads & contractors profit complete but excluding steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - For Column (Pump House)	Design Mix Concrete M30 Grade	1,95,851.20
538	4.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but including all applicable taxes (excluding GST on all materials) etc., and overheads & contractors profit complete but excluding steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - For Plinth Beams (Pump house)	Design Mix Concrete M30 Grade	41,252.53
539	15.00	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but including all applicable taxes (excluding GST on all materials) etc., and overheads & contractors profit complete but excluding steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - For Beams (Pump house)	Design Mix Concrete M30 Grade	1,88,399.40
540	38.93	Supply and placing of approved design Mix for Reinforced cement Concrete of M30 grade corresponding to IS 4926 & 456 with cement content of 400 kg/cum concrete and approved mix using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using 20mm graded metal for approved quarry, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating & curing, centering & shuttering, including cost of all other incidental and all other operational charges of T&P required etc., for finished item of work, but including all applicable taxes (excluding GST on all materials) etc., and overheads & contractors profit complete but excluding steel reinforcement etc. complete as per drawings and and as directed by the Engineer - in-Charge - For Slabs (Pump house)	Design Mix Concrete M30 Grade	4,43,976.80

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
541	16212.00	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars Fe - 500/500D/550 grade as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	Steel	14,82,587.40
542	97.00	Providing brick work of 230mm thick in CM (1:6) prop., using common burnt clay bricks of class as per Table-1 of IS:1077-1992 Non-Modular or traditional size , including cost & conveyance of all material and labour charges, hire and operational charges etc., centering & scafolding charges, and overhead charges & Contractors profit etc., complete as per APSS No.501 and directed by engineer-in-charge.	Brick Work	8,44,479.09
543	26.00	Providing Half brick work of 110mm thick in CM (1:6) prop., using common burnt clay bricks of class as per Table-1 of IS:1077-1992 Non-Modular or traditional size , including cost & conveyance of all material and labour charges, hire and operational charges etc., centering & scafolding charges, and overhead charges & Contractors profit etc., complete as per APSS No.501 and directed by engineer-in-charge.	Brick Work	25,190.10
544	299.00	Plastering in CM (1:3) with 12mm thick including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work. - for Internal Plastering for Walls	Plastering	1,38,768.89
545	251.00	Plastering with 20mm thick double coat in CM (1:6) 16 mm thick base coat and CM (1:4) of 4mm thick top coat with dubara sponge finish including cost and conveyance of material to site, screening, and mixing mortar, laying, scaffolding, lift charges, finishing with sponge finish and watering curing, cutting grooves, including all labour charges, hire and operational charges etc., complete for finished item of work and as directed by the Engineer-in-charge of the work - for External Walls.	Plastering	1,60,045.13
546	247.00	Painting walls with snowcem or other equal and approved Water Proof Cement paint over priming coat, 2 coats (all colours) including cost and conveyance of all materials to work site and all operational, incidental, labour charges, finsihing, scaffolding, lift charges, complete for finished item of work as directed by Engineer-in-charge - For Extrenal walls & Surfaces	Walls Painting	54,710.50
547	10.00	Supply & fixing of Rolling shutter made of 80 x 1.25 mm machine rolled CRCA laths, interlocked together through their entire length and jointed together at the ends by end-locks, mounted on specially designed pipe shaft of 50mm dia nominal bore MS B class pipe with brackets, plates, guide channels, stoppers, bottom locking plates and arrangements for inside & outside locking with push-pull operations including cost of hood cover and springs complete, painted with one coat of approved steel primer, locks, ball bearings, all accessories etc complete for finished item of work as per special spn: 1108 and directed by Engineer-in-charge	Rolling Shutter	50,910.90
548	14.00	Supplying and fixing of Unplasticised Poly Vinyl Chloride (UPVC) sliding windows three track - two glass shutters sliding and one mesh shutter - 80-Series duly manufactured using UPVC reinforced profiles of 80 mm x 52 mm x 2.25 mm for outer frames, 54 mm x 38 mm x 2.25 mm for sliding shutter frames capable of mounting single glazing system structurally reinforced with hot dip galvanized up to 50 microns of minimum thickness of 1.2 mm prefabricated & welded through fusion welding the window sash shall be fitted with 5 mm thick clear float glass of reputed make and mesh shutter frame shall be 52 mm x 21.5 mm x 2 mm fitted with nylon/ polymer mesh on rollers/ pulley duly fixed with EPDM weathering seal resistant accessories like clipping locking system made of aluminium 1 No., per set of sashes and the system is to be installed at the site using anchor fasteners, silicon rubber sealant, easy glazing/ deglazing at site etc., including cost and conveyance of all materials, accessories, labour charges for transportation, erection at site with templates for casement sizing complete for finished item of work	Windows	1,33,238.42

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
549	4.00	Supply and fixing of pre-painted steel windows & top hung and fixed louvered ventilators made of pre - painted steel (base steel as per IS 513 of -0.58 mm thick 'D" quality, galvanized as per IS 277 with zinc of 120 GSM) primer coated with epoxy primer of 5-7 microns thick, finish painted with a polyester paint of 12-16 microns thick and back coated with 5-7 microns thick alkyd backer, section for outer frame of 46 x 52 mm section and for shutter of 46 x 46 mm section for mullion 46 x 70 mm, and section for beading should be 18 x 25 mm and section for louvered ventilation of 33 x 56 mm Box section and the windows panelled with 5 mm thick plain float glass & 4 mm pinhead glass for ventilators with Ethyl propylene Diamine monomer Gasket (EPDM) and the sections cut to length mitre joined with corner brocket centre mullions fixed using mullion cap and with handle made of high grade aluminium powder coated and nylon receiver, corner brackets made of CRCA with Zinc Phosphate, Mullion caps made of glass filled nylon, frames fixed to the concrete /masonry wall by means of self expanding screws including 10 mm square guard bars with 6" pitch complete for finished item of work. Ventilators: Fixed louvers 4'-0" x 3'-0" (1219.2 x 914.4 mm) (Box section) outer frame section size of 33 x 56 mm Mullion section size of 33 x 56 mm	Ventilators	35,207.00
550	1.00	Supply, transportation and delivery at site of 3 Phase, 50 Hz, oil immersed and naturally cooled, outdoor / Indoor type copper wound transformer designed and manufactured as per IS 2026-1977 and 1st filling of oil as per IS 335 of 1993, connected delta on primary side and Star on secondary side with additional neutral brought out on load side, 33000V / (433V / 415V) with HV tapping + or - 2.5% contineously rated for full load and temporature rise not exceeding 50°C in oil and 55°C rise by th resistance of the winding after contineous run on full load rating complete with the following standard mountings -63 KVA for PH-1	Transformer	3,92,000.00
551	1.00	Supply, transportation and delivery at site of 3 Phase, 50 Hz, oil immersed and naturally cooled, outdoor / Indoor type copper wound transformer designed and manufactured as per IS 2026-1977 and 1st filling of oil as per IS 335 of 1993, connected delta on primary side and Star on secondary side with additional neutral brought out on load side, 33000V / (433V / 415V) with HV tapping + or - 2.5% contineously rated for full load and temporature rise not exceeding 50°C in oil and 55°C rise by th resistance of the winding after contineous run on full load rating complete with the following standard mountings -100 KVA for PH-2	Transformer	5,60,000.00
552	3	Design, Manufacture, supply, Installing, testing & commissoning of Horizontal Centrifugal Pumps of suitable rpm conforming to IS: 6595-1 - Flow (LPS) 58 (208.8 Cum/Hr) ; Head 11 m; Capacity (HP/KW) 12.57 / 9.3 for PH-1	Centrifugal Pumps	8,83,253.25
553	3	Design, Manufacture, supply, Installing, testing & commissoning of Horizontal Centrifugal Pumps of suitable rpm conforming to IS: 6595-1 - Flow (LPS) 115 (414 Cum/Hr) ; Head 15 m; Capacity (HP/KW) 30 / 22 for PH-2	Centrifugal Pumps	16,37,416.95
554	2	Manufacture, supply, delivery and fixing 2 Tonne Capacity of Chain pully block withsuitable tripple gear arrangments, lifting hooks, load chains, hand chain & locking devices with necessary mounting girder / structure, spur gear travelling trolly and all accessories including cost and coveyance of all materials, labour charges for fixing and other operational charges etc., complete for finished item of work as per approved drawing and as directed by the Engineer-in-Charge	Chain pulley block	73,800.00
555	1	Supply installation testing of 3 phase 415 V 4 wire free standing In doortype Floor mounted MCC made out of 14/16 SWG MS sheet after seventank process and painting with epoxy powder coating including allswitchgear as given below. With Suitable rating TPN Al bus bar (at therating of 0.8/sqmm) supported as specified and consisting of theswitchgear as mentioned below. The size of all panel mounting meters 125A TP MCCB as Incomer 1No. Digital Metering AVF with C.T. 200/5A 1 Set. I lamps 3 Nos. 63A TP MCCB - 1N for Lighting and power load, 63A TP MCCB - 1No,MNX 25A Cont -1No, 20-33A OLR -1No, I Lamps -3Nos, Push Buttons -2Nos, for 12.5HP Starter 3 Set	MCC Panel	98,000.00

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
556	1	Supply installation testing of 3 phase 415 V 4 wire free standing In doortype Floor mounted MCC made out of 14/16 SWG MS sheet after seventank process and painting with epoxy powder coating including allswitchgear as given below. With Suitable rating TPN Al bus bar (at therating of 0.8/sqmm) supported as specified and consisting of theswitchgear as mentioned below. The size of all panel mounting meters 200A TP MCCB as Incomer 1No. Digital Metering AVF with C.T. 200/5A 1 Set. I lamps 3 Nos. 63A TP MCCB - 1N for Lighting and power load, 125A TP MCCB - 1No,MNX 70A Cont -3Nos, 30-50A OLR -1No, A Meter 1No, I Lamps -3Nos, Push Buttons -2Nos, & Timer - 1No., for 30HP Starter 3	MCC Panel	1,90,000.00
557	100	Manufacture, Supply, & Delivery of 90 mm OD HDPE PE - 100 Grade (10Kg/Sqcm) Pipes conforming to IS 4984 - 1995 including transportation to anywhere in A.P, unloading & stacking and as directed by Engineer - in - Charge -	HDPE Pipe	25,563.00
558	100	Laying and jointing of 50mm HDPE pipes by butt fusion welding as per IS:7634-Part-II/1975 as amended from time to time to the alignment and gradient and testing the pipe line to the required pressure and as directed by the Engineer-in-Charge.	HDPE Laying & Jointing	3,295.00
559	100	Supply of 2RX25 Sqmm 3.5 Core XLPE insulated, 1100V grade armoured alluminium cable as per specification confirming to IS:7098 (Part - I) (Transformer to PCC Panel)	Electrical Works	28,063.00
560	8	Supply and Fixing of single compression brass cable glands for 3.5 core XLPE armoured cable from 25 Sqmm to 50.0 Sq.mm with brass washers complete. (Transformer to PCC Panel)	Electrical Works	1,654.24
561	24	Supply and fixing of crimping type copper lugs confirming to I.S specifications for cable of 95 Sq.mm including nuts and bolts with connections. (Transformer to PCC Panel)	Electrical Works	3,026.64
562	180	Supply of 1RX 16 Sqmm 4 Core XLPE insulated, 1100V grade armoured alluminium cable as per specification confirming to IS:7098 (Part – I) (PCC Panel to motors-22KW -S&D)	Electrical Works	41,310.00
563	24	Supply and Fixing of Single compression brass cable glands for 3 core XLPE armoured cable from 8 mm to 15 mm dia with brass washers completete. (PCC Panel to motors)	Electrical Works	1,152.00

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
564	72	Supply and fixing of crimping type aluminium lugs confirming to I.S specifications for cable upto 16 Sq.mm including nuts and bolts with connections (PCC Panel to motors)	Electrical Works	981.36
565	8	Providing independent earthing for Important equipment with 40mm dia 'B' class 2.5m long G.I pipe and 19mm dia 'B' class G.I pipe of 0.3mtr. long connected with reducer providing G.I funnel with mesh enclosed in C.C.Chamber of 400m x 400m x 400mm with R.C.C. Slab cover duly providing staggered holes filling with salt and charcoal from the bottom of the pipe giving earth connection from electrode through G.I strip of 40 x 6mm x 200mm length with all accessories and labour charges complete, as per IS specifications 732/1982 (Part II)	Electrical Works	55,548.49
566	100	Supply and laying of following sizes Earth wire/Strip in horizontal /Vertical run in Ground/surface/Recess including, riveting, soldering, saddles, making connection etc as required -25mm x 6mm GI Flat (1.18Kgs/1Mtr)	Electrical Works	11,021.00
567	4	Supply and fixing of ABC stored pressure squeeze grip type fire extinguishers, 9 kg capacity, IS:15683 : 2006, filled with ABC Mono Ammonium Phosphate base powder-90 complete with discharge hose and wall mounting bracket, 2mm Mild Steel, EPDM Rubbers, Pressure Guage, which work effectively on all class of fires (A, B, C & Electrical fires) with 5 years warranty Including transportation.	Electrical Works	52,885.52
568	4	Supply and fixing of ISI mark (IS:15683) Mono ammonium phosphate powder 90 (MAP) 2 Kg Fire extinguisher, stored pressure type, pressure gauge, gross wt. 3.6 kg, empty wt.1.6 kg, Discharge time minimum 8 sec, controllable discharge mechanism, range min. 2 mts applicable on classes A,B, C & electrically started fire, A rating -2 A, B rating -21 B, can construction: Deep drawn and Co2 mig welding, Valve construction: Forging & Machining, internal coating of can: Epoxy powder coating, External coating of Can:Epoxy polyster powder coating, sheet metal thickness:1.60mm, Helium leak detection tested with 5 years warranty Including transportation.	Electrical Works	25,767.88
569	8	Supply and fixing of 4Nos of 9 Ltrs capacity round bottom sand buckets along with bucket sand, Fire buckets with round bottom type enamel painted, white inside & red out side and letter FIRE inblack out side & Handle with mounting bracket	Electrical Works	13,797.44
570		**Internal Wiring**		-
571	40	Supply of ISI 25mm outer dia heavy (2.20mm thickness) grade with IS:9537 part 3 regid PVC pipe.	ISI 25mm outer dia PVC pipe.	2,090.40
572	6	Supply of 19/20mm PVC Flexible Pipe	19/20mm PVC Flexible Pipe	115.86
573	20	Supply of PVC Junction Boxes Deep size 25mm.	PVC Junction Boxes Deep size 25mm.	818.00
574	10	Supply of 25mm PVC Flexible Couplings	25mm PVC Flexible Couplings	238.60

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
575	16	Supply of 25mm dia 1.5mm thick PVC Bends.	25mm dia 1.5mm thick PVC Bends.	218.08
576	4	Supply of 6" x 6" Metal Box	6" x 6" Metal Box	386.28
577	4	Supply of T.W.Deep Box of Size 6" x 6"	T.W.Deep Box of Size 6" x 6"	118.16
578	2	Supply of 4" x 7" Metal Box	4" x 7" Metal Box	165.88
579	2	Supply of T.W.Deep Box of Size 4" x 7"	T.W.Deep Box of Size 4" x 7"	54.54
580	2	Supply of No.8 Screws of 25mm	No.8 Screws of 25mm	2.20
581	150	Supply of 36/0.3mm (2.5 Sqmm) FRLS / HFFR / ZHFR PVC insulated 1100V grade as perIS:694/1990 specification for Copper cable.	36/0.3mm (2.5 Sqmm) FRLS / HFFR / ZHFR PVC insulated Copper cable.	5,632.47
582	24	Supply of 6A 1 Way flush type Swich.	6A 1 Way flush type Swich.	490.80
583	4	Supply of 6A 3/2 pin flush type Socket with shutter.	6A 3/2 pin flush type Socket with shutter.	122.72
584	2	Supply of 6-32A 10KA DP MCB, C/D Curve ISI	6-32A 10KA DP MCB, C/D Curve ISI	1,572.44
585	6	Supply of 6-32A 10KA SP MCB, C/D Curve ISI Mark.	6-32A 10KA SP MCB, C/D Curve ISI Mark.	1,554.24
586	2	Supply of 4 Way SPN DB with IP 20 Protection as per IS:13032 and suitable for 4Nos S.P out goings and for 1 No Incommer etc complete.	4 Way SPN DB	2,510.90
587	14	Supply, Transportation and fixing of **6W** LED Down lighter, suitable for Recessed / Surface mounting made of diecast alluminium body with powder coating, acrylic diffuser with Driver, operating voltage range of 150 to 265 Volts AC, P.F > 0.9, Surge protection: 2KV, THD<10% with high power LED's having efficacy of > 120 lumins / watt, CCT: 3000K - 5700K, minimum CRI > 70, Luminaire performance complies to IS 10322 (Part 5 / Sec-3) etc., complete	6W LED Down lighter	10,211.74
588	4	Supply of 48" (1200mm) Sweep ISI mark Ceiling Fan as per IS 374 - 1979 and, with double ball bearings, power input not more than 50W , air delivery more than 200 cubic meter/min but without Regulator	Ceiling Fan	15,665.24
589	4	Supply of 9" (225mm), Light duty exhaust fan with double ball bearing and wire guard etc complete.	Exhaust fan	7,053.20
590		**Pump House Mechanical (Pipe & Fittings)**		-

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
591	40633.00	Manufacture, Supply and Delivery of Cast Iron pipes and fittings (spls) confirming to IS:7181/1986, 5531/1988, 3950/1979 & C.I.D joints confirming to IS: 8794/1988 at site of work any where in A.P including loading, unloading transportation to site of work staking at site transit risk and package. and as directed by engineer-in-charge	Cast Iron Pipes & Fittings	37,64,647.45
592	3	Supply delivery of **200mm dia PN 1.6 (Mpa) Double Flanged Slant seat Swing Check Valve (NRV)** with body and Disc of Ductile Iron GGG-40/SG-400/15 or GGG-50/SG-500/7 or Equivalent as per IS1865, IS:3896-2 with fully encapsulated in RAL 5005 with Min. Coating thickness of 250powder coating inside and outside color Bluerubber & Fusion bonded Electro Static epoxyVulcanized EPDM microns. The EPDM rubber & Epoxy rubber & Epoxy powder should conform to W 270 standards (Drinking water application) and face to face dimensions as per EN 558-1 / DIN 3202-F6 / IS 5312 & Flange connections as per IS:1538 and including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge for isolated valves	Valves	1,39,661.25
593	3	Supply delivery of **250mm dia PN 1.6 (Mpa) Double Flanged Slant seat Swing Check Valve (NRV)** with body and Disc of Ductile Iron GGG-40/SG-400/15 or GGG-50/SG-500/7 or Equivalent as per IS1865, IS:3896-2 with fully encapsulated in RAL 5005 with Min. Coating thickness of 250powder coating inside and outside color Bluerubber & Fusion bonded Electro Static epoxyVulcanized EPDM microns. The EPDM rubber & Epoxy rubber & Epoxy powder should conform to W 270 standards (Drinking water application) and face to face dimensions as per EN 558-1 / DIN 3202-F6 / IS 5312 & Flange connections as per IS:1538 and including transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge for isolated valves	Valves	1,86,527.43
594	6	Supply, Delivery of **200mm dia D.I double flanged Sluice Valves** conforming to IS- 14846 (with up to date amendments, if any) including gear arrangements for the following dia. as per test pressure having Body, Bonnet, Dome, Stool cover, Wedge, Stuffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ; Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel, including Transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge, etc. complete ISI marked PN 1.6 (MPa) for Scour valves	Valves	2,32,456.32
595	6	Supply, Delivery of **250mm dia D.I double flanged Sluice Valves** conforming to IS- 14846 (with up to date amendments, if any) including gear arrangements for the following dia. as per test pressure having Body, Bonnet, Dome, Stool cover, Wedge, Stuffing box, Gland, Thrust plate, Cap/Hand wheel with D.I; Stem, Body seat ring, Wedge facing ring, Bushes, Bolts, Nuts, Pinion and Pinion shaft with Stainless steel (IS 6603) ; Wedge nut, Shoe, Channel with Leaded Tin Bronze (IS 318); Gasket with Neoprene Rubber; Gland packing with Rubber; Gear, Gear housing with Cast Steel, including Transportation to work site, unloading & stacking for finished item of work and as directed by the Engineer - in - charge, etc. complete ISI marked PN 1.6 (MPa) for Scour valves	Valves	3,23,318.76
596	18.00	Lowering C.I. / D.I. Pipes of 300mm dia (all classes) and specials (fittings) with flanged (welded) ends carefully into trench and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Reference to specifications. BIS No.3114/1994) and as directed by Engineer-in-charge	Lowering of DI pipes	4,957.74
597	26.00	Lowering C.I. / D.I. Pipes of 200mm dia (all classes) and specials (fittings) with flanged (welded) ends carefully into trench and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Reference to specifications. BIS No.3114/1994) and as directed by Engineer-in-charge	Lowering of DI pipes	4,098.12
598	40.00	Lowering C.I. / D.I. Pipes of 400mm dia (all classes) and specials (fittings) with flanged (welded) ends carefully into trench and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Reference to specifications. BIS No.3114/1994) and as directed by Engineer-in-charge	Lowering of DI pipes	16,864.80

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
599	80.00	Lowering C.I. / D.I. Pipes of 250mm dia (all classes) and specials (fittings) with flanged (welded) ends carefully into trench and laying them true to alignment and gradient including all sundries but excluding cost and conveyance of pipes from source of supply. (Reference to specifications. BIS No.3114/1994) and as directed by Engineer-in-charge	Lowering of DI pipes	17,036.80
600	47.00	Jointing DI pipes, fittings and valves with flanged ends for 250mm dia including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994). and as directed by Engineer-in-charge	Jointing of Pipes	41,094.45
601	16.00	Jointing DI pipes, fittings and valves with flanged ends for 200mm dia including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994). and as directed by Engineer-in-charge	Jointing of Pipes	10,014.56
602	22.00	Jointing DI pipes, fittings and valves with flanged ends for 400mm dia including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994). and as directed by Engineer-in-charge	Jointing of Pipes	42,928.16
603	15.00	Jointing DI pipes, fittings and valves with flanged ends for 200mm dia including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994). and as directed by Engineer-in-charge	Jointing of Pipes	9,364.54
604	25.00	Jointing DI pipes, fittings and valves with flanged ends for 300mm dia including cost of jointing materials such as bolts, rubber insertion, white lead including filling with water, with lead up to 500 meters and testing to required pressure complete. (Reference to specifications. BIS No.3114/1994). and as directed by Engineer-in-charge	Jointing of Pipes	23,095.25
605	1.00	Design, provide and install automation for pumps in reuse pump houses and to link the RWMD'S Valves and controlling points components through hSCADA (Hydraulically Supervised Control and Data Acquisition) and all the flow control components shall be capable to enable to control and monitor the parameters from /at hSCADA room Control Center to the satisfaction of Engineer in charge.	SCADA	44,98,000.00
606		**Power & ICT**		-
607	177645.27	Earthwork excavation in all type of soils including ordinary rock by mechanical means **upto 3mts** depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	2,37,63,607.77

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
608	11483.00	Earthwork excavation in all type of soils including ordinary rock by mechanical means **3 to 6 mts** depth for trenches as per drawing and technical specification including setting out, removal of stumps and other deleterious matter, dressing sides of bottom, back filling with the approved material to the extent required and disposal of surplus earth with all lifts and lead upto 1 KM etc., complete including charges for finished item of work as per MoRT&H specification 304 (5th Revision) or as per latest revisions and specifications and as directed by the Engineer-in-Charge.	Earthwork	17,55,521.04
609	16200.00	Bailing out water from the pipe line trenches with oil engine driven pumpsets, including hire charges, fuel charges and wages for Driver and Helper with finished item of workas directed by Engineer-in-charge.	Dewatering	11,69,640.00
610	146871.87	Providing & laying Sand bedding in foundations,filling and encasing in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding	5,01,89,055.42
611	9463.00	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC 150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) **Single staging from 2.0 to 2.5 Mts.**	Steel shoring and shrutting Single staging from 2.00 to 2.50Mts.	26,68,566.00
612	566.02	Providing and fixing close Steel shoring and shrutting made of Steel Girder Piling work for support the both side of trenches with ISMC 150 as vertical member at 1.25 m centre to centre, ISMC150 as horizontal member for tie at two depths, Struts to support the both side of trench of ISMC 250 and face of trench to be covered with steel sheets of thickness not less than 4mm and removing Steel Girder piling. complete as per specifications and as directed by Engineer. (Measurements to be taken for Contact area) **Single staging from 2.50 to 3.00 Mts.**	Steel shoring and shrutting Single staging from 2.50 to 3.00 Mts.	1,91,315.64
613	107151.00	Providing barricading, hoarding, lighting and watching etc., arrangements with casurina ballies and tape as per the design duly excavating pits and its removal after the function is over including the cost of barricading materials as per the schedule given by the departmental authorities completed for finished item of work and as directed by Engineer-in-charge.	Barricading	2,01,40,101.96
614	2.00	Manufature, Supply and delivery of 160mm dia HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs, dimensional ratio of 13.5,Deflection not greater than 5% when exposed to the normal operating temparature 90°C under the over burden soil presuure and other physical properties comforming to ASTMF 2160 and /or NEMA TC7/as per Schedule D of contract. (The expected service life of HDPE pipe conduits and accessories shall not be less than 50 years) including transportation and as directed by the Engineer - in - charge.	HDPE Silicore Pipe	2,774.48
615	46457.69	Manufature, Supply and delivery of 200mm dia HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs, dimensional ratio of 13.5,Deflection not greater than 5% when exposed to the normal operating temparature 90°C under the over burden soil presuure and other physical properties comforming to ASTMF 2160 and /or NEMA TC7/as per Schedule D of contract.(The expected service life of HDPE pipe conduits and accessories shall not be less than 50 years) including transportation and as directed by the Engineer - in - charge.	HDPE Silicore Pipe	10,45,62,787.46
616	1877.00	Manufature, Supply and delivery of 225mm dia HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs, dimensional ratio of 13.5,Deflection not greater than 5% when exposed to the normal operating temparature 90°C under the over burden soil presuure and other physical properties comforming to ASTMF 2160 and /or NEMA TC7/as per Schedule D of contract.(The expected service life of HDPE pipe conduits and accessories shall not be less than 50 years) including transportation and as directed by the Engineer - in - charge.	HDPE Silicore Pipe	61,88,675.47
617	30614.00	Manufacture, supply and delivery of 7 way 40mm dia Multi Ducts with Silicore Lubricant inner layer for ICT fibre cables comforming to ASTMF 2160 and /or equivalent indian standard/as per Schedule D of contract, as per the approved specification including transportation at site and other incidental charges etc., complete and as directed by engineer-in-charge.	HDPE Silicore Pipe	3,32,16,802.28

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
618	107549.69	Lowering, laying and jointing of 160mm dia HDPE Electrical pipe Conduits with Silicore Lubricant inner layer having ribs with coupler and as per drawing in ready made trenches true to alignment and gradient and maintain specified spacing with spacers (excluding cost of spacer and coupler) including all materials, labour charges, and all other incidental charges etc., complete for finished item of work as per the drawing and as directed by the Engineer - in - Charge	Lowering & Jointing	1,11,00,203.50
619	113845.69	Lowering, laying and jointing of 200mm dia HDPE Electrical pipe Conduits with Silicore Lubricant inner layer having ribs with coupler and as per drawing in ready made trenches true to alignment and gradient and maintain specified spacing with spacers (excluding cost of spacer and coupler) including all materials, labour charges, and all other incidental charges etc., complete for finished item of work as per the drawing and as directed by the Engineer - in - Charge	Lowering & Jointing	1,39,03,974.12
620	8277.00	Lowering, laying and jointing of 225mm dia HDPE Electrical pipe Conduits with Silicore Lubricant inner layer having ribs with coupler and as per drawing in ready made trenches true to alignment and gradient and maintain specified spacing with spacers (excluding cost of spacer and coupler) including all materials, labour charges, and all other incidental charges etc., complete for finished item of work as per the drawing and as directed by the Engineer - in - Charge	Lowering & Jointing	11,10,938.94
621	69014.00	Lowering, laying and jointing with pushfit coupler of 7 way 40mm dia Multi Ducts with Silicore Lubricant inner layer for ICT fibre cables as per drawing in ready made trenches true to alignment and gradient and maintain specified spacing with spacers (excluding cost of spacer and coupler) including all materials, labour charges, and all other incidental charges etc., complete for finished item of work as per the drawing and as directed by the Engineer - in - Charge	Lowering & Jointing	29,88,306.20
622	179.00	Manufacture, supply, delivery and fixing of A1 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	4,13,490.00
623	1006.00	Manufacture, supply, delivery and fixing of A2 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	16,90,080.00
624	135.00	Manufacture, supply, delivery and fixing of A3 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	2,83,500.00
625	404.00	Manufacture, supply, delivery and fixing of A5 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	6,78,720.00
626	3693.00	Manufacture, supply, delivery and fixing of A6 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	46,53,180.00
627	7316.00	Manufacture, supply, delivery and fixing of A8 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	46,09,080.00
628	2720.00	Manufacture, supply, delivery and fixing of A9 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	28,56,000.00

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629	465.00	Manufacture, supply, delivery and fixing of A10 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	7,81,200.00
630	109.00	Manufacture, supply, delivery and fixing of A16A Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	2,28,900.00
631	8812.00	Manufacture, supply, delivery and fixing of B1 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	55,51,560.00
632	1284.00	Manufacture, supply, delivery and fixing of B2 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	13,48,200.00
633	155.00	Manufacture, supply, delivery and fixing of B3 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	2,60,400.00
634	273.00	Manufacture, supply, delivery and fixing of D2 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	4,58,640.00
635	7.00	Manufacture, supply, delivery and fixing of D3-A Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	14,700.00
636	237.00	Manufacture, supply, delivery and fixing of D7 Type spacer sets consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	99,540.00
637	34507.00	Manufacture, supply, delivery and fixing of Spacers for ICT Cable-7 way 40mm dia consisting of top and bottom pieces of size suitable for all diameter of power ducts (HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs) and 7 way ICT ducts with 25mm side thiness and 5mm thickness of all braces etc., made with Acrylonitrile Butadiene Styrene (ABS) material as per the approved drawing, technical specification and relavant IS codes including cost of matarials, transportation, labour chares for fixing and other incidental charges etc., complte and as directed by engineer-in-charge	Spacers	58,66,190.00
638	107151.00	Supply and installation of Warning tape in Trenches as per drawing, specifications including cost of all materials, labour charges, and all other incidental charges etc., complete for finished item of work as per the drawing and as directed by the Engineer - in - Charge.	Warning Tape	35,42,412.06
639	54837.00	Supplying and placing Plain chequered tiles of 25mm thick conforming to IS: 13801 includind all leads and lifts etc., including all materials, labour charges, and all other incidental charges etc., complete for finished item of work as per the drawing and as directed by the Engineer - in - Charge.	Plain Tiles	2,46,13,039.08

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
640	2370.00	Providing and placing Plain Cement Concrete - Grade M10 (1:3:6) for foundations/leveling course/ under flooring bed using coarse aggregate 40mm size hard, machine crushed granite metal from approved quarry including cost and conveyance of all materials to site, machine mixing, laying concrete in foundations , ramming, finishing top surface to the required level, curing etc.,complete for finished item of work and as directed by the Engineer-in-Charge.	Plain Cement Concrete (PCC) - M10	1,20,43,605.30
641	6457.00	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20 MSA conforming to MoRT&H 5th edition and as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating, curing, centering, shuttering including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer - in-Charge **For Man Hole raft**	Design Mix Concrete M30 Grade	3,51,66,307.11
642	11679.00	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20 MSA conforming to MoRT&H 5th edition and as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating, curing, centering, shuttering including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer - in-Charge **For Man Hole walls**	Design Mix Concrete M30 Grade	11,45,29,529.55
643	2283.00	Supply and placing of Reinforced cement Concrete of M30 grade using approved design Mix corresponding to relevant IS codes with cement content of 407 kg per cum of concrete using batching plant at site and transporting concrete to site by transit mixer and pumping concrete using concrete pump and using machine crushed graded metal of 20 MSA conforming to MoRT&H 5th edition and as per latest revisions and specifications, including cost and conveyance of all materials to site, pumping, laying concrete, vibrating, curing, centering, shuttering including cost of all other incidental and operational charges of T&P required etc., for finished item of work but excluding steel reinforcement etc. complete as per drawings and technical specifications of MORTH or as per latest revisions and specifications and as directed by the Engineer - in-Charge **For Man Hole Cover Slabs**	Design Mix Concrete M30 Grade	1,32,15,465.12
644	1429394.00	Providing and placing of High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) steel bars **Fe - 500/500D/550 grade** as per IS 1786 of different diameters for Reinforced concrete structures, including labour charges for staightening, cutting, bending to required size and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages, overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in postion, tying, protection caps for exposed bars, complete for finished item of work complete as per drawing and conforming to MoRTH Specifications (5th Revision) or as per latest revisions and specifications and as directed by the Engineer in Charge.	Steel	13,07,18,081.30
645	11997.00	Manufacture supply transportation and fixing of encapsulated plastic steps for man holes anywhere in A.P. as per company's standard specification including cost of materials packing as per company's standards, loading, transportation, unloading and stacking at site of work etc, complete and as directed by the Engineer-in-charge.	Manhole Cover	22,62,634.20
646		**Retrofitting Works**		-
647		**Roads - Retrofitting Works**		-
648	184.00	Forming embankment with borrowed useful earth from outside road boundary by mechanical means up to SDR with all leads and lifts including pre-watering of soil at borrow area, removal of top soil, excavation of soils at borrowed area, conveyance of soil, depositing the soil on the embankment, spreading soil, breaking clods, sectioning, grading and consolidation with 8 to 10 Tonnes Vibratory Road Roller @ OMC to meet requirement of table 300-1 of MoRT&H, including all hire and operational charges of T&P charges, complete for finished item of work as per MoRT&H specification 305 (5th Revision) , satisfying the Free Swell Index value less than 50%, soaked CBR value not less than 6% and other regirements from clause 305 MoRT&H (5th Revision) and as directed by the Engineer in Charge	Embankment	2,63,057.44

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
649	1999.40	Forming Subgrade with borrowed useful earth from approved quarries outside road boundary including conveyance, with all lead and lifts, including pre-watering of soil at borrow area, removal of top soil, excavation of soils at borrowed area, conveyance of soil, depositing the soil on the embankment, spreading soil, breaking clods, sectioning, grading and consolidation with 8 to 10 Tonnes Vibratory Road Roller in layers @ OMC to meet requirement of table 300-1 and 300-2 of MoRTH or as per latest revisions and specifications , including all hire and operational charges of T&P charges, complete for finished item of work, satisfying the Free Swell Index value less than 50%, soaked CBR value not less than 8% and other reqirements, confirming to MoRTH specification 305 (5th Revision) or as per latest revisions & specifications and as directed by the Engineer in Charge.	Sub Grade	31,85,644.02
650	6640.00	Loosening of existing embankment/subgarde/GSB, watered, graded and compacted in layers to meet requirements of Morth and as directed by the Engineer in Charge.	L&R of Subgrade	7,88,832.00
651	5536.40	Dismantling/removal of Granular Courses/Embankment/Subgrade and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately and as directed by the Engineer in Charge.	Dismantling of Granular Courses	28,96,478.39
652	2122.10	Construction of Granular sub-base by providing HBG material confirming to Grading - VI of MoRT&H Table 400-1 & 400-2 including cost and conveyance of all materials to work site and spreading in uniform layers with motor grader or by approved means, on prepared surface mixing by mix in place method with Rotavator / approved means at OMC and compacting with vibratory roller to achieve the desired density (98% of maximum dry density) etc., complete for finished item of work as per MoRT&H Specification 401 (5th revision) and as directed by the Engineer-in-charge.	SUB-BASE AND BASE COURSES	45,02,204.92
653	1230.90	Providing, Laying, Spreading and compacting graded HBG crushed stone aggregate to Wet Mix macadem specification including cost of all materials and including premixing the material with water at OMC in Mechanical mix plant carriage of mixed material by tipper to site, laying in uniform layers with paver in base courses on well prepared surface and compacting with Vibratory roller to acheive the desired density (98% of maximum dry density) etc., as directed by the Engineer-in-Charge and as per MoRT&H specification 406 (5th revision) for finished item of work with Plant Mix Method and Laying using mechanical paver.	SUB-BASE AND BASE COURSES	35,60,095.14
654		**Storm Water Drains - Retrofitting Works**		-
655	105.40	Desilting of Storm Water Drain complete as directed by the Engineer-in-charge.	Desilting in SWD	31,177.19
656	241.50	Relaying & Rejointing of Precast Drains including jointing required grouting and aligning in postion as per levels including labour,machinery etc.,as directed by engineer-in-charge	Relaying & Rejointing	60,375.00
657	441.95	Providing & laying Sand bedding in foundations & filling in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding/Filling/Encasing	1,51,021.45
658	17.82	Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 m as per Technical Specification Clause 202 MORD / MORTH	Dismantling of existing structures	35,853.66
659		**Water Supply - Retrofitting Works**		-
660	11245.32	Providing and applying Black Bitumen coating Outside of Ductile iron Pipes (K7/K9) of any pipe diameter including all material and labour and machinery etc., complete, with all taxes, insurance, freight charges, inspection charges, transportation, etc. complete including all labour, materials and ROU/ROW as per specification and to the satisfaction of Engineer-in-charge.	Black Bitumen coating Outside of Ductile iron Pipes	19,24,074.02

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
661	3334.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for 150mm dia Pipeline,TEE's,Bend's,Taper's,Flanged socket per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	3,86,368.26
662	88.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for 250mm dia Pipeline,TEE's,Bend's,Taper's per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	13,797.41
663	50.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for 450mm dia Pipeline,TEE's,Bend's,Taper's per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	19,541.78
664	29.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for 500mm dia Pipeline,TEE's,Bend's,Taper's per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	15,749.31
665	5.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for 600mm dia Pipeline,TEE's,Bend's,Taper's per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	3,431.17
666		**Reuse - Retrofitting Works**		-
667	461.69	Providing and applying Brown Bitumen coating Outside of Ductile iron Pipes (K7/K9) of any pipe diameter including all material and labour and machinery etc., complete, with all taxes, insurance, freight charges, inspection charges, transportation, etc. complete including all labour, materials and ROU/ROW as per specification and to the satisfaction of Engineer-in-charge.	Brown Bitumen coating Outside of Ductile iron Pipes	78,994.89
668	223.00	Manufacture, supply and delivery of S.B.R. Quality Rubber for 100mm dia Pipeline,TEE's,Bend's,Taper's,Flanged socket per BIS:12820/89 with confirming to BIS:5382/85, Rubber Gaskets suitable for CI, DI, S/S pipes including cost of material, loading, incidental, handling with companys standard packing, transportation, unloading & stacking and as directed by the Engineer - in - charge	Rubber Gasket	17,735.30
669		**Waste Water - Retrofitting Works**		-
670	1977.39	Providing & laying Sand bedding in foundations & filling in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding/Filling/Encasing	6,75,714.14
671	3070.00	Cleaning and Chocked sewer line by diesel running vehicle mounting hydraulic operated high pressure suction cum jetting sewer cleaning machine fitted with pump having 4000 litre suction capacity and 6000 litre water tank capacity including skilled operator supervising engineer etc. for cleaning and partial desilting of manholes and dechocking of Pipe lines.Dechocking and flusing of sewer line from one manhole to another by high pressure jetting systemof 2200 PSI for sewer line from 150mm dia upto 300mm	Cleaning of sewerline	8,43,850.90
672	714.00	Manufacture, supply, & delivery of 200mm (ID) dia, SN 8 Class (DWC) structured wall polyethylene/polypropylene piping system with non smooth external annular corrugated and smooth internal surface (Double Wall) for non pressure sewage & Drainage application pipes of standard length 6 m, grade conforming to IS 16098 (part-II: 2013), including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DWC Pipe	4,29,941.88

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
673	60.00	Manufacture, supply, & delivery of 250mm (ID) dia, SN 8 Class (DWC) structured wall polyethylene/polypropylene piping system with non smooth external annular corrugated and smooth internal surface (Double Wall) for non pressure sewage & Drainage application pipes of standard length 6 m, grade conforming to IS 16098 (part-II: 2013), including transportation to site, unloading & stacking and as directed by the Engineer - in - charge.	DWC Pipe	56,239.43
674	714.00	Lowering, Laying, Jointing and testing of 200 mm (ID) of DWC Pipes in ready made trenches true to alignment and level and perfect jointing including cost of rubber rings and cost of water for testing, all labour, all leads in lifts etc., complete for finished item of work as per drawing/specification etc., and as directed by the Engineer in charge.	DWC Pipe Laying & Jointing	98,153.58
675	60.00	Lowering, Laying, Jointing and testing of 250 mm (ID) of DWC Pipes in ready made trenches true to alignment and level and perfect jointing including cost of rubber rings and cost of water for testing, all labour, all leads in lifts etc., complete for finished item of work as per drawing/specification etc., and as directed by the Engineer in charge.	DWC Pipe Laying & Jointing	12,952.20
676		**Power & ICT - Retrofitting Works**		-
677	1470.91	Providing & laying Sand bedding in foundations & filling in trenches as per drawing including cost and conveyance of materials to site with all leads & lifts including watering, tamping, raming all other incidental and operational charges etc., complete as per technical specification Clause 305.3.9 MORD & 304 MORTH (5th Revision) or as per latest revisions and specifications and as directed by the Engineer - in - charge.	Sand Bedding/Filling/Encasing	5,02,640.23
678	588.55	Cleaning and Chocked sewer line by diesel running vehicle mounting hydraulic operated high pressure suction cum jetting sewer cleaning machine fitted with pump having 4000 litre suction capacity and 6000 litre water tank capacity including skilled operator supervising engineer etc. for cleaning and partial desilting of manholes and dechocking of Pipe lines.Dechocking and flusing of sewer line from one manhole to another by high pressure jetting systemof 2200 PSI for sewer line from 150mm dia upto 300mm	Cleaning of pipeline	1,61,774.74
679	43200.00	Retrofitting of Existing 7 Way Multiduct Path sheathing with Anti termite & Copper Tracer Wire (40/34.2mm Three-layer sub duct, inner ribbed) inclusive Inward and Outward Transportation from Dharwad or at site complete	Polyethylene over sheath	1,25,28,000.00
680	1160.00	Manufature, Supply and delivery of 160mm dia HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs, dimensional ratio of 13.5,Deflection not greater than 5% when exposed to the normal operating temparature 90°C under the over burden soil presuure and other physical properties comforming to ASTMF 2160 and /or NEMA TC7/as per Schedule D of contract. (The expected service life of HDPE pipe conduits and accessories shall not be less than 50 years) including transportation and as directed by the Engineer - in - charge.	HDPE Silicore Pipe	16,09,198.40
681	1190.00	Manufature, Supply and delivery of 200mm dia HDPE Electrical pipe Conduits with Silicore Lubricant inner layer with ribs, dimensional ratio of 13.5,Deflection not greater than 5% when exposed to the normal operating temparature 90°C under the over burden soil presuure and other physical properties comforming to ASTMF 2160 and /or NEMA TC7/as per Schedule D of contract.(The expected service life of HDPE pipe conduits and accessories shall not be less than 50 years) including transportation and as directed by the Engineer - in - charge.	HDPE Silicore Pipe	26,78,344.90
682	1160.00	Lowering, laying and jointing of 160mm dia HDPE Electrical pipe Conduits with Silicore Lubricant inner layer having ribs with coupler and as per drawing in ready made trenches true to alignment and gradient and maintain specified spacing with spacers (excluding cost of spacer and coupler) including all materials, labour charges, and all other incidental charges etc., complete for finished item of work as per the drawing and as directed by the Engineer - in - Charge	Lowering & Jointing	1,19,723.60
683	1190.00	Lowering, laying and jointing of 200mm dia HDPE Electrical pipe Conduits with Silicore Lubricant inner layer having ribs with coupler and as per drawing in ready made trenches true to alignment and gradient and maintain specified spacing with spacers (excluding cost of spacer and coupler) including all materials, labour charges, and all other incidental charges etc., complete for finished item of work as per the drawing and as directed by the Engineer - in - Charge	Lowering & Jointing	1,45,334.70
684		**Investigation,Designs and Drawings**		-

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
685	1.00	**Investigation, topographical and geotechnical survey** including preparation of contour plans at interval as prescribed by the department and trial pits at the prescribed intervals and hydrological survey for structures, conducting the tests in accredited/reputed labs as prescribed by the department and submission of the reports, sampling and all the other tests required for the balance design and construction of the roads, water supply, sewerage, power ducts, reuse and storm water network in the specified area of the zone and submission of all reports in soft and 5 Nos. of hard copies in the format prescribed by the Department etc. complete all as directed by the Engineer in charge. (Payment to be made after approval)	Investigation, topographical and geotechnical survey	14,06,307.00
686	1.00	Preparation and Submission of balance detailed designs and GFC drawings for **Roads & Bridges** including structural designs and drawings for manholes and other related structures to network and BIM modelling, clash analysis of modelling with Civil 3D/Revit/Navis etc., and integration with the trunk infrastructure system and other LPS network etc., and submission of all Designs and drawings duly vetted by IIT in soft and 5 Nos. of hard copies in the format prescribed by the Department etc., complete all as directed by the Engineer in charge. (Payment to be made after approval of designs & Drawings)	Detailed designs and GFC drawings for Roads & Bridges	18,28,199.00
687	1.00	Preparation and Submission of balance detailed designs and GFC drawings for **Storm Water drain network** including structural designs and drawings for manholes and other related structures to network and BIM modelling, clash analysis of modelling with Civil 3D/Revit/Navis etc., and integration with the trunk infrastructure system and other LPS network etc., and submission of all Designs and drawings duly vetted by IIT in soft and 5 Nos. of hard copies in the format prescribed by the Department etc., complete all as directed by the Engineer in charge. (Payment to be made after approval of designs & Drawings)	Detailed designs and GFC drawings for Storm Water drain network	18,28,199.00
688	1.00	Preparation and Submission of balance detailed designs and GFC drawings for **Water Supply network** including structural designs and drawings for manholes and other related structures to network and BIM modelling, clash analysis of modelling with Civil 3D/Revit/Navis etc., and integration with the trunk infrastructure system and other LPS network etc., and submission of all Designs and drawings duly vetted by IIT in soft and 5 Nos. of hard copies in the format prescribed by the Department etc., complete all as directed by the Engineer in charge. (Payment to be made after approval of designs & Drawings)	Detailed designs and GFC drawings for Water Supply network	18,28,199.00
689	1.00	Preparation and Submission of balance detailed designs and GFC drawings for **Waste Water network** including structural designs and drawings for manholes and other related structures to network and BIM modelling, clash analysis of modelling with Civil 3D/Revit/Navis etc., and integration with the trunk infrastructure system and other LPS network etc., and submission of all Designs and drawings duly vetted by IIT in soft and 5 Nos. of hard copies in the format prescribed by the Department etc., complete all as directed by the Engineer in charge. (Payment to be made after approval of designs & Drawings)	Detailed designs and GFC drawings for Waste Water network	18,28,199.00
690	1.00	Preparation and Submission of balance detailed designs and GFC drawings for **Power & ICT network** including structural designs and drawings for manholes and other related structures to network and BIM modelling, clash analysis of modelling with Civil 3D/Revit/Navis etc., and integration with the trunk infrastructure system and other LPS network etc., and submission of all Designs and drawings duly vetted by IIT in soft and 5 Nos. of hard copies in the format prescribed by the Department etc., complete all as directed by the Engineer in charge. (Payment to be made after approval of designs & Drawings)	Detailed designs and GFC drawings for Power & ICT network	18,28,199.00
691	1.00	Preparation and Submission of balance detailed designs and GFC drawings for **Reuse Water network** including structural designs and drawings for manholes and other related structures to network and BIM modelling, clash analysis of modelling with Civil 3D/Revit/Navis etc., and integration with the trunk infrastructure system and other LPS network etc., and submission of all Designs and drawings duly vetted by IIT in soft and 5 Nos. of hard copies in the format prescribed by the Department etc., complete all as directed by the Engineer in charge. (Payment to be made after approval of designs & Drawings)	Detailed designs and GFC drawings for Reuse Water network	18,28,199.00
692	1.00	Preparation and Submission of as build drawings for roads, bridges, water supply, sewerage, power ducts, reuse and storm water network after the completion of Project in soft and 5 Nos. of hard copies in the format prescribed by the Department etc., complete all as directed by the Engineer in charge. (Payment to be made after approval of drawings)	Preparation and Submission of as build drawings	16,87,570.00
693		**Environment and Social Management Plan (ESMP)**		-

SlNo	Estimate Quantity (only Figures)	Item Detailed Specification Description	Work Type eg. Earth Work, Electrical works.. etc (upto 200 Characters)	Amount (INR) (Upto 2 Decimals)
694	1.00	Compliance of C-ESMP: The C – ESMP shall be prepared considering the EIA/EMP of the capital city and project specific EMP, RAP and RPF. The indicative activities (but not limited) provided in the bid document shall be complied by the contractor during the contract duration. On award of work, the contractor shall work out a C-ESMP in line with labour laws and other regulatory guidelines along with the quantities of each of these indicated activities (which should be sufficient for effective implementation of the C-ESMP and other E&S clauses mentioned in the bid document) and submit for approval of PMC/Employer The modalities of monitoring these activities is to be jointly finalised by Employer/contractor. * During periodical inspection, in case of necessity, on direction of Employer, the contractor shall provide additional quantities and activities. * The payment for all these activities shall be made out of provisional sum. The payments are subjected to scrutiny and approval of all the activities done at site.	Compliance of C-Environmental & Social Management Plan	3,75,01,523.00
			Total ECV	**3,80,17,18,866.87**

Complete itinerary Report

Vehicle No	Status	From Time	To Time	Duration	From Location	To Location	Distance	Avg Speed	Wheelseye Device
AP39V5819	STOPPAGE	24 Dec 2025 00:00	24 Dec 2025 06:20	6:20	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	0	Yes
AP39V5819	DRIVING	24 Dec 2025 06:20	24 Dec 2025 06:36	0:16	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	130 m from Mattipati Realty, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	8.08	1.22	Yes
AP39V5819	STOPPAGE	24 Dec 2025 06:36	24 Dec 2025 06:41	0:4	130 m from Mattipati Realty, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.06	1.22	Yes
AP39V5819	DRIVING	24 Dec 2025 06:41	24 Dec 2025 06:44	0:3	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	1.23	1.39	Yes
AP39V5819	STOPPAGE	24 Dec 2025 06:44	24 Dec 2025 06:47	0:3	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PADMAVATHI BHAVANAM, 67 m from Sri Venugopala Swami Vari Gudi, TALLAYA PAEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.05	1.39	Yes

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AP39V5819	DRIVING	24 Dec 2025 06:47	24 Dec 2025 06:50	0:3	PADMAVATHI BHAVANAM, 67 m from Sri Venugopala Swami Vari Gudi, TALLAYAPAEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.23	1.41	Yes
AP39V5819	STOPPAGE	24 Dec 2025 06:50	24 Dec 2025 07:13	0:22	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.02	1.34	Yes
AP39V5819	DRIVING	24 Dec 2025 07:13	24 Dec 2025 07:16	0:3	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.09	1.34	Yes
AP39V5819	STOPPAGE	24 Dec 2025 07:16	24 Dec 2025 07:29	0:13	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.03	1.31	Yes
AP39V5819	DRIVING	24 Dec 2025 07:29	24 Dec 2025 07:32	0:3	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	37 m from Bank of Baroda, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.16	1.32	Yes

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AP39V5819	STOPPAGE	24 Dec 2025 07:32	24 Dec 2025 07:38	0:5	37 m from Bank of Baroda, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	10 m from Dr YS Rajashekar Reddy Statue, INAVOLU ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.03	1.31	Yes
AP39V5819	DRIVING	24 Dec 2025 07:38	24 Dec 2025 07:43	0:5	10 m from Dr YS Rajashekar Reddy Statue, INAVOLU ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	1.25	1.46	Yes
AP39V5819	STOPPAGE	24 Dec 2025 07:43	24 Dec 2025 07:51	0:7	GUNTUR, ANDHRA PRADESH, 522503, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.01	1.43	Yes
AP39V5819	DRIVING	24 Dec 2025 07:51	24 Dec 2025 08:04	0:12	GUNTUR, ANDHRA PRADESH, 522503, INDIA	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	1.2	1.55	Yes
AP39V5819	STOPPAGE	24 Dec 2025 08:04	24 Dec 2025 08:10	0:6	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	1.53	Yes
AP39V5819	DRIVING	24 Dec 2025 08:10	24 Dec 2025 08:16	0:6	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.34	1.55	Yes
AP39V5819	STOPPAGE	24 Dec 2025 08:16	24 Dec 2025 08:23	0:6	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	1.53	Yes

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AP39V5819	DRIVING	24 Dec 2025 08:23	24 Dec 2025 08:26	0:3	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	118 m from KIA Motors Electric Vehicle Charging Station, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.75	1.61	Yes
AP39V5819	STOPPAGE	24 Dec 2025 08:26	24 Dec 2025 08:38	0:11	118 m from KIA Motors Electric Vehicle Charging Station, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	118 m from KIA Motors Electric Vehicle Charging Station, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	1.57	Yes
AP39V5819	DRIVING	24 Dec 2025 08:38	24 Dec 2025 08:41	0:3	118 m from KIA Motors Electric Vehicle Charging Station, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.56	1.63	Yes
AP39V5819	STOPPAGE	24 Dec 2025 08:41	24 Dec 2025 08:44	0:3	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	1.62	Yes
AP39V5819	DRIVING	24 Dec 2025 08:44	24 Dec 2025 08:50	0:6	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.69	1.67	Yes
AP39V5819	STOPPAGE	24 Dec 2025 08:50	24 Dec 2025 09:01	0:10	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.14	1.66	Yes

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AP39V5819	DRIVING	24 Dec 2025 09:01	24 Dec 2025 09:04	0:3	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	67 m from Jyothi Ice Creams, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.15	1.66	Yes
AP39V5819	STOPPAGE	24 Dec 2025 09:04	24 Dec 2025 09:08	0:3	67 m from Jyothi Ice Creams, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	126 m from Coastal Bank, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.05	1.66	Yes
AP39V5819	DRIVING	24 Dec 2025 09:08	24 Dec 2025 09:14	0:6	126 m from Coastal Bank, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.4	1.68	Yes
AP39V5819	STOPPAGE	24 Dec 2025 09:14	24 Dec 2025 09:44	0:30	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	1.6	Yes
AP39V5819	DRIVING	24 Dec 2025 09:44	24 Dec 2025 09:47	0:3	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.5	1.64	Yes
AP39V5819	STOPPAGE	24 Dec 2025 09:47	24 Dec 2025 09:53	0:6	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	1.62	Yes
AP39V5819	DRIVING	24 Dec 2025 09:53	24 Dec 2025 10:05	0:11	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	4.21	2.01	Yes
AP39V5819	STOPPAGE	24 Dec 2025 10:05	24 Dec 2025 10:28	0:22	VENKATAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.09	1.95	Yes

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AP39V5819	DRIVING	24 Dec 2025 10:28	24 Dec 2025 10:40	0:11	VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	4.42	2.32	Yes
AP39V5819	STOPPAGE	24 Dec 2025 10:40	24 Dec 2025 10:46	0:6	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.03	2.3	Yes
AP39V5819	DRIVING	24 Dec 2025 10:46	24 Dec 2025 12:32	1:45	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	49.67	5.94	Yes
AP39V5819	STOPPAGE	24 Dec 2025 12:32	24 Dec 2025 12:36	0:4	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	5.91	Yes
AP39V5819	DRIVING	24 Dec 2025 12:36	24 Dec 2025 13:19	0:42	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	124 m from Sambasivarao Halobricks Factory, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	29.53	7.81	Yes
AP39V5819	STOPPAGE	24 Dec 2025 13:19	24 Dec 2025 13:24	0:4	124 m from Sambasivarao Halobricks Factory, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	124 m from Sambasivarao Halobricks Factory, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	0	7.76	Yes
AP39V5819	DRIVING	24 Dec 2025 13:24	24 Dec 2025 14:16	0:52	124 m from Sambasivarao Halobricks Factory, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	25.02	9.04	Yes
AP39V5819	STOPPAGE	24 Dec 2025 14:16	24 Dec 2025 14:42	0:26	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	8.77	Yes

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AP39V5819	DRIVING	24 Dec 2025 14:42	24 Dec 2025 14:46	0:3	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.78	8.79	Yes
AP39V5819	STOPPAGE	24 Dec 2025 14:46	24 Dec 2025 15:13	0:27	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	8.52	Yes
AP39V5819	DRIVING	24 Dec 2025 15:13	24 Dec 2025 15:24	0:10	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	381 m from L and T WETIC CRDA Camp Office, TALLAPALEM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	4.73	8.73	Yes
AP39V5819	STOPPAGE	24 Dec 2025 15:24	24 Dec 2025 15:35	0:11	381 m from L and T WETIC CRDA Camp Office, TALLAPALEM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	381 m from L and T WETIC CRDA Camp Office, TALLAPALEM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.08	8.64	Yes
AP39V5819	DRIVING	24 Dec 2025 15:35	24 Dec 2025 15:53	0:18	381 m from L and T WETIC CRDA Camp Office, TALLAPALEM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	5.4	8.81	Yes
AP39V5819	STOPPAGE	24 Dec 2025 15:53	24 Dec 2025 16:04	0:10	VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	8.71	Yes
AP39V5819	DRIVING	24 Dec 2025 16:04	24 Dec 2025 16:08	0:4	VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATA PALEM MAIN ROAD, VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.92	8.73	Yes

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AP39V5819	STOPPAGE	24 Dec 2025 16:08	24 Dec 2025 16:20	0:11	VENKATA PALEM MAIN ROAD, VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATA PALEM MAIN ROAD, VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.02	8.63	Yes
AP39V5819	DRIVING	24 Dec 2025 16:20	24 Dec 2025 16:27	0:7	VENKATA PALEM MAIN ROAD, VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, KRISHNAYAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	2.83	8.74	Yes
AP39V5819	STOPPAGE	24 Dec 2025 16:27	24 Dec 2025 16:37	0:10	PENUMAKA - AMARAVATHI ROAD, KRISHNAYAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, KRISHNAYAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.01	8.65	Yes
AP39V5819	DRIVING	24 Dec 2025 16:37	24 Dec 2025 16:44	0:6	PENUMAKA - AMARAVATHI ROAD, KRISHNAYAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	3.81	8.82	Yes
AP39V5819	STOPPAGE	24 Dec 2025 16:44	24 Dec 2025 17:00	0:15	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	8.68	Yes
AP39V5819	DRIVING	24 Dec 2025 17:00	24 Dec 2025 18:49	1:49	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	50.17	10.51	Yes
AP39V5819	STOPPAGE	24 Dec 2025 18:49	24 Dec 2025 18:56	0:6	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0	10.45	Yes
AP39V5819	DRIVING	24 Dec 2025 18:56	24 Dec 2025 18:59	0:3	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0.4	10.44	Yes
AP39V5819	STOPPAGE	24 Dec 2025 18:59	24 Dec 2025 19:11	0:12	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	10.33	Yes

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AP39V5819	DRIVING	24 Dec 2025 19:11	24 Dec 2025 19:19	0:8	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	4.17	10.47	Yes
AP39V5819	STOPPAGE	24 Dec 2025 19:19	24 Dec 2025 19:24	0:4	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	10.43	Yes
AP39V5819	DRIVING	24 Dec 2025 19:24	24 Dec 2025 20:49	1:25	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	130 m from Mattipati Realty, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	43.72	11.81	Yes
AP39V5819	STOPPAGE	24 Dec 2025 20:49	25 Dec 2025 06:54	10:4	130 m from Mattipati Realty, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.07	7.97	Yes
AP39V5819	DRIVING	25 Dec 2025 06:54	25 Dec 2025 07:00	0:6	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	230 m from Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	1.47	7.99	Yes
AP39V5819	STOPPAGE	25 Dec 2025 07:00	25 Dec 2025 07:16	0:16	230 m from Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	230 m from Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.04	7.92	Yes
AP39V5819	DRIVING	25 Dec 2025 07:16	25 Dec 2025 07:19	0:3	230 m from Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.47	7.92	Yes

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AP39V5819	STOPPAGE	25 Dec 2025 07:19	25 Dec 2025 07:26	0:6	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	7.89	Yes
AP39V5819	DRIVING	25 Dec 2025 07:26	25 Dec 2025 07:30	0:4	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.6	7.89	Yes
AP39V5819	STOPPAGE	25 Dec 2025 07:30	25 Dec 2025 07:37	0:6	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	7.87	Yes
AP39V5819	DRIVING	25 Dec 2025 07:37	25 Dec 2025 07:43	0:6	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	44 m from KIA Motors Electric Vehicle Charging Station, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	1.16	7.88	Yes
AP39V5819	STOPPAGE	25 Dec 2025 07:43	25 Dec 2025 07:48	0:4	44 m from KIA Motors Electric Vehicle Charging Station, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	44 m from KIA Motors Electric Vehicle Charging Station, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.08	7.86	Yes
AP39V5819	DRIVING	25 Dec 2025 07:48	25 Dec 2025 07:55	0:6	44 m from KIA Motors Electric Vehicle Charging Station, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	214 m from Director Technical Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.68	7.85	Yes

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AP39V5819	STOPPAGE	25 Dec 2025 07:55	25 Dec 2025 07:58	0:3	214 m from Director Technical Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	214 m from Director Technical Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	7.84	Yes
AP39V5819	DRIVING	25 Dec 2025 07:58	25 Dec 2025 08:01	0:3	214 m from Director Technical Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.18	7.83	Yes
AP39V5819	STOPPAGE	25 Dec 2025 08:01	25 Dec 2025 08:25	0:24	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.09	7.74	Yes
AP39V5819	DRIVING	25 Dec 2025 08:25	25 Dec 2025 08:28	0:3	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.21	7.73	Yes
AP39V5819	STOPPAGE	25 Dec 2025 08:28	25 Dec 2025 08:34	0:6	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	7.71	Yes
AP39V5819	DRIVING	25 Dec 2025 08:34	25 Dec 2025 08:46	0:11	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	2.69	7.75	Yes

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AP39V5819	STOPPAGE	25 Dec 2025 08:46	25 Dec 2025 08:57	0:10	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.03	7.7	Yes
AP39V5819	DRIVING	25 Dec 2025 08:57	25 Dec 2025 09:00	0:3	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	90 m from Amaravathi Real Estate, RAYAPUDI MAIN ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.69	7.71	Yes
AP39V5819	STOPPAGE	25 Dec 2025 09:00	25 Dec 2025 09:07	0:7	90 m from Amaravathi Real Estate, RAYAPUDI MAIN ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	90 m from Amaravathi Real Estate, RAYAPUDI MAIN ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	7.69	Yes
AP39V5819	DRIVING	25 Dec 2025 09:07	25 Dec 2025 09:14	0:7	90 m from Amaravathi Real Estate, RAYAPUDI MAIN ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	382 m from Poleramma Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	2.48	7.73	Yes
AP39V5819	STOPPAGE	25 Dec 2025 09:14	25 Dec 2025 09:23	0:9	382 m from Poleramma Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	382 m from Poleramma Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	7.7	Yes
AP39V5819	DRIVING	25 Dec 2025 09:23	25 Dec 2025 09:26	0:3	382 m from Poleramma Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	92 m from Sri Sri Abhayanjaneya Swamy Vari Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.57	7.7	Yes

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AP39V5819	STOPPAGE	25 Dec 2025 09:26	25 Dec 2025 09:35	0:8	92 m from Sri Sri Abhayanjaneya Swamy Vari Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	92 m from Sri Sri Abhayanjaneya Swamy Vari Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	7.67	Yes
AP39V5819	DRIVING	25 Dec 2025 09:35	25 Dec 2025 09:41	0:6	92 m from Sri Sri Abhayanjaneya Swamy Vari Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	280 m from MPP School, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	2.45	7.72	Yes
AP39V5819	STOPPAGE	25 Dec 2025 09:41	25 Dec 2025 09:50	0:8	280 m from MPP School, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	280 m from MPP School, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	7.69	Yes
AP39V5819	DRIVING	25 Dec 2025 09:50	25 Dec 2025 10:01	0:11	280 m from MPP School, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	130 m from Mattipati Realty, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	4.43	7.77	Yes
AP39V5819	STOPPAGE	25 Dec 2025 10:01	25 Dec 2025 10:06	0:4	130 m from Mattipati Realty, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.04	7.76	Yes
AP39V5819	DRIVING	25 Dec 2025 10:06	25 Dec 2025 10:28	0:21	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	247 m from Megha Kurugallu, KURAGALLU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	8.29	7.92	Yes
AP39V5819	STOPPAGE	25 Dec 2025 10:28	25 Dec 2025 10:49	0:21	247 m from Megha Kurugallu, KURAGALLU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	247 m from Megha Kurugallu, KURAGALLU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	0	7.83	Yes

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AP39V5819	DRIVING	25 Dec 2025 10:49	25 Dec 2025 10:52	0:3	247 m from Megha Kurugallu, KURAGALLU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	MANDADAM-KURAGALLU ROAD, GUNTUR, ANDHRA PRADESH, 522236, INDIA	0.11	7.82	Yes
AP39V5819	STOPPAGE	25 Dec 2025 10:52	25 Dec 2025 11:04	0:11	MANDADAM-KURAGALLU ROAD, GUNTUR, ANDHRA PRADESH, 522236, INDIA	MANDADAM-KURAGALLU ROAD, GUNTUR, ANDHRA PRADESH, 522236, INDIA	0	7.78	Yes
AP39V5819	DRIVING	25 Dec 2025 11:04	25 Dec 2025 11:12	0:7	MANDADAM-KURAGALLU ROAD, GUNTUR, ANDHRA PRADESH, 522236, INDIA	MANDADAM-KURAGALLU ROAD, NOWLUR RURAL, GUNTUR, ANDHRA PRADESH, 522503, INDIA	1	7.78	Yes
AP39V5819	STOPPAGE	25 Dec 2025 11:12	25 Dec 2025 11:16	0:4	MANDADAM-KURAGALLU ROAD, NOWLUR RURAL, GUNTUR, ANDHRA PRADESH, 522503, INDIA	MANDADAM-KURAGALLU ROAD, NOWLUR RURAL, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	7.77	Yes
AP39V5819	DRIVING	25 Dec 2025 11:16	25 Dec 2025 11:55	0:39	MANDADAM-KURAGALLU ROAD, NOWLUR RURAL, GUNTUR, ANDHRA PRADESH, 522503, INDIA	NH 16 SERVICE ROAD, NAMBURU, GUNTUR, ANDHRA PRADESH, 522508, INDIA	12.55	7.97	Yes
AP39V5819	STOPPAGE	25 Dec 2025 11:55	25 Dec 2025 12:00	0:4	NH 16 SERVICE ROAD, NAMBURU, GUNTUR, ANDHRA PRADESH, 522508, INDIA	NH 16 SERVICE ROAD, NAMBURU, GUNTUR, ANDHRA PRADESH, 522508, INDIA	0	7.96	Yes
AP39V5819	DRIVING	25 Dec 2025 12:00	25 Dec 2025 12:30	0:30	NH 16 SERVICE ROAD, NAMBURU, GUNTUR, ANDHRA PRADESH, 522508, INDIA	33 m from Erukula Hakkula Porata Samithi, NH 16, GUNTUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522017, INDIA	21.3	8.43	Yes
AP39V5819	STOPPAGE	25 Dec 2025 12:30	25 Dec 2025 12:37	0:6	33 m from Erukula Hakkula Porata Samithi, NH 16, GUNTUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522017, INDIA	33 m from Erukula Hakkula Porata Samithi, NH 16, GUNTUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522017, INDIA	0	8.4	Yes

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AP39V5819	DRIVING	25 Dec 2025 12:37	25 Dec 2025 12:52	0:15	33 m from Erukula Hakkula Porata Samithi, NH 16, GUNTUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522017, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	7.57	8.55	Yes
AP39V5819	STOPPAGE	25 Dec 2025 12:52	25 Dec 2025 12:58	0:5	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0	8.53	Yes
AP39V5819	DRIVING	25 Dec 2025 12:58	25 Dec 2025 14:26	1:28	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	48.35	9.46	Yes
AP39V5819	STOPPAGE	25 Dec 2025 14:26	25 Dec 2025 16:10	1:43	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	9.05	Yes
AP39V5819	DRIVING	25 Dec 2025 16:10	25 Dec 2025 16:14	0:3	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	40 m from Mandal Parishad Primary School, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.14	9.04	Yes
AP39V5819	STOPPAGE	25 Dec 2025 16:14	26 Dec 2025 06:25	14:10	40 m from Mandal Parishad Primary School, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	40 m from Mandal Parishad Primary School, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.69	Yes

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AP39V5819	DRIVING	26 Dec 2025 06:25	26 Dec 2025 06:31	0:6	40 m from Mandal Parishad Primary School, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	1.31	6.7	Yes
AP39V5819	STOPPAGE	26 Dec 2025 06:31	26 Dec 2025 07:14	0:42	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.04	6.61	Yes
AP39V5819	DRIVING	26 Dec 2025 07:14	26 Dec 2025 07:17	0:3	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.12	6.61	Yes
AP39V5819	STOPPAGE	26 Dec 2025 07:17	26 Dec 2025 07:38	0:21	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	46 m from Nurani Jamiya Masjid, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.06	6.57	Yes
AP39V5819	DRIVING	26 Dec 2025 07:38	26 Dec 2025 07:41	0:3	46 m from Nurani Jamiya Masjid, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	37 m from Bank of Baroda, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.13	6.56	Yes

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AP39V5819	STOPPAGE	26 Dec 2025 07:41	26 Dec 2025 07:51	0:9	37 m from Bank of Baroda, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	37 m from Bank of Baroda, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.54	Yes
AP39V5819	DRIVING	26 Dec 2025 07:51	26 Dec 2025 07:54	0:3	37 m from Bank of Baroda, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.45	6.55	Yes
AP39V5819	STOPPAGE	26 Dec 2025 07:54	26 Dec 2025 08:07	0:13	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.52	Yes
AP39V5819	DRIVING	26 Dec 2025 08:07	26 Dec 2025 08:10	0:3	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.21	6.52	Yes
AP39V5819	STOPPAGE	26 Dec 2025 08:10	26 Dec 2025 08:26	0:15	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.07	6.49	Yes

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AP39V5819	DRIVING	26 Dec 2025 08:26	26 Dec 2025 08:29	0:3	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.13	6.49	Yes
AP39V5819	STOPPAGE	26 Dec 2025 08:29	26 Dec 2025 08:32	0:3	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	67 m from Jyothi Ice Creams, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.04	6.48	Yes
AP39V5819	DRIVING	26 Dec 2025 08:32	26 Dec 2025 08:35	0:3	67 m from Jyothi Ice Creams, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.2	6.48	Yes
AP39V5819	STOPPAGE	26 Dec 2025 08:35	26 Dec 2025 08:53	0:17	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.44	Yes
AP39V5819	DRIVING	26 Dec 2025 08:53	26 Dec 2025 09:00	0:7	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	1.31	6.45	Yes
AP39V5819	STOPPAGE	26 Dec 2025 09:00	26 Dec 2025 09:13	0:12	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	126 m from Coastal Bank, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.13	6.43	Yes

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AP39V5819	DRIVING	26 Dec 2025 09:13	26 Dec 2025 09:16	0:3	126 m from Coastal Bank, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.19	6.43	Yes
AP39V5819	STOPPAGE	26 Dec 2025 09:16	26 Dec 2025 09:21	0:4	MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.42	Yes
AP39V5819	DRIVING	26 Dec 2025 09:21	26 Dec 2025 09:28	0:7	MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	1.62	6.44	Yes
AP39V5819	STOPPAGE	26 Dec 2025 09:28	26 Dec 2025 09:34	0:6	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.42	Yes
AP39V5819	DRIVING	26 Dec 2025 09:34	26 Dec 2025 09:43	0:9	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	381 m from L and T WETIC CRDA Camp Office, TALLAPALEM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	3.23	6.46	Yes
AP39V5819	STOPPAGE	26 Dec 2025 09:43	26 Dec 2025 10:17	0:33	381 m from L and T WETIC CRDA Camp Office, TALLAPALEM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	381 m from L and T WETIC CRDA Camp Office, TALLAPALEM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.25	6.41	Yes

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AP39V5819	DRIVING	26 Dec 2025 10:17	26 Dec 2025 10:31	0:14	381 m from L and T WETIC CRDA Camp Office, TALLAPALEM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	139 m from Bhakina Prayer Hall, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	4.77	6.46	Yes
AP39V5819	STOPPAGE	26 Dec 2025 10:31	26 Dec 2025 10:40	0:9	139 m from Bhakina Prayer Hall, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	139 m from Bhakina Prayer Hall, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	6.44	Yes
AP39V5819	DRIVING	26 Dec 2025 10:40	26 Dec 2025 10:44	0:4	139 m from Bhakina Prayer Hall, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.77	6.45	Yes
AP39V5819	STOPPAGE	26 Dec 2025 10:44	26 Dec 2025 10:54	0:10	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	6.43	Yes
AP39V5819	DRIVING	26 Dec 2025 10:54	26 Dec 2025 11:06	0:11	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	2.52	6.45	Yes
AP39V5819	STOPPAGE	26 Dec 2025 11:06	26 Dec 2025 11:10	0:4	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	6.45	Yes

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AP39V5819	DRIVING	26 Dec 2025 11:10	26 Dec 2025 12:37	1:27	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	51.06	7.13	Yes
AP39V5819	STOPPAGE	26 Dec 2025 12:37	26 Dec 2025 12:47	0:9	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0	7.11	Yes
AP39V5819	DRIVING	26 Dec 2025 12:47	26 Dec 2025 14:13	1:26	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	50.36	7.76	Yes
AP39V5819	STOPPAGE	26 Dec 2025 14:13	27 Dec 2025 05:45	15:32	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	6.21	Yes
AP39V5819	DRIVING	27 Dec 2025 05:45	27 Dec 2025 05:48	0:3	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0.65	6.21	Yes
AP39V5819	STOPPAGE	27 Dec 2025 05:48	27 Dec 2025 06:10	0:21	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	6.18	Yes
AP39V5819	DRIVING	27 Dec 2025 06:10	27 Dec 2025 06:32	0:22	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	9.71	6.28	Yes

Wheelseye

AP39V5819	STOPPAGE	27 Dec 2025 06:32	27 Dec 2025 07:08	0:35	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.21	6.23	Yes
AP39V5819	DRIVING	27 Dec 2025 07:08	27 Dec 2025 07:11	0:3	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	46 m from Nurani Jamiya Masjid, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.12	6.23	Yes
AP39V5819	STOPPAGE	27 Dec 2025 07:11	27 Dec 2025 07:16	0:5	46 m from Nurani Jamiya Masjid, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	46 m from Nurani Jamiya Masjid, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.22	Yes
AP39V5819	DRIVING	27 Dec 2025 07:16	27 Dec 2025 07:23	0:6	46 m from Nurani Jamiya Masjid, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	1.36	6.23	Yes
AP39V5819	STOPPAGE	27 Dec 2025 07:23	27 Dec 2025 07:26	0:3	GUNTUR, ANDHRA PRADESH, 522503, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.23	Yes
AP39V5819	DRIVING	27 Dec 2025 07:26	27 Dec 2025 07:36	0:9	GUNTUR, ANDHRA PRADESH, 522503, INDIA	BLOCK 5, 46 m from Commissioner of Vigilance, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.95	6.23	Yes

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AP39V5819	STOPPAGE	27 Dec 2025 07:36	27 Dec 2025 07:46	0:9	BLOCK 5, 46 m from Commissioner of Vigilance, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 5, 46 m from Commissioner of Vigilance, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.21	Yes
AP39V5819	DRIVING	27 Dec 2025 07:46	27 Dec 2025 07:49	0:3	BLOCK 5, 46 m from Commissioner of Vigilance, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.23	6.21	Yes
AP39V5819	STOPPAGE	27 Dec 2025 07:49	27 Dec 2025 07:58	0:8	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.2	Yes
AP39V5819	DRIVING	27 Dec 2025 07:58	27 Dec 2025 08:01	0:3	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.14	6.2	Yes
AP39V5819	STOPPAGE	27 Dec 2025 08:01	27 Dec 2025 08:04	0:3	GUNTUR, ANDHRA PRADESH, 522503, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.01	6.2	Yes
AP39V5819	DRIVING	27 Dec 2025 08:04	27 Dec 2025 08:07	0:3	GUNTUR, ANDHRA PRADESH, 522503, INDIA	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.2	6.19	Yes
AP39V5819	STOPPAGE	27 Dec 2025 08:07	27 Dec 2025 08:12	0:5	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.19	Yes

Wheelseye

AP39V5819	DRIVING	27 Dec 2025 08:12	27 Dec 2025 08:16	0:3	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	1.31	6.2	Yes
AP39V5819	STOPPAGE	27 Dec 2025 08:16	27 Dec 2025 08:25	0:8	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.19	Yes
AP39V5819	DRIVING	27 Dec 2025 08:25	27 Dec 2025 08:31	0:6	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.71	6.19	Yes
AP39V5819	STOPPAGE	27 Dec 2025 08:31	27 Dec 2025 09:03	0:32	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.26	6.15	Yes
AP39V5819	DRIVING	27 Dec 2025 09:03	27 Dec 2025 09:10	0:6	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.3	6.15	Yes
AP39V5819	STOPPAGE	27 Dec 2025 09:10	27 Dec 2025 09:15	0:5	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	67 m from Jyothi Ice Creams, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.03	6.14	Yes

Wheelseye

AP39V5819	DRIVING	27 Dec 2025 09:15	27 Dec 2025 09:21	0:6	67 m from Jyothi Ice Creams, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.24	6.14	Yes
AP39V5819	STOPPAGE	27 Dec 2025 09:21	27 Dec 2025 09:24	0:3	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.13	Yes
AP39V5819	DRIVING	27 Dec 2025 09:24	27 Dec 2025 09:27	0:3	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.48	6.13	Yes
AP39V5819	STOPPAGE	27 Dec 2025 09:27	27 Dec 2025 09:38	0:10	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.06	6.12	Yes
AP39V5819	DRIVING	27 Dec 2025 09:38	27 Dec 2025 09:48	0:10	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATA PALEM MAIN ROAD, VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	3.28	6.15	Yes
AP39V5819	STOPPAGE	27 Dec 2025 09:48	27 Dec 2025 10:01	0:12	VENKATA PALEM MAIN ROAD, VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATA PALEM MAIN ROAD, VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.05	6.13	Yes
AP39V5819	DRIVING	27 Dec 2025 10:01	27 Dec 2025 10:04	0:3	VENKATA PALEM MAIN ROAD, VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.92	6.14	Yes
AP39V5819	STOPPAGE	27 Dec 2025 10:04	27 Dec 2025 10:24	0:19	VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	98 m from N4 E3 Junction, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.06	6.12	Yes

Wheelseye.com

AP39V5819	DRIVING	27 Dec 2025 10:24	27 Dec 2025 10:37	0:12	98 m from N4 E3 Junction, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BHEESHMA CHARYA ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	4.81	6.16	Yes
AP39V5819	STOPPAGE	27 Dec 2025 10:37	27 Dec 2025 10:46	0:8	BHEESHMA CHARYA ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	175 m from Burial Ground, TALLAYA PAEM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.05	6.15	Yes
AP39V5819	DRIVING	27 Dec 2025 10:46	27 Dec 2025 12:23	1:37	175 m from Burial Ground, TALLAYA PAEM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	33 m from Erukula Hakkula Porata Samithi, NH 16, GUNTUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522017, INDIA	44.25	6.56	Yes
AP39V5819	STOPPAGE	27 Dec 2025 12:23	27 Dec 2025 12:30	0:7	33 m from Erukula Hakkula Porata Samithi, NH 16, GUNTUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522017, INDIA	33 m from Erukula Hakkula Porata Samithi, NH 16, GUNTUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522017, INDIA	0	6.55	Yes
AP39V5819	DRIVING	27 Dec 2025 12:30	27 Dec 2025 12:43	0:12	33 m from Erukula Hakkula Porata Samithi, NH 16, GUNTUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522017, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	7.27	6.62	Yes
AP39V5819	STOPPAGE	27 Dec 2025 12:43	27 Dec 2025 12:46	0:3	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0.05	6.61	Yes
AP39V5819	DRIVING	27 Dec 2025 12:46	27 Dec 2025 12:49	0:3	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0.21	6.61	Yes
AP39V5819	STOPPAGE	27 Dec 2025 12:49	27 Dec 2025 13:00	0:10	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0	6.6	Yes

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AP39V5819	DRIVING	27 Dec 2025 13:00	27 Dec 2025 13:12	0:12	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	5.09	6.64	Yes
AP39V5819	STOPPAGE	27 Dec 2025 13:12	27 Dec 2025 13:27	0:15	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	6.62	Yes
AP39V5819	DRIVING	27 Dec 2025 13:27	27 Dec 2025 13:50	0:22	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	NH 16 SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522509, INDIA	15.06	6.77	Yes
AP39V5819	STOPPAGE	27 Dec 2025 13:50	27 Dec 2025 16:11	2:20	NH 16 SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522509, INDIA	NH 16 SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522509, INDIA	0.04	6.59	Yes
AP39V5819	DRIVING	27 Dec 2025 16:11	27 Dec 2025 17:11	1:0	NH 16 SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522509, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	30.18	6.85	Yes
AP39V5819	STOPPAGE	27 Dec 2025 17:11	29 Dec 2025 05:51	36:39	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	4.86	Yes
AP39V5819	DRIVING	29 Dec 2025 05:51	29 Dec 2025 05:54	0:3	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	PADMAVATHI NILAYAM, 13 m from Union Bank of India, COLLEGE ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.05	4.86	Yes
AP39V5819	STOPPAGE	29 Dec 2025 05:54	29 Dec 2025 06:07	0:12	PADMAVATHI NILAYAM, 13 m from Union Bank of India, COLLEGE ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	PADMAVATHI NILAYAM, 13 m from Union Bank of India, COLLEGE ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	4.85	Yes

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AP39V5819	DRIVING	29 Dec 2025 06:07	29 Dec 2025 06:10	0:3	PADMAVATHI NILAYAM, 13 m from Union Bank of India, COLLEGE ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	511 m from Burial Ground, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.95	4.86	Yes
AP39V5819	STOPPAGE	29 Dec 2025 06:10	29 Dec 2025 06:20	0:10	511 m from Burial Ground, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	511 m from Burial Ground, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	4.85	Yes
AP39V5819	DRIVING	29 Dec 2025 06:20	29 Dec 2025 06:23	0:3	511 m from Burial Ground, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.16	4.86	Yes
AP39V5819	STOPPAGE	29 Dec 2025 06:23	29 Dec 2025 06:41	0:17	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.08	4.85	Yes
AP39V5819	DRIVING	29 Dec 2025 06:41	29 Dec 2025 06:44	0:3	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	139 m from Bhakina Prayer Hall, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.18	4.86	Yes
AP39V5819	STOPPAGE	29 Dec 2025 06:44	29 Dec 2025 06:58	0:14	139 m from Bhakina Prayer Hall, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.04	4.85	Yes

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AP39V5819	DRIVING	29 Dec 2025 06:58	29 Dec 2025 07:07	0:8	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	PADMAVATHI BHAVANAM, 67 m from Sri Venugopala Swami Vari Gudi, TALLAYA PAEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	6.06	4.89	Yes
AP39V5819	STOPPAGE	29 Dec 2025 07:07	29 Dec 2025 07:10	0:3	PADMAVATHI BHAVANAM, 67 m from Sri Venugopala Swami Vari Gudi, TALLAYA PAEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.09	4.89	Yes
AP39V5819	DRIVING	29 Dec 2025 07:10	29 Dec 2025 07:13	0:3	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.14	4.89	Yes
AP39V5819	STOPPAGE	29 Dec 2025 07:13	29 Dec 2025 08:32	1:19	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	10 m from Dr YS Rajashekar Reddy Statue, INAVOLU ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.34	4.84	Yes
AP39V5819	DRIVING	29 Dec 2025 08:32	29 Dec 2025 08:36	0:3	10 m from Dr YS Rajashekar Reddy Statue, INAVOLU ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.55	4.84	Yes

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AP39V5819	STOPPAGE	29 Dec 2025 08:36	29 Dec 2025 08:39	0:3	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.03	4.84	Yes
AP39V5819	DRIVING	29 Dec 2025 08:39	29 Dec 2025 08:42	0:3	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.1	4.84	Yes
AP39V5819	STOPPAGE	29 Dec 2025 08:42	29 Dec 2025 09:11	0:29	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	4.82	Yes
AP39V5819	DRIVING	29 Dec 2025 09:11	29 Dec 2025 09:17	0:6	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	126 m from Coastal Bank, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.26	4.82	Yes
AP39V5819	STOPPAGE	29 Dec 2025 09:17	29 Dec 2025 09:29	0:12	126 m from Coastal Bank, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	126 m from Coastal Bank, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.02	4.81	Yes
AP39V5819	DRIVING	29 Dec 2025 09:29	29 Dec 2025 09:39	0:10	126 m from Coastal Bank, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	379 m from Golden Rule Ems Mdam, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	2.38	4.82	Yes

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AP39V5819	STOPPAGE	29 Dec 2025 09:39	29 Dec 2025 09:51	0:11	379 m from Golden Rule Ems Mdam, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	379 m from Golden Rule Ems Mdam, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	4.82	Yes
AP39V5819	DRIVING	29 Dec 2025 09:51	29 Dec 2025 11:14	1:23	379 m from Golden Rule Ems Mdam, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	46.59	5.12	Yes
AP39V5819	STOPPAGE	29 Dec 2025 11:14	29 Dec 2025 11:23	0:8	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0.07	5.12	Yes
AP39V5819	DRIVING	29 Dec 2025 11:23	29 Dec 2025 12:45	1:22	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	48.91	5.43	Yes
AP39V5819	STOPPAGE	29 Dec 2025 12:45	29 Dec 2025 13:01	0:15	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.02	5.42	Yes
AP39V5819	DRIVING	29 Dec 2025 13:01	29 Dec 2025 13:04	0:3	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	90 m from Amaravathi Real Estate, RAYAPUDI MAIN ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.71	5.42	Yes

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AP39V5819	STOPPAGE	29 Dec 2025 13:04	29 Dec 2025 13:14	0:9	90 m from Amaravathi Real Estate, RAYAPUDI MAIN ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	90 m from Amaravathi Real Estate, RAYAPUDI MAIN ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.01	5.42	Yes
AP39V5819	DRIVING	29 Dec 2025 13:14	29 Dec 2025 13:26	0:12	90 m from Amaravathi Real Estate, RAYAPUDI MAIN ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PENUMAKA - AMARAVATHI ROAD, KRISHNAYAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	6.38	5.46	Yes
AP39V5819	STOPPAGE	29 Dec 2025 13:26	29 Dec 2025 13:43	0:16	PENUMAKA - AMARAVATHI ROAD, KRISHNAYAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, KRISHNAYAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.06	5.45	Yes
AP39V5819	DRIVING	29 Dec 2025 13:43	29 Dec 2025 13:49	0:6	PENUMAKA - AMARAVATHI ROAD, KRISHNAYAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	2.71	5.46	Yes
AP39V5819	STOPPAGE	29 Dec 2025 13:49	29 Dec 2025 14:01	0:12	VENKATAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	5.45	Yes
AP39V5819	DRIVING	29 Dec 2025 14:01	29 Dec 2025 14:05	0:3	VENKATAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATAPALEM MAIN ROAD, VENKATAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.96	5.46	Yes
AP39V5819	STOPPAGE	29 Dec 2025 14:05	29 Dec 2025 14:26	0:21	VENKATAPALEM MAIN ROAD, VENKATAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATAPALEM MAIN ROAD, VENKATAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.06	5.44	Yes
AP39V5819	DRIVING	29 Dec 2025 14:26	29 Dec 2025 14:55	0:28	VENKATAPALEM MAIN ROAD, VENKATAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	15.15	5.54	Yes

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AP39V5819	STOPPAGE	29 Dec 2025 14:55	29 Dec 2025 23:03	8:8	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.22	Yes
AP39V5819	DRIVING	29 Dec 2025 23:03	29 Dec 2025 23:49	0:46	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	150 m from Raintree Park Basketball Court, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	20.71	5.34	Yes
AP39V5819	STOPPAGE	29 Dec 2025 23:49	30 Dec 2025 00:21	0:31	150 m from Raintree Park Basketball Court, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	150 m from Raintree Park Basketball Court, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	0	5.32	Yes
AP39V5819	DRIVING	30 Dec 2025 00:21	30 Dec 2025 01:05	0:44	150 m from Raintree Park Basketball Court, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	29.78	5.5	Yes
AP39V5819	STOPPAGE	30 Dec 2025 01:05	30 Dec 2025 01:09	0:4	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	5.49	Yes
AP39V5819	DRIVING	30 Dec 2025 01:09	30 Dec 2025 01:46	0:36	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	77 m from Yes Super Market, NH 16, KAZA, MANGALAGIRI, GUNTUR DISTRICT, ANDHRA PRADESH, 522503, INDIA	29.06	5.67	Yes
AP39V5819	STOPPAGE	30 Dec 2025 01:46	30 Dec 2025 04:10	2:23	77 m from Yes Super Market, NH 16, KAZA, MANGALAGIRI, GUNTUR DISTRICT, ANDHRA PRADESH, 522503, INDIA	77 m from Yes Super Market, NH 16, KAZA, MANGALAGIRI, GUNTUR DISTRICT, ANDHRA PRADESH, 522503, INDIA	0	5.58	Yes

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AP39V5819	DRIVING	30 Dec 2025 04:10	30 Dec 2025 04:51	0:41	77 m from Yes Super Market, NH 16, KAZA, MANGALA GIRI, GUNTUR DISTRICT, ANDHRA PRADESH, 522503, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARI MI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	21.32	5.7	Yes
AP39V5819	STOPPAGE	30 Dec 2025 04:51	30 Dec 2025 06:20	1:28	145 m from Taj Pan & Cooldrinks, PEDAPARI MI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARI MI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.64	Yes
AP39V5819	DRIVING	30 Dec 2025 06:20	30 Dec 2025 06:41	0:20	145 m from Taj Pan & Cooldrinks, PEDAPARI MI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	9.98	5.69	Yes
AP39V5819	STOPPAGE	30 Dec 2025 06:41	30 Dec 2025 06:46	0:5	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	5.69	Yes
AP39V5819	DRIVING	30 Dec 2025 06:46	30 Dec 2025 06:49	0:3	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.52	5.69	Yes
AP39V5819	STOPPAGE	30 Dec 2025 06:49	30 Dec 2025 07:13	0:24	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	5.68	Yes

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AP39V5819	DRIVING	30 Dec 2025 07:13	30 Dec 2025 07:17	0:3	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	190 m from Sai Baba Temple, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.79	5.68	Yes
AP39V5819	STOPPAGE	30 Dec 2025 07:17	30 Dec 2025 07:25	0:8	190 m from Sai Baba Temple, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.03	5.67	Yes
AP39V5819	DRIVING	30 Dec 2025 07:25	30 Dec 2025 07:28	0:3	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.26	5.67	Yes
AP39V5819	STOPPAGE	30 Dec 2025 07:28	30 Dec 2025 07:32	0:3	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	5.67	Yes
AP39V5819	DRIVING	30 Dec 2025 07:32	30 Dec 2025 07:35	0:3	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	67 m from Jyothi Ice Creams, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.7	5.68	Yes
AP39V5819	STOPPAGE	30 Dec 2025 07:35	30 Dec 2025 07:46	0:10	67 m from Jyothi Ice Creams, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.15	5.67	Yes
AP39V5819	DRIVING	30 Dec 2025 07:46	30 Dec 2025 07:49	0:3	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.17	5.67	Yes

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AP39V5819	STOPPAGE	30 Dec 2025 07:49	30 Dec 2025 08:11	0:22	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.03	5.66	Yes
AP39V5819	DRIVING	30 Dec 2025 08:11	30 Dec 2025 08:14	0:3	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.1	5.65	Yes
AP39V5819	STOPPAGE	30 Dec 2025 08:14	30 Dec 2025 08:41	0:27	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	10 m from Dr YS Rajashekar Reddy Statue, INAVOLU ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.24	5.64	Yes
AP39V5819	DRIVING	30 Dec 2025 08:41	30 Dec 2025 08:45	0:3	10 m from Dr YS Rajashekar Reddy Statue, INAVOLU ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 3, 63 m from Department of Women Child Disabled & Senior Citizen, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	1.12	5.64	Yes
AP39V5819	STOPPAGE	30 Dec 2025 08:45	30 Dec 2025 09:03	0:18	BLOCK 3, 63 m from Department of Women Child Disabled & Senior Citizen, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 2, 51 m from AP Para Medical Board Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.15	5.63	Yes

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AP39V5819	DRIVING	30 Dec 2025 09:03	30 Dec 2025 09:06	0:3	BLOCK 2, 51 m from AP Para Medical Board Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 5, 46 m from Commissioner of Vigilance, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.28	5.63	Yes
AP39V5819	STOPPAGE	30 Dec 2025 09:06	30 Dec 2025 09:13	0:6	BLOCK 5, 46 m from Commissioner of Vigilance, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 5, 46 m from Commissioner of Vigilance, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	5.63	Yes
AP39V5819	DRIVING	30 Dec 2025 09:13	30 Dec 2025 09:16	0:3	BLOCK 5, 46 m from Commissioner of Vigilance, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.21	5.63	Yes
AP39V5819	STOPPAGE	30 Dec 2025 09:16	30 Dec 2025 09:21	0:4	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	5.63	Yes
AP39V5819	DRIVING	30 Dec 2025 09:21	30 Dec 2025 09:24	0:3	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.13	5.62	Yes
AP39V5819	STOPPAGE	30 Dec 2025 09:24	30 Dec 2025 09:46	0:21	GUNTUR, ANDHRA PRADESH, 522503, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	5.61	Yes
AP39V5819	DRIVING	30 Dec 2025 09:46	30 Dec 2025 09:49	0:3	GUNTUR, ANDHRA PRADESH, 522503, INDIA	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.22	5.61	Yes

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AP39V5819	STOPPAGE	30 Dec 2025 09:49	30 Dec 2025 09:56	0:7	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	5.61	Yes
AP39V5819	DRIVING	30 Dec 2025 09:56	30 Dec 2025 10:05	0:9	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	1.07	5.61	Yes
AP39V5819	STOPPAGE	30 Dec 2025 10:05	30 Dec 2025 10:08	0:3	GUNTUR, ANDHRA PRADESH, 522503, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.05	5.61	Yes
AP39V5819	DRIVING	30 Dec 2025 10:08	30 Dec 2025 10:11	0:3	GUNTUR, ANDHRA PRADESH, 522503, INDIA	44 m from KIA Motors Electric Vehicle Charging Station, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.25	5.61	Yes
AP39V5819	STOPPAGE	30 Dec 2025 10:11	30 Dec 2025 10:17	0:5	44 m from KIA Motors Electric Vehicle Charging Station, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	44 m from KIA Motors Electric Vehicle Charging Station, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	5.6	Yes
AP39V5819	DRIVING	30 Dec 2025 10:17	30 Dec 2025 10:20	0:3	44 m from KIA Motors Electric Vehicle Charging Station, INAVOLU ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.77	5.61	Yes
AP39V5819	STOPPAGE	30 Dec 2025 10:20	30 Dec 2025 10:34	0:13	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	5.6	Yes

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AP39V5819	DRIVING	30 Dec 2025 10:34	30 Dec 2025 11:54	1:20	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	65 m from Care Dental College, AH 45, POTHUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522005, INDIA	43.32	5.83	Yes
AP39V5819	STOPPAGE	30 Dec 2025 11:54	30 Dec 2025 12:03	0:9	65 m from Care Dental College, AH 45, POTHUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522005, INDIA	65 m from Care Dental College, AH 45, POTHUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522005, INDIA	0	5.82	Yes
AP39V5819	DRIVING	30 Dec 2025 12:03	30 Dec 2025 12:18	0:14	65 m from Care Dental College, AH 45, POTHUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522005, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	5.06	5.84	Yes
AP39V5819	STOPPAGE	30 Dec 2025 12:18	30 Dec 2025 12:27	0:8	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0	5.84	Yes
AP39V5819	DRIVING	30 Dec 2025 12:27	30 Dec 2025 14:08	1:40	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	53.43	6.12	Yes
AP39V5819	STOPPAGE	30 Dec 2025 14:08	30 Dec 2025 14:29	0:21	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	6.1	Yes
AP39V5819	DRIVING	30 Dec 2025 14:29	30 Dec 2025 14:32	0:3	16 m from Ashok Mechanic Works, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.79	6.1	Yes

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AP39V5819	STOPPAGE	30 Dec 2025 14:32	30 Dec 2025 14:54	0:22	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	6.09	Yes
AP39V5819	DRIVING	30 Dec 2025 14:54	30 Dec 2025 15:00	0:6	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	459 m from MPP School, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	2.06	6.1	Yes
AP39V5819	STOPPAGE	30 Dec 2025 15:00	30 Dec 2025 15:04	0:4	459 m from MPP School, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	459 m from MPP School, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	6.1	Yes
AP39V5819	DRIVING	30 Dec 2025 15:04	30 Dec 2025 15:07	0:3	459 m from MPP School, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	459 m from MPP School, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.53	6.1	Yes
AP39V5819	STOPPAGE	30 Dec 2025 15:07	30 Dec 2025 15:14	0:6	459 m from MPP School, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	459 m from MPP School, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	6.09	Yes
AP39V5819	DRIVING	30 Dec 2025 15:14	30 Dec 2025 15:28	0:13	459 m from MPP School, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	381 m from L and T WETIC CRDA Camp Office, TALLAPALEM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	4.5	6.11	Yes
AP39V5819	STOPPAGE	30 Dec 2025 15:28	30 Dec 2025 15:43	0:14	381 m from L and T WETIC CRDA Camp Office, TALLAPALEM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	381 m from L and T WETIC CRDA Camp Office, TALLAPALEM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.04	6.1	Yes

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AP39V5819	DRIVING	30 Dec 2025 15:43	30 Dec 2025 15:46	0:3	381 m from L and T WETIC CRDA Camp Office, TALLAPALEM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	CHINNA DONKA, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.46	6.11	Yes
AP39V5819	STOPPAGE	30 Dec 2025 15:46	30 Dec 2025 15:49	0:3	CHINNA DONKA, GUNTUR, ANDHRA PRADESH, 522503, INDIA	156 m from L and T WETIC CRDA Camp Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.05	6.1	Yes
AP39V5819	DRIVING	30 Dec 2025 15:49	30 Dec 2025 16:01	0:11	156 m from L and T WETIC CRDA Camp Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	230 m from Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	2.76	6.11	Yes
AP39V5819	STOPPAGE	30 Dec 2025 16:01	30 Dec 2025 16:16	0:15	230 m from Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	129 m from Temple, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.03	6.1	Yes
AP39V5819	DRIVING	30 Dec 2025 16:16	30 Dec 2025 16:19	0:3	129 m from Temple, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	86 m from Mandal Parishad Pradhamika Patashala, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.19	6.1	Yes
AP39V5819	STOPPAGE	30 Dec 2025 16:19	30 Dec 2025 16:24	0:4	86 m from Mandal Parishad Pradhamika Patashala, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	86 m from Mandal Parishad Pradhamika Patashala, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.1	Yes

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AP39V5819	DRIVING	30 Dec 2025 16:24	30 Dec 2025 16:28	0:4	86 m from Mandal Parishad Pradhamika Patashala, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.98	6.1	Yes
AP39V5819	STOPPAGE	30 Dec 2025 16:28	30 Dec 2025 16:38	0:9	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.1	Yes
AP39V5819	DRIVING	30 Dec 2025 16:38	30 Dec 2025 16:41	0:3	PENUMAKA - AMARAVATHI ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.46	6.1	Yes
AP39V5819	STOPPAGE	30 Dec 2025 16:41	30 Dec 2025 16:49	0:7	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.09	Yes
AP39V5819	DRIVING	30 Dec 2025 16:49	30 Dec 2025 19:23	2:34	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	105 m from Shafee Hotel, NIDAMARRU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	85.93	6.52	Yes
AP39V5819	STOPPAGE	30 Dec 2025 19:23	30 Dec 2025 19:27	0:3	105 m from Shafee Hotel, NIDAMARRU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	105 m from Shafee Hotel, NIDAMARRU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	0.03	6.52	Yes
AP39V5819	DRIVING	30 Dec 2025 19:27	30 Dec 2025 19:30	0:3	105 m from Shafee Hotel, NIDAMARRU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	4/24, 40 m from NTR Statue, NIDAMARRU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	0.13	6.52	Yes

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AP39V5819	STOPPAGE	30 Dec 2025 19:30	30 Dec 2025 19:42	0:11	4/24, 40 m from NTR Statue, NIDAMARRU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	4/24, 40 m from NTR Statue, NIDAMARRU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	0	6.51	Yes
AP39V5819	DRIVING	30 Dec 2025 19:42	30 Dec 2025 20:12	0:30	4/24, 40 m from NTR Statue, NIDAMARRU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	11.92	6.56	Yes
AP39V5819	STOPPAGE	30 Dec 2025 20:12	30 Dec 2025 22:36	2:23	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.47	Yes
AP39V5819	DRIVING	30 Dec 2025 22:36	30 Dec 2025 22:39	0:3	63 m from Malkapuram Bus Stop, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.92	6.47	Yes
AP39V5819	STOPPAGE	30 Dec 2025 22:39	30 Dec 2025 22:42	0:3	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.07	6.47	Yes
AP39V5819	DRIVING	30 Dec 2025 22:42	30 Dec 2025 22:50	0:8	PARUCHURI SIVA PARVATHI, 18 m from Peoples Clinic, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PENUMAKA - AMARAVATHI ROAD, KRISHNAYAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	4.36	6.49	Yes

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AP39V5819	STOPPAGE	30 Dec 2025 22:50	30 Dec 2025 23:02	0:11	PENUMAKA - AMARAVATHI ROAD, KRISHNAYAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, KRISHNAYAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.02	6.48	Yes
AP39V5819	DRIVING	30 Dec 2025 23:02	30 Dec 2025 23:12	0:9	PENUMAKA - AMARAVATHI ROAD, KRISHNAYAPALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	4.96	6.51	Yes
AP39V5819	STOPPAGE	30 Dec 2025 23:12	30 Dec 2025 23:28	0:15	VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.5	Yes
AP39V5819	DRIVING	30 Dec 2025 23:28	30 Dec 2025 23:31	0:3	VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATA PALEM MAIN ROAD, VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.92	6.5	Yes
AP39V5819	STOPPAGE	30 Dec 2025 23:31	30 Dec 2025 23:43	0:12	VENKATA PALEM MAIN ROAD, VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	VENKATA PALEM MAIN ROAD, VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.07	6.49	Yes
AP39V5819	DRIVING	30 Dec 2025 23:43	30 Dec 2025 23:49	0:6	VENKATA PALEM MAIN ROAD, VENKATA PALEM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	457 m from Mandadam L and T Camp Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	3.49	6.51	Yes
AP39V5819	STOPPAGE	30 Dec 2025 23:49	30 Dec 2025 23:57	0:7	457 m from Mandadam L and T Camp Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	457 m from Mandadam L and T Camp Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.04	6.51	Yes
AP39V5819	DRIVING	30 Dec 2025 23:57	31 Dec 2025 00:05	0:7	457 m from Mandadam L and T Camp Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	100 m from Burial Ground, TALLAYA PAEM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	2.35	6.51	Yes

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AP39V5819	STOPPAGE	31 Dec 2025 00:05	31 Dec 2025 00:16	0:10	100 m from Burial Ground, TALLAYA PAEM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	100 m from Burial Ground, TALLAYA PAEM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.06	6.51	Yes
AP39V5819	DRIVING	31 Dec 2025 00:16	31 Dec 2025 00:24	0:7	100 m from Burial Ground, TALLAYA PAEM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	544 m from Poleramma Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	3.85	6.53	Yes
AP39V5819	STOPPAGE	31 Dec 2025 00:24	31 Dec 2025 00:40	0:16	544 m from Poleramma Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	382 m from Poleramma Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.02	6.52	Yes
AP39V5819	DRIVING	31 Dec 2025 00:40	31 Dec 2025 00:46	0:6	382 m from Poleramma Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	90 m from Amaravathi Real Estate, RAYAPUDI MAIN ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	2.48	6.53	Yes
AP39V5819	STOPPAGE	31 Dec 2025 00:46	31 Dec 2025 00:54	0:7	90 m from Amaravathi Real Estate, RAYAPUDI MAIN ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	90 m from Amaravathi Real Estate, RAYAPUDI MAIN ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.01	6.52	Yes
AP39V5819	DRIVING	31 Dec 2025 00:54	31 Dec 2025 00:57	0:3	90 m from Amaravathi Real Estate, RAYAPUDI MAIN ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.64	6.52	Yes

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AP39V5819	STOPPAGE	31 Dec 2025 00:57	31 Dec 2025 01:05	0:7	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.52	Yes
AP39V5819	DRIVING	31 Dec 2025 01:05	31 Dec 2025 02:55	1:50	43/97, 103 m from Dr BR Ambedkar Statue, MANDADAM ROAD, VELAGAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	50.58	6.74	Yes
AP39V5819	STOPPAGE	31 Dec 2025 02:55	31 Dec 2025 02:58	0:3	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0	6.74	Yes
AP39V5819	DRIVING	31 Dec 2025 02:58	31 Dec 2025 03:08	0:10	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	17 m from BATHU RAMBHOTULU COLLEGE OF EDUCATION, NH 16, POTHUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522005, INDIA	2.74	6.75	Yes
AP39V5819	STOPPAGE	31 Dec 2025 03:08	31 Dec 2025 03:25	0:16	17 m from BATHU RAMBHOTULU COLLEGE OF EDUCATION, NH 16, POTHUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522005, INDIA	17 m from BATHU RAMBHOTULU COLLEGE OF EDUCATION, NH 16, POTHUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522005, INDIA	0	6.74	Yes
AP39V5819	DRIVING	31 Dec 2025 03:25	31 Dec 2025 03:33	0:8	17 m from BATHU RAMBHOTULU COLLEGE OF EDUCATION, NH 16, POTHUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522005, INDIA	51 m from HP Petrol Pump, GUNTUR BYPASS, GUNTUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522017, INDIA	5.2	6.77	Yes

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AP39V5819	STOPPAGE	31 Dec 2025 03:33	31 Dec 2025 03:39	0:5	51 m from HP Petrol Pump, GUNTUR BYPASS, GUNTUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522017, INDIA	51 m from HP Petrol Pump, GUNTUR BYPASS, GUNTUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522017, INDIA	0	6.76	Yes
AP39V5819	DRIVING	31 Dec 2025 03:39	31 Dec 2025 04:44	1:5	51 m from HP Petrol Pump, GUNTUR BYPASS, GUNTUR, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522017, INDIA	GUNTUR, ANDHRA PRADESH, 522236, INDIA	35.92	6.93	Yes
AP39V5819	STOPPAGE	31 Dec 2025 04:44	31 Dec 2025 04:47	0:3	GUNTUR, ANDHRA PRADESH, 522236, INDIA	GUNTUR, ANDHRA PRADESH, 522236, INDIA	0	6.92	Yes
AP39V5819	DRIVING	31 Dec 2025 04:47	31 Dec 2025 04:58	0:10	GUNTUR, ANDHRA PRADESH, 522236, INDIA	63 m from Malkapuram Bus Stop, MANDADA M ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	4.49	6.94	Yes
AP39V5819	STOPPAGE	31 Dec 2025 04:58	31 Dec 2025 06:02	1:3	63 m from Malkapuram Bus Stop, MANDADA M ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	63 m from Malkapuram Bus Stop, MANDADA M ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.9	Yes
AP39V5819	DRIVING	31 Dec 2025 06:02	31 Dec 2025 06:05	0:3	63 m from Malkapuram Bus Stop, MANDADA M ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PADMAVATHI BHAVANAM, 67 m from Sri Venugopala Swami Vari Gudi, TALLAYA PAEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	1.28	6.91	Yes

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AP39V5819	STOPPAGE	31 Dec 2025 06:05	31 Dec 2025 06:09	0:4	PADMAVATHI BHAVANAM, 67 m from Sri Venugopala Swami Vari Gudi, TALLAYAPAEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PADMAVATHI BHAVANAM, 67 m from Sri Venugopala Swami Vari Gudi, TALLAYAPAEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.9	Yes
AP39V5819	DRIVING	31 Dec 2025 06:09	31 Dec 2025 06:12	0:3	PADMAVATHI BHAVANAM, 67 m from Sri Venugopala Swami Vari Gudi, TALLAYAPAEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	230 m from Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.52	6.9	Yes
AP39V5819	STOPPAGE	31 Dec 2025 06:12	31 Dec 2025 06:38	0:25	230 m from Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	230 m from Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.01	6.89	Yes
AP39V5819	DRIVING	31 Dec 2025 06:38	31 Dec 2025 06:41	0:3	230 m from Temple, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYAPALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.41	6.89	Yes
AP39V5819	STOPPAGE	31 Dec 2025 06:41	31 Dec 2025 07:28	0:47	KSR NILAYAM, 49 m from Union Bank of India, TALLAYAPALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	37 m from Bank of Baroda, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.26	6.86	Yes

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AP39V5819	DRIVING	31 Dec 2025 07:28	31 Dec 2025 07:31	0:3	37 m from Bank of Baroda, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	10 m from Dr YS Rajashekar Reddy Statue, INAVOLU ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.21	6.86	Yes
AP39V5819	STOPPAGE	31 Dec 2025 07:31	31 Dec 2025 07:35	0:4	10 m from Dr YS Rajashekar Reddy Statue, INAVOLU ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	10 m from Dr YS Rajashekar Reddy Statue, INAVOLU ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.86	Yes
AP39V5819	DRIVING	31 Dec 2025 07:35	31 Dec 2025 07:39	0:3	10 m from Dr YS Rajashekar Reddy Statue, INAVOLU ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.48	6.86	Yes
AP39V5819	STOPPAGE	31 Dec 2025 07:39	31 Dec 2025 07:45	0:6	KSR NILAYAM, 49 m from Union Bank of India, TALLAYA PALEM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	86 m from Mandal Parishad Pradhamika Patashala, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.04	6.85	Yes
AP39V5819	DRIVING	31 Dec 2025 07:45	31 Dec 2025 07:48	0:3	86 m from Mandal Parishad Pradhamika Patashala, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.14	6.85	Yes

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AP39V5819	STOPPAGE	31 Dec 2025 07:48	31 Dec 2025 08:01	0:13	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADA M ROAD, MANDADA M, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	126 m from Coastal Bank, MANDADA M ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.08	6.84	Yes
AP39V5819	DRIVING	31 Dec 2025 08:01	31 Dec 2025 08:04	0:3	126 m from Coastal Bank, MANDADA M ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADA M ROAD, MANDADA M, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.25	6.84	Yes
AP39V5819	STOPPAGE	31 Dec 2025 08:04	31 Dec 2025 08:08	0:3	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADA M ROAD, MANDADA M, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADA M ROAD, MANDADA M, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.84	Yes
AP39V5819	DRIVING	31 Dec 2025 08:08	31 Dec 2025 08:11	0:3	SRI SAI NILAYAM, 55 m from DTDC Courier, MANDADA M ROAD, MANDADA M, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	80 m from Telugu Baptist Church, MANDADA M ROAD, MANDADA M, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.19	6.84	Yes
AP39V5819	STOPPAGE	31 Dec 2025 08:11	31 Dec 2025 08:22	0:11	80 m from Telugu Baptist Church, MANDADA M ROAD, MANDADA M, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	80 m from Telugu Baptist Church, MANDADA M ROAD, MANDADA M, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.83	Yes

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AP39V5819	DRIVING	31 Dec 2025 08:22	31 Dec 2025 08:26	0:3	80 m from Telugu Baptist Church, MANDADAM ROAD, MANDADAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	190 m from Sai Baba Temple, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.82	6.83	Yes
AP39V5819	STOPPAGE	31 Dec 2025 08:26	31 Dec 2025 08:32	0:6	190 m from Sai Baba Temple, MANDADAM ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.02	6.83	Yes
AP39V5819	DRIVING	31 Dec 2025 08:32	31 Dec 2025 08:35	0:3	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.25	6.83	Yes
AP39V5819	STOPPAGE	31 Dec 2025 08:35	31 Dec 2025 08:45	0:9	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.82	Yes
AP39V5819	DRIVING	31 Dec 2025 08:45	31 Dec 2025 08:56	0:10	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	BLOCK 3, 63 m from Department of Women Child Disabled & Senior Citizen, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	2.6	6.83	Yes
AP39V5819	STOPPAGE	31 Dec 2025 08:56	31 Dec 2025 09:01	0:5	BLOCK 3, 63 m from Department of Women Child Disabled & Senior Citizen, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 2, 51 m from AP Para Medical Board Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.07	6.83	Yes
AP39V5819	DRIVING	31 Dec 2025 09:01	31 Dec 2025 09:07	0:6	BLOCK 2, 51 m from AP Para Medical Board Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.49	6.83	Yes

Wheelseye

AP39V5819	STOPPAGE	31 Dec 2025 09:07	31 Dec 2025 09:15	0:7	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.01	6.82	Yes
AP39V5819	DRIVING	31 Dec 2025 09:15	31 Dec 2025 09:18	0:3	BLOCK 3, 13 m from FASTag Centre, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.11	6.82	Yes
AP39V5819	STOPPAGE	31 Dec 2025 09:18	31 Dec 2025 09:36	0:18	GUNTUR, ANDHRA PRADESH, 522503, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.81	Yes
AP39V5819	DRIVING	31 Dec 2025 09:36	31 Dec 2025 09:39	0:3	GUNTUR, ANDHRA PRADESH, 522503, INDIA	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.36	6.81	Yes
AP39V5819	STOPPAGE	31 Dec 2025 09:39	31 Dec 2025 09:46	0:6	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.8	Yes
AP39V5819	DRIVING	31 Dec 2025 09:46	31 Dec 2025 09:49	0:3	BLOCK 1, 82 m from Additional Secretary of Chief Minister Office, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.22	6.8	Yes
AP39V5819	STOPPAGE	31 Dec 2025 09:49	31 Dec 2025 09:57	0:7	GUNTUR, ANDHRA PRADESH, 522503, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.01	6.8	Yes
AP39V5819	DRIVING	31 Dec 2025 09:57	31 Dec 2025 10:03	0:6	GUNTUR, ANDHRA PRADESH, 522503, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.97	6.8	Yes
AP39V5819	STOPPAGE	31 Dec 2025 10:03	31 Dec 2025 10:08	0:5	GUNTUR, ANDHRA PRADESH, 522503, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.8	Yes

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AP39V5819	DRIVING	31 Dec 2025 10:08	31 Dec 2025 10:20	0:11	GUNTUR, ANDHRA PRADESH, 522503, INDIA	251 m from AELC Church, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	3.66	6.81	Yes
AP39V5819	STOPPAGE	31 Dec 2025 10:20	31 Dec 2025 10:32	0:11	251 m from AELC Church, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	251 m from AELC Church, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	6.8	Yes
AP39V5819	DRIVING	31 Dec 2025 10:32	31 Dec 2025 10:41	0:9	251 m from AELC Church, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	2.66	6.81	Yes
AP39V5819	STOPPAGE	31 Dec 2025 10:41	31 Dec 2025 10:49	0:8	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.81	Yes
AP39V5819	DRIVING	31 Dec 2025 10:49	31 Dec 2025 10:52	0:3	KURAGALLU - MALKAPURAM ROAD, MANDADAM, GUNTUR, ANDHRA PRADESH, 522503, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.97	6.81	Yes
AP39V5819	STOPPAGE	31 Dec 2025 10:52	31 Dec 2025 12:57	2:4	GUNTUR, ANDHRA PRADESH, 522503, INDIA	GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	6.73	Yes
AP39V5819	DRIVING	31 Dec 2025 12:57	31 Dec 2025 13:54	0:57	GUNTUR, ANDHRA PRADESH, 522503, INDIA	NH 16 SERVICE ROAD, NAMBURU, GUNTUR, ANDHRA PRADESH, 522508, INDIA	19.75	6.81	Yes
AP39V5819	STOPPAGE	31 Dec 2025 13:54	31 Dec 2025 14:10	0:16	NH 16 SERVICE ROAD, NAMBURU, GUNTUR, ANDHRA PRADESH, 522508, INDIA	NH 16 SERVICE ROAD, NAMBURU, GUNTUR, ANDHRA PRADESH, 522508, INDIA	0	6.8	Yes
AP39V5819	DRIVING	31 Dec 2025 14:10	31 Dec 2025 14:56	0:45	NH 16 SERVICE ROAD, NAMBURU, GUNTUR, ANDHRA PRADESH, 522508, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	27.53	6.92	Yes
AP39V5819	STOPPAGE	31 Dec 2025 14:56	31 Dec 2025 15:05	0:9	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0.02	6.91	Yes

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AP39V5819	DRIVING	31 Dec 2025 15:05	31 Dec 2025 15:09	0:3	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0.43	6.91	Yes
AP39V5819	STOPPAGE	31 Dec 2025 15:09	31 Dec 2025 15:26	0:17	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0	6.9	Yes
AP39V5819	DRIVING	31 Dec 2025 15:26	31 Dec 2025 15:34	0:8	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	4.18	6.92	Yes
AP39V5819	STOPPAGE	31 Dec 2025 15:34	31 Dec 2025 15:38	0:4	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	6.92	Yes
AP39V5819	DRIVING	31 Dec 2025 15:38	31 Dec 2025 17:03	1:25	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	40 m from Mandal Parishad Primary School, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	43.82	7.1	Yes
AP39V5819	STOPPAGE	31 Dec 2025 17:03	31 Dec 2025 19:06	2:3	40 m from Mandal Parishad Primary School, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	40 m from Mandal Parishad Primary School, MANDADAM ROAD, MALKAPURAM, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.02	7.02	Yes
AP39V5820	STOPPAGE	24 Dec 2025 00:00	24 Dec 2025 07:00	7:0	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	0	Yes

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AP39V5820	DRIVING	24 Dec 2025 07:00	24 Dec 2025 07:03	0:3	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	65 m from Government Registration Office, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.27	0.04	Yes
AP39V5820	STOPPAGE	24 Dec 2025 07:03	24 Dec 2025 07:07	0:3	65 m from Government Registration Office, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	65 m from Government Registration Office, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	0.04	Yes
AP39V5820	DRIVING	24 Dec 2025 07:07	24 Dec 2025 07:21	0:14	65 m from Government Registration Office, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	167 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	3.47	0.51	Yes
AP39V5820	STOPPAGE	24 Dec 2025 07:21	24 Dec 2025 07:51	0:30	167 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	167 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.06	0.48	Yes
AP39V5820	DRIVING	24 Dec 2025 07:51	24 Dec 2025 08:06	0:15	167 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	8 m from Sai Srinivas Consultancy , PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	3.76	0.93	Yes
AP39V5820	STOPPAGE	24 Dec 2025 08:06	24 Dec 2025 08:18	0:12	8 m from Sai Srinivas Consultancy , PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	8 m from Sai Srinivas Consultancy , PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	0.91	Yes

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AP39V5820	DRIVING	24 Dec 2025 08:18	24 Dec 2025 09:22	1:3	8 m from Sai Srinivas Consultancy, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	187 m from The Pentecostal Mission Koppuravuru Church, AH 45, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	22.66	3.23	Yes
AP39V5820	STOPPAGE	24 Dec 2025 09:22	24 Dec 2025 09:29	0:7	187 m from The Pentecostal Mission Koppuravuru Church, AH 45, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	187 m from The Pentecostal Mission Koppuravuru Church, AH 45, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	0	3.18	Yes
AP39V5820	DRIVING	24 Dec 2025 09:29	24 Dec 2025 10:15	0:46	187 m from The Pentecostal Mission Koppuravuru Church, AH 45, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	28.62	5.73	Yes
AP39V5820	STOPPAGE	24 Dec 2025 10:15	24 Dec 2025 10:23	0:7	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0	5.67	Yes
AP39V5820	DRIVING	24 Dec 2025 10:23	24 Dec 2025 11:44	1:21	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	40.08	8.43	Yes
AP39V5820	STOPPAGE	24 Dec 2025 11:44	24 Dec 2025 11:52	0:7	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	8.34	Yes
AP39V5820	DRIVING	24 Dec 2025 11:52	24 Dec 2025 12:20	0:28	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	26 m from Bhakina Prayer Hall, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	12.62	9.04	Yes

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AP39V5820	STOPPAGE	24 Dec 2025 12:20	24 Dec 2025 12:26	0:6	26 m from Bhakina Prayer Hall, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	26 m from Bhakina Prayer Hall, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.06	8.97	Yes
AP39V5820	DRIVING	24 Dec 2025 12:26	24 Dec 2025 12:33	0:6	26 m from Bhakina Prayer Hall, RAYAPUDI MAIN ROAD, RAYAPUDI, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	2.31	9.07	Yes
AP39V5820	STOPPAGE	24 Dec 2025 12:33	24 Dec 2025 13:37	1:4	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	8.36	Yes
AP39V5820	DRIVING	24 Dec 2025 13:37	24 Dec 2025 13:47	0:10	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.71	8.38	Yes
AP39V5820	STOPPAGE	24 Dec 2025 13:47	24 Dec 2025 14:00	0:12	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	8.25	Yes
AP39V5820	DRIVING	24 Dec 2025 14:00	24 Dec 2025 14:03	0:3	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0.87	8.29	Yes
AP39V5820	STOPPAGE	24 Dec 2025 14:03	24 Dec 2025 14:19	0:16	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	8.13	Yes

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AP39V5820	DRIVING	24 Dec 2025 14:19	24 Dec 2025 14:24	0:4	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.17	8.17	Yes
AP39V5820	STOPPAGE	24 Dec 2025 14:24	24 Dec 2025 14:32	0:8	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	8.09	Yes
AP39V5820	DRIVING	24 Dec 2025 14:32	24 Dec 2025 14:42	0:9	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	2.11	8.14	Yes
AP39V5820	STOPPAGE	24 Dec 2025 14:42	24 Dec 2025 14:54	0:11	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	8.03	Yes
AP39V5820	DRIVING	24 Dec 2025 14:54	24 Dec 2025 16:50	1:56	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	50.13	10.09	Yes
AP39V5820	STOPPAGE	24 Dec 2025 16:50	24 Dec 2025 16:53	0:3	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0.06	10.06	Yes
AP39V5820	DRIVING	24 Dec 2025 16:53	24 Dec 2025 17:55	1:1	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	150 m from Raintree Park Basketball Court, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	29.29	11.12	Yes

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AP39V5820	STOPPAGE	24 Dec 2025 17:55	24 Dec 2025 17:58	0:3	150 m from Raintree Park Basketball Court, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	150 m from Raintree Park Basketball Court, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	0	11.09	Yes
AP39V5820	DRIVING	24 Dec 2025 17:58	24 Dec 2025 19:02	1:4	150 m from Raintree Park Basketball Court, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	20.74	11.55	Yes
AP39V5820	STOPPAGE	24 Dec 2025 19:02	26 Dec 2025 06:48	35:45	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.04	4.01	Yes
AP39V5820	DRIVING	26 Dec 2025 06:48	26 Dec 2025 07:01	0:12	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	112 m from Sri Sai Manikanta Real Estate & Consultancy, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	3.06	4.05	Yes
AP39V5820	STOPPAGE	26 Dec 2025 07:01	26 Dec 2025 07:08	0:7	112 m from Sri Sai Manikanta Real Estate & Consultancy, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	397 m from HANUMAN TEMPLE, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.05	4.05	Yes
AP39V5820	DRIVING	26 Dec 2025 07:08	26 Dec 2025 07:14	0:6	397 m from HANUMAN TEMPLE, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	373 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.58	4.05	Yes
AP39V5820	STOPPAGE	26 Dec 2025 07:14	26 Dec 2025 07:18	0:3	373 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	373 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	4.04	Yes

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AP39V5820	DRIVING	26 Dec 2025 07:18	26 Dec 2025 07:22	0:4	373 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	167 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.8	4.05	Yes
AP39V5820	STOPPAGE	26 Dec 2025 07:22	26 Dec 2025 07:33	0:11	167 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	167 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.05	4.04	Yes
AP39V5820	DRIVING	26 Dec 2025 07:33	26 Dec 2025 07:50	0:16	167 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	GUNTUR, ANDHRA PRADESH, 522237, INDIA	3.47	4.08	Yes
AP39V5820	STOPPAGE	26 Dec 2025 07:50	26 Dec 2025 08:06	0:15	GUNTUR, ANDHRA PRADESH, 522237, INDIA	GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	4.06	Yes
AP39V5820	DRIVING	26 Dec 2025 08:06	26 Dec 2025 08:17	0:11	GUNTUR, ANDHRA PRADESH, 522237, INDIA	KURAGALLU - MALKAPURAM ROAD, INAVOLU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	3.22	4.11	Yes
AP39V5820	STOPPAGE	26 Dec 2025 08:17	26 Dec 2025 08:33	0:16	KURAGALLU - MALKAPURAM ROAD, INAVOLU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	KURAGALLU - MALKAPURAM ROAD, INAVOLU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	4.09	Yes
AP39V5820	DRIVING	26 Dec 2025 08:33	26 Dec 2025 08:47	0:13	KURAGALLU - MALKAPURAM ROAD, INAVOLU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	INAVOLU ROAD, SAKHAMURU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	3.23	4.13	Yes
AP39V5820	STOPPAGE	26 Dec 2025 08:47	26 Dec 2025 09:04	0:16	INAVOLU ROAD, SAKHAMURU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	INAVOLU ROAD, SAKHAMURU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	4.11	Yes
AP39V5820	DRIVING	26 Dec 2025 09:04	26 Dec 2025 09:07	0:3	INAVOLU ROAD, SAKHAMURU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	58 m from NTR Sujala Water Plant, SAKHAMURU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.44	4.11	Yes

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AP39V5820	STOPPAGE	26 Dec 2025 09:07	26 Dec 2025 09:12	0:5	58 m from NTR Sujala Water Plant, SAKHAMURU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	58 m from NTR Sujala Water Plant, SAKHAMURU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	4.11	Yes
AP39V5820	DRIVING	26 Dec 2025 09:12	26 Dec 2025 09:28	0:15	58 m from NTR Sujala Water Plant, SAKHAMURU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	TADIKONDA - RAYAPUDI ROAD, PEDAPARIMI, GUNTUR, ANDHRA PRADESH, 522236, INDIA	5.58	4.19	Yes
AP39V5820	STOPPAGE	26 Dec 2025 09:28	26 Dec 2025 09:41	0:13	TADIKONDA - RAYAPUDI ROAD, PEDAPARIMI, GUNTUR, ANDHRA PRADESH, 522236, INDIA	TADIKONDA - RAYAPUDI ROAD, PEDAPARIMI, GUNTUR, ANDHRA PRADESH, 522236, INDIA	0.05	4.17	Yes
AP39V5820	DRIVING	26 Dec 2025 09:41	26 Dec 2025 09:50	0:8	TADIKONDA - RAYAPUDI ROAD, PEDAPARIMI, GUNTUR, ANDHRA PRADESH, 522236, INDIA	MANGALAGIRI NEERUKONDA TADIKONDA ROAD, NEERU KONDA, GUNTUR, ANDHRA PRADESH, 522236, INDIA	4.46	4.24	Yes
AP39V5820	STOPPAGE	26 Dec 2025 09:50	26 Dec 2025 10:21	0:30	MANGALAGIRI NEERUKONDA TADIKONDA ROAD, NEERU KONDA, GUNTUR, ANDHRA PRADESH, 522236, INDIA	MANGALAGIRI NEERUKONDA TADIKONDA ROAD, NEERU KONDA, GUNTUR, ANDHRA PRADESH, 522236, INDIA	0	4.2	Yes
AP39V5820	DRIVING	26 Dec 2025 10:21	26 Dec 2025 10:30	0:9	MANGALAGIRI NEERUKONDA TADIKONDA ROAD, NEERU KONDA, GUNTUR, ANDHRA PRADESH, 522236, INDIA	7 m from Guptha General Stores, PEDAPARIMI ROAD, PEDAPARIMI, THULLUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	4.7	4.27	Yes
AP39V5820	STOPPAGE	26 Dec 2025 10:30	26 Dec 2025 10:34	0:4	7 m from Guptha General Stores, PEDAPARIMI ROAD, PEDAPARIMI, THULLUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	7 m from Guptha General Stores, PEDAPARIMI ROAD, PEDAPARIMI, THULLUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	0	4.26	Yes

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AP39V5820	DRIVING	26 Dec 2025 10:34	26 Dec 2025 12:02	1:27	7 m from Guptha General Stores, PEDAPARIMI ROAD, PEDAPARIMI, THULLUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	43.78	4.89	Yes
AP39V5820	STOPPAGE	26 Dec 2025 12:02	26 Dec 2025 12:06	0:4	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	4.88	Yes
AP39V5820	DRIVING	26 Dec 2025 12:06	26 Dec 2025 12:41	0:34	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	92 m from John Dear Mechanic Work Shop, GUNTUR BYPASS, GUNTUR AUTO NAGAR, PEDAKAKANI, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522001, INDIA	21.14	5.18	Yes
AP39V5820	STOPPAGE	26 Dec 2025 12:41	26 Dec 2025 12:46	0:5	92 m from John Dear Mechanic Work Shop, GUNTUR BYPASS, GUNTUR AUTO NAGAR, PEDAKAKANI, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522001, INDIA	92 m from John Dear Mechanic Work Shop, GUNTUR BYPASS, GUNTUR AUTO NAGAR, PEDAKAKANI, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522001, INDIA	0.04	5.18	Yes
AP39V5820	DRIVING	26 Dec 2025 12:46	26 Dec 2025 12:55	0:9	92 m from John Dear Mechanic Work Shop, GUNTUR BYPASS, GUNTUR AUTO NAGAR, PEDAKAKANI, GUNTUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522001, INDIA	67 m from Public Telephone Coin Box, AH 45, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522509, INDIA	5.45	5.25	Yes
AP39V5820	STOPPAGE	26 Dec 2025 12:55	26 Dec 2025 13:14	0:19	67 m from Public Telephone Coin Box, AH 45, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522509, INDIA	67 m from Public Telephone Coin Box, AH 45, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522509, INDIA	0	5.23	Yes

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AP39V5820	DRIVING	26 Dec 2025 13:14	26 Dec 2025 13:47	0:32	67 m from Public Telephone Coin Box, AH 45, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522509, INDIA	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	13.43	5.4	Yes
AP39V5820	STOPPAGE	26 Dec 2025 13:47	26 Dec 2025 14:04	0:17	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	5.37	Yes
AP39V5820	DRIVING	26 Dec 2025 14:04	26 Dec 2025 14:25	0:20	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	9.34	5.49	Yes
AP39V5820	STOPPAGE	26 Dec 2025 14:25	26 Dec 2025 14:30	0:5	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	5.49	Yes
AP39V5820	DRIVING	26 Dec 2025 14:30	26 Dec 2025 14:44	0:13	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	510 m from AJ Estate, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	5.98	5.56	Yes
AP39V5820	STOPPAGE	26 Dec 2025 14:44	26 Dec 2025 14:49	0:5	510 m from AJ Estate, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	510 m from AJ Estate, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.55	Yes
AP39V5820	DRIVING	26 Dec 2025 14:49	26 Dec 2025 14:58	0:9	510 m from AJ Estate, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	4.16	5.61	Yes
AP39V5820	STOPPAGE	26 Dec 2025 14:58	26 Dec 2025 15:11	0:13	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.59	Yes
AP39V5820	DRIVING	26 Dec 2025 15:11	26 Dec 2025 15:15	0:3	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	304 m from HDFC ATM, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.83	5.59	Yes

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AP39V5820	STOPPAGE	26 Dec 2025 15:15	26 Dec 2025 15:22	0:6	304 m from HDFC ATM, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	304 m from HDFC ATM, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.58	Yes
AP39V5820	DRIVING	26 Dec 2025 15:22	26 Dec 2025 15:27	0:5	304 m from HDFC ATM, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.69	5.6	Yes
AP39V5820	STOPPAGE	26 Dec 2025 15:27	26 Dec 2025 15:37	0:9	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.59	Yes
AP39V5820	DRIVING	26 Dec 2025 15:37	26 Dec 2025 15:40	0:3	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.24	5.59	Yes
AP39V5820	STOPPAGE	26 Dec 2025 15:40	26 Dec 2025 15:47	0:7	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.58	Yes
AP39V5820	DRIVING	26 Dec 2025 15:47	26 Dec 2025 15:50	0:3	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0.89	5.59	Yes
AP39V5820	STOPPAGE	26 Dec 2025 15:50	26 Dec 2025 16:05	0:14	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	5.57	Yes

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AP39V5820	DRIVING	26 Dec 2025 16:05	26 Dec 2025 16:08	0:3	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	65 m from Government Registration Office, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.43	5.57	Yes
AP39V5820	STOPPAGE	26 Dec 2025 16:08	26 Dec 2025 16:12	0:4	65 m from Government Registration Office, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	65 m from Government Registration Office, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.56	Yes
AP39V5820	DRIVING	26 Dec 2025 16:12	26 Dec 2025 16:42	0:29	65 m from Government Registration Office, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	21 m from Devi Cafe, NIDAMARRU ROAD, TADIKONDA, TADIKONDA, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	12.29	5.71	Yes
AP39V5820	STOPPAGE	26 Dec 2025 16:42	26 Dec 2025 16:52	0:10	21 m from Devi Cafe, NIDAMARRU ROAD, TADIKONDA, TADIKONDA, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	21 m from Devi Cafe, NIDAMARRU ROAD, TADIKONDA, TADIKONDA, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	0.07	5.7	Yes
AP39V5820	DRIVING	26 Dec 2025 16:52	26 Dec 2025 18:06	1:13	21 m from Devi Cafe, NIDAMARRU ROAD, TADIKONDA, TADIKONDA, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	38.03	6.16	Yes
AP39V5820	STOPPAGE	26 Dec 2025 18:06	26 Dec 2025 18:09	0:3	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0.07	6.16	Yes
AP39V5820	DRIVING	26 Dec 2025 18:09	26 Dec 2025 18:16	0:7	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0.55	6.16	Yes
AP39V5820	STOPPAGE	26 Dec 2025 18:16	26 Dec 2025 18:24	0:7	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	6.15	Yes

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AP39V5820	DRIVING	26 Dec 2025 18:24	26 Dec 2025 18:34	0:10	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	4.19	6.19	Yes
AP39V5820	STOPPAGE	26 Dec 2025 18:34	26 Dec 2025 18:38	0:4	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	6.19	Yes
AP39V5820	DRIVING	26 Dec 2025 18:38	26 Dec 2025 19:37	0:58	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	19 m from Ali Footwear, TADIKONDA KANTHERU ROAD, TADIKONDA, TADIKONDA, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	33.36	6.59	Yes
AP39V5820	STOPPAGE	26 Dec 2025 19:37	26 Dec 2025 19:43	0:6	19 m from Ali Footwear, TADIKONDA KANTHERU ROAD, TADIKONDA, TADIKONDA, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	19 m from Ali Footwear, TADIKONDA KANTHERU ROAD, TADIKONDA, TADIKONDA, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	0	6.58	Yes
AP39V5820	DRIVING	26 Dec 2025 19:43	26 Dec 2025 20:22	0:38	19 m from Ali Footwear, TADIKONDA KANTHERU ROAD, TADIKONDA, TADIKONDA, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	12.71	6.7	Yes
AP39V5820	STOPPAGE	26 Dec 2025 20:22	27 Dec 2025 07:39	11:17	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.75	Yes
AP39V5820	DRIVING	27 Dec 2025 07:39	27 Dec 2025 07:54	0:14	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	199 m from Aakash Book Store, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	4.15	5.79	Yes

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AP39V5820	STOPPAGE	27 Dec 2025 07:54	27 Dec 2025 08:00	0:6	199 m from Aakash Book Store, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	199 m from Aakash Book Store, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.08	5.78	Yes
AP39V5820	DRIVING	27 Dec 2025 08:00	27 Dec 2025 08:07	0:7	199 m from Aakash Book Store, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	174 m from Church, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	2.02	5.8	Yes
AP39V5820	STOPPAGE	27 Dec 2025 08:07	27 Dec 2025 08:18	0:11	174 m from Church, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	174 m from Church, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.79	Yes
AP39V5820	DRIVING	27 Dec 2025 08:18	27 Dec 2025 08:27	0:9	174 m from Church, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	172 m from Mandal Parishad Primary School, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	2.09	5.8	Yes
AP39V5820	STOPPAGE	27 Dec 2025 08:27	27 Dec 2025 08:31	0:3	172 m from Mandal Parishad Primary School, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	172 m from Mandal Parishad Primary School, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.8	Yes
AP39V5820	DRIVING	27 Dec 2025 08:31	27 Dec 2025 08:42	0:11	172 m from Mandal Parishad Primary School, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	3.4	5.82	Yes
AP39V5820	STOPPAGE	27 Dec 2025 08:42	27 Dec 2025 09:05	0:23	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	5.8	Yes

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AP39V5820	DRIVING	27 Dec 2025 09:05	27 Dec 2025 09:12	0:6	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.03	5.8	Yes
AP39V5820	STOPPAGE	27 Dec 2025 09:12	27 Dec 2025 09:16	0:3	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.8	Yes
AP39V5820	DRIVING	27 Dec 2025 09:16	27 Dec 2025 09:38	0:22	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522016, INDIA	5.92	5.84	Yes
AP39V5820	STOPPAGE	27 Dec 2025 09:38	27 Dec 2025 09:52	0:14	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522016, INDIA	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522016, INDIA	0	5.83	Yes
AP39V5820	DRIVING	27 Dec 2025 09:52	27 Dec 2025 09:57	0:4	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522016, INDIA	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522236, INDIA	0.66	5.83	Yes
AP39V5820	STOPPAGE	27 Dec 2025 09:57	27 Dec 2025 10:12	0:14	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522236, INDIA	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522236, INDIA	0	5.81	Yes
AP39V5820	DRIVING	27 Dec 2025 10:12	27 Dec 2025 10:17	0:5	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522236, INDIA	169 m from Puncture Shop, BOMMALA ROAD, NEKKALLU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	1.73	5.83	Yes
AP39V5820	STOPPAGE	27 Dec 2025 10:17	27 Dec 2025 10:55	0:37	169 m from Puncture Shop, BOMMALA ROAD, NEKKALLU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	169 m from Puncture Shop, BOMMALA ROAD, NEKKALLU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	0	5.78	Yes

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AP39V5820	DRIVING	27 Dec 2025 10:55	27 Dec 2025 10:58	0:3	169 m from Puncture Shop, BOMMALA ROAD, NEKKALLU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	350 m from MANDAL PRAJA PARISHAD PRIMARY SCHOOL CHINAGAR LAPADU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	0.94	5.79	Yes
AP39V5820	STOPPAGE	27 Dec 2025 10:58	27 Dec 2025 11:08	0:9	350 m from MANDAL PRAJA PARISHAD PRIMARY SCHOOL CHINAGAR LAPADU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	350 m from MANDAL PRAJA PARISHAD PRIMARY SCHOOL CHINAGAR LAPADU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	0	5.78	Yes
AP39V5820	DRIVING	27 Dec 2025 11:08	27 Dec 2025 11:13	0:5	350 m from MANDAL PRAJA PARISHAD PRIMARY SCHOOL CHINAGAR LAPADU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	327 m from Pedaparimi Branch Post Office, PEDAPARIMI, THULLUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	2.54	5.8	Yes
AP39V5820	STOPPAGE	27 Dec 2025 11:13	27 Dec 2025 11:18	0:4	327 m from Pedaparimi Branch Post Office, PEDAPARIMI, THULLUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	327 m from Pedaparimi Branch Post Office, PEDAPARIMI, THULLUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	0	5.8	Yes
AP39V5820	DRIVING	27 Dec 2025 11:18	27 Dec 2025 12:45	1:27	327 m from Pedaparimi Branch Post Office, PEDAPARIMI, THULLUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	44.93	6.23	Yes
AP39V5820	STOPPAGE	27 Dec 2025 12:45	27 Dec 2025 12:55	0:9	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0.03	6.22	Yes
AP39V5820	DRIVING	27 Dec 2025 12:55	27 Dec 2025 13:01	0:6	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0.31	6.21	Yes
AP39V5820	STOPPAGE	27 Dec 2025 13:01	27 Dec 2025 13:07	0:5	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	6.21	Yes

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AP39V5820	DRIVING	27 Dec 2025 13:07	27 Dec 2025 13:16	0:9	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	4.76	6.25	Yes
AP39V5820	STOPPAGE	27 Dec 2025 13:16	27 Dec 2025 13:27	0:11	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	6.24	Yes
AP39V5820	DRIVING	27 Dec 2025 13:27	27 Dec 2025 13:53	0:26	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	NH 16 SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522509, INDIA	15.26	6.38	Yes
AP39V5820	STOPPAGE	27 Dec 2025 13:53	27 Dec 2025 15:29	1:35	NH 16 SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522509, INDIA	NH 16 SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522509, INDIA	0.04	6.27	Yes
AP39V5820	DRIVING	27 Dec 2025 15:29	27 Dec 2025 16:41	1:12	NH 16 SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522509, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	30.12	6.52	Yes
AP39V5820	STOPPAGE	27 Dec 2025 16:41	29 Dec 2025 07:07	38:26	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	4.55	Yes
AP39V5820	DRIVING	29 Dec 2025 07:07	29 Dec 2025 07:10	0:3	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.5	4.55	Yes
AP39V5820	STOPPAGE	29 Dec 2025 07:10	29 Dec 2025 07:17	0:7	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	4.55	Yes

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AP39V5820	DRIVING	29 Dec 2025 07:17	29 Dec 2025 07:24	0:6	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	1.03	4.55	Yes
AP39V5820	STOPPAGE	29 Dec 2025 07:24	29 Dec 2025 07:48	0:24	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	4.54	Yes
AP39V5820	DRIVING	29 Dec 2025 07:48	29 Dec 2025 07:51	0:3	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.74	4.54	Yes
AP39V5820	STOPPAGE	29 Dec 2025 07:51	29 Dec 2025 08:42	0:51	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	4.51	Yes
AP39V5820	DRIVING	29 Dec 2025 08:42	29 Dec 2025 08:47	0:5	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.35	4.52	Yes
AP39V5820	STOPPAGE	29 Dec 2025 08:47	29 Dec 2025 09:09	0:21	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.05	4.51	Yes
AP39V5820	DRIVING	29 Dec 2025 09:09	29 Dec 2025 09:12	0:3	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.21	4.51	Yes

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AP39V5820	STOPPAGE	29 Dec 2025 09:12	29 Dec 2025 09:22	0:9	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	4.5	Yes
AP39V5820	DRIVING	29 Dec 2025 09:22	29 Dec 2025 11:13	1:50	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	52.12	4.83	Yes
AP39V5820	STOPPAGE	29 Dec 2025 11:13	29 Dec 2025 11:18	0:5	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0	4.83	Yes
AP39V5820	DRIVING	29 Dec 2025 11:18	29 Dec 2025 12:06	0:48	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	138 m from Public Drinking Water, NH 16, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	27.24	5.01	Yes
AP39V5820	STOPPAGE	29 Dec 2025 12:06	29 Dec 2025 12:12	0:5	138 m from Public Drinking Water, NH 16, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	138 m from Public Drinking Water, NH 16, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	0	5	Yes
AP39V5820	DRIVING	29 Dec 2025 12:12	29 Dec 2025 12:47	0:35	138 m from Public Drinking Water, NH 16, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	124 m from Sambha Siva Cement & Sanitary, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	12.76	5.08	Yes
AP39V5820	STOPPAGE	29 Dec 2025 12:47	29 Dec 2025 13:04	0:17	124 m from Sambha Siva Cement & Sanitary, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.05	5.07	Yes

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AP39V5820	DRIVING	29 Dec 2025 13:04	29 Dec 2025 13:45	0:40	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	12.72	5.14	Yes
AP39V5820	STOPPAGE	29 Dec 2025 13:45	29 Dec 2025 13:52	0:7	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.13	Yes
AP39V5820	DRIVING	29 Dec 2025 13:52	29 Dec 2025 13:57	0:5	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.32	5.14	Yes
AP39V5820	STOPPAGE	29 Dec 2025 13:57	29 Dec 2025 14:57	0:59	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.1	Yes
AP39V5820	DRIVING	29 Dec 2025 14:57	29 Dec 2025 15:03	0:6	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	2.47	5.12	Yes
AP39V5820	STOPPAGE	29 Dec 2025 15:03	29 Dec 2025 17:04	2:0	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.04	Yes

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AP39V5820	DRIVING	29 Dec 2025 17:04	29 Dec 2025 17:16	0:12	174 m from Golden Bakery Fresh Food Products, RAYAPUDI MAIN ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	3.76	5.06	Yes
AP39V5820	STOPPAGE	29 Dec 2025 17:16	30 Dec 2025 06:46	13:29	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.01	4.61	Yes
AP39V5820	DRIVING	30 Dec 2025 06:46	30 Dec 2025 06:49	0:3	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0.6	4.61	Yes
AP39V5820	STOPPAGE	30 Dec 2025 06:49	30 Dec 2025 06:52	0:3	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	4.61	Yes
AP39V5820	DRIVING	30 Dec 2025 06:52	30 Dec 2025 07:05	0:13	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	167 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	3.91	4.63	Yes
AP39V5820	STOPPAGE	30 Dec 2025 07:05	30 Dec 2025 07:27	0:22	167 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	167 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.01	4.62	Yes
AP39V5820	DRIVING	30 Dec 2025 07:27	30 Dec 2025 07:42	0:14	167 m from Andhra Pradesh High Court, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	GUNTUR, ANDHRA PRADESH, 522237, INDIA	3.55	4.63	Yes
AP39V5820	STOPPAGE	30 Dec 2025 07:42	30 Dec 2025 07:53	0:11	GUNTUR, ANDHRA PRADESH, 522237, INDIA	GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	4.63	Yes

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AP39V5820	DRIVING	30 Dec 2025 07:53	30 Dec 2025 07:58	0:5	GUNTUR, ANDHRA PRADESH, 522237, INDIA	456 m from Vellore Institute of Technology, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	1.69	4.64	Yes
AP39V5820	STOPPAGE	30 Dec 2025 07:58	30 Dec 2025 08:09	0:10	456 m from Vellore Institute of Technology, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	AMARAVATHI ROAD, INAVOLU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0.08	4.63	Yes
AP39V5820	DRIVING	30 Dec 2025 08:09	30 Dec 2025 08:20	0:11	AMARAVATHI ROAD, INAVOLU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	KURAGALLU - MALKAPURAM ROAD, INAVOLU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	3.79	4.65	Yes
AP39V5820	STOPPAGE	30 Dec 2025 08:20	30 Dec 2025 08:32	0:12	KURAGALLU - MALKAPURAM ROAD, INAVOLU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	KURAGALLU - MALKAPURAM ROAD, INAVOLU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	4.64	Yes
AP39V5820	DRIVING	30 Dec 2025 08:32	30 Dec 2025 09:03	0:31	KURAGALLU - MALKAPURAM ROAD, INAVOLU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	MANGALAGIRI NEERUKONDA TADIKONDA ROAD, NEERU KONDA, GUNTUR, ANDHRA PRADESH, 522236, INDIA	9.9	4.69	Yes
AP39V5820	STOPPAGE	30 Dec 2025 09:03	30 Dec 2025 09:32	0:28	MANGALAGIRI NEERUKONDA TADIKONDA ROAD, NEERU KONDA, GUNTUR, ANDHRA PRADESH, 522236, INDIA	MANGALAGIRI NEERUKONDA TADIKONDA ROAD, NEERU KONDA, GUNTUR, ANDHRA PRADESH, 522236, INDIA	0	4.68	Yes
AP39V5820	DRIVING	30 Dec 2025 09:32	30 Dec 2025 09:43	0:11	MANGALAGIRI NEERUKONDA TADIKONDA ROAD, NEERU KONDA, GUNTUR, ANDHRA PRADESH, 522236, INDIA	7 m from Guptha General Stores, PEDAPARIMI ROAD, PEDAPARIMI, THULLUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	4.49	4.7	Yes

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AP39V5820	STOPPAGE	30 Dec 2025 09:43	30 Dec 2025 09:54	0:10	7 m from Guptha General Stores, PEDAPARIMI ROAD, PEDAPARIMI, THULLUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	7 m from Guptha General Stores, PEDAPARIMI ROAD, PEDAPARIMI, THULLUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	0	4.7	Yes
AP39V5820	DRIVING	30 Dec 2025 09:54	30 Dec 2025 10:29	0:35	7 m from Guptha General Stores, PEDAPARIMI ROAD, PEDAPARIMI, THULLUR, GUNTUR DISTRICT, ANDHRA PRADESH, 522236, INDIA	77 m from Yes Super Market, NH 16, KAZA, MANGALAGIRI, GUNTUR DISTRICT, ANDHRA PRADESH, 522503, INDIA	14.52	4.77	Yes
AP39V5820	STOPPAGE	30 Dec 2025 10:29	30 Dec 2025 10:40	0:11	77 m from Yes Super Market, NH 16, KAZA, MANGALAGIRI, GUNTUR DISTRICT, ANDHRA PRADESH, 522503, INDIA	77 m from Yes Super Market, NH 16, KAZA, MANGALAGIRI, GUNTUR DISTRICT, ANDHRA PRADESH, 522503, INDIA	0.05	4.77	Yes
AP39V5820	DRIVING	30 Dec 2025 10:40	30 Dec 2025 11:30	0:49	77 m from Yes Super Market, NH 16, KAZA, MANGALAGIRI, GUNTUR DISTRICT, ANDHRA PRADESH, 522503, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	29.12	4.93	Yes
AP39V5820	STOPPAGE	30 Dec 2025 11:30	30 Dec 2025 11:35	0:5	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0	4.93	Yes
AP39V5820	DRIVING	30 Dec 2025 11:35	30 Dec 2025 13:00	1:24	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	MANDADAM-KURAGALLU ROAD, NOWLUR RURAL, GUNTUR, ANDHRA PRADESH, 522503, INDIA	41.17	5.14	Yes
AP39V5820	STOPPAGE	30 Dec 2025 13:00	30 Dec 2025 13:13	0:12	MANDADAM-KURAGALLU ROAD, NOWLUR RURAL, GUNTUR, ANDHRA PRADESH, 522503, INDIA	MANDADAM-KURAGALLU ROAD, NOWLUR RURAL, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0.24	5.14	Yes
AP39V5820	DRIVING	30 Dec 2025 13:13	30 Dec 2025 13:18	0:4	MANDADAM-KURAGALLU ROAD, NOWLUR RURAL, GUNTUR, ANDHRA PRADESH, 522503, INDIA	MANDADAM-KURAGALLU ROAD, GUNTUR, ANDHRA PRADESH, 522236, INDIA	1	5.14	Yes

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AP39V5820	STOPPAGE	30 Dec 2025 13:18	30 Dec 2025 13:27	0:9	MANDADAM-KURAGALLU ROAD, GUNTUR, ANDHRA PRADESH, 522236, INDIA	247 m from Megha Kurugallu, KURAGALLU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	0.07	5.14	Yes
AP39V5820	DRIVING	30 Dec 2025 13:27	30 Dec 2025 13:43	0:16	247 m from Megha Kurugallu, KURAGALLU, MANGALAGIRI, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522502, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	6	5.17	Yes
AP39V5820	STOPPAGE	30 Dec 2025 13:43	30 Dec 2025 13:52	0:9	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	5.16	Yes
AP39V5820	DRIVING	30 Dec 2025 13:52	30 Dec 2025 14:14	0:21	PENUMAKA - AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	146 m from Mandal Praja Parishad Upper Primary School Naramalapadu, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	9.52	5.21	Yes
AP39V5820	STOPPAGE	30 Dec 2025 14:14	30 Dec 2025 15:13	0:58	146 m from Mandal Praja Parishad Upper Primary School Naramalapadu, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	146 m from Mandal Praja Parishad Upper Primary School Naramalapadu, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.18	Yes
AP39V5820	DRIVING	30 Dec 2025 15:13	30 Dec 2025 15:17	0:3	146 m from Mandal Praja Parishad Upper Primary School Naramalapadu, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	304 m from HDFC ATM, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.85	5.18	Yes

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AP39V5820	STOPPAGE	30 Dec 2025 15:17	30 Dec 2025 15:27	0:10	304 m from HDFC ATM, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	304 m from HDFC ATM, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.18	Yes
AP39V5820	DRIVING	30 Dec 2025 15:27	30 Dec 2025 15:35	0:7	304 m from HDFC ATM, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.47	5.18	Yes
AP39V5820	STOPPAGE	30 Dec 2025 15:35	30 Dec 2025 15:49	0:14	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.17	Yes
AP39V5820	DRIVING	30 Dec 2025 15:49	30 Dec 2025 15:56	0:6	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	1.04	5.18	Yes
AP39V5820	STOPPAGE	30 Dec 2025 15:56	30 Dec 2025 16:12	0:16	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	5.17	Yes
AP39V5820	DRIVING	30 Dec 2025 16:12	30 Dec 2025 16:19	0:6	TADIKONDA - RAYAPUDI ROAD, THULLUR, GUNTUR, ANDHRA PRADESH, 522237, INDIA	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.03	5.17	Yes
AP39V5820	STOPPAGE	30 Dec 2025 16:19	30 Dec 2025 16:30	0:10	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.16	Yes

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AP39V5820	DRIVING	30 Dec 2025 16:30	30 Dec 2025 18:30	2:0	84 m from Sri Ayyappa Swamy Temple, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	49.98	5.41	Yes
AP39V5820	STOPPAGE	30 Dec 2025 18:30	30 Dec 2025 18:34	0:3	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0	5.41	Yes
AP39V5820	DRIVING	30 Dec 2025 18:34	30 Dec 2025 18:37	0:3	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0.4	5.41	Yes
AP39V5820	STOPPAGE	30 Dec 2025 18:37	30 Dec 2025 18:45	0:7	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	5.4	Yes
AP39V5820	DRIVING	30 Dec 2025 18:45	30 Dec 2025 18:59	0:13	POTHUR, GUNTUR, ANDHRA PRADESH, 522005, INDIA	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	4.69	5.42	Yes
AP39V5820	STOPPAGE	30 Dec 2025 18:59	30 Dec 2025 19:07	0:8	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	0	5.42	Yes
AP39V5820	DRIVING	30 Dec 2025 19:07	30 Dec 2025 20:47	1:39	SERVICE ROAD, GUNTUR, ANDHRA PRADESH, 522005, INDIA	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	45.19	5.64	Yes
AP39V5820	STOPPAGE	30 Dec 2025 20:47	31 Dec 2025 07:48	11:0	61 m from South Indian Bank, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.02	5.29	Yes

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AP39V5820	DRIVING	31 Dec 2025 07:48	31 Dec 2025 08:04	0:16	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	199 m from Aakash Book Store, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	4.23	5.3	Yes
AP39V5820	STOPPAGE	31 Dec 2025 08:04	31 Dec 2025 08:09	0:4	199 m from Aakash Book Store, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	199 m from Aakash Book Store, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.3	Yes
AP39V5820	DRIVING	31 Dec 2025 08:09	31 Dec 2025 08:17	0:8	199 m from Aakash Book Store, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	139 m from Church, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	2.15	5.31	Yes
AP39V5820	STOPPAGE	31 Dec 2025 08:17	31 Dec 2025 08:33	0:16	139 m from Church, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	174 m from Church, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.09	5.3	Yes
AP39V5820	DRIVING	31 Dec 2025 08:33	31 Dec 2025 08:38	0:4	174 m from Church, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	172 m from Mandal Parishad Primary School, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.97	5.31	Yes
AP39V5820	STOPPAGE	31 Dec 2025 08:38	31 Dec 2025 08:48	0:10	172 m from Mandal Parishad Primary School, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	172 m from Mandal Parishad Primary School, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.3	Yes

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AP39V5820	DRIVING	31 Dec 2025 08:48	31 Dec 2025 09:06	0:18	172 m from Mandal Parishad Primary School, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522016, INDIA	6.5	5.33	Yes
AP39V5820	STOPPAGE	31 Dec 2025 09:06	31 Dec 2025 09:22	0:15	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522016, INDIA	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522016, INDIA	0.06	5.32	Yes
AP39V5820	DRIVING	31 Dec 2025 09:22	31 Dec 2025 09:29	0:6	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522016, INDIA	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522236, INDIA	0.64	5.32	Yes
AP39V5820	STOPPAGE	31 Dec 2025 09:29	31 Dec 2025 09:37	0:8	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522236, INDIA	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522236, INDIA	0	5.32	Yes
AP39V5820	DRIVING	31 Dec 2025 09:37	31 Dec 2025 09:42	0:5	ANANTHAVARAM, GUNTUR, ANDHRA PRADESH, 522236, INDIA	BOMMALA ROAD, NEKKALLU, GUNTUR, ANDHRA PRADESH, 522236, INDIA	1.78	5.33	Yes
AP39V5820	STOPPAGE	31 Dec 2025 09:42	31 Dec 2025 09:56	0:13	BOMMALA ROAD, NEKKALLU, GUNTUR, ANDHRA PRADESH, 522236, INDIA	BOMMALA ROAD, NEKKALLU, GUNTUR, ANDHRA PRADESH, 522236, INDIA	0	5.32	Yes
AP39V5820	DRIVING	31 Dec 2025 09:56	31 Dec 2025 10:44	0:48	BOMMALA ROAD, NEKKALLU, GUNTUR, ANDHRA PRADESH, 522236, INDIA	187 m from The Pentecostal Mission Koppuravuru Church, AH 45, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	19.6	5.41	Yes
AP39V5820	STOPPAGE	31 Dec 2025 10:44	31 Dec 2025 10:53	0:8	187 m from The Pentecostal Mission Koppuravuru Church, AH 45, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	187 m from The Pentecostal Mission Koppuravuru Church, AH 45, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	0	5.4	Yes

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AP39V5820	DRIVING	31 Dec 2025 10:53	31 Dec 2025 11:39	0:46	187 m from The Pentecostal Mission Koppuravuru Church, AH 45, KOPPURAVURU, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522508, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	28.72	5.54	Yes
AP39V5820	STOPPAGE	31 Dec 2025 11:39	31 Dec 2025 11:46	0:6	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	0	5.53	Yes
AP39V5820	DRIVING	31 Dec 2025 11:46	31 Dec 2025 12:32	0:45	AMINABADA, PHIRANGIPURAM, GUNTUR DISTRICT, ANDHRA PRADESH, 522529, INDIA	67 m from Public Telephone Coin Box, AH 45, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522509, INDIA	26.63	5.66	Yes
AP39V5820	STOPPAGE	31 Dec 2025 12:32	31 Dec 2025 13:05	0:33	67 m from Public Telephone Coin Box, AH 45, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522509, INDIA	67 m from Public Telephone Coin Box, AH 45, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522509, INDIA	0	5.64	Yes
AP39V5820	DRIVING	31 Dec 2025 13:05	31 Dec 2025 13:51	0:45	67 m from Public Telephone Coin Box, AH 45, PEDAKAKANI, GUNTUR DISTRICT, ANDHRA PRADESH, 522509, INDIA	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	13.44	5.69	Yes
AP39V5820	STOPPAGE	31 Dec 2025 13:51	31 Dec 2025 14:02	0:11	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	0	5.69	Yes
AP39V5820	DRIVING	31 Dec 2025 14:02	31 Dec 2025 14:36	0:33	KURAGALLU - MALKAPURAM ROAD, GUNTUR, ANDHRA PRADESH, 522503, INDIA	INAVOLU ROAD, SAKHAMURU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	10.86	5.73	Yes
AP39V5820	STOPPAGE	31 Dec 2025 14:36	31 Dec 2025 14:51	0:15	INAVOLU ROAD, SAKHAMURU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	INAVOLU ROAD, SAKHAMURU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	0	5.72	Yes

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AP39V5820	DRIVING	31 Dec 2025 14:51	31 Dec 2025 14:54	0:3	INAVOLU ROAD, SAKHAMURU, GUNTUR, ANDHRA PRADESH, 522237, INDIA	105 m from Sakhamuru Post Office, SAKHAMURU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0.44	5.72	Yes
AP39V5820	STOPPAGE	31 Dec 2025 14:54	31 Dec 2025 14:58	0:3	105 m from Sakhamuru Post Office, SAKHAMURU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	105 m from Sakhamuru Post Office, SAKHAMURU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	0	5.72	Yes
AP39V5820	DRIVING	31 Dec 2025 14:58	31 Dec 2025 15:18	0:20	105 m from Sakhamuru Post Office, SAKHAMURU, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522238, INDIA	8 m from Sai Srinivas Consultancy, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	5.78	5.74	Yes
AP39V5820	STOPPAGE	31 Dec 2025 15:18	31 Dec 2025 15:33	0:14	8 m from Sai Srinivas Consultancy, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	8 m from Sai Srinivas Consultancy, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.73	Yes
AP39V5820	DRIVING	31 Dec 2025 15:33	31 Dec 2025 15:40	0:7	8 m from Sai Srinivas Consultancy, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.12	5.73	Yes
AP39V5820	STOPPAGE	31 Dec 2025 15:40	31 Dec 2025 15:54	0:14	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.73	Yes

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AP39V5820	DRIVING	31 Dec 2025 15:54	31 Dec 2025 15:57	0:3	82 m from Shiva Sree Wines, THULLUR AMARAVATHI ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.23	5.73	Yes
AP39V5820	STOPPAGE	31 Dec 2025 15:57	31 Dec 2025 16:05	0:8	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.72	Yes
AP39V5820	DRIVING	31 Dec 2025 16:05	31 Dec 2025 16:10	0:5	159 m from ZILA PARISHAD HIGH SCHOOL, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.45	5.73	Yes
AP39V5820	STOPPAGE	31 Dec 2025 16:10	31 Dec 2025 16:33	0:22	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.01	5.72	Yes
AP39V5820	DRIVING	31 Dec 2025 16:33	31 Dec 2025 16:38	0:5	11 m from Cross Ministries, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	65 m from Government Registration Office, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	1.12	5.72	Yes
AP39V5820	STOPPAGE	31 Dec 2025 16:38	31 Dec 2025 16:44	0:6	65 m from Government Registration Office, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	65 m from Government Registration Office, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.03	5.72	Yes

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AP39V5820	DRIVING	31 Dec 2025 16:44	31 Dec 2025 16:48	0:3	65 m from Government Registration Office, PEDAPARIMI TULLUR ROAD, THULLUR, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0.16	5.72	Yes
AP39V5820	STOPPAGE	31 Dec 2025 16:48	31 Dec 2025 19:06	2:18	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	145 m from Taj Pan & Cooldrinks, PEDAPARIMI TULLUR ROAD, THULLUR, AMARAVATI, GUNTUR DISTRICT, ANDHRA PRADESH, 522237, INDIA	0	5.64	Yes

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GOVERNMENT OF ANDHRA PRADESH

ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY

Report on

HYDROGEOMORPHOLOGICAL STUDIES OF AMARAVATI CAPITAL CITY (TO PLAN TO CONSERVE WATER RESOURCES AND REGULATE CITY DEVELOPMENT), ANDHRA PRADESH

By

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July 2025

Report on

HYDROGEOMORPHOLOGICAL STUDIES OF AMARAVATI CAPITAL CITY (TO PLAN TO CONSERVE WATER RESOURCES AND REGULATE CITY DEVELOPMENT), ANDHRA PRADESH

By

BLUEENERGY BUILD PRIVATE LIMITED

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STATEMENT OF AUTHENTICITY

*I/We hereby declare that the work presented in this report entitled "**HYDROGEOMORPHOLOGICAL STUDIES OF AMARAVATI CAPITAL CITY (TO PLAN TO CONSERVE WATER RESOURCES AND REGULATE CITY DEVELOPMENT), ANDHRA PRADESH**" is the result of independent investigation carried out by **BlueEnergy Build Private Limited**.*

The data, analyses, interpretations, and conclusions contained in this report are original and have been prepared using scientific methods and reliable sources to the best of our knowledge. Any material taken from other sources has been duly acknowledged and referenced.

This report has not been submitted, in whole or in part, to any other organization or institution for any purpose.

Signed,

Dr. P. Lakshminarayana

Managing Director, BlueEnergy Build Private Limited

Date: _____
Place: _____

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TABLE OF CONTENTS

STATEMENT OF AUTHENTICITY 3

ACKNOWLEDGEMENTS 4

LIST OF FIGURES 10

LIST OF TABLES 13

EXECUTIVE SUMMARY 14

LIST OF ABBREVIATIONS / ACRONYMS 15

CHAPTER 1: INTRODUCTION 17

1.0. GENERAL 17

1.1. OBJECTIVES 17

1.2. SCOPE OF WORK 18

1.3. LOCATION AND ACCESSIBILITY 18

1.4. DATA COLLECTION 20

1.5. TOPOSHEET, SATELLITE IMAGES AND DIGITAL ELEVATION MODEL 22

1.6. PHYSIOGRAPHY 25

1.7. CLIMATE 26

1.8. FLORA AND FAUNA 28

CHAPTER 2: THEMATIC MAPS OF AMARAVATI CAPITAL CITY 30

2.0. GENERAL 30

2.1. SLOPE CHARACTERISTICS 30

2.2. DRAINAGE AND WATER BODIES 30

2.3. GROUNDWATER HYDROLOGY 33

2.4. GEOLOGY 33

2.5. GEOMORPHOLOGY 36

2.6. SOIL CHARACTERISTICS 38

2.7. LAND COVER AND LAND USE (LULC) 41

CHAPTER 3: HYDROLOGICAL MODELLING 42

3.0. GENERAL 42

3.1. METHODOLOGY 42

3.2. KEY CONTRIBUTIONS OF THE STUDY 44

3.3. ANNUAL AVAILABLE FLOW 46

CHAPTER 4: GEOPHYSICAL INVESTIGATIONS 50

4.0. GENERAL 50

4.1. ROLE OF GEOPHYSICAL SURVEYS IN HYDRO-GEOMORPHOLOGICAL STUDIES 51

4.2. GEOPHYSICAL SURVEY PLANNING AND OBJECTIVES 52

4.3. INTEGRATION OF DIGITAL DATA AND SURVEY ACCURACY 53

4.4. METHODOLOGY 54

4.5. INSTRUMENTS USED 58

4.6. MAPPING OF RESISTIVITY DATA 58

4.7. MAPPING OF MAGNETIC DATA 59

4.8. INTERPRETATION OF RESISTIVITY SOUNDING CURVES 59

4.9. GEO-ELECTRIC LAYER CHARACTERISTICS AND RESISTIVITY ANALYSIS 60

4.10. TYPICAL VES CURVES AT DIFFERENT VILLAGES 63

4.11. INFERRED GEO-ELECTRIC SECTIONS 73

4.12. INFERRED RESISTIVITY IMAGES AT VARIOUS DEPTHS FROM SOUNDINGS (VES) 82

4.13. MAGNETIC SIGNATURES OVER NNE-SSW SHEAR ZONE 88

4.14. REGIONAL MAGNETIC (TF) SURVEYS OVER AMARAVATI CITY 93

4.15. INTERPRETATION OF GRAVITY ANOMALY MAP (after GSI, 2006) 102

4.16. GRAVITY, MAGNETIC & RESISTIVITY PROFILES 104

4.17. LINEAMENT ANALYSIS 105

4.18. STRUCTURAL FABRIC AND BASEMENT CONFIGURATION 108

4.19. SEISMIC HAZARD & MICROZONATION STUDIES 111

CHAPTER 5: HYDROGEOLOGICAL STUDIES 115

5.0. GENERAL 115

5.1. GROUNDWATER DYNAMICS 115

5.2. PUMPING TESTS 117

5.3. WATER QUALITY ANALYSIS 118

CHAPTER 6: GROUNDWATER MODELING 120

6.0. GENERAL 120

6.1. AQUIFER CHARACTERISTICS INFERRED FROM RESISTIVITY SOUNDINGS 120

6.2. INFERRED DEPTH SECTIONS OF ALLUVIAM / SAND LAYER FROM DRILLING DATA 123

6.3. MANDAL WISE AQUIFER DISPOSITION 125

CHAPTER 7: RECHARGE PLAN FOR THE AMARAVATI CAPITAL CITY 127

7.0. GENERAL 127

7.1. OBJECTIVES 127

7.2. GROUNDWATER POTENTIAL ZONES 127

7.3. RECOMMENDED RECHARGE STRUCTURES 129

7.4. WATER QUALITY IMPROVEMENT MEASURES 129

7.5. INTEGRATION WITH FLOOD MANAGEMENT 129

7.6. IMPLEMENTATION PHASING 129

CHAPTER 8: CONCLUSIONS 131

FIELD PHOTOGRAPHS 135

R E F E R E N S E S 152

LIST OF FIGURES

Figure 1:Location map of Amaravati Capital City 19
Figure 2: Master Plan of Amaravati Capital City (Source: APCRDA) 20
Figure 3: Toposheet map (65D6, 65D7, 65D10 and 65D11) along with Amaravati Capital City ... 22
Figure 4: Satellite Image of Amaravati Capital City along with Village boundaries and Settlements 23
Figure 5: Digital Elevation Model (DEM) of the Amaravati region at two different spatial resolutions: (a) 30 meters (SRTM data base) and (b) 2 meters (APCRDA data base) 24
Figure 6: Average Annual Rainfall (mm) of the Study Area (1993 to 2024) 26
Figure 7: Annual rainfall trend of different Stations in Amaravati Area 28
Figure 8: Slope map of the Study Area 31
Figure 9: Stream and Water bodies map of the study area 32
Figure 10: Groundwater hydrology of Amaravati Capital City 34
Figure11: Geological map of the study area (after GSI, 2021) 34
Figure 12:Geomorphological Map of the study area (after GSI, 2021) 38
Figure 13: Soil map of Amaravati Capital City 40
Figure 14: Land use land cover map of Amaravati Capital City 41
Figure 15:HEC-HMS Model for Annual Water Balance Calculation 45
Figure 16: Annual Simulation (Graphs) of Rainfall Runoff in Different Sub Basins of Kondaveeti Vagu Catchment 49
Figure 17: Spatial map of locations of Vertical Electrical Soundings (VES) 55
Figure 18: Location map of Shear zone from Andhra Pradesh Earthquake Hazard Map 56
Figure 19: Layout of detailed Magnetic Survey across Shear Zone 57
Figure 20: Layout of Regional Magnetic Surveys 57
Figure 21: Schematic Diagram of Vertical Electrical Sounding (Schlumberger Array) 58
Figure 22: Typical Resistivity Sounding Curves 61
Figure 23: Typical VES curve of Anantavaram 64
Figure 24: Typical Resistivity Curve of Dondapadu Village 65
Figure 25: Typical Resistivity curve of Inavolu Village 66
Figure 26: Typical Resistivity curve of Lingayapalem 67
Figure 27: Typical Resistivity Curve of Nelapadu 68
Figure 28: Typical Resistivity curve of Rayapudi Village 69
Figure 29: Typical Resistivity curve of Sakhamuru 70
Figure 30: Typical Resistivity curve of SW of Velagapudi 71
Figure 31: Typical Resistivity curve of a Velagapudi 72
Figure 32: Typical Resistivity curve of a Thullur 72
Figure 33: Typical Resistivity Curve of a Neerukonda 73

Figure 34: Google Image showing the Geo-Electric Sections from I to VI. 74
Figure 35: Geoelectric Section from Borupalem to Nekkallu 76
Figure 36: Geo-electric section (N-S) of Rayapudi to Sakhamuru 77
Figure 37: Geoelectric Section from Lingayapalem to Neerukonda 78
Figure 38: Geo-electric section (N-S) of Uddandarayunipalem to Nidamarru 79
Figure 39: Geo-electric section (N-S) of Undavalli to Mangalagiri 80
Figure 40: Geo-electric section of South of Anantavaram to South-east of Penumaka 81
Figure 41: Iso Resistivity contour map at 1 m depth 83
Figure 42: Iso Resistivity contour map at 2 m depth 84
Figure 43: Iso Resistivity contour map at 5 m depth 84
Figure 44: Iso Resistivity contour map at 8 m depth 85
Figure 45: Iso Resistivity contour map at 10 m depth 85
Figure 46: Iso Resistivity contour map at 17 m depth 86
Figure 47: Iso Resistivity contour map at 20 m depth 86
Figure 48: Iso Resistivity contour map at 53 m depth 87
Figure 49: Iso Resistivity contour map at 80 m depth 87
Figure 50: Iso Resistivity contour map at 100 m depth 88
Figure 51: Geophysical Traverses across Concealed Shear Zone (Lines-1 to 9) 89
Figure 52: Magnetic Response along Line-2 89
Figure 53: Magnetic Response along Line-3 90
Figure 54: Magnetic Response along Line-4 90
Figure 55: Magnetic Response along Line-5 91
Figure 56: Magnetic Response along Line-6 92
Figure 57: Magnetic Response along Line-7 92
Figure 58: Magnetic Response along Line-9 93
Figure 59: Magnetic Anomaly map overlay on Google Image 94
Figure 60: Magnetic (TF) Anomaly Map, Amaravati City 95
Figure 61: Magnetic Residual Map, Amaravati City 96
Figure 62: Magnetic Regional, Amaravati City 97
Figure 63:Magnetic Analytical Signal Map, Amaravati City 98
Figure 64:Magnetic Horizontal Derivative Map, Amaravati City 99
Figure 65: Magnetic Vertical Derivative Map, Amaravati City 100
Figure 66: Magnetic Vertical Integration Map, Amaravati City 100
Figure 67: Radially Averaged Power Spectrum of Magnetic data 101
Figure 68: Regional Gravity Map of Amaravati City and adjoining areas 102
Figure 69: Gravity Anomaly Map of Amaravati City 103
Figure 70: Gravity, Magnetic & Resistivity Profiles 105

Figure 71: Inferred Lineaments from Stream Network (First Image), Gravity Map (Second image) and Magnetic Map (Third image) 107
Figure 72: Inferred Basement configuration Magnetic (First Image), Gravity Map (Second image) and Resistivity Map (Third image) 109
Figure 73: Structural Fabric and Basement Configuration 111
Figure 74: Regional Geology and Tectonic Framework 112
Figure 75: Peak Amplification contour map, parts of Amaravati City 113
Figure 76: Peak Frequency contour map, parts of Amaravati City 114
Figure 77: Water table (ft) below ground level. 117
Figure 78: Thickness of concealed & unconfined aquifer zone 121
Figure 79: Variation of Resistivity of concealed & unconfined aquifer zone 122
Figure 80: Locations of lithologs used for sand layer delineation 124
Figure 81: Contour map of Alluvium / Sand layer thickness 124
Figure 82: Inferred Sand Layer Thickness of Sections A to H 125
Figure 83: Groundwater Potential Zones derived from Land use land cover, Geology, Geomorphology, Drainage, Slope, Soil and Lineament Density 128

LIST OF TABLES

Table 1:Principal Geological Units of Amaravati Capital City 35
Table 2: Geomorphic Units of Amaravati Capital City 36
Table 3: Model used Hydrological Elements, Drainage Area and Total Volume of Water Generated during a year 46
Table 4:Resistivity and depth range of different formations at Amaravati 63
Table 5: Details of Geoelectric Section 75
Table 6: Groundwater levels of the study area during 11th and 12th of June, 2025 116
Table 7: Aquifer parameters of different aquifer systems in Amaravati Area 118
Table 8: Aquifer characteristics, its resistivity and depth range, Amaravati 125
Table 9: Recharge zonation based on aquifer type, geomorphic setting, infiltration potential, and water quality 128

EXECUTIVE SUMMARY

BlueEnergy Build Private Limited, under agreement with the Andhra Pradesh Capital Region Development Authority (APCRDA), conducted Hydrogeomorphological Studies for the Amaravati Capital City area of 217.23 km^2 to support sustainable water resource management and urban development.

The study integrated high-resolution satellite imagery, digital elevation models, field-based geophysical surveys (Vertical Electrical Soundings and Magnetic Surveys), hydrological modelling (HEC-HMS & HEC-RAS), pumping tests, and water quality analysis to map geomorphic features, aquifer systems, and flood-prone zones.

Findings indicate:

Geomorphology: Dominance of flood plains, pediplains, valley fills, and structurally controlled uplands, with NNE–SSW trending shear zones serving as key groundwater conduits.

Groundwater: Multi-aquifer systems with varying yields; high potential in alluvial zones, moderate to low in crystalline formations; water table depths ranging from <2 m near Krishna River to >10 m in uplands.

Hydrological Modelling: Identified basin-wise runoff volumes, peak flood discharges, and optimal locations for water retention structures to reduce flood duration to <24 hours under 1-in-100-year events.

Water Quality: Generally suitable for drinking/irrigation but localized brackish zones require targeted recharge and quality improvement measures.

Key Recommendations include scientific siting of recharge wells and water harvesting systems, preservation of natural flood retention zones, phased drainage and pumping infrastructure, and integration of groundwater sustainability measures into the Amaravati Master Plan.

The study delivers a comprehensive spatial and analytical baseline enabling APCRDA to plan resilient infrastructure, safeguard water resources, and ensure long-term water security for the capital city.

List of Abbreviations / Acronyms

APCRDA	Andhra Pradesh Capital Region Development Authority
BEBPL	BlueEnergy Build Private Limited
CDT	Constant Discharge Test
CGWB	Central Ground Water Board
CHIRPS	Climate Hazards Group InfraRed Precipitation with Station data
CWC FER	Central Water Commission Flood Estimation Report
D/S	Downstream
DEM	Digital Elevation Model
DPR	Detailed Project Report
EC	Electrical conductivity
EW	Exploratory Wells
GEV	Generalized extreme value distribution
GOI	Government of India
GPS	Global Positioning System
GSI	Geological Survey of India
HEC-HMS	Hydrologic Engineering Centre- Hydrologic Modeling System
HEC-RAS	Hydrologic Engineering Centre- River Analysis System
HFL	High Flood Level
IGRF	International Geomagnetic Reference Field
IIIT	International Institute of Information Technology
IIT	Indian Institute of Technology
IMD	Indian Meteorological Department
IRS	Indian Remote Sensing Satellite
KV	Kondaveeti Vagu
LULC	Land Use / Land Cover
AMSL	Above Mean Sea Level
NAQUIM	National Aquifer Mapping and Management Programme
NGT	National Green Tribunal
NIT	National Institute of Technology
NRSC	National Remote Sensing Centre
OW	Observation Wells
R2A L4FX	Resource sat 2A Liss
SDT	Step Drawdown Test
SOI	Survey of India
SR	Southern Region
SRTM	Shuttle Radar Topography Mission
SSR-MP-ATS	Resistivity Meter Model
TDS	Total Dissolved Solids
TF	Total Field (Magnetic Survey)
U/S	Upstream

VES	Vertical Electrical Sounding
VGTM	Vijayawada-Guntur-Tenali-Mangalagiri
VIT	Vellore Institute of Technology
WQI	Water Quality Index

CHAPTER 1: INTRODUCTION

1.0. GENERAL

The Andhra Pradesh Capital Region Development Authority (APCRDA) has commissioned BlueEnergy Build Private Limited to undertake comprehensive hydrogeomorphological studies within the Amaravati Capital City area, which encompasses 217.23 km^2. This initiative is a critical part of an integrated approach to sustainable water resource management and urban planning. The primary aim of the study is to assess, conserve, and enhance the region's natural hydrological systems, ensuring alignment with the master plan for the capital city.

Vision for Amaravati Capital City

Amaravati is envisioned as a world-class, sustainable, and livable capital for the State of Andhra Pradesh. The city is strategically situated between Vijayawada and Guntur, along the southern bank of the Krishna River. Spanning approximately 217.23 km^2, Amaravati encompasses 25 villages located in the Thulluru, Mangalagiri, and Tadepalli Mandals of Guntur District. The region exhibits a varied geomorphic landscape that includes alluvial plains, residual hillocks, riverine formations, and a complex network of drainage channels. This diversity underscores the importance of hydrogeomorphological assessment in supporting sustainable urban planning and effective groundwater management.

Purpose and Scope of the Study

The hydrogeomorphological studies aim to delineate both surface and subsurface geomorphic features that influence groundwater occurrence, movement, recharge potential, and surface-water interaction within Amaravati's proposed city limits. These studies are integral to the broader environmental and hydrological framework established for the capital region by APCRDA. The city's development plan emphasizes a "Green and Blue City" concept, integrating natural drainage networks, waterbodies, and green corridors. Understanding the area's hydrogeomorphological characteristics is central to this vision, as it ensures effective groundwater recharge, flood mitigation, stormwater management, and the sustainability of water resources.

1.1. OBJECTIVES

- Assess and map the geomorphological features and hydrological systems that influence surface water and groundwater behavior.

- Identify and prioritize potential zones for constructing water retention structures, recharge wells, and implementing rainwater harvesting interventions.
- Integrate hydrological, hydrogeological, and geophysical datasets to evaluate groundwater availability, quality, and sustainability.
- Provide actionable recommendations for stormwater drainage planning and flood risk reduction in accordance with the Amaravati master plan.

1.2. SCOPE OF WORK

- Detailed hydrogeomorphological mapping through the interpretation of satellite imagery, field verification, and geospatial analysis.
- Execution of geophysical surveys to delineate subsurface lithological and aquifer characteristics.
- Compilation and assessment of hydrological and hydrogeological data, including rainfall, runoff, infiltration, and recharge potential.
- Preparation of integrated water resource management strategies, supported by thematic maps, cross-sections, and 3D visualizations.
- Submission of a comprehensive report containing spatial datasets to support planning, design, and decision-making processes.

Significance of the Study

This hydrogeomorphological study provides a critical scientific baseline for the sustainable management of water resources in Amaravati Capital City. It ensures that urban development is supported by resilient hydrological systems and safeguards the ecological balance of the city.

1.3. LOCATION AND ACCESSIBILITY

The Amaravati Capital City, the administrative capital of Andhra Pradesh, is strategically located between Vijayawada and Guntur on the right bank of the Krishna River within Guntur District, covering an area of about 217.23 km^2 comprising 25 villages across Thulluru, Mangalagiri, and Tadepalli Mandals. Geographically, the city lies between latitudes 16°24'30"N to 16°31'00"N and longitudes 80°22'30"E to 80°37'00"E, with elevation ranging from 18 m to 260 m above mean sea level. The terrain is characterized by a combination of alluvial plains, residual hillocks, pediplains, and floodplains influenced by the Krishna River, Kondaveeti Vagu, and Paleru Vagu, which form the main drainage systems governing runoff and recharge patterns. The Krishna River defines the northern boundary of the city, while the south eastern portion is bordered by undulating hillocks near Tadepalli and Velagapudi.

Amaravati is well connected through multiple transport networks—NH-16 (Chennai–Kolkata) and NH-65 (Hyderabad–Machilipatnam) provide regional road connectivity, the Vijayawada Railway Junction and K.C. Canal Station near Tadepalli offer rail access, and the Gannavaram International Airport located about 22 km northeast ensures air connectivity. The physiography of the region, encompassing alluvial plains, residual hills, pediment zones, and valley fills, plays a vital role in controlling groundwater occurrence, infiltration potential, and surface drainage. Its strategic location and excellent accessibility make Amaravati a favorable site for sustainable urban development and integrated hydrogeomorphological planning. The location map of Amaravati Capita City is shown in Figure 1

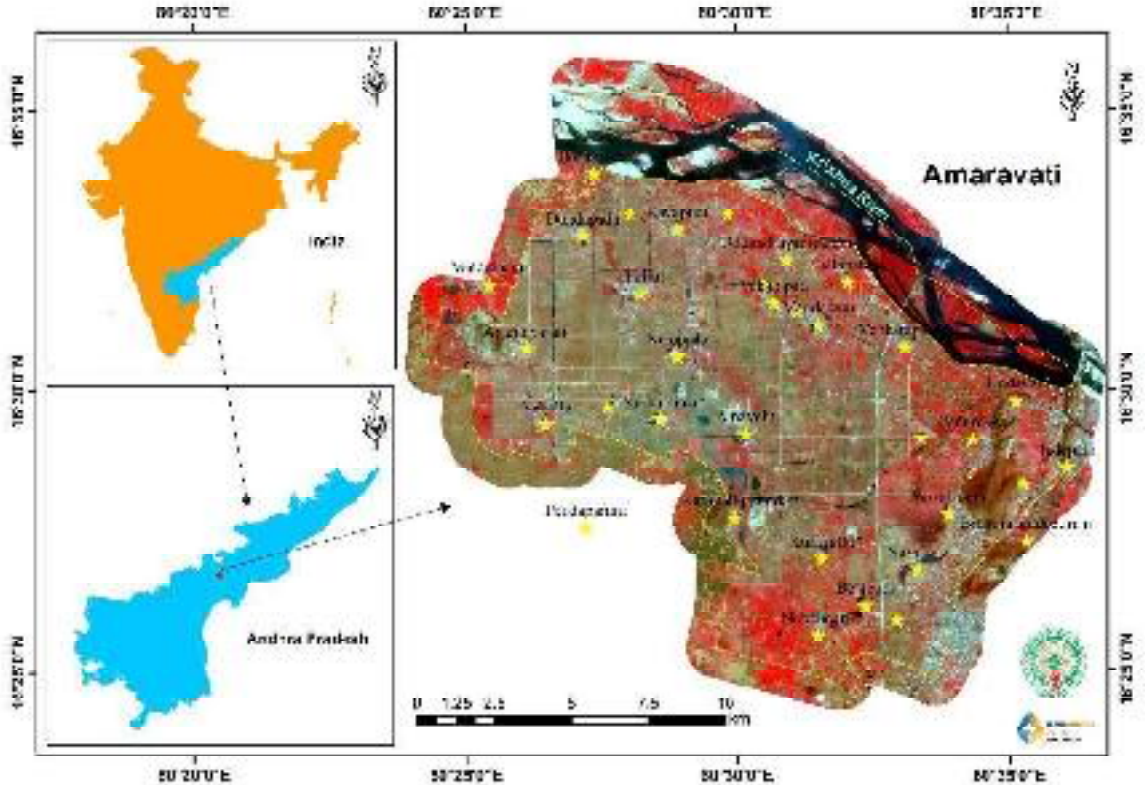


Figure 1:Location map of Amaravati Capital City

Master Plan of Amaravati Capital City

Figure 2 presents the master plan of Amaravati Capital City, as obtained from the Andhra Pradesh Capital Region Development Authority (APCRDA). This master plan has served as the foundational reference for conducting comprehensive hydrogeomorphological studies within the area. The use of the official master plan ensures that all assessments and analyses are aligned with the planned urban layout and development framework, enabling

accurate integration of scientific findings into the broader context of city planning and resource management.

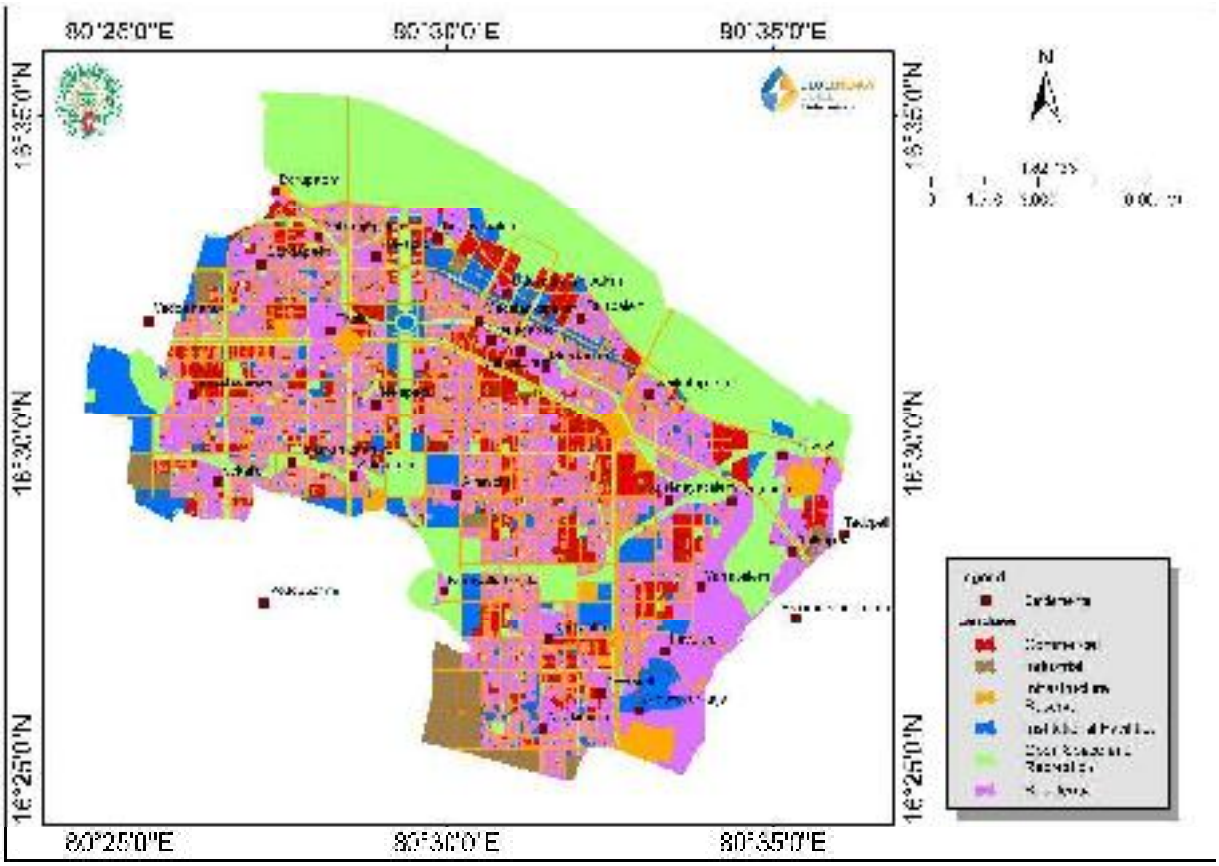


Figure 2: Master Plan of Amaravati Capital City (Source: APCRDA)

1.4. DATA COLLECTION

The primary objective of the data collection phase is to acquire and process essential geospatial datasets necessary for conducting comprehensive, village-level microplanning within the project area. These datasets form the foundation for detailed analyses and integration with ground-based surveys, supporting effective planning for water resources, infrastructure development, land use, and environmental sustainability. The data collection process is categorized into Primary Data and Secondary Data.

Secondary Data Collection

- Toposheets and Village Boundaries: This involves gathering 1:50,000 scale toposheet maps, specifically sheets numbered 65D6, 65D7, 65D10, and 65D11 from the Survey

of India (SOI). Additionally, village boundary maps are collected to accurately delineate administrative and planning units within the study area.

- High-Resolution Satellite Imagery: Recent, cloud-free satellite imagery is procured from various sources, including the National Remote Sensing Centre (NRSC), Sentinel satellites, and Google Earth. The imagery undergoes radiometric and geometric corrections to ensure accuracy and reliability for further analysis.
- Digital Elevation Model (DEM): High-resolution elevation data with a 2-meter pixel size is acquired from the Amaravati Capital Region Development Authority (APCRDA), complemented by 30-meter pixel data from the Shuttle Radar Topography Mission (SRTM). These datasets facilitate detailed terrain and hydrological modeling.
- Literature and Map Collection: Spatial maps of the capital city and its master plan are collected from APCRDA. Additional documentation includes geotechnical investigation reports, flood study and management reports, rainfall datasets, and National Green Tribunal (NGT) reports from APCRDA. Reports from the Central Ground Water Board (CGWB) and the Geological Survey of India (GSI) are also incorporated. Furthermore, relevant research publications from institutions such as IIIT, IIT, NIT, and other universities and research organizations are reviewed. Water quality and supply reports are obtained from the Rural Development and Irrigation Departments.

Primary Data Collection (Field Level Data)

- Geophysical Surveys: Field investigations include resistivity surveys using Vertical Electrical Soundings conducted at 651 locations and magnetic surveys conducted at 650 locations. These surveys help characterize subsurface conditions relevant to water resource management.
- Hydrogeological Survey and Geological Mapping: Comprehensive surveys and mapping activities are undertaken to document the hydrogeological and geological attributes of the area.
- Palaeoflood Survey and Sampling: Investigations are carried out to gather evidence of historic flood events through palaeo flood surveys and sample collection, contributing to flood risk assessment.
- Pumping Test for Aquifer Parameters: Pumping tests are performed to determine key aquifer parameters, providing critical data for groundwater resource evaluation and management.

1.5. TOPOSHEET, SATELLITE IMAGES AND DIGITAL ELEVATION MODEL

Survey of India (SOI) Toposheets

The Survey of India (SOI) toposheets, specifically sheets 65D6, 65D7, 65D10, and 65D11, form a composite mosaic (Figure 3) that serves as a foundational spatial dataset for micro-level planning within the Amaravati region. By overlaying these sheets with the Amaravati boundary and village locations, planners gain access to a highly authoritative base layer for geospatial analysis.

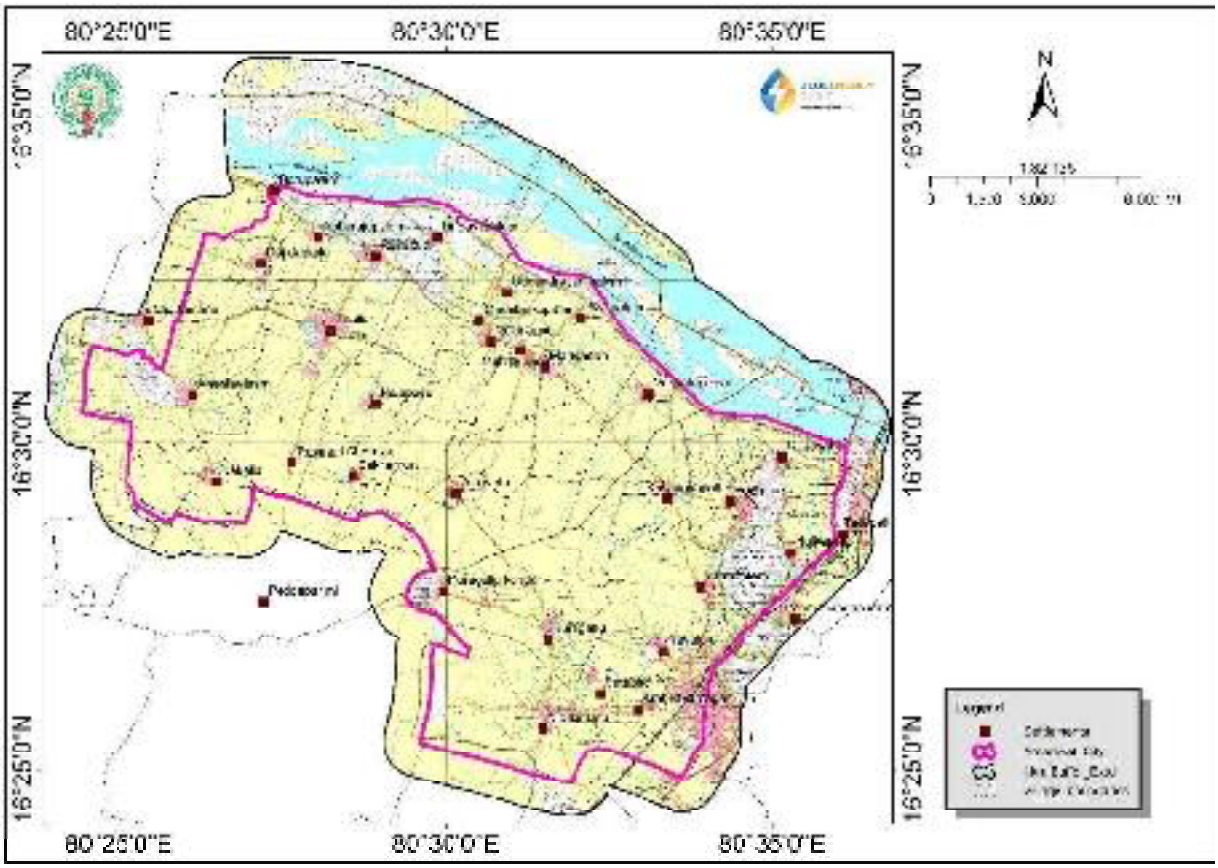


Figure 3: Toposheet map (65D6, 65D7, 65D10 and 65D11) along with Amaravati Capital City

These toposheets are characterized by detailed representations of terrain features. They include contour lines that depict elevation changes, drainage patterns that reveal the flow of surface water, and landform configurations that outline the physical structure of the landscape. Such detailed spatial information is indispensable for tasks like watershed

delineation and morphometric analysis, which are commonly conducted using Geographic Information Systems (GIS) and remote sensing techniques.

Integrating SOI toposheet data into GIS platforms allows for precise overlay with other thematic layers, such as slope, land use, geology, and hydrology. This capability supports advanced multi-criteria decision support systems, aiding in infrastructure siting, water resource management, and soil-conservation planning. The detailed topographic information provided by these toposheets enhances both the spatial accuracy and hydrological integrity of micro-planning initiatives, ultimately supporting informed village-level development decisions.

Satellite Imagery

The high-resolution satellite imagery, dated 02/19/2025, obtained from the IRS-R2A L4FX database, provides a comprehensive and processed visual representation of Amaravati Capital City. This imagery, illustrated in Figure 4, is annotated with the names of villages and clearly demarcated by yellow boundary lines, creating a foundational geospatial dataset essential for village-level microplanning.

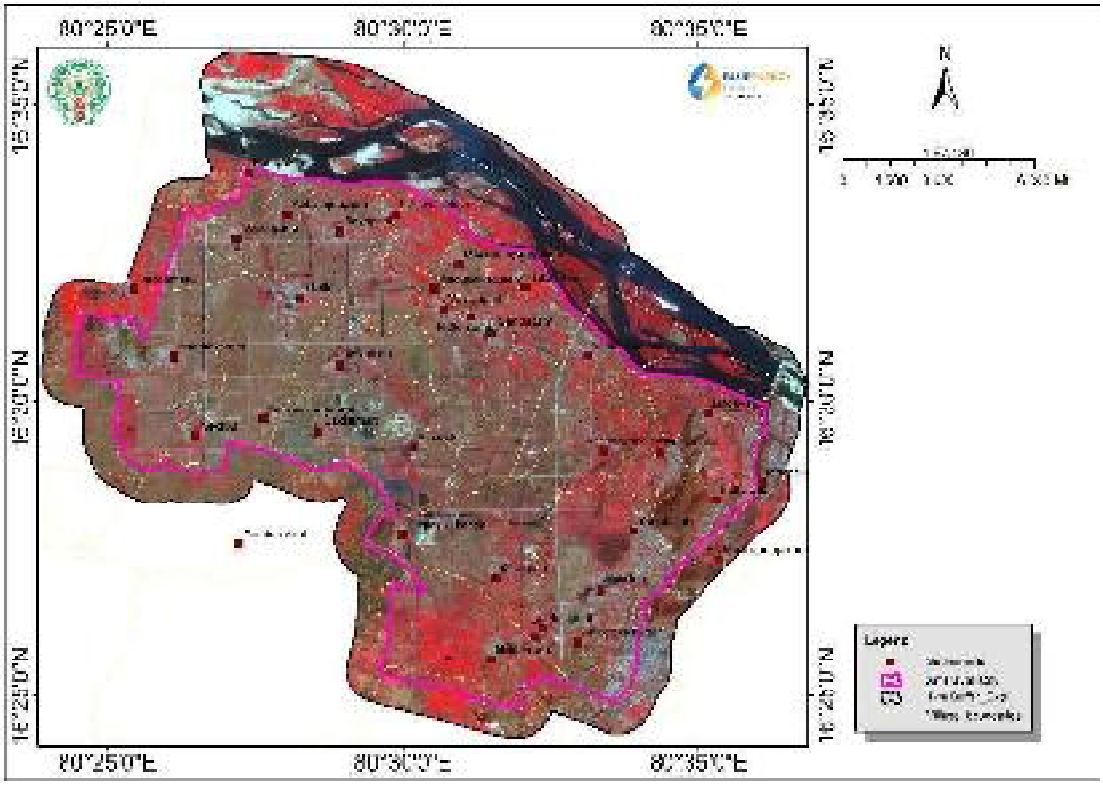


Figure 4: Satellite Image of Amaravati Capital City along with Village boundaries and Settlements

Captured at a spatial resolution of just a few meters, the satellite imagery enables precise mapping of existing land use, infrastructure, vegetation, and hydrographic features within the Amaravati region. Its high level of detail allows for accurate spatial alignment with field-based surveys, ensuring consistency and reliability in data interpretation and planning.

This detailed imagery plays a vital role in scientific micro-planning processes, as it supports the delineation of village boundaries, identification of water resources and drainage patterns, and assessment of infrastructural connectivity. By facilitating a clear understanding of the spatial layout and environmental attributes, the imagery underpins informed decision-making for development and resource management at the village level.

Digital Elevation Model (DEM)

Figure 5 presents the Digital Elevation Model (DEM) of Amaravati Capital City, captured at two distinct spatial resolutions: 30 meters and 2 meters. Both DEMs are accompanied by overlays that delineate the boundaries of villages and the Amaravati Capital City itself. The 30-meter resolution DEM offers a broad regional perspective, making it suitable for comprehensive terrain analysis. In contrast, the 2-meter resolution DEM provides a highly detailed view, allowing for the precise identification of topographical features and micro-level variations in elevation.

By integrating village boundaries and capital city limits into these models, planners and decision-makers gain valuable spatial context that is essential for effective planning across various administrative levels. The availability of DEMs at multiple resolutions supports both wide-ranging assessments and focused, localized studies. This ensures that those involved in infrastructure development, water resource management, and environmental planning have access to accurate and detailed elevation data.

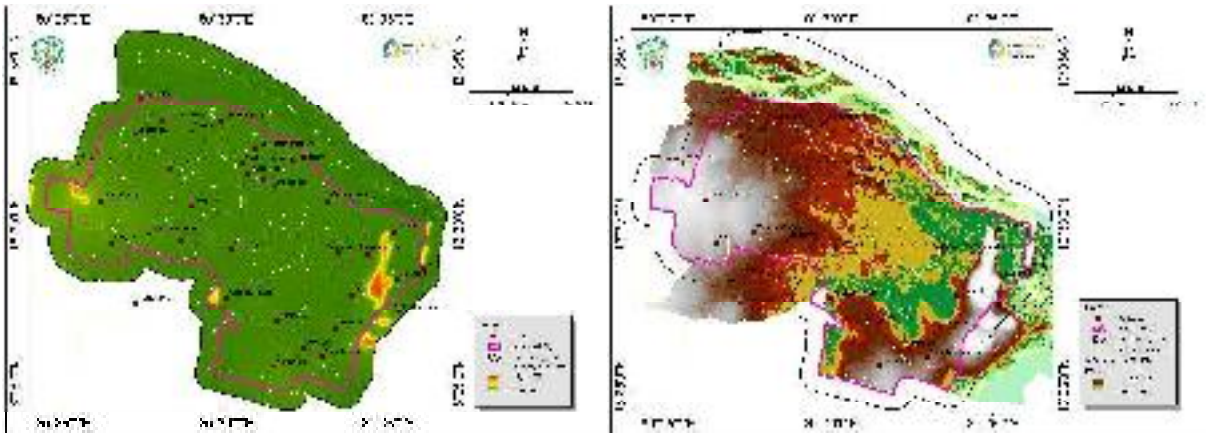


Figure 5: Digital Elevation Model (DEM) of the Amaravati region at two different spatial resolutions: (a) 30 meters (SRTM data base) and (b) 2 meters (APCRDA data base)

Utilizing this elevation data, planners and analysts are able to perform precise terrain analyses, including the evaluation of slope gradients and the determination of surface water flow direction. The DEM is instrumental in delineating watersheds, which assists in identifying areas where water naturally collects and channels. Additionally, it facilitates the detection of topographic depressions and ridges, providing critical insights into water accumulation, drainage patterns, and landform development.

Through these capabilities, the DEM supports informed decision-making in areas such as infrastructure development, water resource management, and environmental planning. By ensuring that micro-level planning efforts are grounded in accurate topographical information, the DEM contributes to the reliability and effectiveness of development and conservation initiatives within Amaravati Capital City.

1.6. PHYSIOGRAPHY

The Amaravati Capital City area exhibits a diverse and transitional physiographic setting shaped by fluvial and denudational processes. Covering an area of about 217.23 km^2, the region extends across Thulluru, Tadepalli, and Mangalagiri mandals of Guntur District, between 16°24'30"N to 16°31'00"N latitudes and 80°22'30"E to 80°37'00"E longitudes, with elevation ranging from 18 m to 260 m above mean sea level. The terrain is characterized by gently undulating topography, comprising alluvial plains, pediplains, valley fills, and isolated residual hillocks. The northern and northeastern parts, adjoining the Krishna River, form extensive alluvial and floodplains that are gently sloping and agriculturally fertile, while the central and southern zones are dominated by pediplains and denudational uplands developed over weathered crystalline rocks. The residual hillocks occurring near Tadepalli, Velagapudi, and Ananthavaram rise up to 260 m and exert a strong influence on local drainage, slope pattern, and micro-watershed development.

Physiographically, the area can be categorized into three major units — the floodplains of Krishna River, the gently undulating pediplains, and the residual hillocks of the southern uplands. The Kondaveeti Vagu and its tributaries drain the central portion of the city, forming a dendritic to sub-dendritic drainage pattern that ultimately joins the Krishna River along the northern boundary. Seasonal inundation is common in low-lying tracts, particularly in the Kondaveeti Vagu catchment, due to inadequate drainage gradients and river backflow during monsoon floods. The physiographic diversity of Amaravati provides a strong geomorphic control on groundwater occurrence, infiltration capacity, and recharge dynamics, which are crucial for sustainable urban development. The combination of fluvial plains, denudational pediplains, and residual uplands forms an integrated

hydrogeomorphological framework that governs both surface and subsurface hydrological behavior within the Amaravati Capital City region.

1.7. CLIMATE

Over a span of 30 years, a time series analysis was conducted using the CHIRPS dataset (Climate Hazards Group Infra-Red Precipitation with Station data), leveraging python programming techniques to assess rainfall patterns in the Amaravati region. This analysis identified 2024 as the year with the highest recorded rainfall. Monthly rainfall data spanning the past three decades reveals that July consistently receives the greatest amount of precipitation annually. Furthermore, the most significant 24-hour rainfall event in recent years occurred at the end of August and in September 2024. A spatial map illustrating the annual rainfall distribution is available in Figure 6.

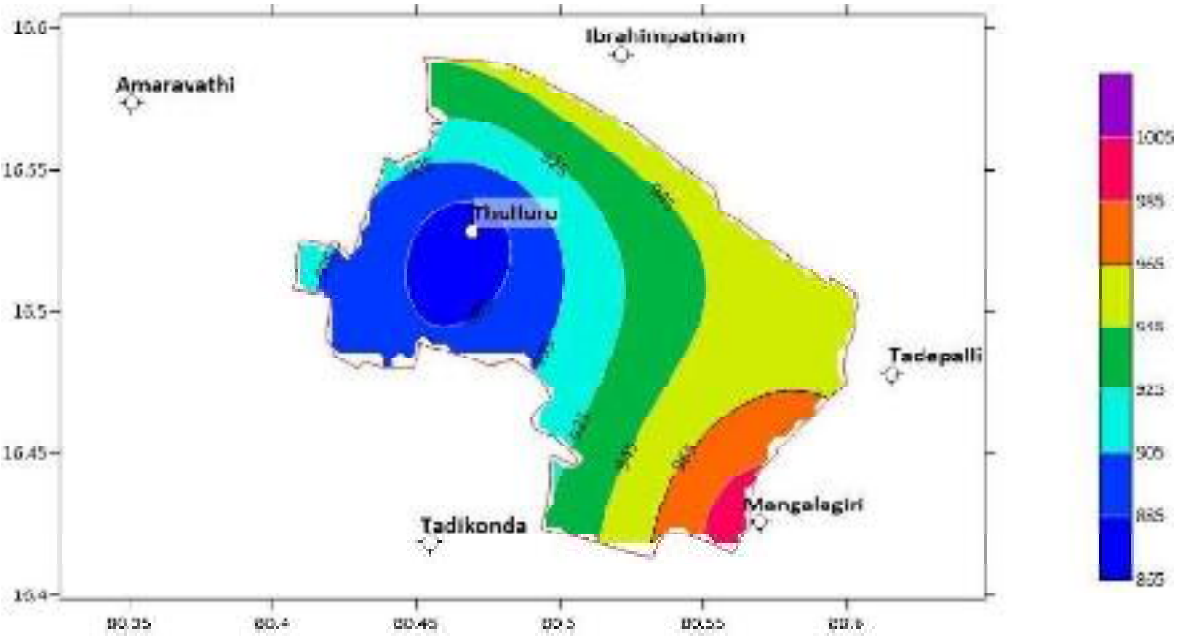


Figure 6: Average Annual Rainfall (mm) of the Study Area (1993 to 2024)

The broader Amaravati Capital City region is classified as having a tropical monsoon climate. This classification is characterized by the presence of hot summers, humid monsoon seasons, and mild winters. Situated within the Krishna River basin of Guntur District, the area is influenced by both the Southwest monsoon (occurring from June to September) and the Northeast monsoon (from October to November). The interplay of these monsoons dictates the region's rainfall distribution and shapes seasonal hydrological processes. These climatic conditions play a crucial role in regulating groundwater recharge, surface

runoff, and evapotranspiration, all of which are essential considerations in hydrogeomorphological assessments.

The summer season in Amaravati extends from March to May, with maximum daily temperatures typically ranging from 38°C to 44°C, and occasionally surpassing 45°C. The monsoon season, lasting from June to October, brings approximately 850–950 mm of rainfall annually, accounting for nearly 85% of the region's total yearly precipitation. Additional rainfall from the Northeast monsoon is received during October and November. The winter season, spanning from December to February, is marked by cool and dry conditions, with average temperatures ranging from 16°C to 28°C. Relative humidity in the region fluctuates between 40% and 85%, peaking during the monsoon months (IMD, 2022; APSDMA, 2021; APCRDA, 2018; CGWB, 2020; and IMD, 2023).

The mean annual potential evapotranspiration (PET) in Amaravati is estimated to be between 1,500 and 1,800 mm, which exceeds the average annual rainfall. This disparity underscores the necessity of implementing rainwater harvesting, artificial recharge structures, and efficient stormwater management strategies in the region. Predominant wind directions are southwesterly during the summer and monsoon periods, shifting to northeasterly during the winter months. Although these climatic conditions are generally conducive to agriculture and water resource development, they highlight the importance of integrated planning to manage seasonal water scarcity and to support sustainable groundwater utilization (IMD, 2022; APSDMA, 2021; APCRDA, 2018; CGWB, 2020; and IMD, 2023).

Rainfall Trends at Monitoring Stations

The annual rainfall graphs compiled from 30 years of data across various stations in Amaravati—specifically Amaravati, Thullur, Mangalagiri, Tadepalli, Tadikonda, and Ibrahimpatnam—demonstrate a consistent decreasing trend in rainfall at each location. Despite yearly fluctuations, all stations exhibit a similar pattern in annual precipitation, indicating that rainfall amounts tend to follow the same trend across the region year after year (Figure 7).

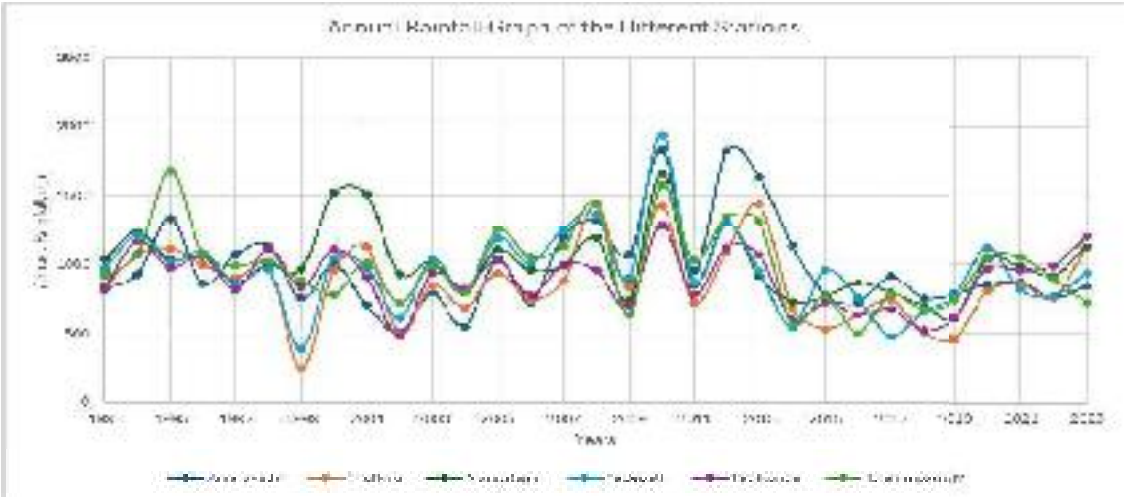


Figure 7: Annual rainfall trend of different Stations in Amaravati Area

1.8. FLORA AND FAUNA

Except for the hilly terrains, the study area lacks significant plantation cover. The Amaravati Capital City region, situated along the right bank of the Krishna River, features a diverse mosaic of natural and modified ecosystems. These ecosystems are shaped by the interplay of the riverine landscape, agricultural practices, and semi-urban development. Vegetation in the region is predominantly classified as Southern Tropical Dry Deciduous, interspersed with riverine vegetation, scrublands, and agro-ecosystems. Despite considerable alteration of the natural vegetation due to cultivation and settlement expansion, areas along riverbanks, canals, and village groves continue to support patches of native flora and habitats for local fauna (APCRDA, 2018; BSI, 2019; ZSI, 2019; APSBB,2020; IUCN, 2023).

Major Flora

The region hosts a variety of floral species, including Azadirachta indica (Neem), Ficus religiosa (Peepal), Ficus benghalensis (Banyan), Tamarindus indica (Tamarind), Albizia lebbeck, Delonix regia, Cassia fistula, and Butea monosperma. Riparian zones along the Krishna River and Kondaveeti Vagu are home to hydrophytic and semi-aquatic species such as Typha angustata, Cyperus rotundus, and Saccharum spontaneum, which play an important role in stabilizing riverbanks and filtering sediments. Agricultural lands are primarily planted with paddy, maize, and cotton, and are bordered by hedgerow vegetation and fruit-bearing trees like Mango (Mangifera indica), Guava (Psidium guajava), and Coconut (Cocos nucifera). Introduced species such as Prosopis juliflora and Leucaena leucocephala have also become established in fallow lands and along canal bunds.

Faunal Diversity

The faunal diversity in Amaravati is closely linked to its proximity to the Krishna River floodplain, supporting both terrestrial and aquatic species. Common mammals observed in the area include the Indian Hare (Lepus nigricollis), Common Mongoose (Herpestes edwardsii), Five-striped Palm Squirrel (Funambulus pennantii), and Fruit Bat (Pteropus giganteus). The region's avifauna is particularly rich, supported by wetland habitats and agricultural landscapes. Notable bird species include the Indian Pond Heron (Ardeola grayii), Little Cormorant (Microcarbo niger), various Egrets (Egretta spp.), Kingfishers (Alcedo spp.), Black Drongo (Dicrurus macrocercus), as well as weaver birds and bee-eaters. During the winter, migratory waterfowl such as Northern Pintail, Garganey, and Common Teal are occasionally spotted along the Krishna River and adjacent wetlands. Reptiles like the Garden Lizard (Calotes versicolor) and Common Rat Snake (Ptyas mucosa) are frequently encountered, while amphibians such as Bufo melanostictus are common in irrigated fields. Aquatic habitats support Indian Major Carps, Catfish, and Tilapia, contributing to local fisheries.

Conservation Status and Ecological Importance

No rare, endangered, or threatened (RET) species, as classified by the IUCN Red List or Wildlife Protection Act, 1972 (Schedules I & II), have been reported within the Amaravati Capital City boundaries. Nevertheless, the Krishna River corridor functions as a vital ecological zone for avifaunal migration and aquatic biodiversity. The maintenance of green buffers, wetland retention zones, and plantation belts along riverbanks and drainage networks is critical for preserving ecological balance in the face of rapid urbanization.

CHAPTER 2: THEMATIC MAPS OF AMARAVATI CAPITAL CITY

2.0. GENERAL

The Amaravati Capital City area was analyzed using a series of GIS-based thematic maps derived from remote sensing data, field observations, and secondary sources such as Survey of India Toposheets, GSI Geological Maps, and NRSC IRS satellite data. These thematic layers were prepared at a 1:2,000 scale and form the foundation for understanding the terrain characteristics, subsurface conditions, drainage behavior, and recharge potential of the region (APCRDA, 2018; GSI, 2019; CGWB, 2020). Integration of these maps in a GIS environment enabled delineation of hydrogeomorphological units, identification of groundwater potential zones, and preparation of a comprehensive spatial database for sustainable water management in Amaravati Capital City.

2.1. SLOPE CHARACTERISTICS

The slope map (Figure 8) of the Amaravati Capital City region reveals a diverse range of slope gradients, spanning from flat surfaces to very steep inclines, with slope angles varying from 0 degrees up to more than 55 degrees. The predominant slope direction throughout the area is towards the Northeast.

Most of the study areas feature nearly level to very gentle slopes, providing favorable conditions for infrastructure development and agriculture. However, strong to very steep slopes are distinctly observed along the eastern side of the region, as well as around isolated hills located in the west and southern portions of the area.

Slope and aspect play a significant role in shaping landforms and guiding their development. These two factors directly influence geomorphic processes such as erosion and landform degradation, thereby affecting the overall topography and landscape evolution within the Amaravati Capital City area.

2.2. DRAINAGE AND WATER BODIES

The Amaravati Capital City area is an integral part of the Krishna River Basin, located along the right bank of the Krishna River, one of India's major east-flowing rivers. The region exhibits a well-defined natural and artificial drainage network, consisting of the Kondaveeti Vagu system, its tributaries, irrigation canals, and a series of ponds and reservoirs that together form the city's blue infrastructure. The city's drainage pattern is largely dendritic to sub-dendritic, influenced by gentle topography and a network of natural streams and man-

made channels. The drainage and water bodies map of Amaravati Capital City is shown in Figure 9.

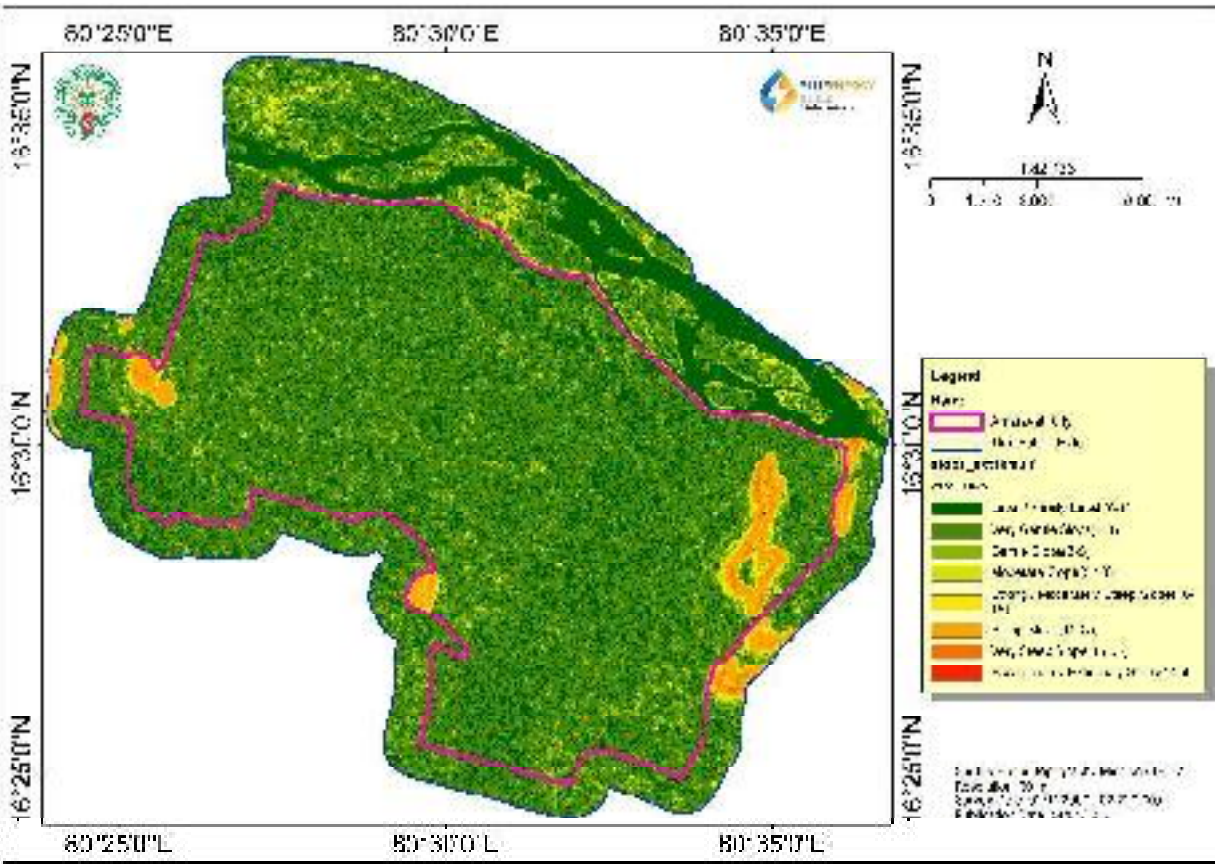


Figure 8: Slope map of the Study Area

Natural Drainage System

The Kondaveeti Vagu serves as the primary natural drainage channel within the Amaravati Capital City area. This channel originates from the Kondaveedu Hill Range and flows in a northeast direction, traversing Tadikonda, Thulluru, and Mangalagiri Mandals before joining the Krishna River near Undavalli, which is situated upstream of the Prakasam Barrage. The Kondaveeti Vagu encompasses a total catchment area estimated between 421 and 453 square kilometers, with its main channel extending approximately 31 kilometers in length.

Several tributaries, including Pala Vagu, Ayanna Vagu, and Kottela Vagu, converge with Kondaveeti Vagu within the boundaries of the capital region. These tributaries, together with smaller feeder streams, play a crucial role in shaping the hydrological characteristics of the basin.

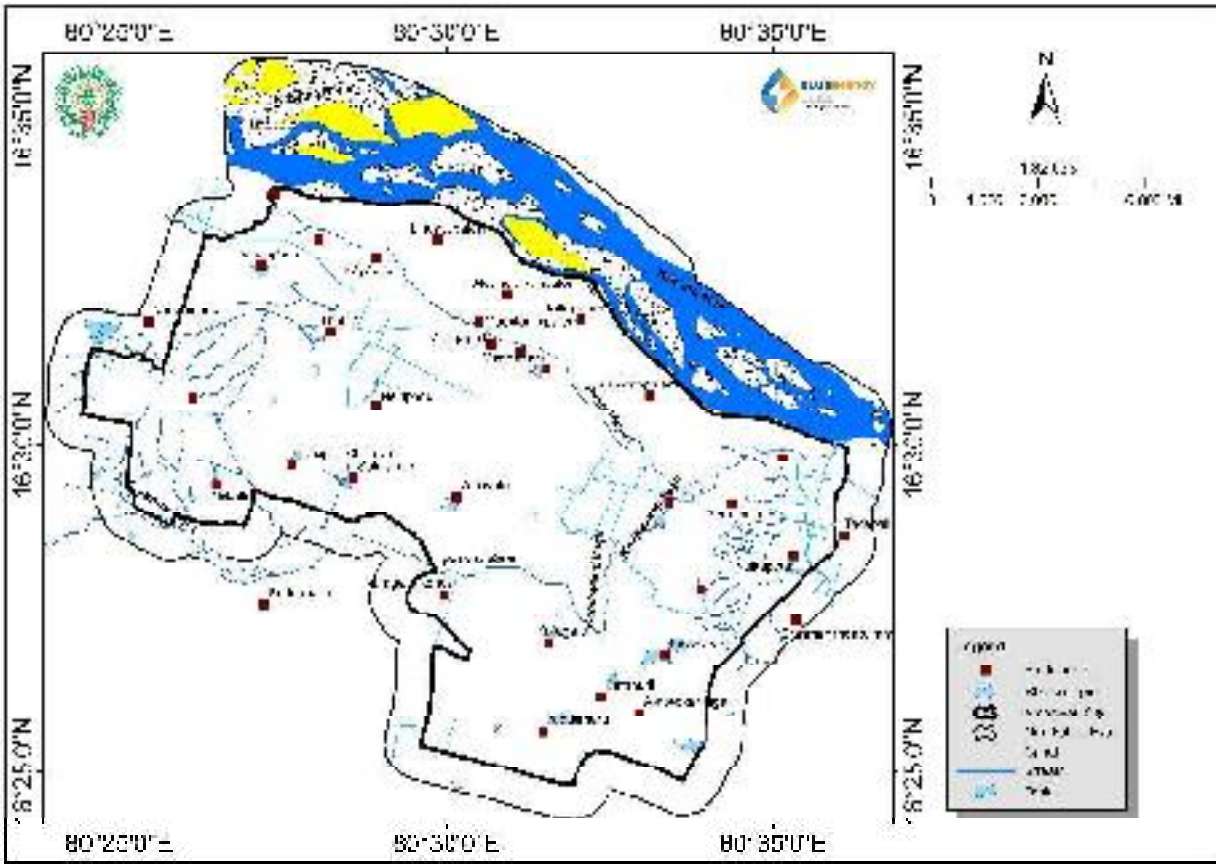


Figure 9: Stream and Water bodies map of the study area

The drainage gradient of the area generally follows a southwest to northeast direction, with elevations ranging from +260 meters in the hillocks near Tadepalli to +18 meters along the Krishna floodplain. Low-lying sections, particularly in the eastern and central portions of the city, are susceptible to seasonal flooding. This inundation occurs mainly during periods of monsoon rainfall, when elevated water levels in the Krishna River limit the outflow from Kondaveeti Vagu.

Additionally, the central part of the region displays a noticeable absence of stream networks. This may be attributed to zones with high groundwater recharge potential or significant geological variability, which influences the surface hydrology and stream formation in the area.

Water Bodies

The capital city region hosts forty-seven natural and man-made water bodies, distributed across the floodplain and low-lying terrain. These include tanks, ponds, reservoirs, and irrigation canals that support both flood management and groundwater recharge. According to the EIA and EMP Report (APCRDA, 2018), the total area under existing water bodies is

approximately 2,578 hectares, including rivers, canals, reservoirs, and ponds. Notable among them are the Neerukonda, Krishnayapalem, Sakhamuru, Pedaparimi, Lam, and Vykuntapuram Reservoirs, which are key components of the flood control and water storage system proposed under the Blue and Green Plan.

All existing water bodies are proposed to be retained and enhanced, serving dual purposes of stormwater detention and ecological balance. The Green–Blue Lattice Plan integrates these water bodies into a network of linear parks, riparian buffers, and ecological corridors, ensuring that the natural hydrology is preserved. New detention ponds have been proposed at strategic low-lying junctions and stream confluences to manage urban runoff during extreme rainfall events.

2.3. GROUNDWATER HYDROLOGY

The groundwater hydrology (Figure 10) of the Amaravati Capital City region is closely influenced by the area's geological formations, geomorphological features, topographic gradient, and the hydrological connectivity within the Krishna River basin. This region contains a heterogeneous aquifer system that transitions from unconfined to semi-confined alluvial aquifers in the northern part to fractured crystalline aquifers in the southern uplands. The Kondaveeti Vagu, Krishna River, and their associated floodplains serve as important recharge and discharge systems, facilitating the interaction between surface water and groundwater regimes (CGWB, 2020; APCRDA, 2018).

Groundwater extraction in Amaravati city occurs primarily through two types of wells: tube wells and large open wells. Tube wells are indicative of the shallow water table present in the river sand beds along the southern part of the Krishna River and the linear stretches of Borupalem, Abbarajupalem, Rayapudi, Velagapudi, Malkapuram, Krishnayapalem, and Undavalli. These tube wells typically have depths of less than 100 feet, with most being less than 50 feet deep.

2.4. GEOLOGY

The Amaravati Capital City region is situated within the Krishna River Basin, part of the Eastern Peninsular Region of India. The area's geology is defined by the presence of Precambrian crystalline formations, which are overlain by Quaternary alluvial deposits (APCRDA, 2018; GSI, 2019). This region marks a transitional zone between the Eastern Ghats Mobile Belt (EGMB) and the Krishna Alluvial Plains, exhibiting a range of lithological and structural characteristics that have a direct impact on groundwater availability, drainage patterns, and the geomorphic development of the landscape (CGWB, 2020). The principle

geological units of Amaravati capital City is given in Table 1. The lithological map of the study area is shown in Figure11.

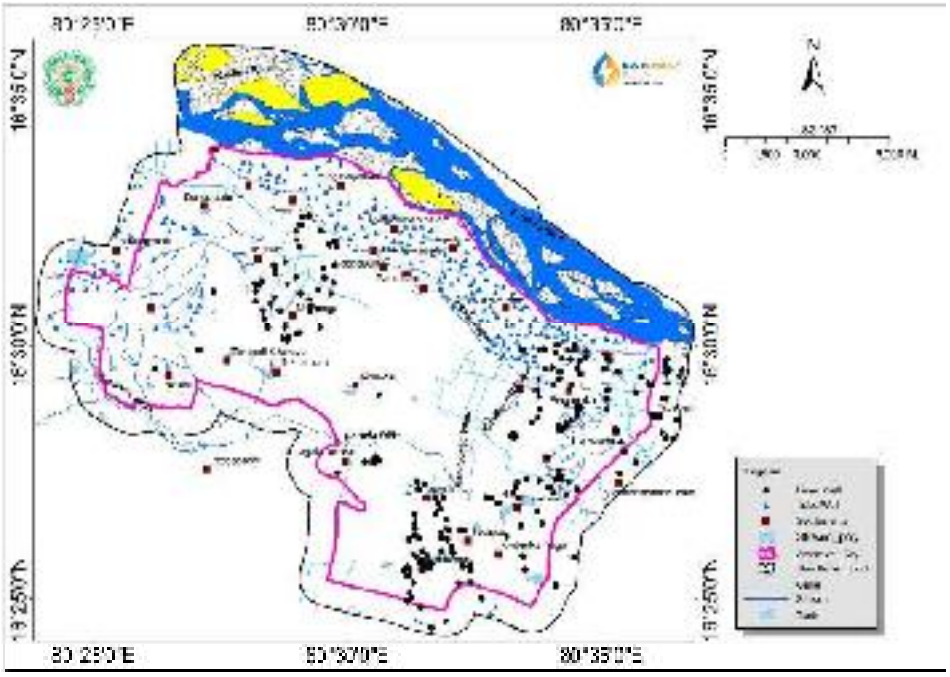


Figure 10: Groundwater hydrology of Amaravati Capital City

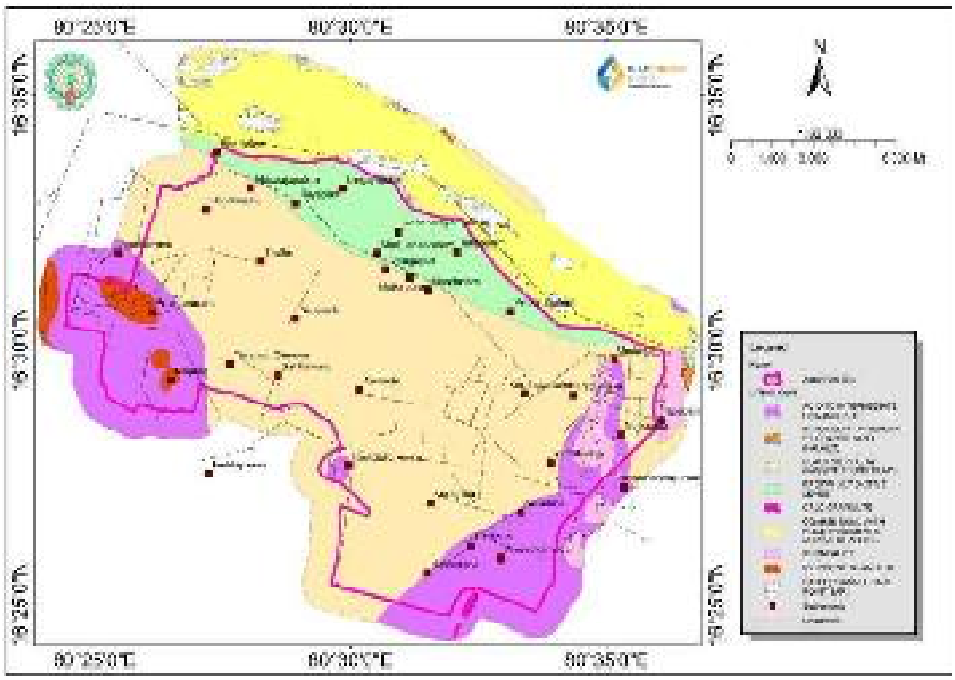


Figure11: Geological map of the study area (after GSI, 2021)

Table 1:Principal Geological Units of Amaravati Capital City

Geological Unit	Description
Acid to Intermediate Charnockite	This unit comprises hypersthene–granite gneiss and quartz–feldspathic granulites. These rocks form the basement in the southern uplands, notably near Tadepalli, Velagapudi, and Ananthavaram. They are characterized by their hard, compact, and massive nature, exhibiting low primary porosity. However, the presence of secondary fractures and joints enables localized groundwater movement(GSI, 2019; CGWB, 2020).
Black Clay underlain by Charnockite (Paleo Channel Deposits)	These deposits are found along the buried channels of ancient Krishna River courses. The black clay layers are rich in organic matter and are underlain by charnockitic bedrock, leading to poorly drained depressions with limited infiltration. These paleo-channel deposits influence subsurface hydrology and recharge gradients (APCRDA, 2018).
Black Silt Clay (Passive Flood Plain Deposits)	Formed in low-energy depositional environments along the inactive floodplain areas of the Krishna River, these fine-grained, cohesive clays are poorly drained and susceptible to seasonal waterlogging. They provide temporary storage for floodwater (CGWB, 2020).
Brown Silt (Active Levee Deposits)	Located along the current levee and meander belts of the Krishna River, these moderately permeable brown silt layers are part of the active floodplain system. They facilitate moderate infiltration and shallow aquifer recharge, supporting the most productive groundwater zones in the area (APCRDA, 2018).
Calc-Granulite	This unit consists of calc-silicate rocks and garnetiferous granulites, found as discontinuous lenses and ridges within the charnockitic terrain, particularly near the southern margins. These rocks are dense and compact, with low permeability and minimal groundwater storage potential (GSI, 2019).
Khondalite	These high-grade metamorphic rocks, formed by garnet–sillimanite–graphite gneiss, appear as linear ridges and isolated hillocks in the southwestern part of the region. Khondalite forms residual uplands with limited infiltration, but these areas contribute to runoff and serve as sources for nearby valleys (GSI, 2019; NRSC, 2020).
Pyroxene Granulite	Medium- to coarse-grained, dark hypersthene–pyroxene granulites are exposed in scattered patches south of Velagapudi and Tulluru. These massive and hard rocks create moderate topographic highs, and their fractured zones may function as secondary aquifers (CGWB, 2020).

Structural Features

The crystalline basement of the region contains a network of minor lineaments and joints, trending northeast–southwest and northwest–southeast, which align with the broader tectonic structure of the Eastern Ghats Mobile Belt (NRSC, 2020). These fractures and joints enhance secondary porosity and transmissivity in the granitic rocks, serving as preferential pathways for groundwater movement (CGWB, 2020).

Overall, the Amaravati Capital City area is defined by its transitional geology between the Eastern Ghats Mobile Belt and the Krishna Alluvial Plains. The varied lithological units and structural features control groundwater occurrence, drainage patterns, and the geomorphic evolution of the landscape.

2.5. GEOMORPHOLOGY

The Amaravati Capital City region is characterized by a diverse geomorphological framework (Figure 12) shaped by the interplay of fluvial, denudational, and anthropogenic processes. This area serves as a transitional landscape, positioned between the crystalline uplands of the Eastern Ghats in the south and the floodplains of the Krishna River in the north. The terrain exhibits a southwest-to-northeast slope gradient, guiding natural surface runoff and drainage toward the Krishna River, which forms the northern boundary of the city (APCRDA, 2018; GSI, 2019).

Geomorphological Mapping and Major Units

Comprehensive geomorphological mapping has been conducted in the Amaravati Capital Region using IRS LISS-IV satellite imagery, Digital Elevation Model (DEM) data, and field validation. This mapping has identified seven major geomorphic units within the region (Table 2). The delineation of paleo channels is based on satellite data interpretation, information from existing tube wells, and lithologs data from geotechnical reports. Together, these landforms regulate surface water flow, influence infiltration rates, support groundwater recharge, and shape the dynamics of the floodplain (NRSC, 2020; CGWB, 2020).

Table 2: Geomorphic Units of Amaravati Capital City

Sl. No.	Geomorphic Unit	Description	Hydrogeomorphological Significance
1	Anthropogenic Terrain	Man-modified terrain formed due to urban development, land levelling, embankments, and	Reduced infiltration capacity and increased surface runoff; requires

Sl. No.	Geomorphic Unit	Description	Hydrogeomorphological Significance
		infrastructure works. Natural slope and drainage altered.	stormwater control and recharge structures to restore hydrological balance.
2	Low to Moderately Dissected Hills and Valleys	Found near Anantavaram, and Peddaparimi in the southern uplands. Denudational landforms developed over Khondalite and charnockite rocks; moderate slopes (3–8%) with shallow valleys.	Runoff-dominated terrain; low infiltration but potential for check dams and contour bunds at valley bases.
3	Moderately to Highly Dissected Hills and Valleys	Confined to easter portion of the Amaravati capital city. Steep, rugged terrain with deeply incised valleys; formed due to long-term erosion and weathering of granulite and khondalite formations.	Acts as watershed divide and runoff source zone; suitable for slope stabilization and rainwater harvesting along foothills.
4	Pediment–Pediplain Complex	The largest unit, covering central and southern parts — Velagapudi, Ainavolu, Sakhamuru, Nelapadu, Tanapathi Cheruvu, and Peddaparimi. Gently undulating erosional surface developed by the coalescence of pediments over crystalline rocks; moderate slope (1–3%).	Moderate infiltration and groundwater potential; suitable for percolation ponds and recharge wells; key transition zone between uplands and floodplains.
5	Paleo Channel	The paleo channel extends between the Krishna River and a sequence of villages, namely Borupalem, Abbarajupalem, Malkapuram, Mandadam, Krishnayapalem, and Undavalli. This channel is aligned with the Kondaveeti Vagu drainage system. It represents a buried ancient course of the Krishna River, now filled with layers of black clay and sandy sediments that rest above the charnockite bedrock. The presence of these sediments marks the relict path of the Krishna River through this region.	High groundwater potential zone; ideal for recharge well networks and aquifer restoration projects.
6	Passive Flood Plain	The passive flood plain is situated along the central region, positioned between the paleo channel and the pediment–pediplain complex. This area is characterised by low-lying depositional plains predominantly made up of black silt and clay. Subject to periodic inundation	Acts as recharge–discharge interface; vital for flood moderation and wetland preservation; prone to seasonal waterlogging.

Sl. No.	Geomorphic Unit	Description	Hydrogeomorphological Significance
		during the monsoon season, these plains experience frequent flooding, which plays a significant role in shaping their physical characteristics and hydrological behaviour.	
7	Water Bodies	Scattered across the city — Sakhamuru (Tanapathi Cheruvu), Velagapudi, Ainavolu, Krishnayapalem, and the Krishna River along the north. Natural and man-made tanks, ponds, and reservoirs forming part of the Blue–Green network.	Provide local aquifer recharge, micro-climate regulation, and stormwater detention; key for flood control and ecosystem support.

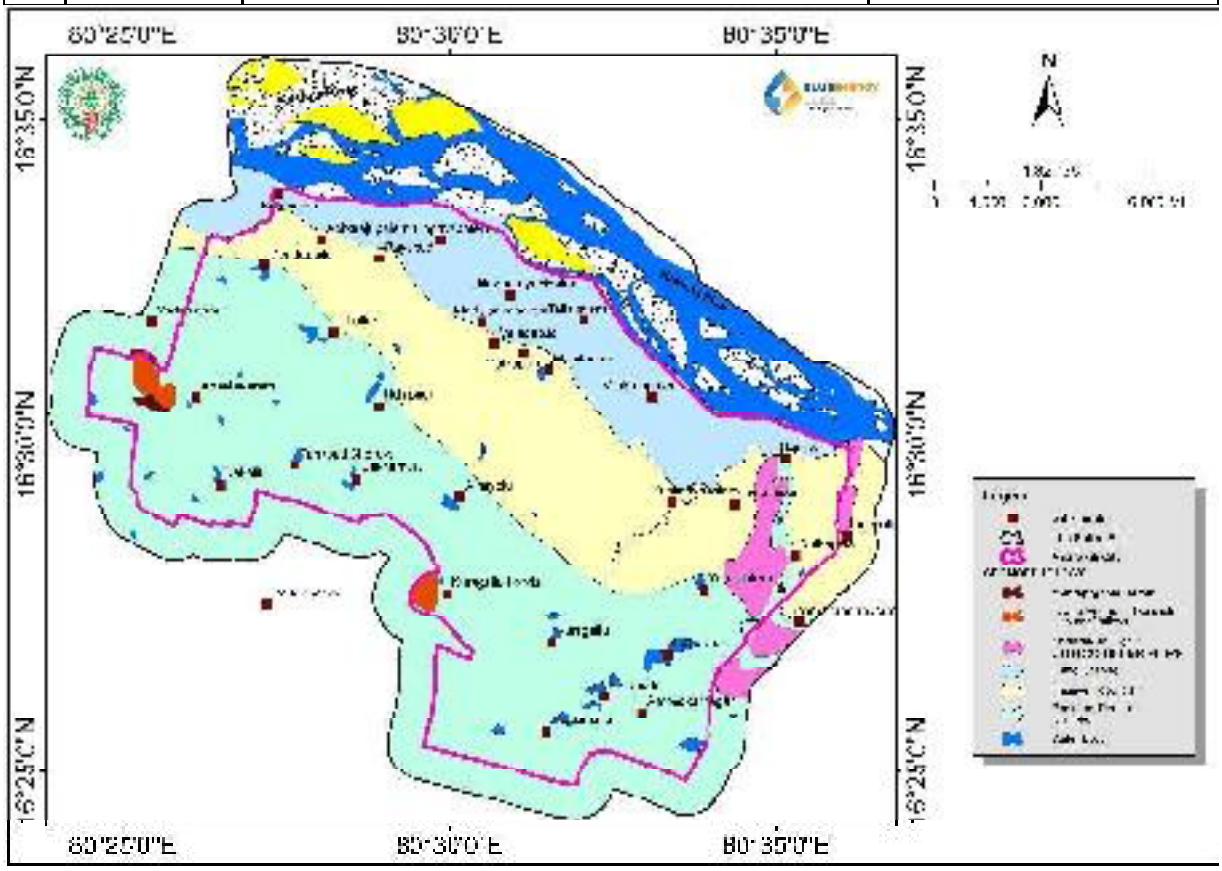


Figure 12:Geomorphological Map of the study area (after GSI, 2021)

2.6. SOIL CHARACTERISTICS

The study area features a variety of soil types, which play a significant role in determining land use and agricultural potential. The soils identified within the region include Clayey,

Clayey Calcareous, Cracking Clay Calcareous, Gravelly Loam, and Loamy Soils. Among these, Cracking Clay Calcareous and Clayey Calcareous soils are the most prevalent, covering the majority of the study area. These dominant soil types are depicted in Figure 13, which illustrates their distribution across the landscape.

SOIL ANALYSIS

Amaravati City exhibits a mix of alluvial soils and weathered residual soils, reflecting its Quaternary floodplain deposits and Eastern Ghats basement geology.

Black Clay / Black Cotton Soil

Occurrence: Peneplain between Amaravati, Errabalem, and Peddaparimi. Composition: Clay with quartz grains and rock fragments; thickness 0.5–4 m. Formation: Derived from weathering of basaltic and crystalline rocks; reworked during rainy season.

Black Silty Clay

Occurrence: Floodplain deposits along Krishna River; western and central Amaravati. Composition: Silty clay with high clay content towards the west; underlain by coarse sand in some areas.

Brown Silt

Occurrence: Intermixed with floodplain deposits, terrace fills. Composition: Fine-grained silt, sometimes with ferricrete concretions.

Reddish Brown Silt

Occurrence: Around upland areas; sometimes associated with concretions/ferricrete.

Calcareous Kankar Soil

Occurrence: SW of Amaravati and west of Nidamarru. Composition: Kankar nodules with sandy and clayey matrix; derived from underlying crystallines.

Red & Reddish-Brown Colluvial Soil (Piedmont Colluvium)

Occurrence: Around Mangalagiri hill slopes. Composition: Heterogeneous mix of clay to pebbles; derived from weathering and fluvial deposition.

Red Sandy Soil (Teri Sand)

Occurrence: Developed in Nidamarru area. Composition: Clay and sand; quartz-dominated grains, sub-angular to sub-rounded.

Grey Brown Clay Soil

Occurrence: North of Betapudi and Atmakur in small patches. Composition: Clay with quartz grains and rock fragments; resembles black cotton soil except colour.

Alkaline Soil

Occurrence: Along small streams in peneplain areas. Composition: High soluble salts; infertile without treatment.

SOIL QUALITY

Fertile Soils

Black Cotton Soil, Black Silty Clay, Brown Silt → High agricultural productivity; retain moisture; good for paddy, sugar cane, horticulture.

Moderate Fertility Soils

Reddish Brown Silt, Grey Brown Clay, Red Sandy Soil → Need organic matter and irrigation for sustained productivity.

Low Fertility / Problem Soils

Calcareous Kankar Soil → Poor water retention, high $CaCO_3$; suitable only after amendment.

Alkaline Soils → Salinity/sodicity issues; require gypsum treatment and leaching.

Piedmont Colluvium → Coarse texture, poor nutrient-holding; moderate productivity after soil improvement.

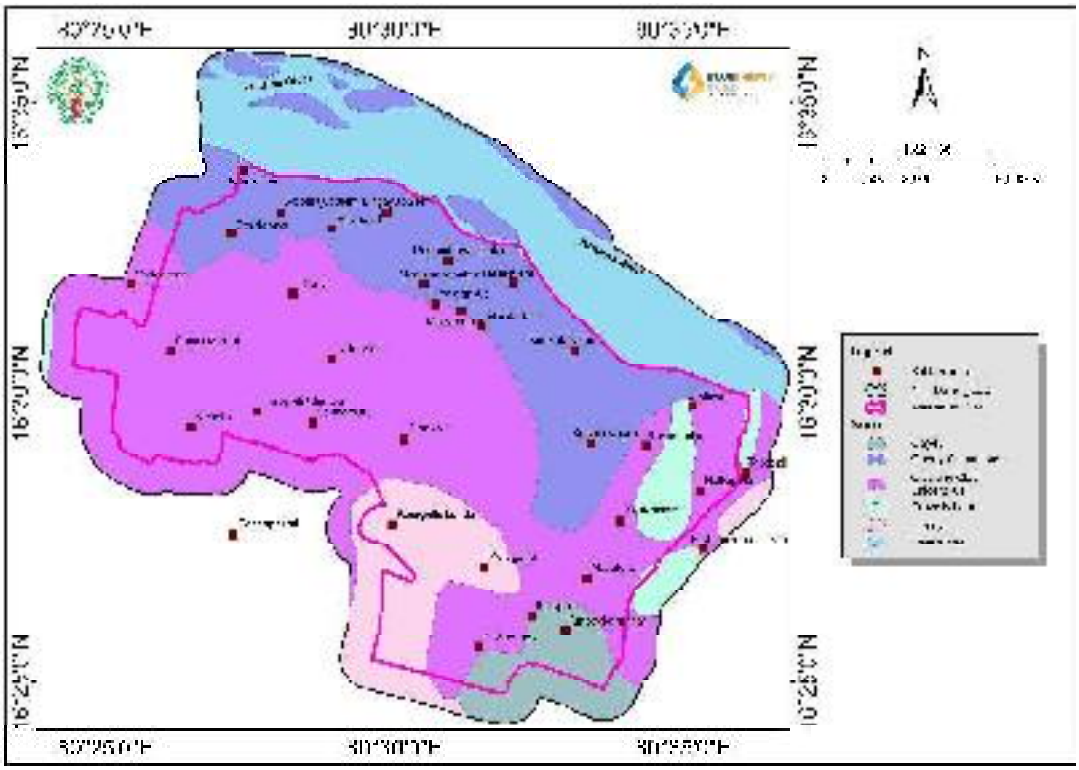


Figure 13: Soil map of Amaravati Capital City

2.7. LAND COVER AND LAND USE (LULC)

The study area encompasses five distinct categories of land use: agriculture or grassland, plantation, fallow or unused land, built-up land, and water bodies. These categories reflect the diverse utilization and management of land within the region.

Between 2002 and 2025, the extent of urban or built-up land has experienced notable growth, increasing from 8% to 15% of the total area. This change highlights the ongoing process of urbanization and expansion of infrastructure within the study zone.

To accurately map and classify the various land use and land cover types, a hybrid classification methodology was employed. This approach has enabled the identification and differentiation of the key land use categories present, as depicted in Figure 14.

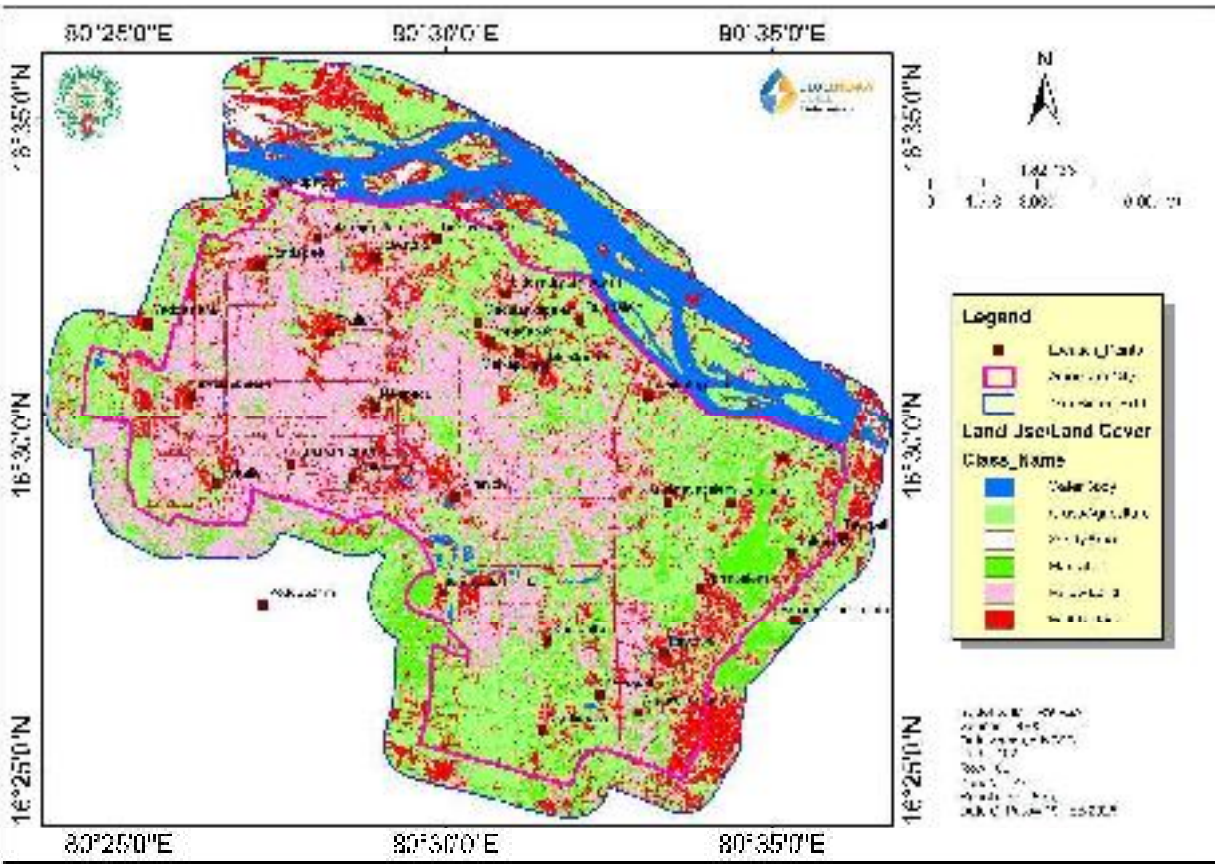


Figure 14: Land use land cover map of Amaravati Capital City

CHAPTER 3: HYDROLOGICAL MODELLING

3.0. GENERAL

Hydrological modelling using HEC-HMS model was carried out to estimate the volume of water arriving for each catchment in a year to plan the water harvesting systems at different locations of the area. The hydrological model developed by Blue Consultant and Aarvee Associates thoroughly checked for consistency and used the same model for assessing the event hydrology of the area. i.e. flood modelling study. The same model was used for annual runoff assessment with different input parameters for Loss calculation, Transforming flow and baseflow. The annual runoff available for each catchment is calculated

3.1. METHODOLOGY

Data Collection & Review

- Gathered **topographic survey data** (KV catchment DEM, cross-sections of Vagus – 2015/2016 survey).
- Collected **rainfall records** from multiple rain gauge stations (KV catchment & surrounding) up to 2024.
- Collated **reservoir, pumping station, and regulator** design data from Irrigation Department and CRDA.
- Reviewed existing **hydrological & hydraulic studies** and flood management proposals.

Rainfall–Runoff Analysis

- **Design Rainfall Estimation**:
    - Followed IS 5542:2003 – Guide for Storm Analysis.
    - Derived 1-day annual maximum rainfall series for each station.
    - Used **GEV distribution** for frequency analysis to get design rainfall for return periods (10, 25, 50, 100 years).
- **Isohyetal Mapping**: Prepared catchment-wide design rainfall maps for input to hydrological modelling.

Hydrological Modelling (HEC-HMS)

- **Basin Delineation**: KV catchment divided into multiple sub-basins.
- **Loss Method**: Initial & Constant Loss method (losses from curve number, infiltration rates from CWC FER).
- **Transform Method**: Clark Unit Hydrograph for runoff transformation.
- **Baseflow Method**: Constant monthly baseflow from empirical equations.
- **Routing Method**: Muskingum-Cunge method for channel routing using literature on surveyed cross-sections & Manning's n.

Meteorological Model Setup

- Converted 24-hr design rainfall to **hourly hyetographs** using CWC temporal distribution factors.
- Applied imperviousness values based on CRDA's phased city development plan.

Hydraulic Modelling (HEC-RAS)

- Built 1D/2D hydrodynamic model of **KV and its tributaries**.
- Incorporated **reservoirs, pumping stations, escape regulators** as hydraulic structures.
- Used **survey DEM** for terrain; refined with land-use/land-cover data.
- Defined boundary conditions from hydrological model outputs (HEC-HMS peak flows).

Scenario Simulations

- Simulated **current and future (phased) development scenarios**:
    - 2024 (existing), 2025, 2030, 2035, 2040.
- Assessed **flood immunity for 1 in 100-year event**.
- Tested **gravity diversion, pumping capacities, and reservoir storage options**.

Validation & Finalisation

- Compared results against **historic flood behaviour** and channel capacity checks.
- Verified **pumping requirements** for different development phases.

- Finalised **design cross-sections** and operational strategies for reservoirs and pumps.

This methodology ensured an **integrated hydrologic–hydraulic approach**, combining **rainfall–runoff simulation (HEC-HMS)** with **2D flood routing (HEC-RAS)** for planning and validating Amaravati's flood management measures.

3.2. KEY CONTRIBUTIONS OF THE STUDY

Peak Flood Estimates

- **Baseline (2017 DPR values) –** Derived for **1 in 100-year return period** events.
- Using **HEC-HMS hydrological modelling**, the study calculated **peak discharges** at multiple key junctions in the Kondaveeti Vagu (KV) catchment.
- At **Undavalli (main outfall)**:
    - 2024 (existing) – ~632 m^3/s (≈ 22,315 cusecs)
    - 2040 (fully developed city, 60% impervious) – ~885 m^3/s (≈ 31,249 cusecs)
- Climate Change Scenario (CCA uplift factor 20% by 2050) – Peak discharge at Undavalli could reach **~1,142 m^3/s (≈ 40,310 cusecs)**.

Flood Duration

- Hydraulic modelling (HEC-RAS 2D) showed that **without mitigation**, high flood levels (HFL) within KV and Paala Vagu would **persist for 2–3 days** in a 1 in 100-year event.
- With proposed interventions (reservoir storage, widened channels, pumping at Undavalli & Vykuntapuram), flood duration reduces to **less than 24 hours** in most areas which were already under execution phase.
- Gravity diversion channels and staged pumping help drain accumulated water faster, reducing downtime for affected infrastructure.

Impacts on Infrastructure Development

- **Road Networks –** Proposed realignment, widening, and deepening of channels reduces flood depth over key arterial roads in the capital city, allowing faster restoration of traffic after heavy rainfall.

- **Urban Land Use –** The flood immunity design allows CRDA to proceed with **60% impervious surface coverage** by 2040 without exceeding design flood levels in primary channels.
- **Reservoirs–**
    - Three key reservoirs inside Amaravati capital (Neerukonda, Krishnayapalem, Sakhamuru) and three outside (Lam, Pedaparimi, Vykuntapuram) are critical for attenuating flood peaks.
- **Floodplain Management –** Identified areas that should remain undeveloped or be used for parks/open spaces to retain temporary floodwaters.
- **Construction Phasing –** Recommendations on timing of Phase 1 & Phase 2 works to match city development pace, avoiding under- or over-design of drainage and pumping systems.

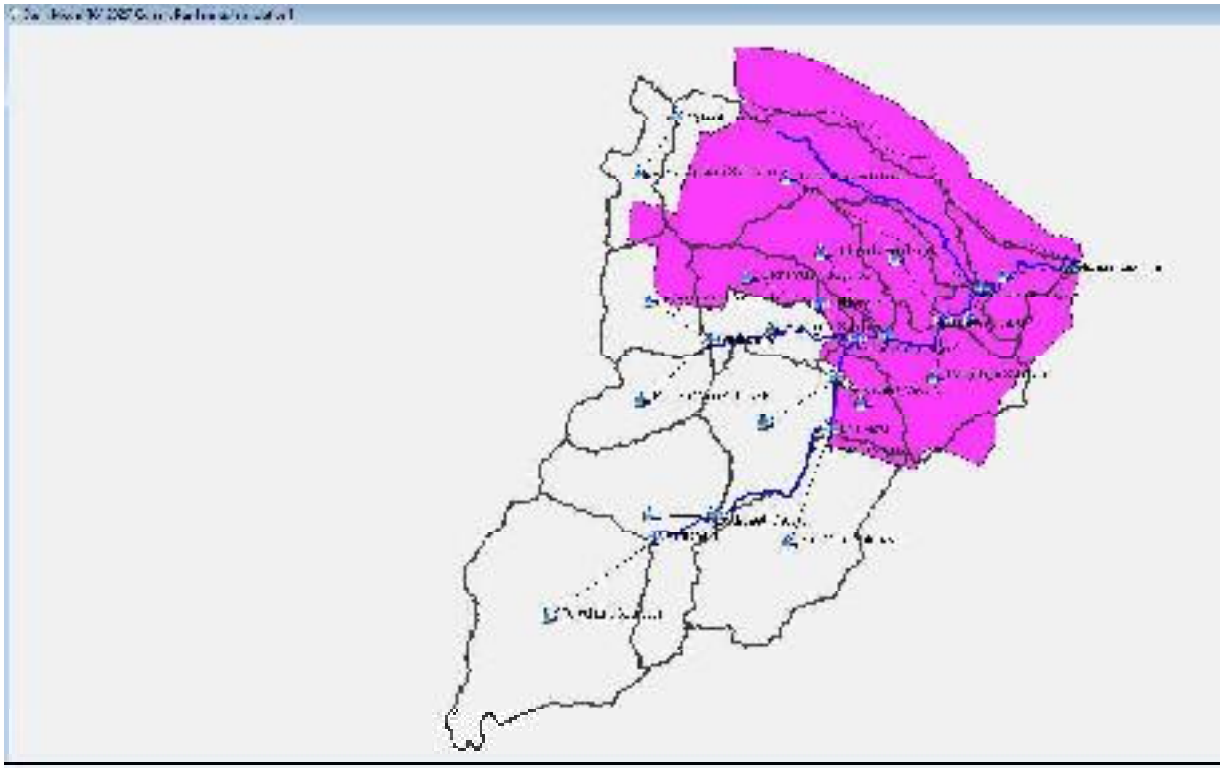


Figure 15:HEC-HMS Model for Annual Water Balance Calculation

3.3. ANNUAL AVAILABLE FLOW

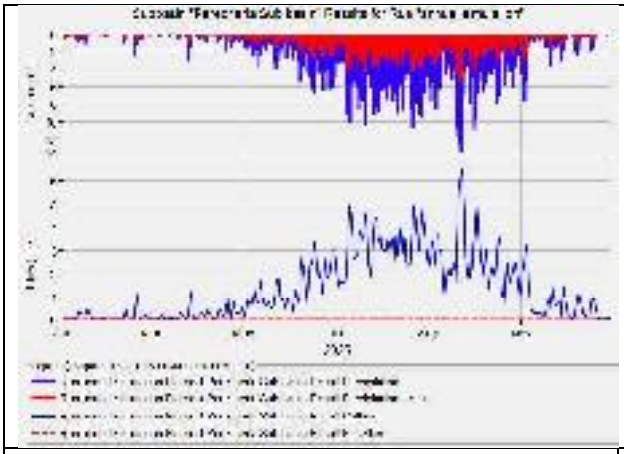
The basin wise and reach wise available annual runoff along with areas is given in Table 3. The daily average annual rainfall of 30 years was used to capture the runoff from each catchment.

Table 3: Model used Hydrological Elements, Drainage Area and Total Volume of Water Generated during a year

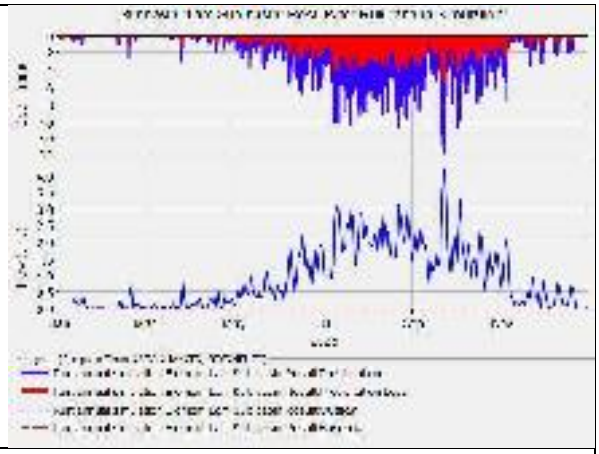
Hydrologic Element	Drainage Area (Sq. Km)	Annual Volume (1000 Cubic Meter)
Perecherla Sub basin	72.3	43394.6
Perecherla	72.3	43394.6
Kondaveeti Vagu 1	72.3	43396.4
Lam Sub basin	46.2	27739
Lam	118.6	71135.3
Kondaveeti Vagu 2	118.6	71146.7
Erra Vagu Sub basin	50.3	30198.5
Erra vagu	168.9	101345.2
Kondaveeti Vagu 3	168.9	101361.7
Tadikonda Sub basin	31.3	18793.4
Nidamarru Sub basin	12.2	7293
Nirukonda U/S	212.4	127448.1
Kondaveeti Vagu 4	212.4	127477.2
Ayyana Vagu Sub basin	22.7	13609.7
Kottela Vagu Sub basin	20.2	12116
Pedaparimi	42.9	25725.7
Kondaveeti Vagu 5	42.9	25726.9
Sakhamur Sub basin	17.2	10331
Sakhamuru_CRDA_SB	12.5	7505.1
Sakhamuru	12.5	7505.1
Nirukonda D/S	285	171040.1
Kondaveeti Vagu 6	285	171080.9
Nelapadu Sub basin	19.4	11631.4
Neelapadu	304.4	182712.3
Kondaveeti vagu 7	304.4	182788.8
Mangalagiri Sub basin	31.1	18657
Amaraveti Sub basin	14.3	8597.7
Krishnayyapalem U/S	349.8	210043.5
Kondaveeti Vagu 8	349.8	210117.1
Vykuntapuram Sub basin	15.1	9046.2

Vykuntapuram	15.1	9046.2
Paala Vagu Sub basin	58.6	35146.6
Kondaveeti Vagu 9	15.1	9050.3
Krishnayyapalem Sub basin	5.7	3437.6
Krishnayayapalem	429.2	257751.6
Kondaveeti Vagu 10	429.2	257839.4
Undavalli Sub basin	13.8	8256.9
Unadavalli	443	266096.3

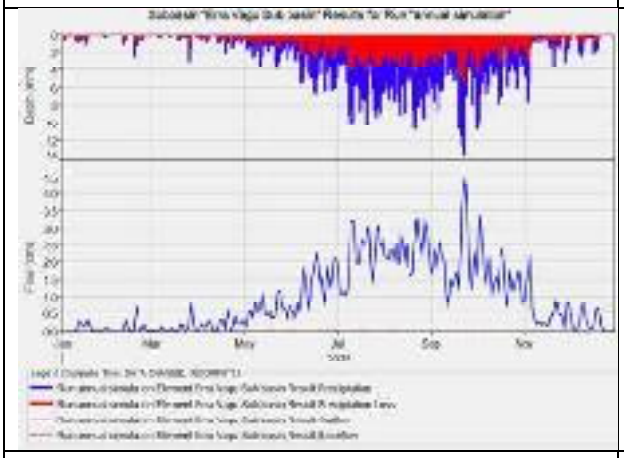
Annual Simulation (Graphs) of Rainfall Runoff in Different Sub Basins of Kondaveeti Vagu Catchment are shown in Figure 16.



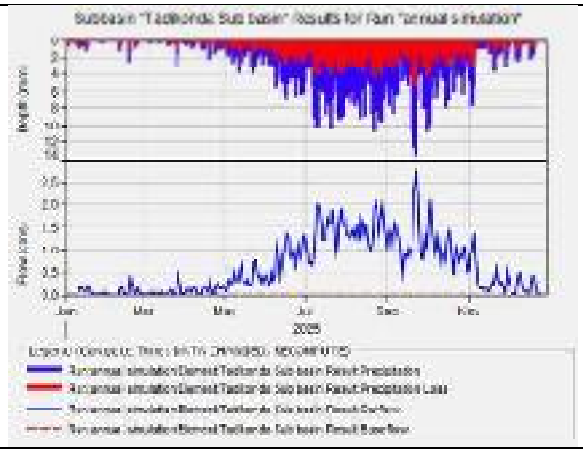
Perecherla Sub-Basin



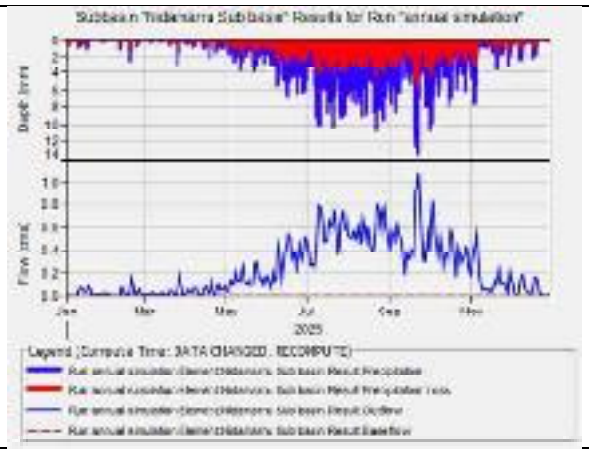
Lam Sub-Basin



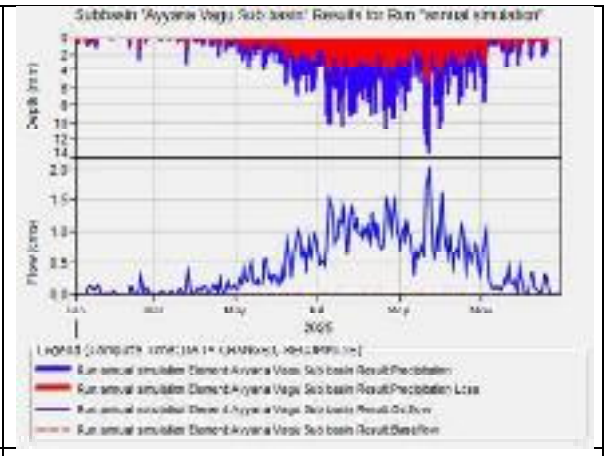
Erra Vagu Sub-Basin



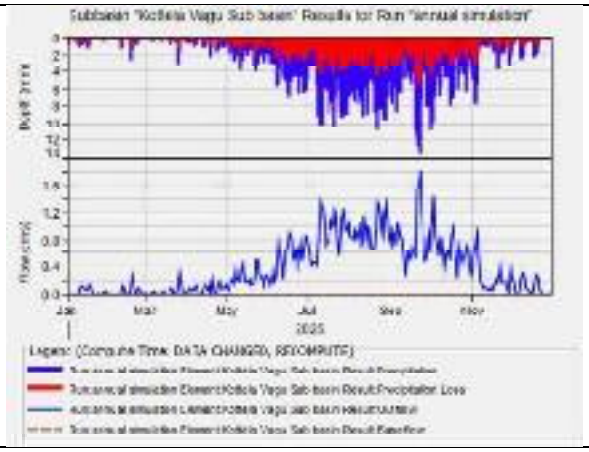
Tadikonda Sub-Basin



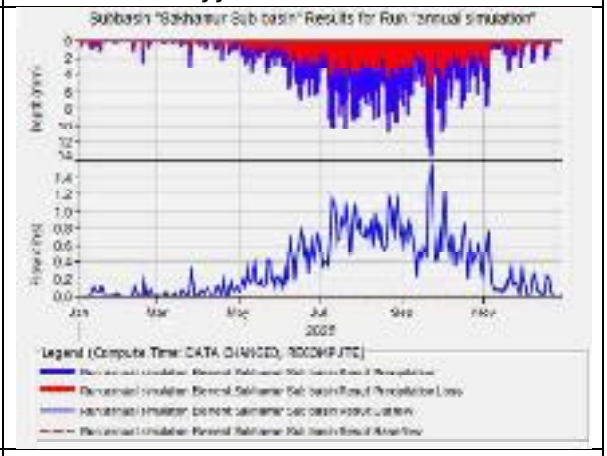
Nidamarru Sub-Basin



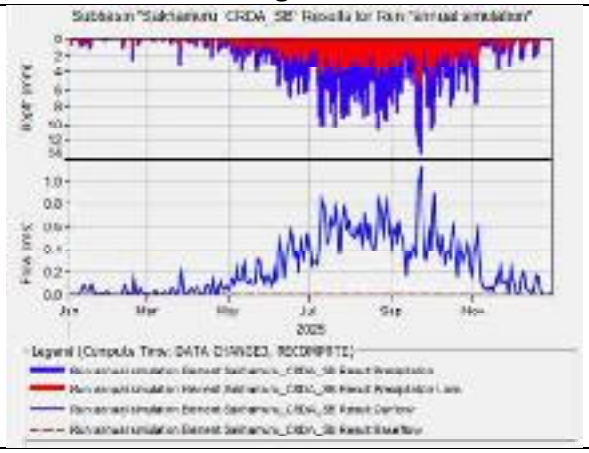
Ayyana Sub-Basin



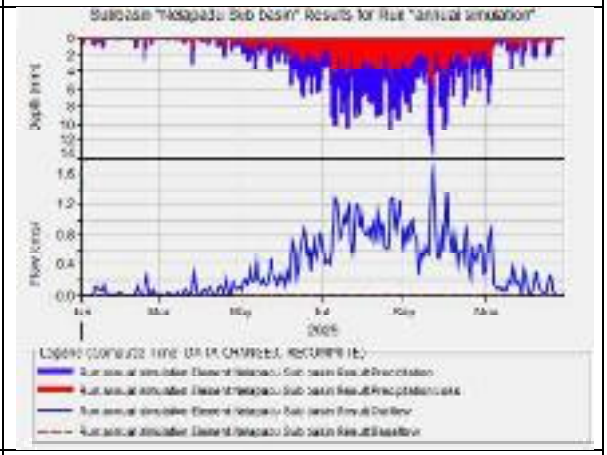
Kottela Vagu Sub-Basin



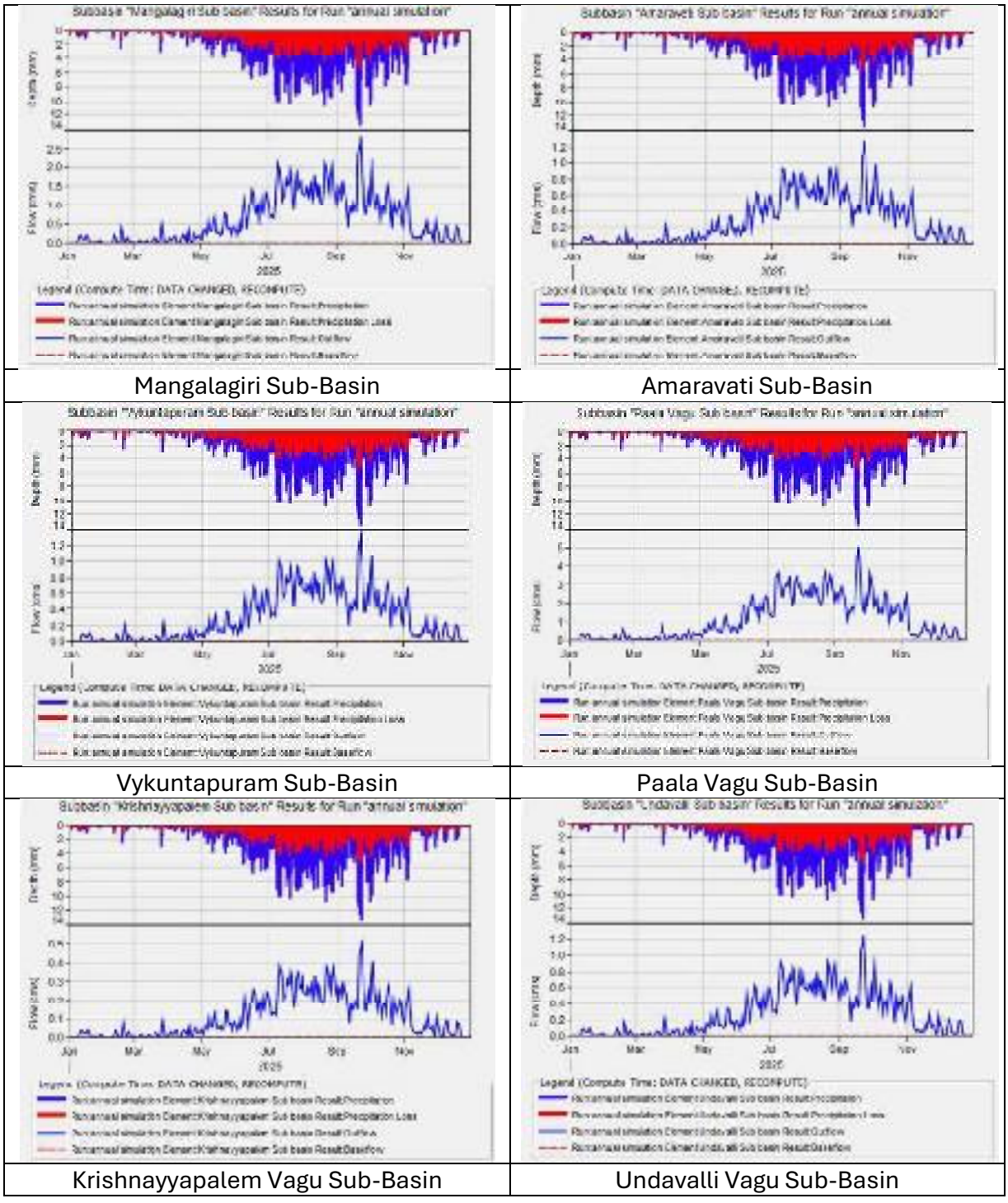
Sakhamur Sub-Basin



Sakhamur CRDA Sub-Basin



Nelapadu Sub-Basin



Mangalagiri Sub-Basin	Amaravati Sub-Basin
Vykuntapuram Sub-Basin	Paala Vagu Sub-Basin
Krishnayyapalem Vagu Sub-Basin	Undavalli Vagu Sub-Basin

Figure 16: Annual Simulation (Graphs) of Rainfall Runoff in Different Sub Basins of Kondaveeti Vagu Catchment

CHAPTER 4: GEOPHYSICAL INVESTIGATIONS

4.0. GENERAL

Ground geophysical techniques were systematically implemented in Amaravati City, which falls under the jurisdiction of the Andhra Pradesh Capital Region Development Authority (APCRDA), to carry out an in-depth investigation of the subsurface structure and the complex basement configuration. The basement in this region displays a stratigraphic sequence consisting of multiple layers and diverse geological features.

A comprehensive approach was adopted by integrating geological, hydrological, and geophysical datasets. This integration enabled the reconstruction of the multi-layered sedimentary system and facilitated both the electrical characterization and geometric identification of the various aquifer systems underlying Amaravati. The investigations involved the execution of Vertical Electrical Resistivity Soundings (VES) using the Schlumberger configuration, along with Magnetic (Total Field) surveys performed at closely spaced intervals. In addition to these primary surveys, secondary gravity data from the Geological Survey of India (GSI, 2006) was used to further elucidate the composition, arrangement, and tectonic framework of the sediments and basement beneath the proposed Capital City in Guntur district. These activities spanned from May 5 to June 30, 2025.

The core objective of these geophysical studies was to analyze the nature and dynamic behavior of subsurface formations, paying particular attention to detailed characterization of soil profiles and aquifer conditions. The analysis focused on identifying favorable groundwater zones that could support both domestic and industrial needs, as well as detecting any hidden structural features present in the area. Furthermore, these studies aimed to provide a deeper understanding of the basement configuration, evaluating its stability and strength, especially in the context of natural disasters such as floods and earthquakes.

The investigations were marked by the systematic application and integration of geological, geomorphological, and hydrological analyses tailored to the specific conditions of Amaravati City. This thorough methodology enabled the characterization of the quality, quantity, and sustainability of groundwater within different horizons. As a result, the presence of concealed aquifer systems was defined, and the findings contributed to the effective management of groundwater resources in the region.

4.1. ROLE OF GEOPHYSICAL SURVEYS IN HYDRO-GEOMORPHOLOGICAL STUDIES

Geophysical surveys are indispensable tools in hydrogeomorphological investigations, as they enable a thorough and detailed characterization of subsurface features that have a direct impact on groundwater occurrence and movement. By employing techniques such as resistivity sounding and magnetic total field surveys, these studies generate accurate, high-resolution data on the nature, thickness, and depth of soil and rock layers. This information forms the foundation for understanding the stratigraphic sequence, geological complexity, and the configuration of aquifer systems within a region.

The integration of multiple geophysical techniques allows for the delineation of aquifer horizons, mapping of basement structures, and identification of significant geological features such as faults, fractures, and lineaments. Such insights are crucial for evaluating groundwater potential, planning effective extraction strategies, and ensuring the sustainable management of water resources. Furthermore, by precisely mapping subsurface anomalies and correlating digital datasets—including geology, geomorphology, and hydrogeology—these surveys enhance the assessment of recharge zones and support effective groundwater management.

Collectively, geophysical surveys establish a robust scientific basis for hydrogeomorphological studies. They facilitate informed decision-making processes related to resource management, urban planning, and infrastructure development, as demonstrated in regions like Amaravati City.

Aquifer Mapping and Groundwater Management

The aquifer mapping undertaken through geophysical surveys has been pivotal in pinpointing regions suitable for groundwater-based water supply systems. By meticulously delineating the geometry and characteristics of aquifers, these surveys have enabled a comprehensive assessment of the sustainability of groundwater extraction, as well as the recharge and yield potential of water-bearing formations. Such data is vital for integrated groundwater recharge planning, ensuring sufficient water supply is maintained, even during prolonged drought periods.

Additionally, the results from these surveys provide guidance and advisories on the possible impacts associated with continued groundwater extraction, thereby helping to mitigate the risks of overexploitation and resource depletion. Based on the findings, targeted recommendations have been made for areas exhibiting strong groundwater prospects, supporting detailed and scientifically sound evaluations of groundwater resources.

Ultimately, these efforts contribute to the sustainable management of groundwater and the development of precise aquifer maps, as well as comprehensive groundwater management plans for the region.

Soil Profile and Structural Suitability Assessment

The information gathered from geophysical surveys has significantly enhanced the understanding of soil profiles and basement conditions at specific locations within the study area. This improved knowledge is essential for assessing the suitability of sites for heavy construction projects or other large-scale developments. In addition, these surveys facilitate the identification of potential geological hazards that could pose risks to infrastructure or public safety.

Through these comprehensive assessments, critical information is provided for informed decision-making in the development of the emerging smart city in Amaravati. This ensures that construction activities and urban planning initiatives are based on a thorough understanding of subsurface conditions, supporting the safe and sustainable growth of the region.

4.2. GEOPHYSICAL SURVEY PLANNING AND OBJECTIVES

The geophysical survey program in Amaravati City was meticulously planned to achieve a series of well-defined objectives, focusing on the accurate assessment of natural resources, their optimal utilization, effective time management, and the acquisition of high-quality data. The selection of survey techniques was guided by these objectives, ensuring that the methodologies employed would be well-suited to the unique geological context of the area.

Two primary geophysical methods were chosen for this investigation: Resistivity Sounding utilizing the Schlumberger array configuration and ground-based Magnetic (Total Field) surveys. These techniques were specifically selected because of their proven effectiveness in the region, their ability to achieve substantial penetration depths, and their capacity to generate precise detection of subsurface anomalies. The careful integration of these methods provided a robust framework for obtaining comprehensive and reliable data on the underlying geological structures and aquifer systems present in Amaravati City.

Resistivity Sounding Techniques

Resistivity sounding techniques were methodically applied throughout the survey area to obtain detailed information about concealed soil profiles. These techniques enabled the identification of the nature, thickness, and depth of subsurface layers, which are essential for understanding the stratigraphic sequence and geological complexity of the region.

The use of resistivity sounding was instrumental in delineating aquifer horizons and characterizing the basement configuration. Through this approach, the surveys were able to determine the depth to bedrock and distinguish between different types of basement formations, including weathered, fractured, hard, compact, and massive structures below ground level. This information is critical for assessing the suitability of the region for groundwater extraction and for evaluating potential construction sites.

To achieve comprehensive coverage and high-resolution mapping, approximately 651 site locations were selected for conducting Vertical Electrical Soundings (VES). The Schlumberger electrode configuration was employed, allowing for a maximum electrode separation (AB) of up to 400 meters. The surveys were systematically carried out at 500-meter intervals wherever possible, creating a grid pattern measuring 500 meters by 500 meters. This design ensured that data density and spatial resolution met the objectives of the investigation, providing a robust foundation for subsurface characterization and resource management.

Magnetic (Total Field) Surveys

Magnetic (Total Field) surveys were systematically carried out across Amaravati City with the primary objective of delineating concealed geological structures. These included features such as faults, fractures, shear zones, lithological contacts, and lineaments that are crucial for understanding the subsurface geology. By applying this technique, survey teams were able to effectively evaluate subsurface formations and gain insights into the configuration and depth of the basement rocks beneath the city.

The use of magnetic surveys offered a rapid and efficient approach, making it particularly well suited for geo-technical investigations within the region. This method enabled the identification and mapping of various subsurface anomalies, greatly contributing to the comprehensive understanding of Amaravati's geological framework. Such detailed knowledge is vital for informed resource evaluation and strategic development planning.

Within the Amaravati Capital Area, data was gathered from 608 magnetic survey points. This extensive data collection facilitated detailed mapping of the subsurface and enhanced the overall geophysical assessment of the region.

4.3. INTEGRATION OF DIGITAL DATA AND SURVEY ACCURACY

To enhance the effectiveness of the geophysical surveys, a comprehensive range of digital datasets was integrated with the resistivity sounding and magnetic survey data. This included information on geology, geomorphology, hydrogeology, drainage patterns,

elevation and digital elevation models, as well as slope, aspect, land use, and land cover. By incorporating these diverse datasets, the survey team was able to correlate surface and subsurface characteristics, thereby facilitating the identification and delineation of concealed geological structures.

During the resistivity survey, lines were carefully laid out and measurement stacking was conducted at each Vertical Electrical Sounding (VES) location with a high degree of precision. This systematic approach ensured that the data collected was both accurate and reliable. Furthermore, the geographical positions of all VES and magnetic survey stations were determined using handheld GPS devices. This use of GPS technology played a crucial role in maintaining accuracy throughout the data collection process, supporting the overall quality and reliability of the survey results.

4.4. METHODOLOGY

To effectively characterize the subsurface geology of the Amaravati City area, both resistivity sounding and magnetic survey techniques were strategically employed. These methods were selected based on the significant contrasts in electrical resistivity, conductivity, and magnetic susceptibility observed within the subsurface sediments and geological structures. Such contrasts are particularly pronounced in features including faults, fractures, contacts, joints, and shear zones, which are often found within the compact, hard, and massive bedrock formations present in the region.

The survey area encompasses a diverse geological setting, with calc granulite and pyroxene granulites exposed in the western part, Khondalite formations in the eastern part, and charnockite rocks occupying the central portion of Amaravati City. This varied bedrock composition necessitated the use of geophysical methods to accurately delineate subsurface structures and stratigraphy. By leveraging the differences in geophysical properties, the survey team was able to identify and map critical geological features and formations, providing foundational data for subsequent analysis of groundwater potential, construction suitability, and resource management.

4.4.1. VERTICAL ELECTRICAL SOUNDINGS (VES)

Vertical Electrical Soundings (VES) were systematically performed throughout the study area at regular intervals of 500 meters, following both north-south (N-S) and east-west (E-W) alignments. The primary purpose of these soundings was to assess the characteristics, depth, and thickness of various sediment layers, including black cotton soil, clay, shale, silt, and sand. In addition, the VES technique was employed to identify the composition and depth of the underlying bedrock.

A total of approximately 651 VES points were established, ensuring comprehensive coverage of the entire Amaravati City region, which spans an area of 217.23 km^2. The soundings were laid out on a grid pattern of 500 by 500 meters, with survey lines following all accessible roads and cart tracks. This approach enabled detailed subsurface profiling across a broad geographic expanse, with data collection trending in both N-S and E-W directions. The spatial distribution of the VES locations depicted in Figure 17.

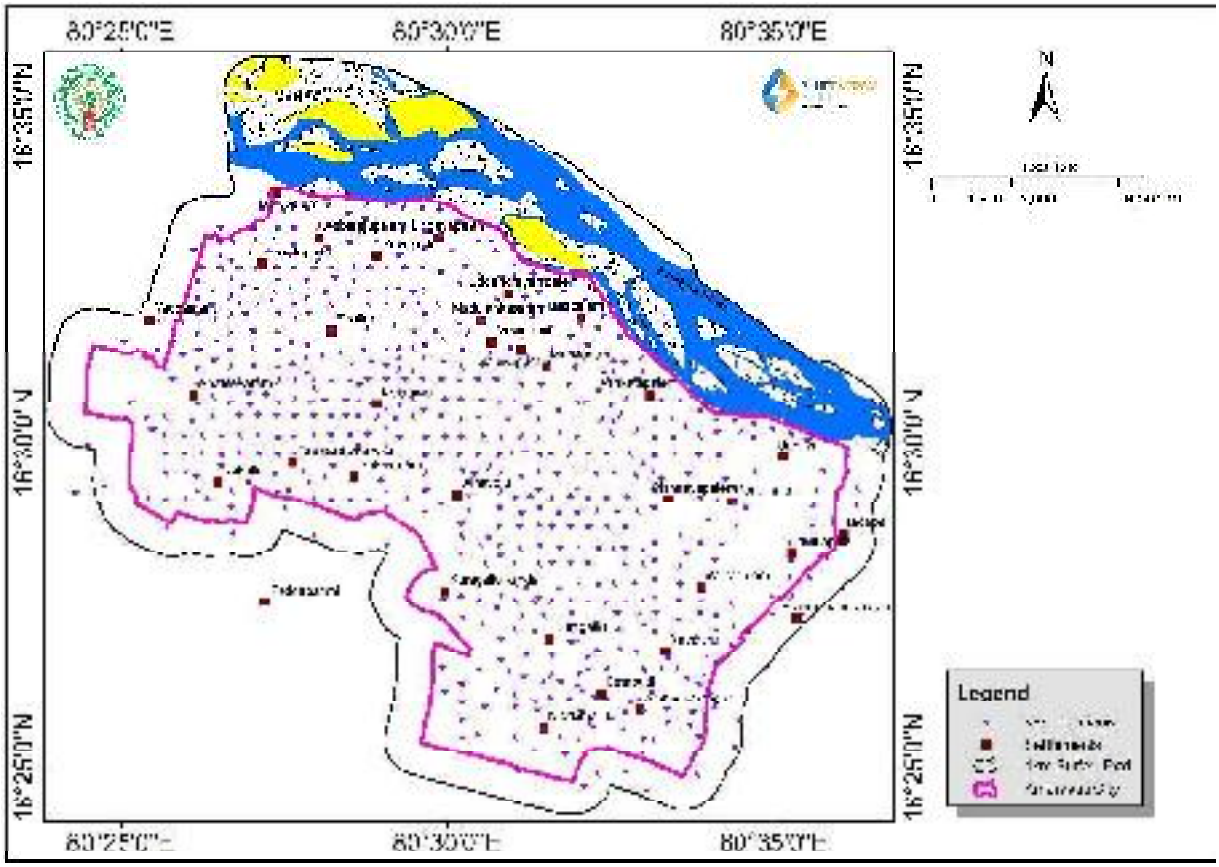


Figure 17: Spatial map of locations of Vertical Electrical Soundings (VES)

4.4.2. MAGNETIC SURVEYS

Magnetic surveys were performed using two distinct approaches: a regional mode, which encompassed the entire study area, and a confined mode, which focused specifically along the shear zone. The principal objective of these surveys was to determine the basement topography and assess variations in the thickness of the sediment layers, both of which have significant implications for groundwater potential within the region.

Analysis of the Andhra Pradesh earthquake hazard map (BMTPC, 2011) indicates that a shear zone traverses Amaravati in the NNE-SSW direction (see Figure 18). To further investigate this feature, detailed magnetic measurements were conducted along the geologically marked, concealed shear zone stretching from Uddandarayunipalem in the north to Ainavolu in the south. Nine traverses were established, each spaced 200 meters apart and trending NNE-SSW, with each traverse length extending for 1 kilometer. Along these traverses, measurement stations were set at 20-meter intervals resulting in a total of approximately 450 data points (as depicted in Figure 19). A shear zone is defined as a linear or planar region in the Earth's crust where rocks have undergone intense deformation due to differential stress. This deformation can manifest as plastic flow, fracturing, and displacement, creating a high-strain region between more rigid rock blocks. The movement within shear zones is typically ductile, occurring at depth through plastic deformation, but may also involve brittle fracturing near the surface. Such zones can range from tens to hundreds of meters in width and may extend for several kilometers.

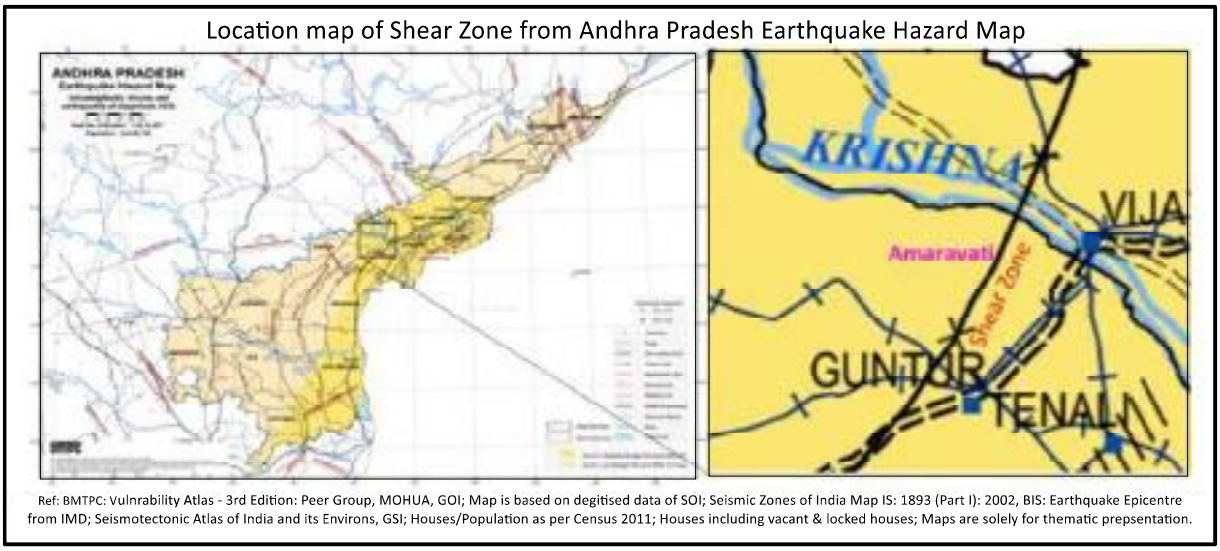


Figure 18: Location map of Shear zone from Andhra Pradesh Earthquake Hazard Map

In addition to the targeted shear zone surveys, regional magnetic (Total Field) surveys were executed at 1-kilometer station intervals along all accessible roads and cart tracks. These regional surveys aimed to delineate concealed structural features and the configuration of the basement, which are essential for understanding the tectonic framework of the Amaravati City study area (refer to Figure 20 and Annexure-1).

All field magnetic data collected during the surveys were referenced to a local magnetic base station established near VIT College in Ainavolu village. To ensure the accuracy and

consistency of the magnetic data, diurnal corrections and International Geomagnetic Reference Field (IGRF, 2005 epoch) corrections were applied using Geosoft software.

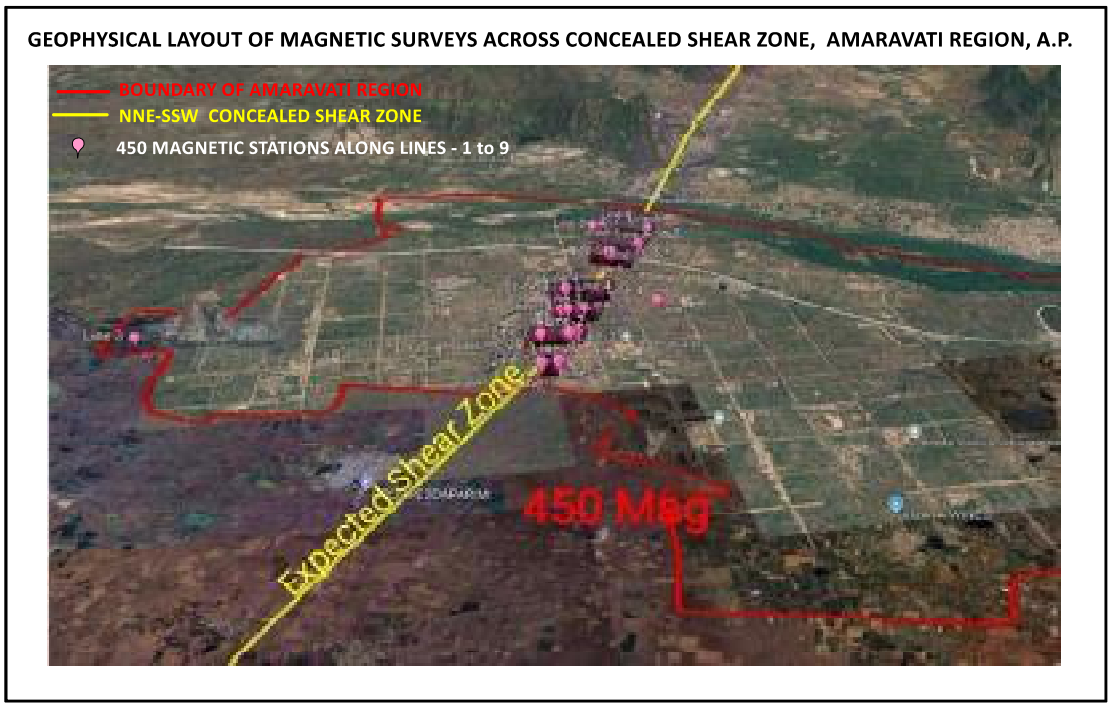


Figure 19: Layout of detailed Magnetic Survey across Shear Zone

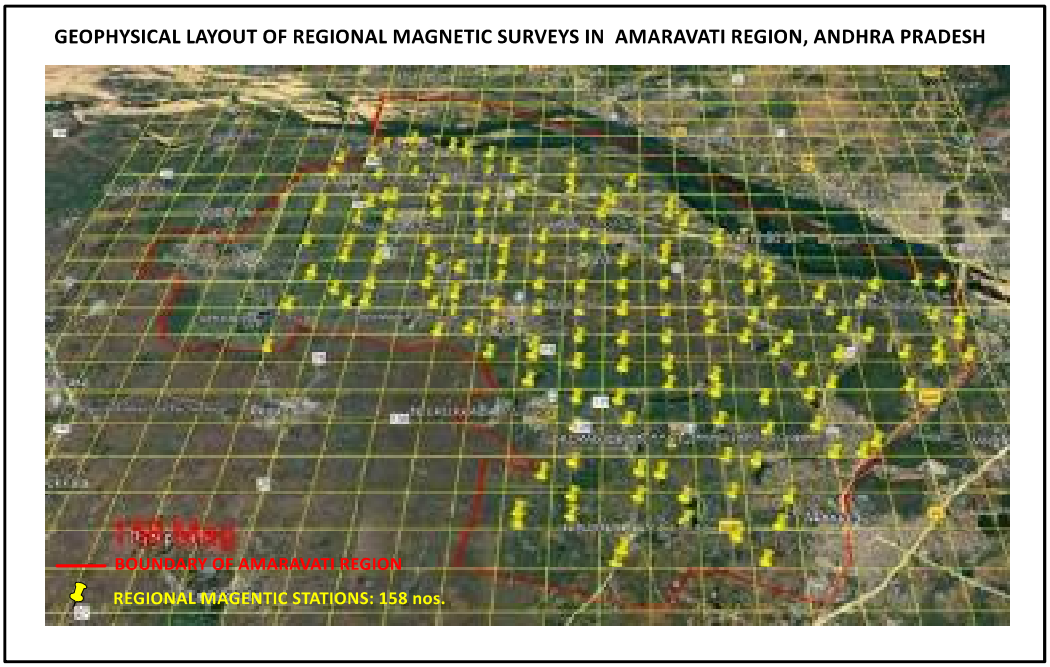


Figure 20: Layout of Regional Magnetic Surveys

Regional magnetic measurements (about 158 stations) have been made at every one kilometer along all available roads and cart tracks amounting to a station density of 1 station per 1.5 to 2.0 sq.km to cover the entire Amaravati City, shown in Figure 20.

4.5. INSTRUMENTS USED

An IGIS signal enhancement resistivity meter model 'SSR-MP-ATS' is used for resistivity sounding measurements to probe both shallow and deeper layers. Proton Precession Type Total field magneto meter of IGIS, Hyderabad was used for magnetic measurements. GPS receiver of Garmin make was used to read the coordinates (longitudes and latitudes) of the VES locations and magnetic stations with an accuracy of ± 3 m.

4.6. MAPPING OF RESISTIVITY DATA

Variation of resistivity within a rock formation is the main source of electrical anomaly and it is an important parameter for mapping different geological formations under soil cover. It is dependent on various factors like nature of formation, degree of weathering, porosity, interconnected pore space, chemical composition and compactness. In the study area, due to the presence of conductive nature and associated structures such as fracture / fault / contact / shear / joints, the resistivities obtained from the underlying and overlying formations may be altered considerably due to percolation of water and degree of weathering. Schematic Diagram of Vertical Electrical Sounding (Schlumberger Array) is shown in Figure 21.

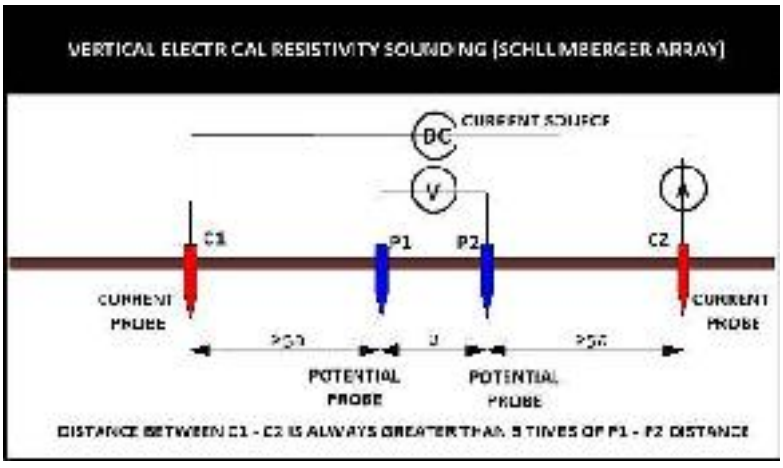


Figure 21: Schematic Diagram of Vertical Electrical Sounding (Schlumberger Array)

The database was initially prepared using MS-Excel and the data was gridded adopting krigging option using Surfer-16 software. The resulting grid was saved in ASCII format to

make it suitable for further processing. The entire database of all the geological parameters was prepared VES wise to facilitate plotting of individual curves. Apparent resistivities are expressed in Ohm.m units. Resistivity sounding curves are plotted on double log graph sheets by apparent resistivity (Ohm.m) vs distance (AB/2) in meters. All multi-layered sounding curves are interpreted with partial Curve Matching Technique (Orellana and Mooney, 1966) and also using 1x1D software. Whereas profiles, sections, contour maps and images were generated using Grapher-12 , Surfer-16 and ArcMap software. The interpreted resistivity, thickness and depths of individual formations are reasonably close to the actual values.

4.7. MAPPING OF MAGNETIC DATA

Magnetic (Total Field) data collected during the survey was systematically corrected for diurnal variation to ensure accuracy. This was accomplished by repeatedly occupying the field base station throughout the magnetic survey. Additionally, corrections for standard variations were applied with reference to the IGRF-2005 epoch, utilizing each IGRF module within the Geosoft software suite.

The magnetic database was initially compiled using MS-Excel, serving as the foundation for subsequent data processing. Both Surfer and Geosoft software were employed to grid the magnetic data, facilitating advanced analysis and visualization.

Following the gridding process, various outputs were generated to interpret the magnetic data. These include profiles, sections, contour maps, images, and derivative maps such as regional and residual maps, analytical signal maps, radially averaged power spectrum, low-pass and high-pass maps, as well as low and high frequency, horizontal, and vertical derivative maps. The generation of these outputs was accomplished using ResReg, Grapher, and Geosoft software.

The characterization of magnetic anomalies, noted for their high frequency, posed challenges in interpretation. To address this, the Radially Averaged Power Spectrum was prepared for the magnetic data. This approach enabled the determination of depth variation in magnetic interfaces and facilitated the identification of magnetic responses from different sources.

4.8. INTERPRETATION OF RESISTIVITY SOUNDING CURVES

The interpretation of Vertical Electrical Sounding (VES) data was conducted using the partial Curve Matching Technique as described by Orellana and Mooney (1966). This approach was

employed to determine the resistivity, thickness, and depth of each geological layer present in the study area. In addition to manual curve matching, model parameters were inferred using the 1X1D software, which provided further insight into the sub-surface characteristics.

During the course of the study, several types of resistivity sounding curves were identified. These curves varied primarily based on the number of layers beneath the surface and the contrasts in their resistivity values. The classification of these curves was based on their shapes, which are reflective of different sub-surface geological conditions.

A notable observation from the analysis is the presence of very low resistivity values over sedimentary formations in the region. This phenomenon is attributed to the existence of thick black cotton soil, which is characterized by a high clay content and elevated salinity, or by the presence of substantial alkaline salts. As a result, there is a significant overlap in resistivity values among individual sedimentary layers, such as top clayey soil, shale, silt, sand, and gravel intercalations.

Furthermore, the VES curves indicated the presence of shallow bedrock at specific locations. These occurrences are likely due to basement highs or undulations within the basement rock, which are reflected as distinct features on the sounding curves.

These curves reveal the existence of four to five multi-layered geological setups in the area (Figure 22). The identified curve types—QKA, HQA, KQA, QAA, and HKA—each correspond to particular geological scenarios and demonstrate specific geological significance within the study area.

4.9. GEO-ELECTRIC LAYER CHARACTERISTICS AND RESISTIVITY ANALYSIS

a) Black Cotton Soil / Clay Layer

The topmost layer across different locations is predominantly composed of black cotton soil or clay. Its thickness varies significantly, ranging between 0.5 meters and 17.8 meters. The resistivity of this layer is generally low, falling within the range of 1 Ω-m to 12 Ω-m. This low resistivity is indicative of high clay content and elevated salinity within the sediments.

b) Silty Clay Layer

Beneath the black cotton soil/clay layer lies the silty clay layer, which typically exhibits a thickness between 4.5 meters and 5.8 meters. The resistivity values for this layer are moderately higher, ranging from 5 Ω-m to 20 Ω-m.

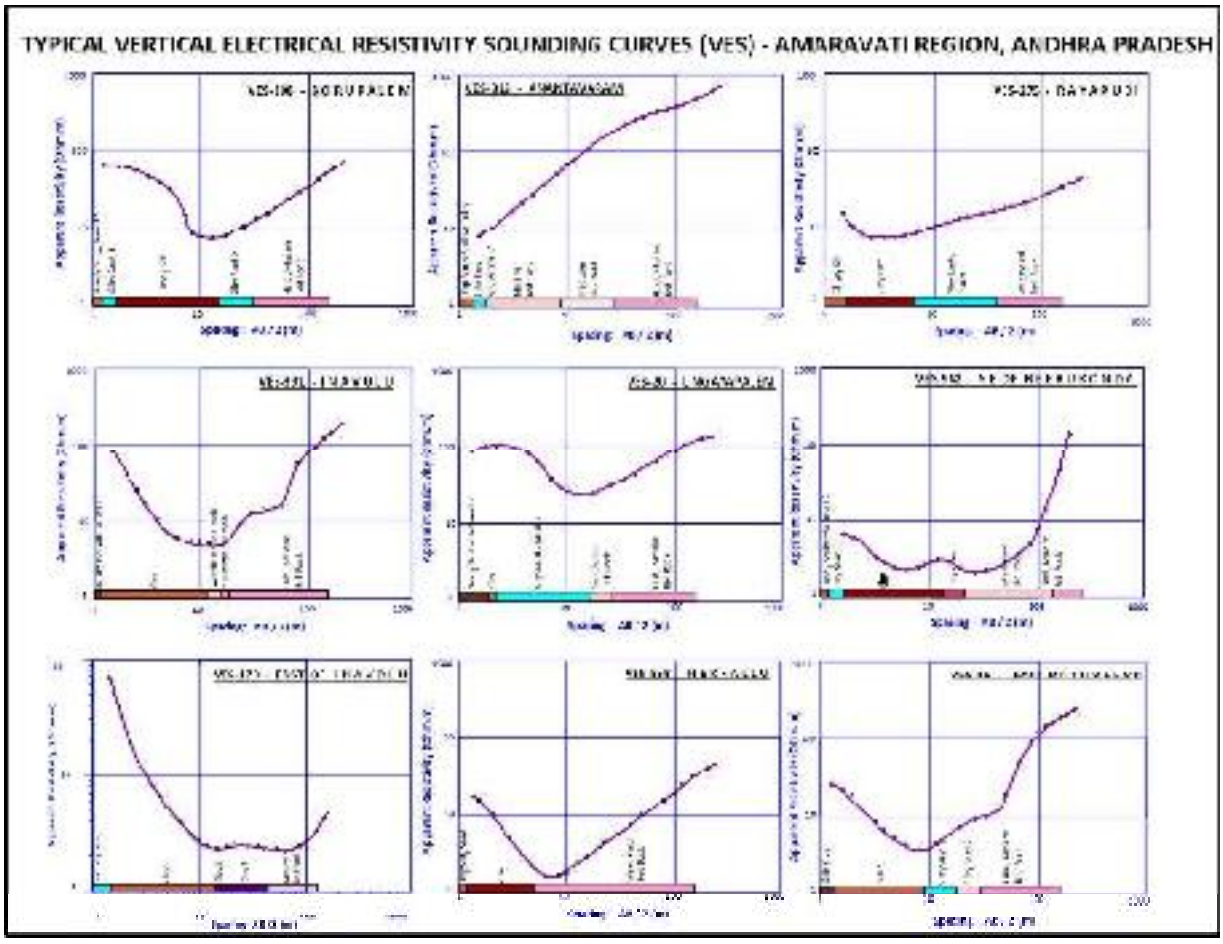


Figure 22: Typical Resistivity Sounding Curves

c) Sandy Clay Layer

The third geo-electric layer is identified as sandy clay. Its thickness is variable, extending from 8 meters to 26 meters. The resistivity of this layer ranges from 4.7 Ω-m to 12 Ω-m, reflecting the mixed nature of sand and clay within the stratum.

d) Silty Sand Layer with Gravel

Following the sandy clay layer, the fourth layer consists of silty sand, occasionally interspersed with gravel. This layer's thickness can range from 10 meters to 40 meters, and its resistivity values are observed between 10 Ω-m and 27 Ω-m.

e) Sand with Gravel

At depths between 10 meters and 40 meters, a layer characterized by sand with gravel is present. This formation is distinguished by higher resistivity values, which vary from 30 Ω-m to 170 Ω-m.

f) Weathered Basement

The presence of a weathered basement is detected at depths between 5 meters and 30 meters. The resistivity of this basement rock ranges from 10 Ω-m to 200 Ω-m, suggesting varying degrees of weathering and mineral composition.

g) Fractured Basement

In certain locations, a fractured basement is encountered at greater depths, typically between 30 meters and 100 meters. The resistivity values in this zone are observed to be between 50 Ω-m and 400 Ω-m. In some areas, the fractured basement extends further, reaching depths of up to 150 meters to 200 meters, and potentially beyond. This indicates the presence of deep-seated fracture systems.

h) Hard, Compact, and Massive Basement

Below these layers, the hard, compact, and massive basement formations—such as Charnockite, Khondalite, pyroxene granulite, or calc granulite—are encountered at depths of 60 meters and greater. These formations exhibit very high resistivity values, exceeding 400 Ω-m and, in some cases, approaching infinity.

i) Alluvium / Sand Layer in Amaravati City

In the northern part of Amaravati City, and just south of the Krishna River, the alluvium or sand layer is particularly prominent. This layer displays a thickness range of 10 meters to 51.5 meters and shows resistivity values from 9 Ω-m to 63 Ω-m. Specific resistivity and depth ranges for each formation are provided in Table 4.

Summary of VES Survey Results

The Vertical Electrical Sounding (VES) survey results demonstrate that the majority of the study area exhibits low resistivity values. These findings are attributed to the high clay content and salinity of the sediments. The depth to the weathered basement generally ranges from 10 meters to 30 meters, while the fractured basement extends from 30 meters to 100 meters, and in some places, reaches depths of 150 meters to 200 meters and beyond. This suggests that deep-seated fractures may penetrate even further into the subsurface.

Detailed analysis of aquifer characteristics, weathering, and fracture zones is presented in subsequent sections.

Table 4:Resistivity and depth range of different formations at Amaravati

Geological formation	Resistivity range (Ώ-m)	Depth range (m)
Flood plain / Sand layer	9 – 63 Ώ-m	10 – 51.5 m
Black Cotton Soil / Clay	1 – 12 Ώ-m	0.5 – 17.8 m
Silty Clay	5 – 20 Ώ-m	4.5 – 5.8 m
Sandy Clay	4.7 – 12 Ώ-m	8 – 26 m
Silty Sand	10 – 27 Ώ-m	12 – 40 m
Silty Sand / Sand with Gravel	30 – 170 Ώ-m	10 – 40 m
Weathered Bed rock	10 – 200 Ώ-m	5 – 30 m
Fractured bed rock	200 – 300 Ώ-m	30 – 200 m
Semi-weathered bed rock	300 – 400 Ώ-m	200 – 400 m
Hard, Massive bed rock	400 – Infinity Ώ-m	400 m and above

4.10. TYPICAL VES CURVES AT DIFFERENT VILLAGES

Interpretation of VES-313 at Anantavaram

VES-313 was conducted near Anantavaram village, situated in the western part of Amaravati City. The interpretation of the field curve at this location reveals a sequence of five distinct geo-electrical layers.

The uppermost layer consists of silty clay, which exhibits a resistivity of 10.5 Ω-m and extends down to a depth of 1.5 meters. Beneath this, the second layer comprises silty sand with gravel, characterized by a moderate resistivity of 157 Ω-m and reaching a thickness of 0.75 meters, resulting in a total depth of 2.25 meters from the surface.

The third layer, identified between depths of 5.8 meters and 8.05 meters, is a shallow, weathered, and compact basement. This layer is notable for its high resistivity value of 1920 Ω-m. Below this, the fourth layer is interpreted as a fractured basement, with a substantial thickness of 26 meters, extending down to a depth of 36 meters.

Finally, from a depth of 36 meters onwards, the fifth and bottommost layer consists of hard, massive, and compact bedrock. This layer is characterized by a very high resistivity of 4500 Ω-m, indicating the presence of competent and unweathered rock material at greater depths (as depicted in Figure 23).

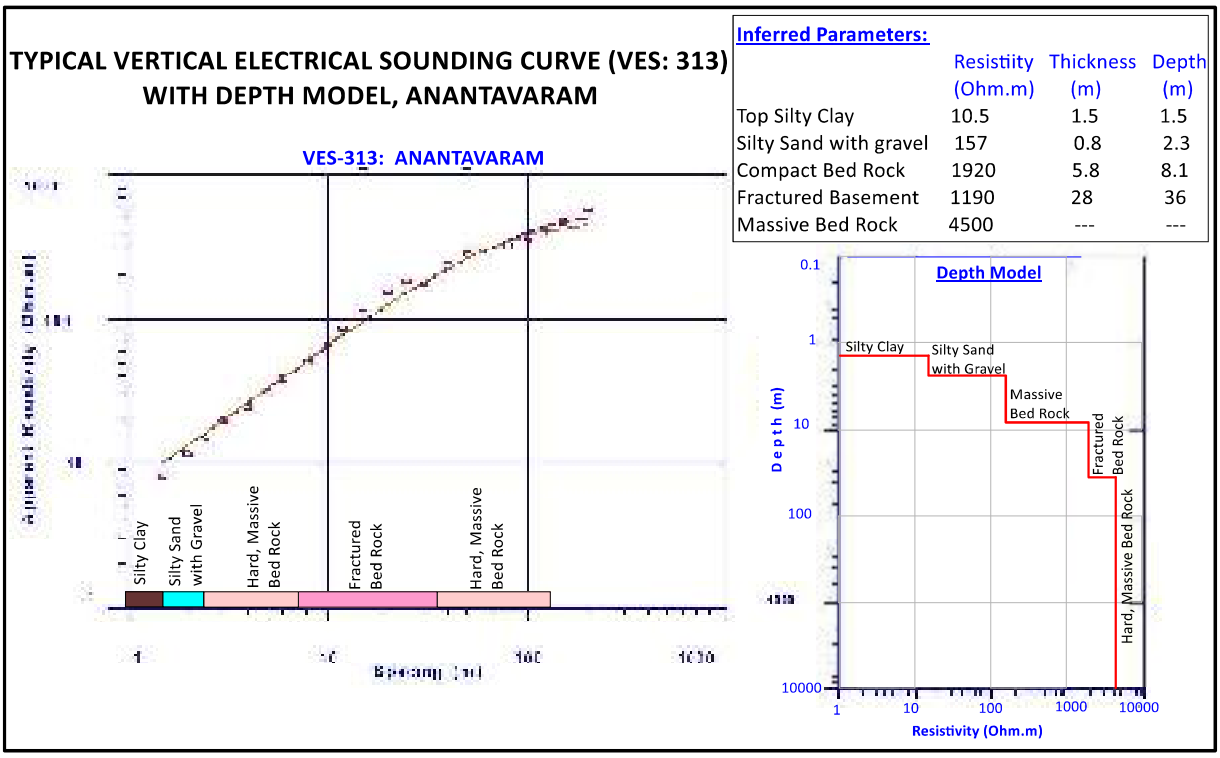


Figure 23: Typical VES curve of Anantavaram

Interpretation of VES-308 at Southwest of Dondapadu Village

Vertical Electrical Sounding (VES) number 308 was conducted at the southwest part of Dondapadu village, located in the western region of Amaravati City. The interpretation of the field curve obtained at this site identifies a sequence of five distinct geo-electrical layers, each characterized by specific resistivity values and thicknesses.

The first, or uppermost, layer consists of sandy material associated with the flood plain environment. This layer exhibits a moderate resistivity of 80 Ω-m and extends from the surface down to a depth of 1.5 meters.

Beneath the sandy surface, the second layer comprises sandy clay. This layer has a resistivity of 24 Ω-m and a thickness of 0.8 meters, reaching a total depth of 2.3 meters from the surface.

The third layer encountered is silty sand, which displays a relatively low resistivity value of 6.6 Ω-m. This layer has a substantial thickness of 9.5 meters.

The fourth layer, found between depths of 11.8 meters and 38 meters, is interpreted as sand containing gravel. It has a resistivity of 37 Ω-m and extends over a thickness of 26 meters, indicating a significant granular composition at this depth interval.

Finally, at a depth of 38 meters and beyond, the fifth and deepest layer is represented by hard, massive, and compact bedrock. This base layer is inferred to possess a very high resistivity, suggesting the presence of competent and un-weathered rock material at greater depths. The stratigraphic arrangement and resistivity profile are depicted in Figure 24.

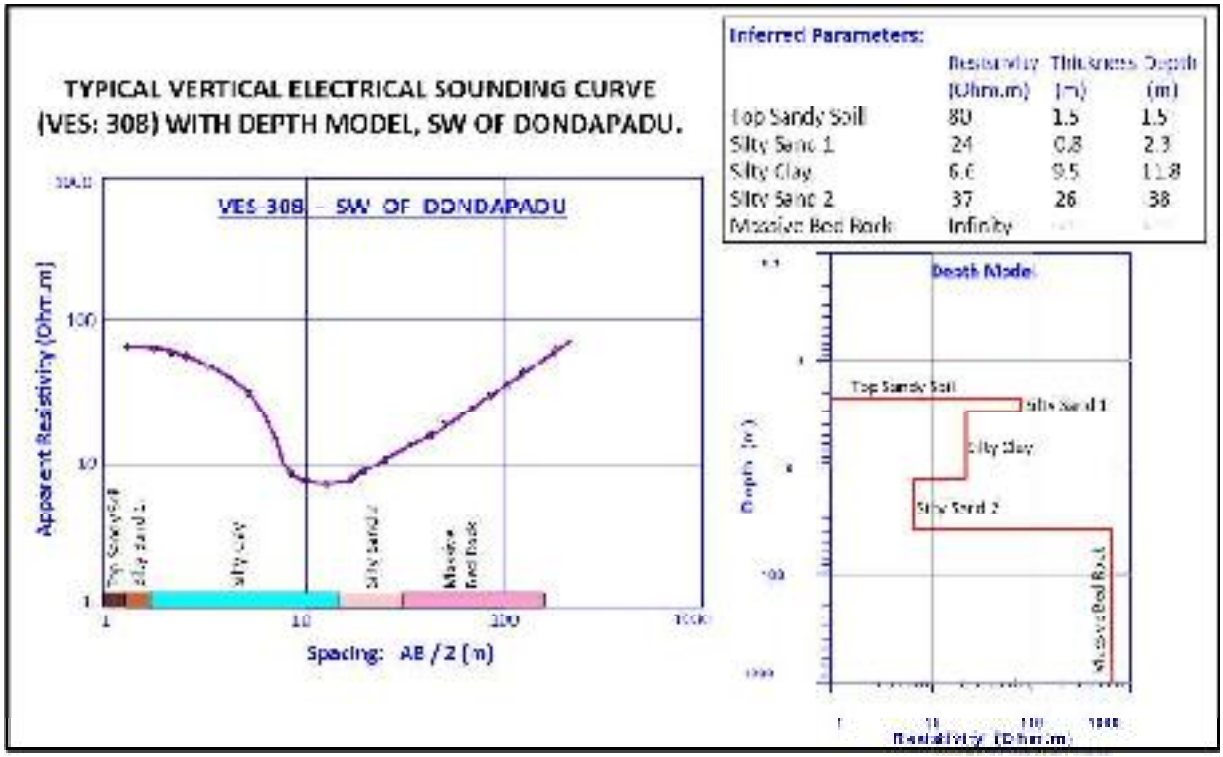


Figure 24: Typical Resistivity Curve of Dondapadu Village

Interpretation of VES-165 at Southeast of Inavolu

Vertical Electrical Sounding (VES) number 165 was conducted in the southeast region of the Inavolu area. The interpretation of the field curve obtained at this site identifies a sequence of five distinct geo-electrical layers, each with its own unique resistivity value and thickness.

The first and uppermost layer is composed of silty clay, which exhibits a resistivity of 14 Ω-m. This layer extends from the ground surface to a depth of 0.9 meters, indicating the presence of fine-grained material in the shallow subsurface.

Beneath the silty clay, the second layer consists of sandy silt with a notably low resistivity value of 2.1 Ω-m. This layer has a thickness of 4.5 meters, reaching a total depth of 5.4 meters from the surface.

The third layer encountered is made up of silty sand and is interpreted to have a thickness of 3.3 meters. The resistivity of this layer is 5.0 Ω-m, and it extends down to a depth of 8.7 meters.

Below the silty sand, a shallow fractured and weathered basement is interpreted between depths of 8.7 meters and 21.7 meters. This layer is characterized by a relatively low resistivity of 10.5 Ω-m, suggesting the presence of weathered and possibly fractured material.

Finally, at a depth of 21.7 meters and beyond, the fifth and deepest layer comprises hard, massive, and compact bedrock. This basement layer is inferred to possess a very high resistivity value, indicating the presence of competent, un-weathered rock material at greater depths. The resistivity arrangement and the stratigraphy for this site are illustrated in Figure 25.

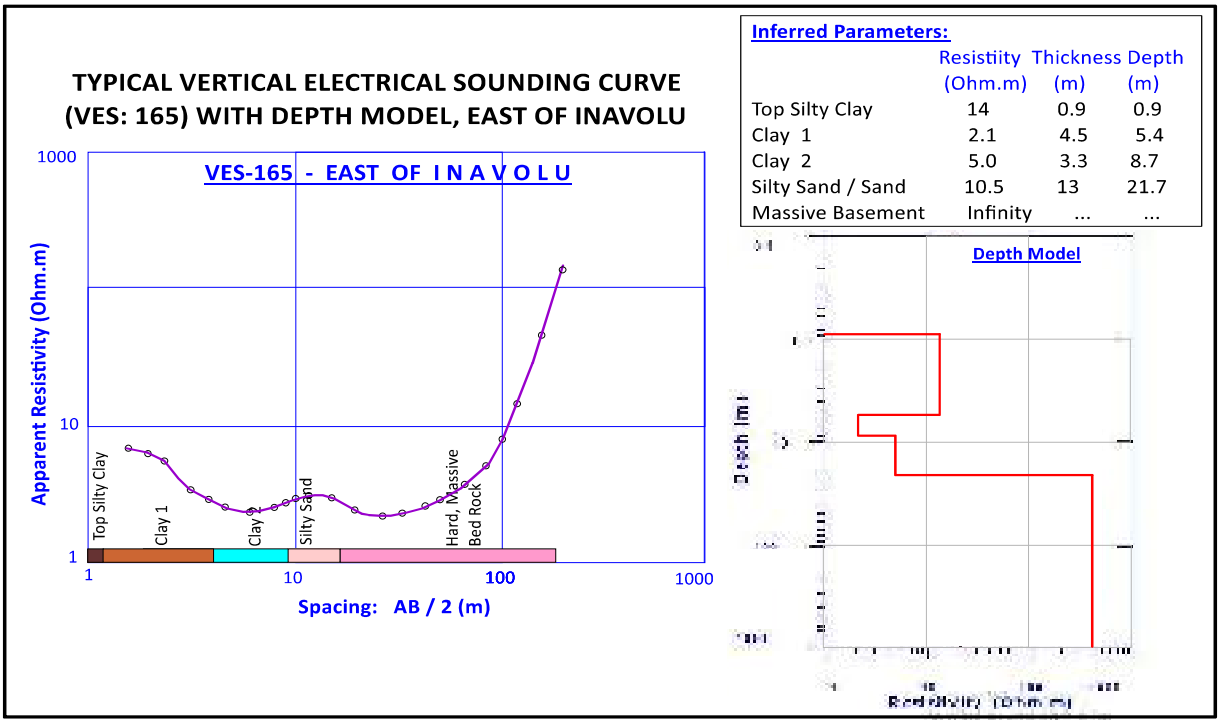


Figure 25: Typical Resistivity curve of Inavolu Village

Interpretation of VES-20 South of Lingayapalem

Vertical Electrical Sounding (VES) number 20 (Figure 26) was conducted just south of Lingayapalem village, situated within the flood plain area in the northern part of Amaravati City. The analysis of the interpreted field curve at this site reveals a sequence of five distinct geo-electrical layers.

The uppermost layer consists of flood plain sand, characterized by a relatively high resistivity of 112 Ω-m. This sand layer extends from the surface to a depth of 2.6 meters, indicating the dominance of sandy material in the shallow subsurface.

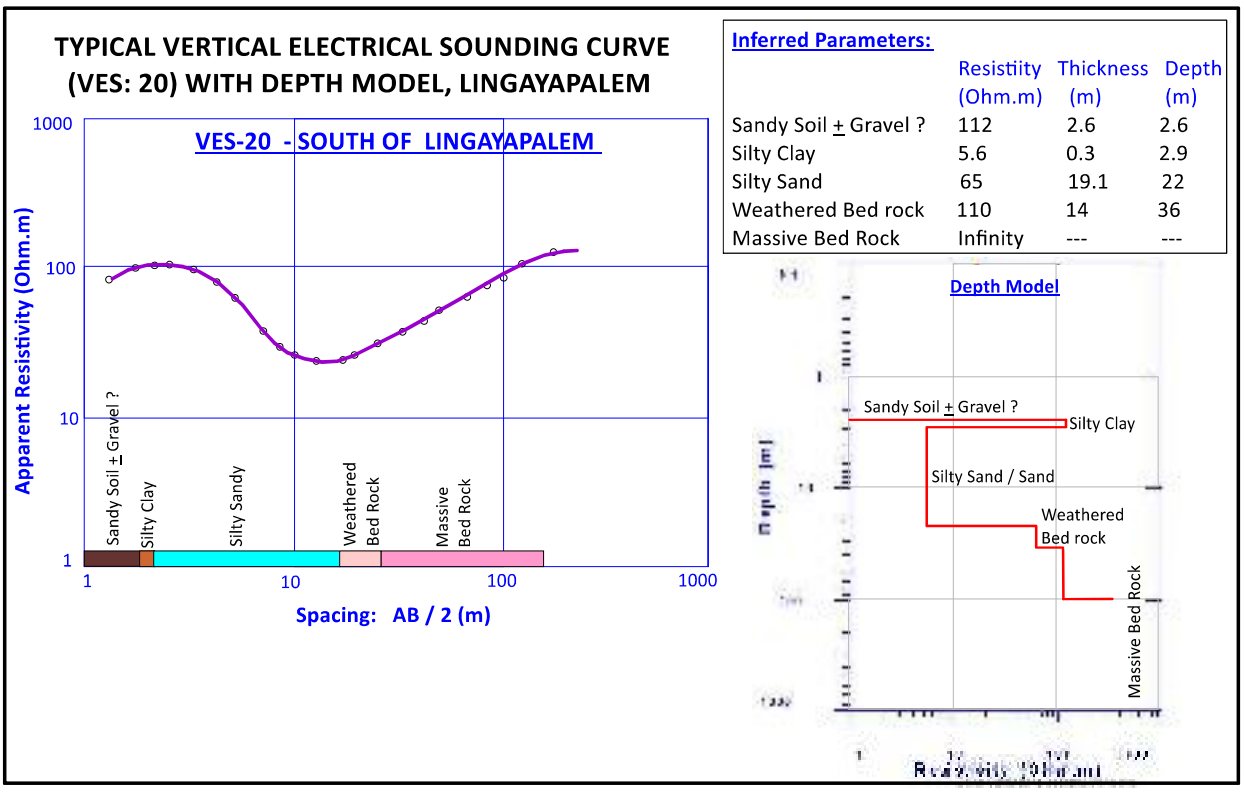


Figure 26: Typical Resistivity curve of Lingayapalem

Directly beneath the sand, the second layer is composed of sandy clay, exhibiting a significantly lower resistivity of 5.6 Ω-m. This layer is comparatively thin, with a thickness of only 0.3 meters, reaching a total depth of 2.9 meters from the surface.

The third layer encountered is silty sand, which has a thickness of 19.1 meters and a resistivity of 65 Ω-m. This substantial layer extends down to a depth of 22 meters, reflecting a major portion of the subsurface profile at this location.

Below the silty sand, a shallow weathered basement is interpreted between depths of 22 meters and 36 meters. This layer is marked by a resistivity value of 110 Ω-m, suggesting weathered and possibly fractured material at these depths.

Finally, at a depth of 36 meters and beyond, the fifth and deepest layer comprises hard, massive, and compact bedrock. This basement layer is characterized by a very high resistivity value, indicating the presence of competent, un-weathered rock material. The stratigraphic arrangement and resistivity distribution at this site are illustrated in Figure 26.

Interpretation of VES-221 at South of Nelapadu

VES-221 was carried out just near Nelapadu village, in the central part of Amaravati City. Interpreted field curve reveals essentially five geo-electrical layer setup at this location. Top black cotton of silty clay having a resistivity of 7.8 Ώ-m, up to a depth of 1.3m. Followed by sandy clay of low resistivity of 1.6 Ώ-m, having a thickness of 1.3m up to a depth of 2.6m. Silty Sand having a thickness of 5.4m with a resistivity of 3.7 Ώ-m interpreted up to a depth of 8.0m. Followed by low resistive sand with clay interpreted at a depth between 8m to 18m having a resistivity of 1.6 Ώ-m, followed by weathered bed rock encountered at a depth from 18m onwards with having a resistivity value of 112 Ώ-m (Figure 27).

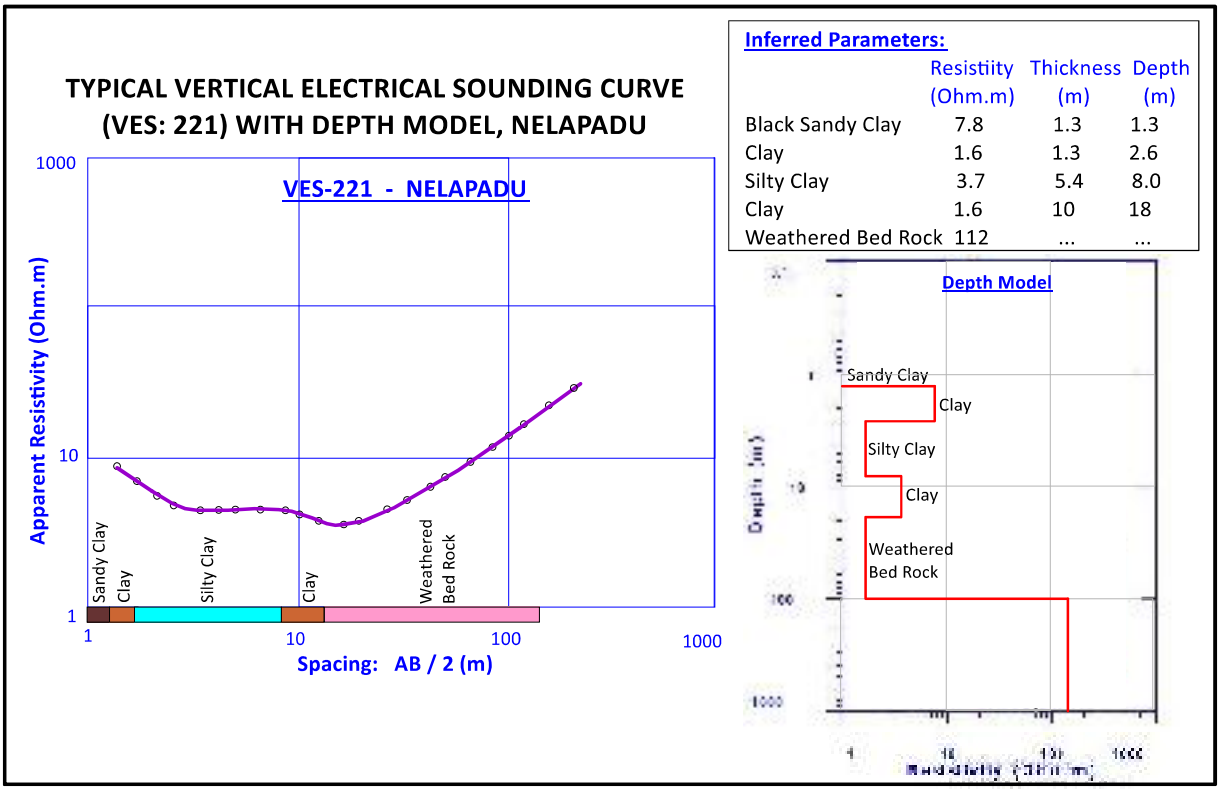


Figure 27: Typical Resistivity Curve of Nelapadu

Interpretation of VES-275 north-west of Rayapudi

VES-275 was carried out just north-west of Rayapudi village, in the north-western part of Amaravati City. Interpreted field curve reveals essentially four geo-electrical layer setup at this location. Top black silty clay having a resistivity of 7.6 Ώ-m, upto a depth of 2.5 m. Followed by sandy clay with a resistivity of 9.5 Ώ-m, having a thickness of 5.0m upto a depth of 7.5m. Silty Sand / sand layer having a thickness of 39m with a resistivity of 24 Ώ-m interpreted upto a depth of 46.5m. Followed by weathered bed rock encountered at a depth from 46.5 m onwards having a resistivity value of 95 Ώ-m (Figure 28).

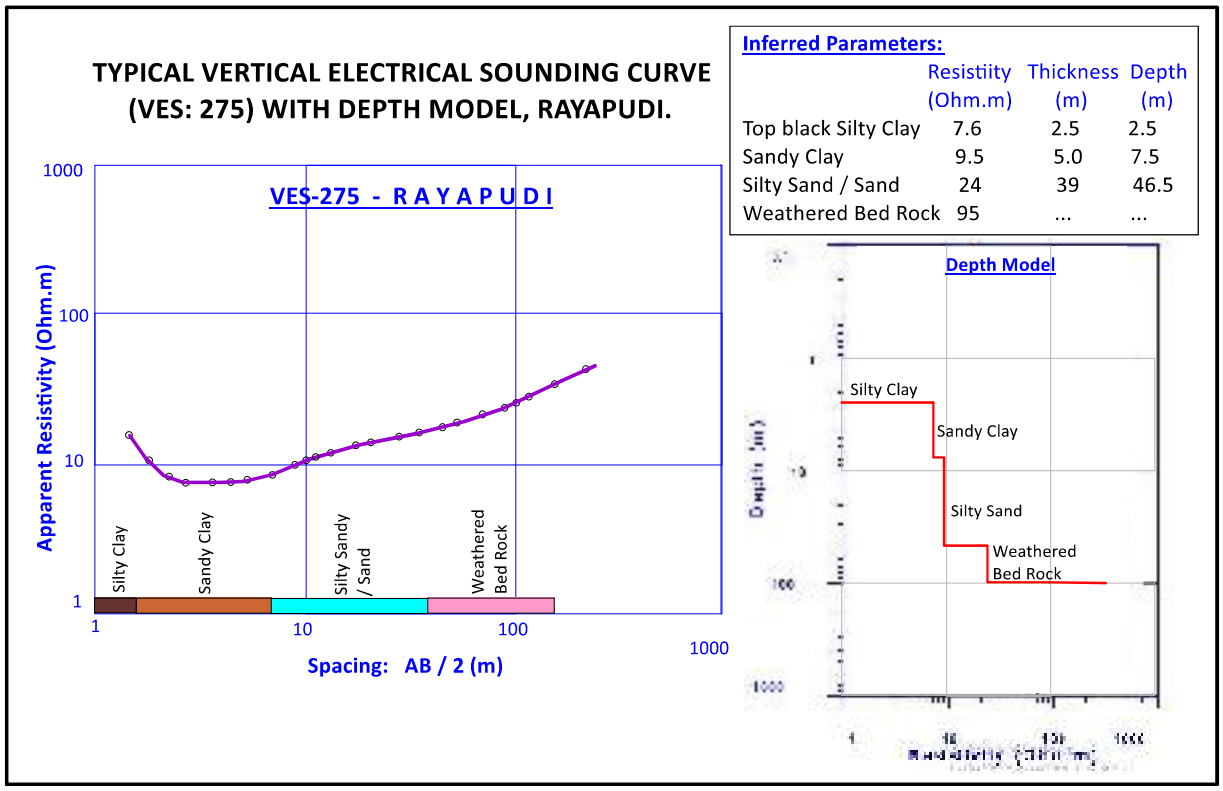


Figure 28: Typical Resistivity curve of Rayapudi Village

Interpretation of VES-341 north-west of Sakhamuru

VES-341 was carried out just north-west of Sakhamuru village, in the south-western part of Amaravati City. Interpreted field curve reveals essentially four geo-electrical layer setup at this location. Top black silty clay having a resistivity of 9.8 Ώ-m, up to a depth of 2.5m. Followed by sandy clay layer having a resistivity of 1.0 Ώ-m, having a thickness of 12.5m up to a depth of 15.0m. Followed by silty sand with gravel having a very high resistivity of 240 Ώ-

m having a thickness of 1.7m up to a depth of 16.7m. Further, massive bed rock from 16.7 m onwards with very high resistivity (Figure 29).

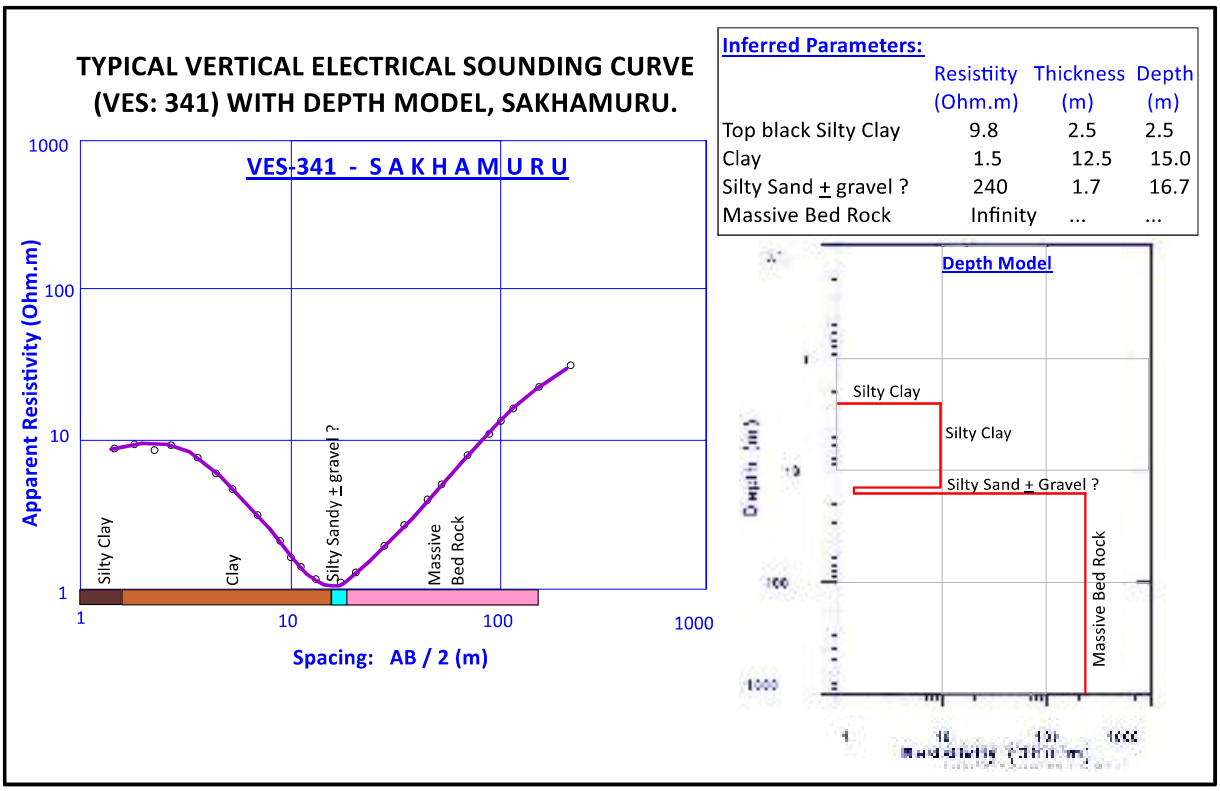


Figure 29: Typical Resistivity curve of Sakhamuru

Interpretation of VES-46 south-west of Velagapudi

VES-46 was carried out just south-west of Velagapudi village, in the central part of Amaravati City. Interpreted field curve reveals essentially five geo-electrical layer setup, consists of top black silty clay having a resistivity of 16 Ώ-m, up to a depth of 1.5m. Followed by sandy clay layer having a resistivity of 2.4 Ώ-m, having a thickness of 7.5m up to a depth of 9.0m. Followed by silty sand with gravel having a resistivity of 70 Ώ-m, having a thickness of 8.0m up to a depth of 17.0m. Weathered basement having a resistivity of 48 Ώ-m and thickness of only 3.4m interpreted upto a depth of 20.4m, followed by hard and massive bed rock with very high resistivity of 1760 Ώ-m (Figure 30).

Interpretation of VES-180 at Velagapudi

VES-180 was carried out just near Velagapudi village, in the north-western part of Amaravati City. Interpreted field curve reveals essentially five geo-electrical layer setup, consists of top black silty clay having a resistivity of 19 Ώ-m, upto a depth of 1.2m. Followed by clayey silt layer having a resistivity of 1.0 Ώ-m, having a thickness of 0.8m upto a depth of 2.0m.

Followed by clayey sand having a resistivity of 1.5 Ώ-m, having a thickness of 6.5m upto a depth of 8.5m. Silty sand layer was interpreted having a resistivity of 13.5 Ώ-m, having a thickness of 7.0m upto a depth of 15.5m. Followed by weathered bed rock with a resistivity of 70.5 Ώ-m (Figure 31).

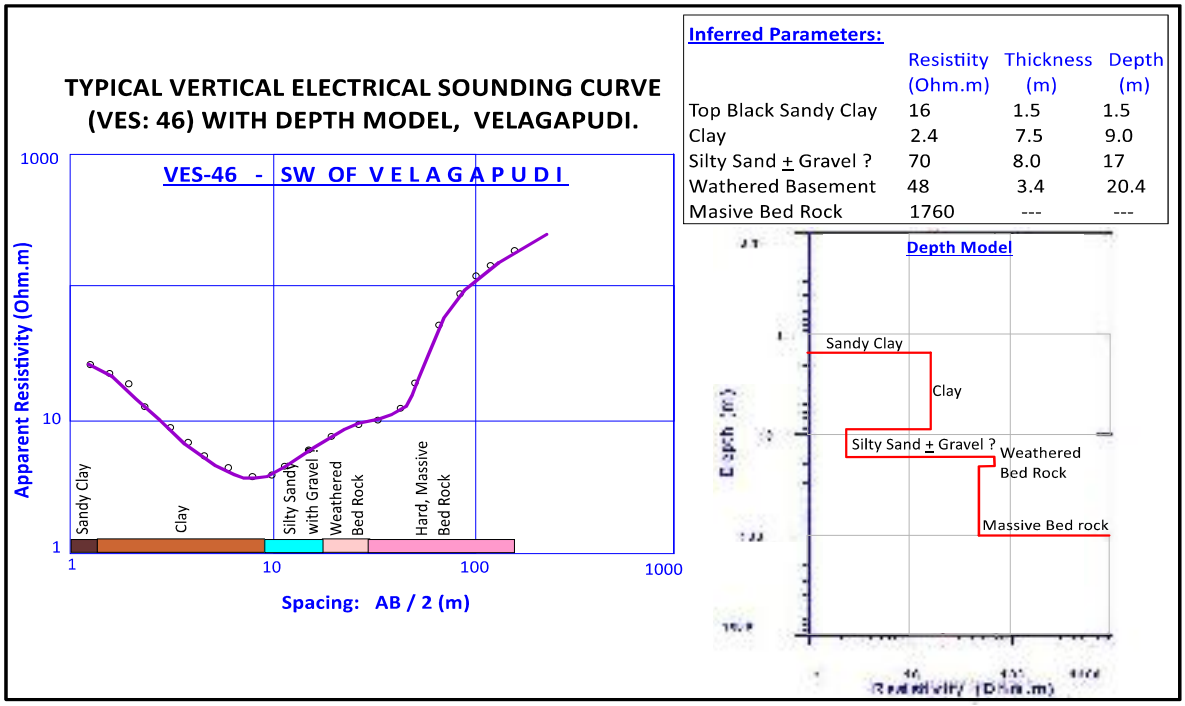


Figure 30: Typical Resistivity curve of SW of Velagapudi

Interpretation of VES-204 at Thullur

VES-204 was carried out just near Thullur village, in the north-western part of Amaravati City. Interpreted field curve reveals essentially five geo-electrical layer setup, consists of top black silty clay having a resistivity of 56 Ώ-m, upto a depth of 2.0m. Followed by sandy clay layer having a resistivity of 1.4 Ώ-m, having a thickness of 10.0m upto a depth of 12m. Followed by silty sand having a resistivity of 96 Ώ-m, having a thickness of 1.5m upto a depth of 13.5m. Followed by hard and massive bed rock with very high resistivity (Figure 32).

Interpretation of VES-562 south-east of Neerukonda

VES-562 was carried out just south-east of Neerukonda village, in the southern part of Amaravati City. Interpreted field curve reveals essentially five geo-electrical layer setup, consists of top black silty clay with gravel having a resistivity of 76 Ώ-m, upto a depth of 1.5m. Followed by silty sand layer having a resistivity of 49.4 Ώ-m, having a thickness of 0.8m up to a depth of 2.3m. Followed by sandy silt having a resistivity of 4.2 Ώ-m, having a thickness of 12m upto a depth of 14.3m. Sand layer was interpreted having a resistivity of 8.1 Ώ-m,

having a thickness of 14m upto a depth of 28.3m. Followed by fractured basement with very low resistivity of 2.2 Ώ-m having a thickness of 90 m upto a depth of 118m. Then continued with massive basement with very high resistivity (Figure 33).

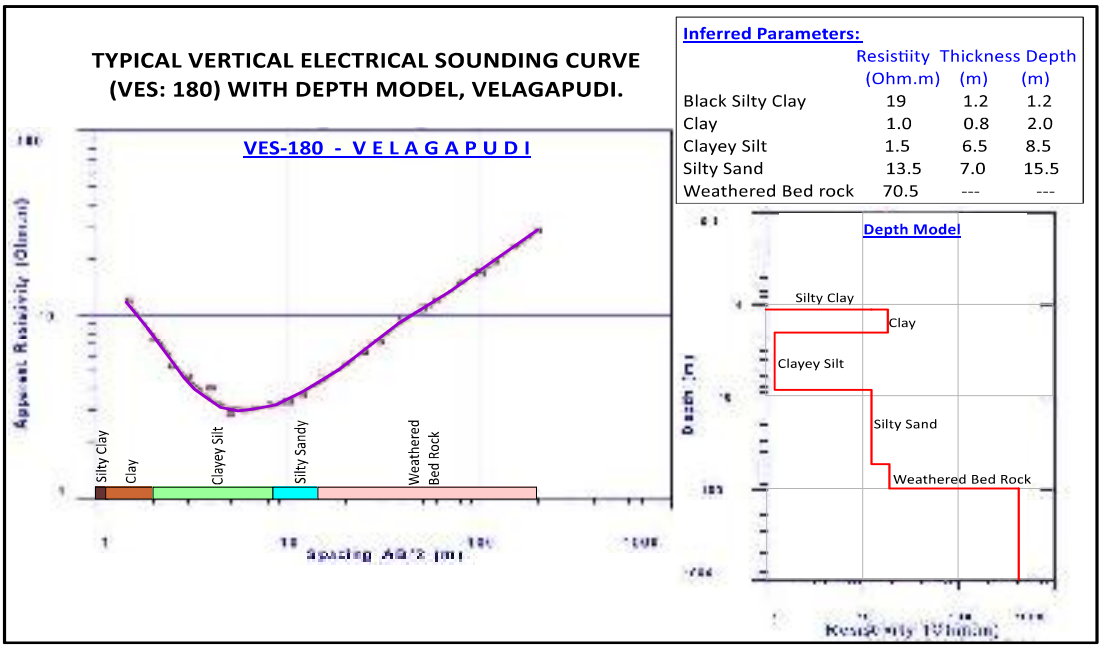


Figure 31: Typical Resistivity curve of a Velagapudi

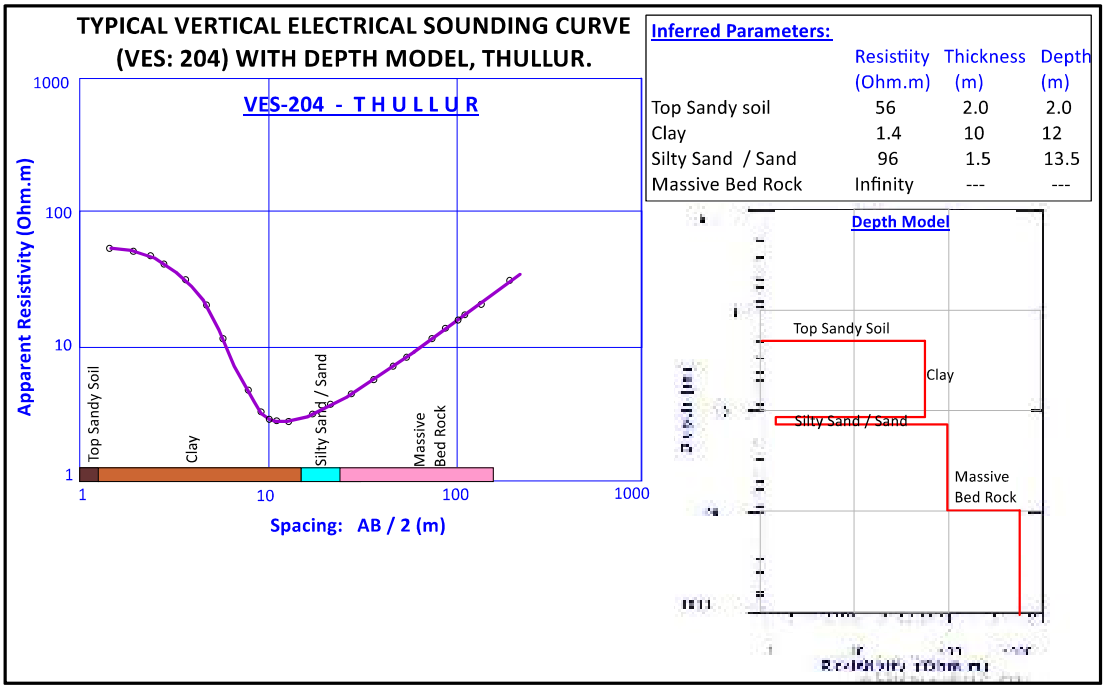


Figure 32: Typical Resistivity curve of a Thullur

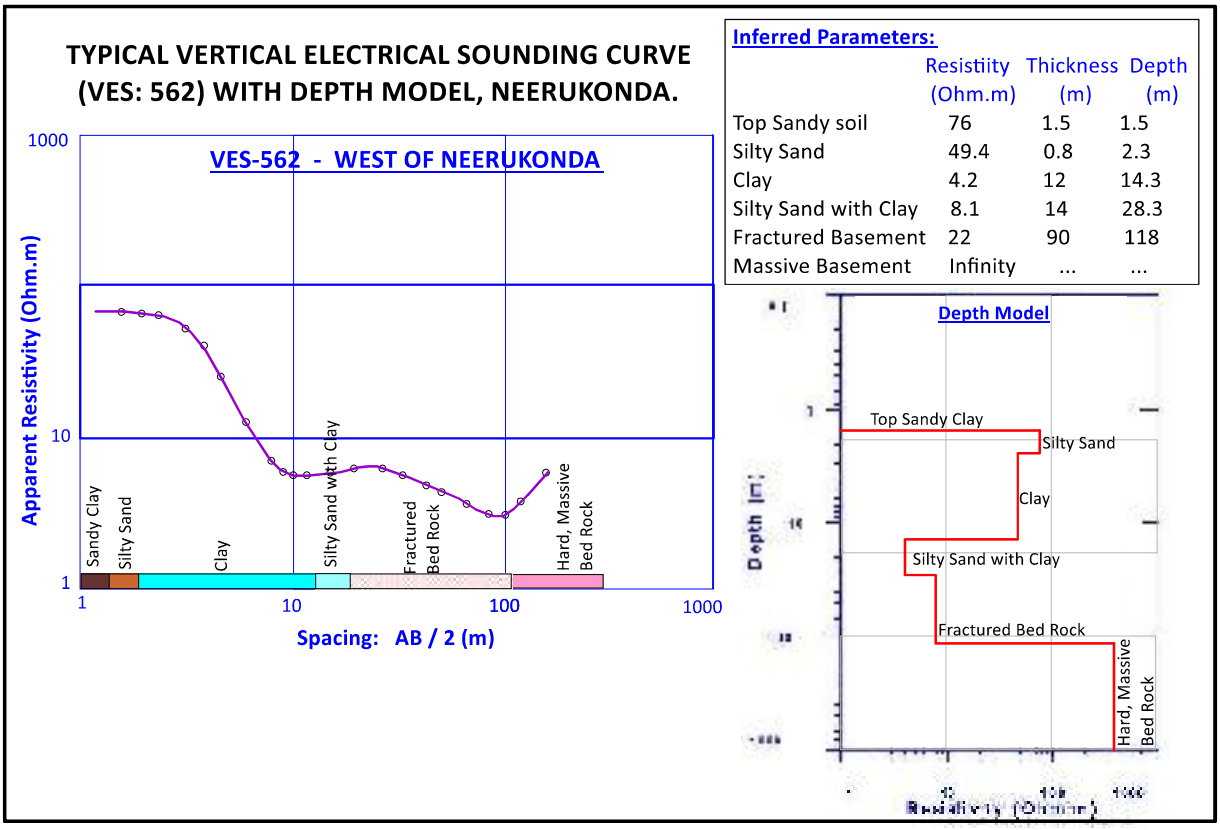


Figure 33: Typical Resistivity Curve of a Neerukonda

In general, the overburden thickness indicates overall variation in thickness from 2 to more than 30m in Amaravati City. In the eastern part of the study area from Nowluru to Mandadam (Velagapudi) the thickness varies from 10 to 30m. In south-eastern part of the area between Yerrabalam to Krishnayapalam, the overburden is thick when compared to other areas. For the resistivity soundings distributed on southern bank of Krishna River, indicating the thickness of alluvium / sand layer varies from 10 – 48m. A general observation based on the available data revealed that the bedrock is exposed as residual hills at Tadepalli and Anantavaram areas.

4.11. INFERRED GEO-ELECTRIC SECTIONS

Based on the hydro-geological conditions, low order of resistivities are attributed to the presence of clay and salinity content in the formations. A total of six geo-electric sections have been identified shown in Figure 34, to study the variations in hydro-geological and aquifer parameters, both in N-S and E-W directions. 1st to 5th geo-electric sections were chosen nearly in N-S direction to study the variations within the sediments and basement from south of Krishna River to southern part of the study area. Whereas 6th geo-electric

section was chosen in WNW-ESE direction from Khondalite basement in the east at Penumaka or Tadepalli, to pyroxene / calc granulite granulite basement in the west at Anantavaram, via charnockite basement in centre.

Geo-electrical section is a perspective view or more geological cross sections in a particular direction, showing their relationship to one another. Sections-I to V were chosen in N-S direction to study the nature, resistivity, thickness and depth of sediments and underlying bed rock configuration. Whereas, section-VI was chosen in WNW-ESE direction, to study the nature of Khondalite basement in the east and to study the nature of pyroxene / calc granulite basement in the west (Figure 35 to Figure *40*). Charnockite basement occupied in the central part of the Amaravati City. The relationship in variation of resistivities, thickness with depth can be best seen in geo-electric sections, a useful way to see the multiple overlapping surfaces, such as hydro-stratigraphic data, aquifer surfaces and fracture proximities of aquifer zones.

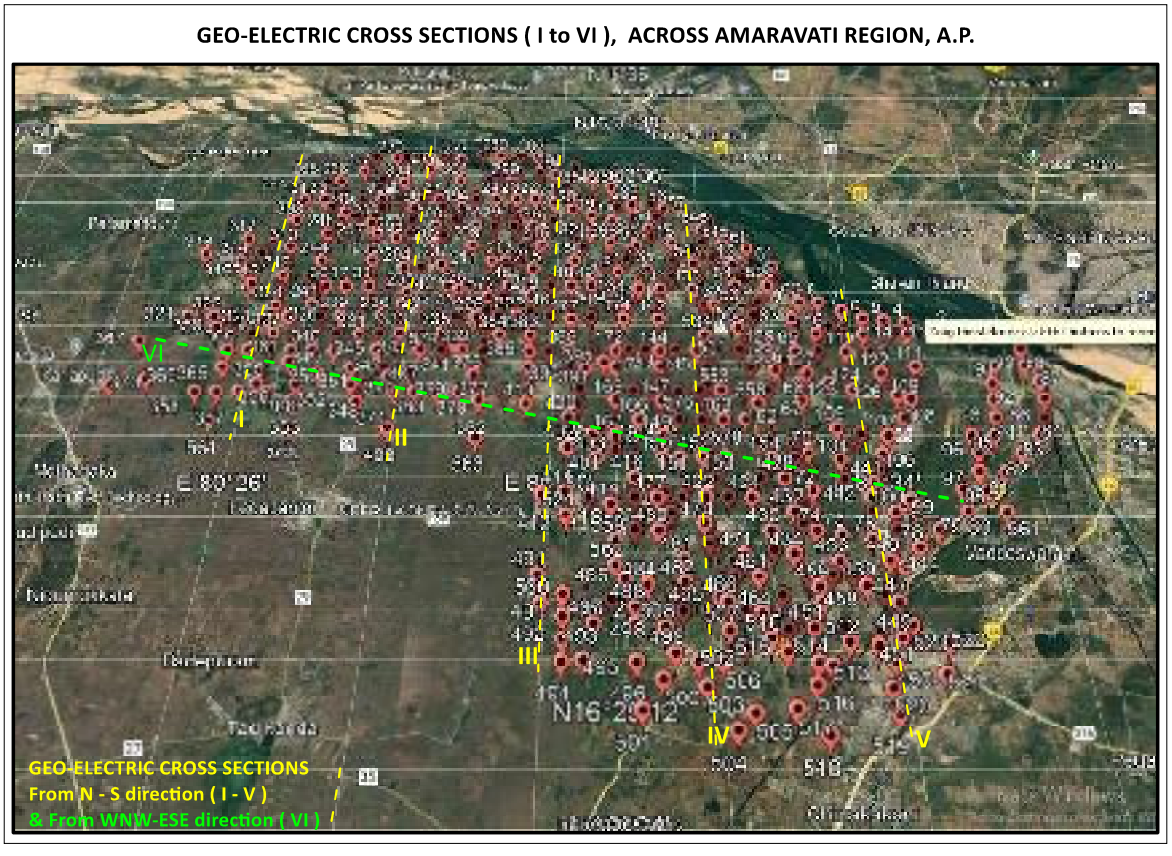


Figure 34: Google Image showing the Geo-Electric Sections from I to VI.

The layer parameters and their corresponding lithology mentioned in the geo-electric sections and typical sounding curves, led to the understanding of the sub-surface nature

(Table 4). Based on geo-electric sections, two types of aquifers are inferred in the study area, (1). Top shallow aquifer (silty sand / sand layer) within the sediments (unconfined), extends to the average depth of 30m and form the shallow or unconfined aquifer, and (2). Highly weathered basement associated with sheared / faulted / fractured elements lies at moderate depths in the form of confined aquifer within the basement, inferred at shallow levels in the eastern part and slightly deeper depths between 30 - 100m in the western part, which are favorable loci for possible occurrence of groundwater. From the analysis, few basement highs are inferred at a shallow depth which correlate well with magnetic and gravity data of Amaravati City. Details of the geo-electric sections are given below in Table 5.

Table 5: Details of Geoelectric Section

Section No.	Geo-electric section from - to	Direction	Length
I	Borupalem – Anantavaram - Nekkallu	N - S	9.30 km
II	Rayapudi – Thullur - Sakhamuru	N - S	10.4 km
III	Lingayapalem – Velagapudi - Inavolu	N - S	14.8 km
IV	Udandrayunipalem–Mandadam-Nidamarru	N - S	14.0 km
V	Undavalli – Penumaka - Mangalagiri	N - S	10.0 km
VI	S of Anantavaram - Ainvolu – Penumaka	WNW- ESE	14 km

Borupalem-Anantavaram-Nekkallu Geo-electric Section (I)

Ten resistivity soundings were chosen along this N-S section (VES-266, 34, 308, 310, 312, 327, 324, 361, 353 and VES-368) from Borupalem in the NW to Nekkallu in the SW. The length of the traverse is about 9.30km and soundings were selected between 500 - 1000m distance approximately (Figure 35). The resistivity sounding curves are multi-layered and can be categorised under QKA, HQA, KQA and QKA types. In all the soundings a conductive layer (clay) with resistivity of 0.2 – 9.8 Ώ-m is traced. The estimated depth to the bed rock varies from 6.9 m to 45 m. The order of resisivities vary from 0.2 Ώ-m to 80 Ώ-m over the sediments clay, silt, sand with gravel. A thick layer of sand with gravel having a thickness of 37.5 m having a resistivity range of 63 Ώ-m just above the bed rock is traced from VES-308, 310, 312 and 327, which may be a good aquifer favourable for groundwater, yield of groundwater in this section is likely to be good. But the quality of water may not be good, because of high salinity and TDS content in the north-western part of Amaravati City.

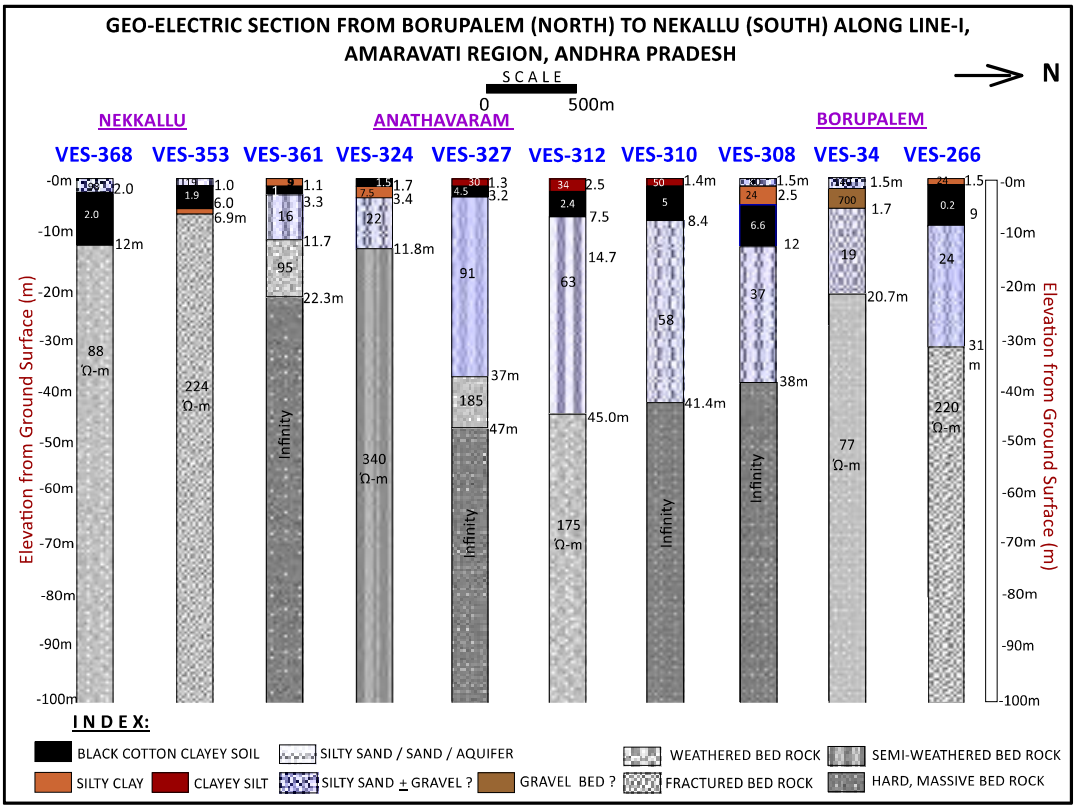


Figure 35: Geoelectric Section from Borupalem to Nekkallu

Rayapudi-Thullur-Sakhamuru Geo-electric Section (II)

Nine resistivity soundings were chosen on this N-S section (VES-374, 341, 334, 194, 205, 204, 28, 303 and VES-275) from Rayapudi in the north to Sakhamuru in the south, via Thullur. The length of the traverse is about 10.4km and soundings are selected between 500 - 1000m length approximately (Figure 36). The resistivity sounding curves are multi-layered and can be categorised under QKA, QAA and HKA types. In all the soundings a conductive layer of clay with resistivity of 0.1 – 5.7 Ώ-m is traced. The estimated depth to the bed rock varies from 13.5 m to 60 m in this section. The order of resisivities vary from 0.1 Ώ-m to 100 Ώ-m over the sediments viz., clay, silt, sand with gravel. A thick layer of sand with gravel having a thickness varies from 11.5m – 39m, with a resistivity range of 24 - 100 Ώ-m is traced from VES-374, 204, 28 and 275, which may be a good aquifer, favorable for groundwater and yield of groundwater in this section is likely to be good. But quality of water may not be good, because of high salinity with high TDS content, in the NW part of Amaravati City.

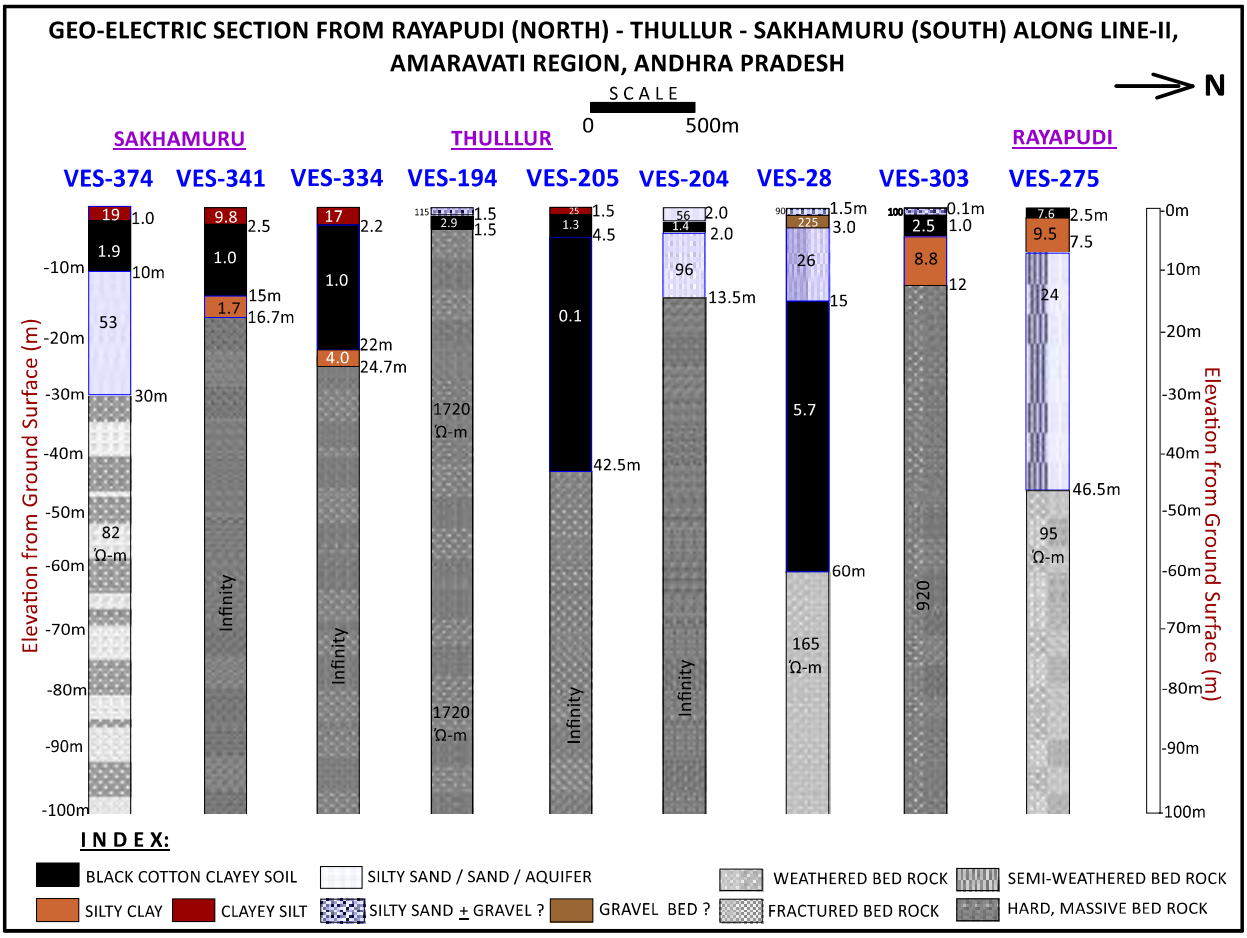


Figure 36: Geo-electric section (N-S) of Rayapudi to Sakhamuru

Lingyapalem-Velagapudi-Ainavolu-Neerukonda Geo-electric Section (III)

Ten resistivity soundings were chosen on this N-S section (VES-501, 497, 403, 411, 221, 49, 181, 183, 19 and 293) from Lingayapalem in the northern part to Ainavolu in the southern part, via Velagapudi and Neerukonda (Figure 37). The length of the traverse was 14.8km and soundings selected between 500 - 1000m. The resistivity sounding curves are multi-layered and can be categorised under QKA, QAA and HKA types. In all the soundings a conductive layer with resistivity of 0.5 – 10.4 Ω-m (clay) is traced. The estimated depth to the bed rock varies from 2.5m to 56.4m. The order of resisivities vary from 0.5 to 56 Ω-m over the sediments.

A thick layer of sand with gravel with a thickness of 6m to 48m having a resistivity range of 6.8 - 98 Ω-m just above the bed rock is traced from VES-501 to VES-411, VES-49 to VES-293, which may be good aquifer, favourable for groundwater. The quality and yield of

groundwater in this section is likely to be good, as the section falls close to the NNE-SSW trending shear zone from Uddandarayunipalem to Ainavolu.

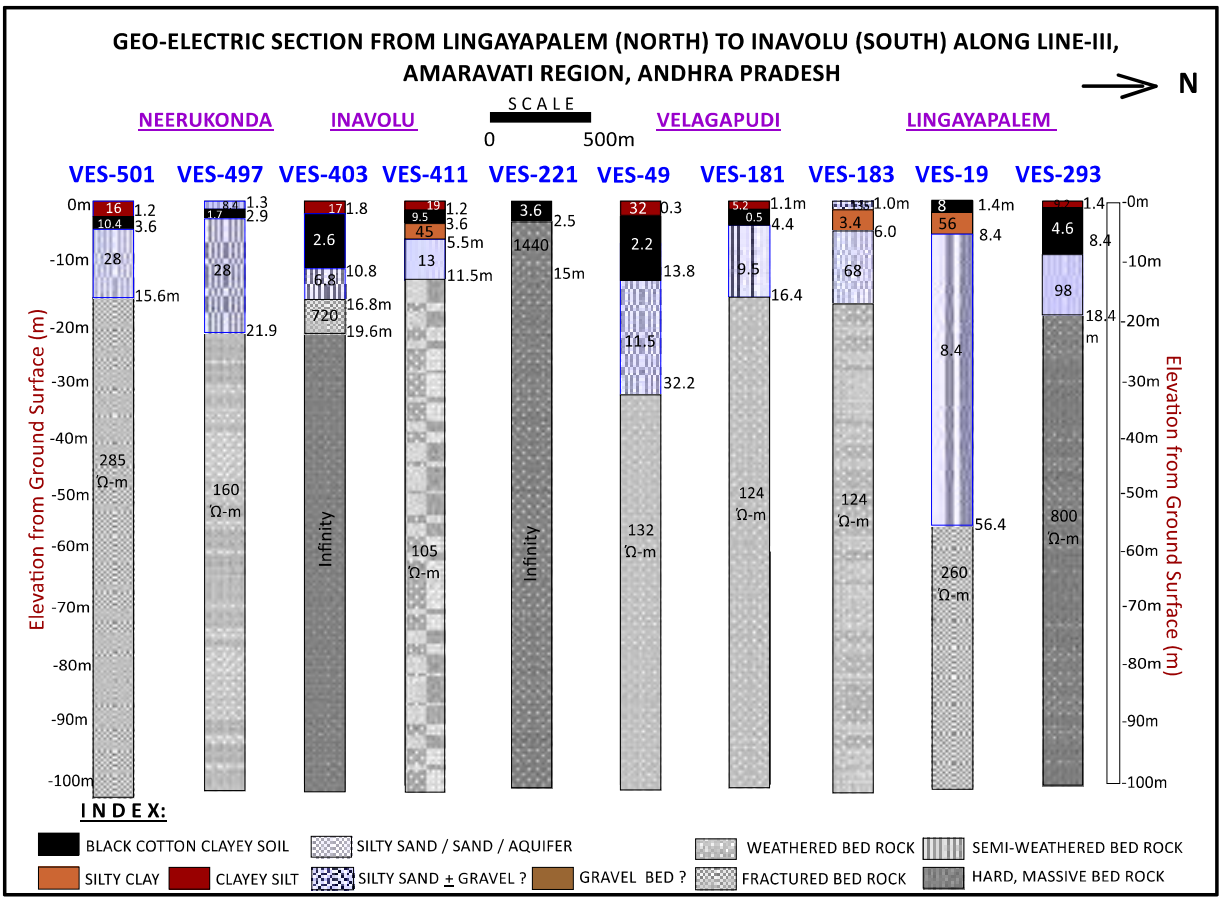


Figure 37: Geoelectric Section from Lingayapalem to Neerukonda

Uddandarayunipalem – Mandadam – Karugallu - Nidamarru Geo-electric Section (IV)

Ten resistivity soundings were chosen on this N-S section (VES-499, 483, 476, 419, 150, 146, 144, 140, 15, and 288) from Uddandarayunipalem in the north-east to Nidamarru in the south-east. The length of the traverse was 14 km and soundings were selected approximately at 500 - 1000m distance apart (Figure 38).

The resistivity sounding curves are multi-layered and can be categorized under QAA and QHA type. In all the soundings a conductive layer with resistivity of 1.2 to 8.4 Ώ-m (black clay) is traced. The estimated depth to the bed rock varies from 10m to 56m. The order of resistivities vary from 1.2 to 180 Ώ-m over the sediments viz., black cotton soil / clay, silty, silty sand, sandy silt with gravel etc. A thick layer of sand with gravel with a thickness of 25m

having a resistivity range of 9.5 Ώ-m to 66 Ώ-m just above the bed rock is traced over VES-150, 144 and VES-15, which may be good aquifer, favourable for groundwater. The quality and yield of groundwater in this section is likely to be good, correlating well with the TDS data.

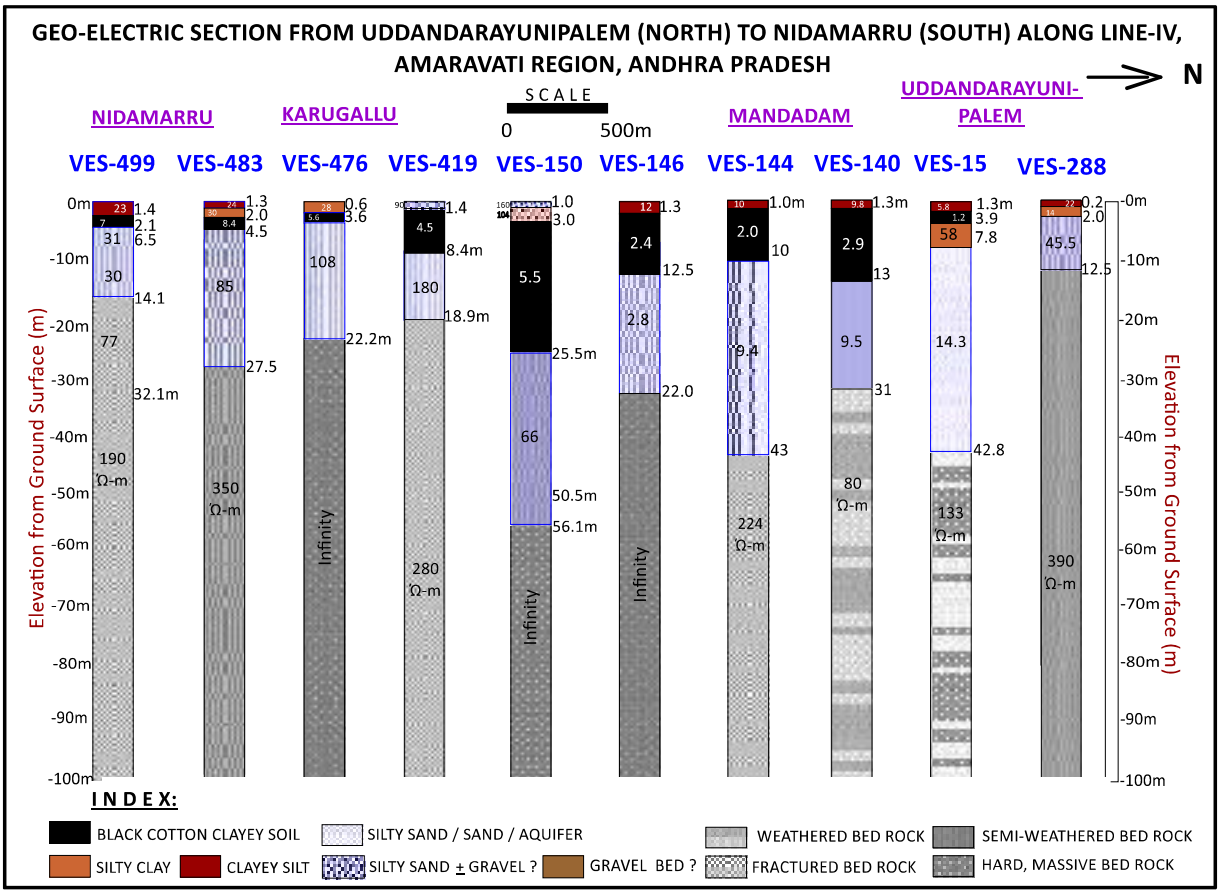


Figure 38: Geo-electric section (N-S) of Uddandarayunipalem to Nidamarru

Undavalli-Penumaka-Mangalagiri Geo-electric Section (V)

Nine resistivity soundings were chosen on this N-S section (VES-452, 76, 442, 106, 107, 125, 122, 120 and 8) from Undavalli in the northeast to Mangalagiri in the south-east (Figure 39). The length of the traverse was 10 km and soundings are selected approximately 500 - 1000m distance apart. The resistivity sounding curves are multi-layered and can be categorized under QKA and HKA type. In all the soundings a conductive layer with resistivity of 1.5 to 9 Ώ-m (black clay) is traced. The estimated depth to the bed rock varies from 24m to 54m. The order of resisivities vary from 1.5 to 120 Ώ-m over the sediments viz., black cotton soil / clay / silt / clayey silt / silt sand with gravel. A thick layer of sand with gravel with a thickness of 20 – 45m having a resistivity range of 3.5 to 38.5 Ώ-m just above the bed rock is traced in

VES-8, 120, 122, 106, 76 and 452, which may be good aquifer, favorable for groundwater. The quality and yield of groundwater in this section is likely to be good, based on less TDS content.

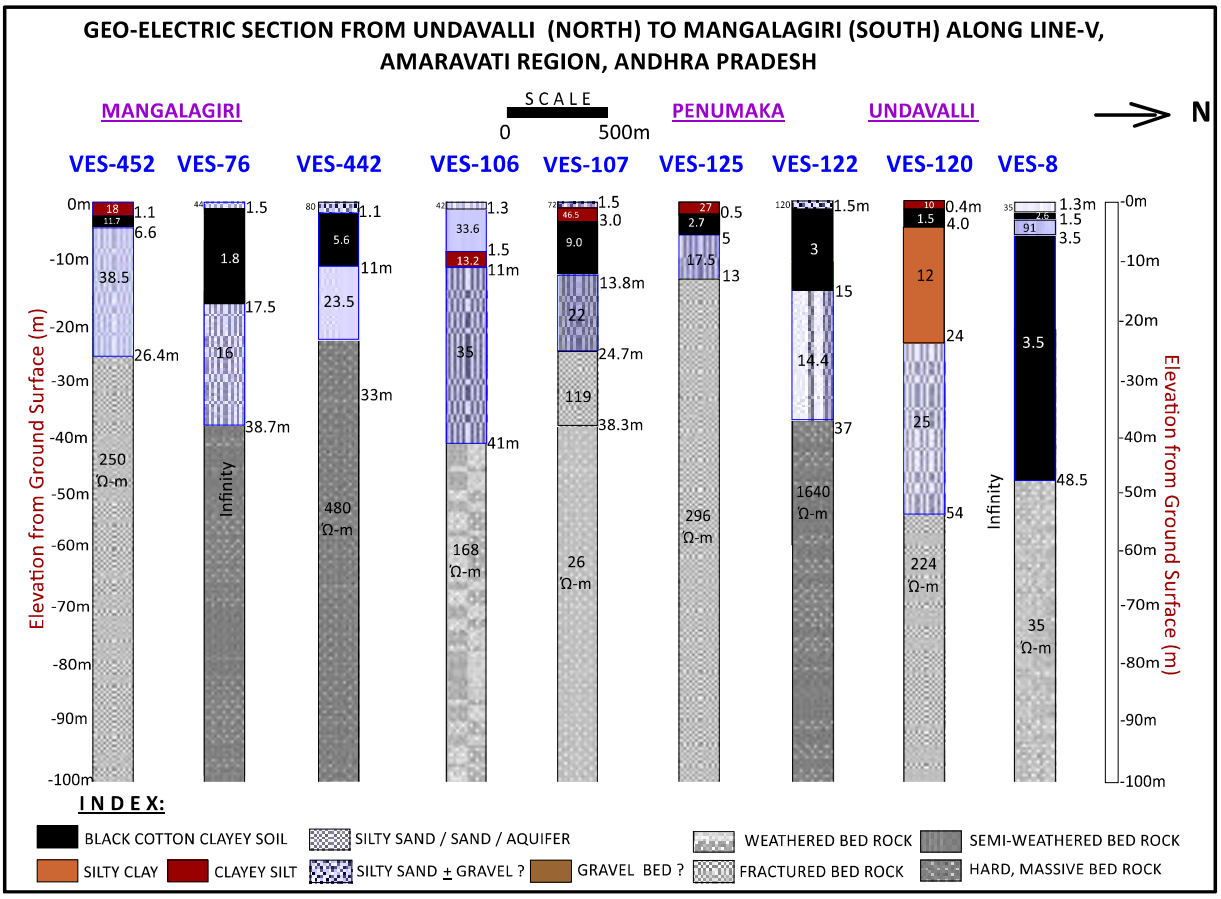


Figure 39: Geo-electric section (N-S) of Undavalli to Mangalagiri

South of Anantavaram to Southeast of Penumaka Geo-electric Section (VI)

Twelve resistivity soundings were chosen on this WNW-SES section (VES-122, 106, 146, 146, 395, 409, 221, 341, 237, 240, 204, 361 and 359) from SE of Penumaka to South of Anantavaram, via Inavolu (Figure 40). This section was chosen in WNW-ESE direction from Khondalite basement in the east at Tadepalli to pyroxene / calc granulite basement in the west at Anantavaram, via charnockite basement in the central part. The length of the traverse is about 14 km and soundings selected at every 500 - 1000m distance apart approximately.

The resistivity sounding curves are multi-layered and can be categorised under QKA, HQA, KQA and QKA types. In all the soundings a conductive layer with resistivity of 1.0 to 9.5 Ω-m

(black clay) is traced. The estimated depth to the bed rock varies from 6.9m to 45m indicating the presence of basement undulations. The order of resisivities vary from 1.0 to 120 Ω-m over the sediments viz, black cotton soil, clay, silt, sand, silty clay, clayey silt, silty sand with gravel etc,.

A thick layer of sand with gravel with a thickness of 22m to 30m having a resistivity range of 14.4 to 35 Ω-m just above the bed rock is traced from VES-240, 106 and 122, which may be good aquifer, may be favorable for groundwater. The quality and yield of groundwater in the eastern part is potable with less TDS, whereas, in the western part there having more TDS.

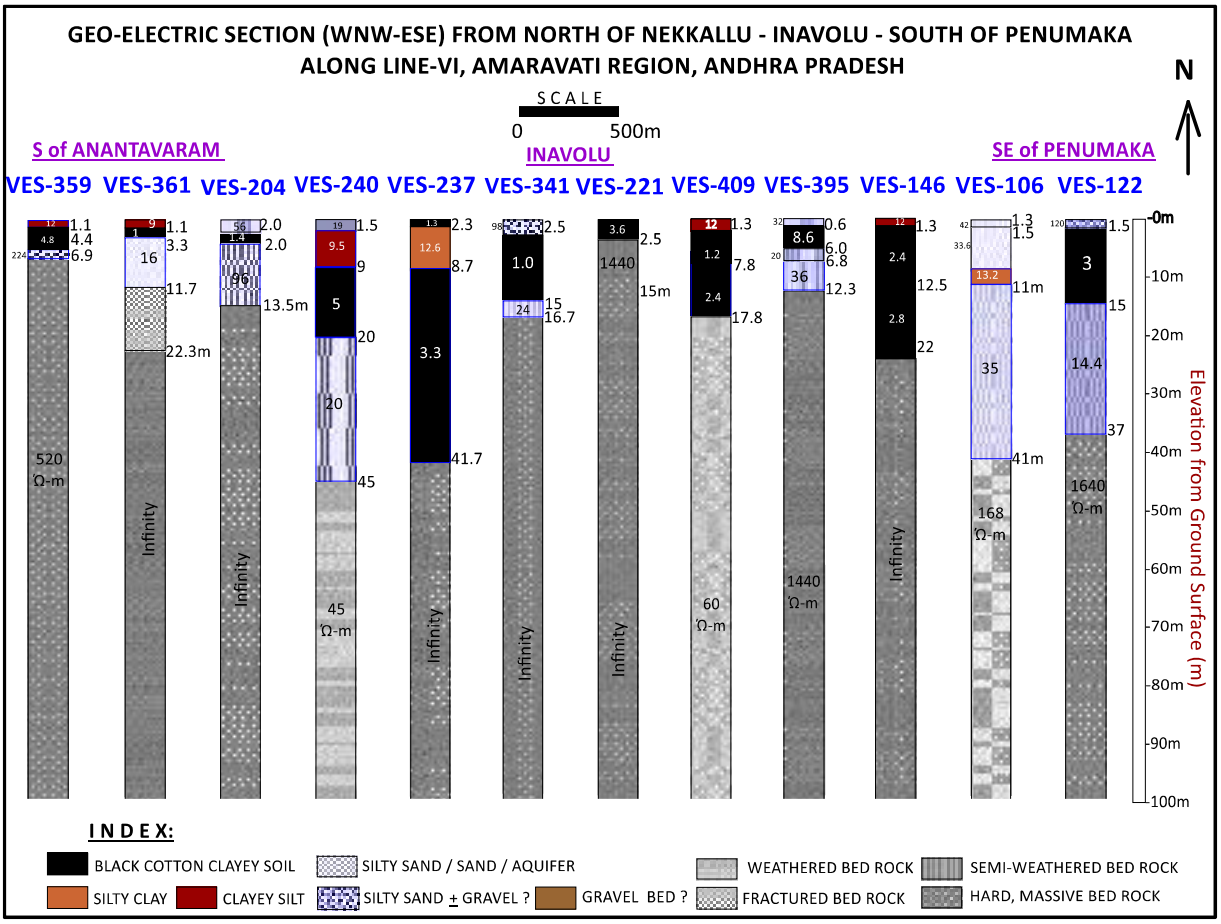


Figure 40: Geo-electric section of South of Anantavaram to South-east of Penumaka

4.12. INFERRED RESISTIVITY IMAGES AT VARIOUS DEPTHS FROM SOUNDINGS (VES)

Resistivity images delineated at different levels, derived from electrical resistivity soundings provide a valuable tool for visualizing subsurface resistivity variations with depth. These sections are created by analyzing data collected from resistivity surveys where electrode spacing is systematically increased to probe deeper levels.

Iso Resistivity depth images were delineated using IDW method in ArcGIS. Iso resistivity maps at various levels i.e., 1m, 2m, 5m, 8m, 10m, 17m, 20m, 53m, 80m and 100 m depths have been generated with increase of AB/2(m) vs apparent resistivity (Ohm.m) helps in nature and depth continuity of different lithological/structural units in Amaravati City.

At 1m depth, very low to low resistivities are recorded over black cotton soil (yellow) indicating its distribution as a background. Slightly moderate resistivities (brown) noticed between Krishnayapalem and Navuluru in the southeast and between Thullur and Dondapadu in the Northwest part (Figure 41).

At 2m depth, very low resistivities are recorded over clayey silt indicating its distribution (green) noticed between Nekkalu and Sakhamuru in the west, around Mandadam in the NE and Penumaka in the east (Figure 42).

At 5m and 8m depths, moderate resistivities recorded over silty clay indicating its distribution (yellow) between Krishnarayapalem and Navuluru in South East, Nidamarru - Kuragalu in south, between Anantavaram and Nekkalu in the west, and around Mandadam and North East of Thullur (Figure 43 & Figure 44).

At 10m depth, moderate and isolated resistivities are recorded over clayey silty indicating its distribution (yellow) noticed between Thullur-Nelapadu, Ainavolu, Mandadam, Navuluru, Kurugallu and Nidamarru (Figure 45).

At 17m depth, isolated moderate to high resistivities are recorded over sandy silt, indicating its distribution (brown) noticed at Nekkallu, east of Mandadam & Nidamarru. Whereas, moderate values over silty sand at Thullur, Ainavolu, Mandadam, Navuluru, Kurugallu area (Figure 46).

At 20m depth, high isolated resistivities are recorded over sand / silty sand indicating its distribution (brown) noticed at Navuluru, Kurugallu. Moderate values noticed at Nekkallu, Mandadam, Ainavolu & Anantavaram areas. Whereas low values observed over remaining part of area (Figure 47).

At 53m depth, isolated high resistivities are recorded over weathered bed rock indicating its distribution (brown) noticed at Navuluru, Kurugallu, Nidamarru, south of Krishnayapakem & Nekkallu. Moderate values noticed at Nelapadu, Ainavolu & Krishnayapalem. Low values are observed over remaining part of study area (Figure 48).

At 80m depth, isolated high resistivities are recorded over weathered to semi-weathered bed rock (brown) noticed at south of Anantavaram, and north of Navuluru, moderate values noticed at South of Vaddamanu, Nelapadu, North of Ainavolu and south-eastern parts (Figure 49).

At 100m depth, isolated high resistivities are recorded over semi-wathered to massive bed rock noticed around Anantavaram, North of Navaluru, Nidamarru and Undavalli areas (Figure 50).

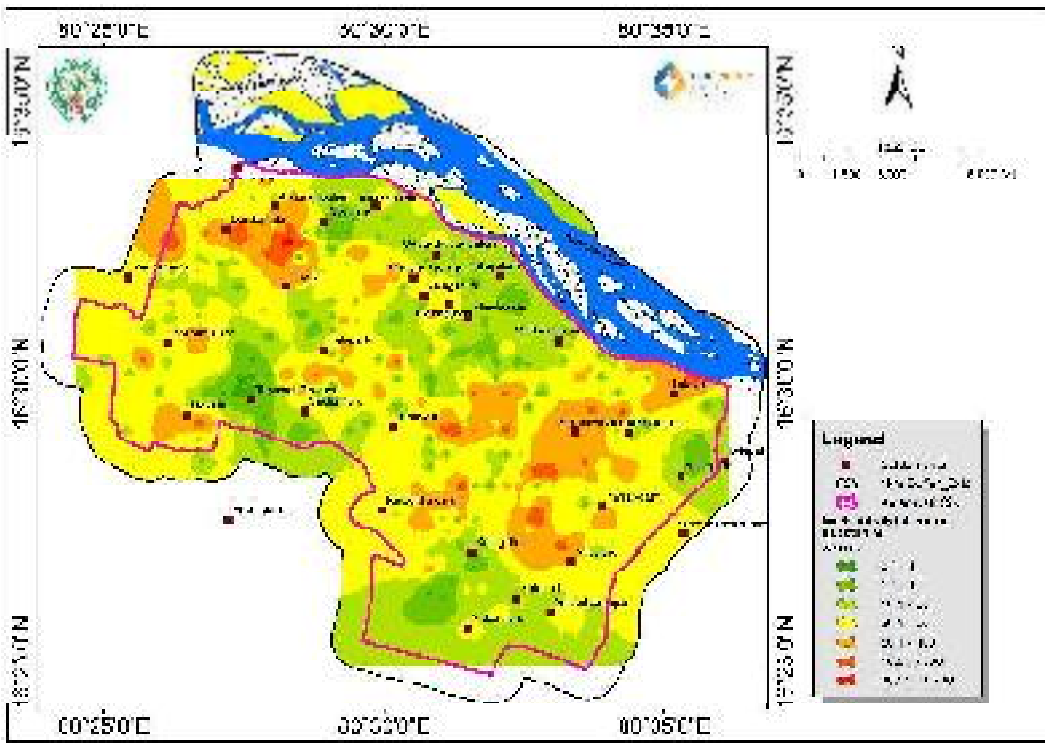


Figure 41: Iso Resistivity contour map at 1 m depth

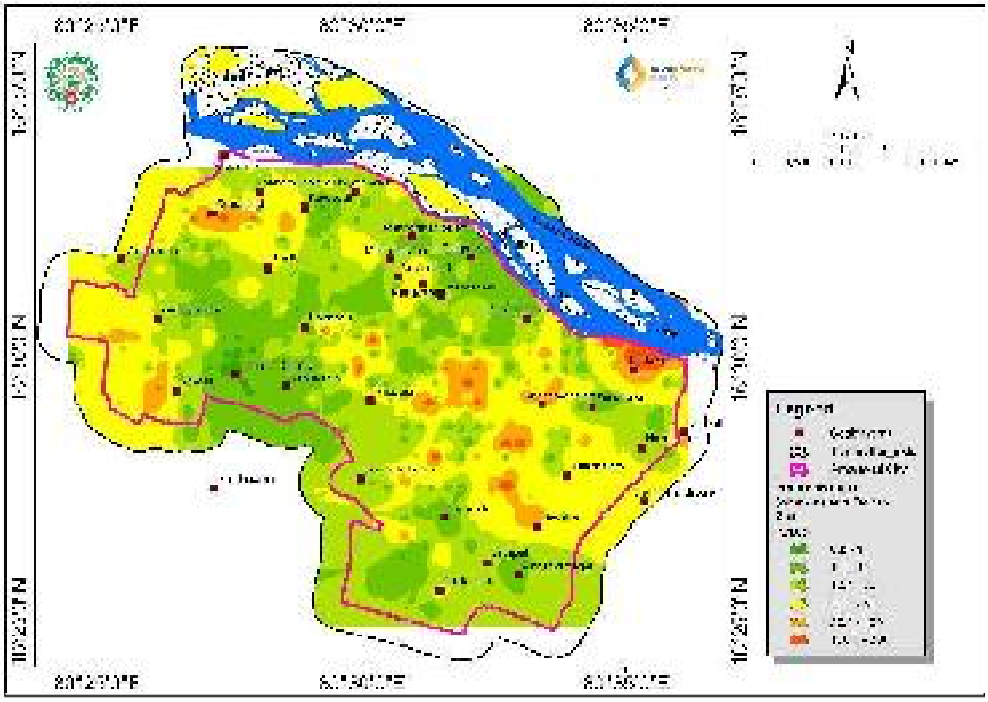


Figure 42: Iso Resistivity contour map at 2 m depth

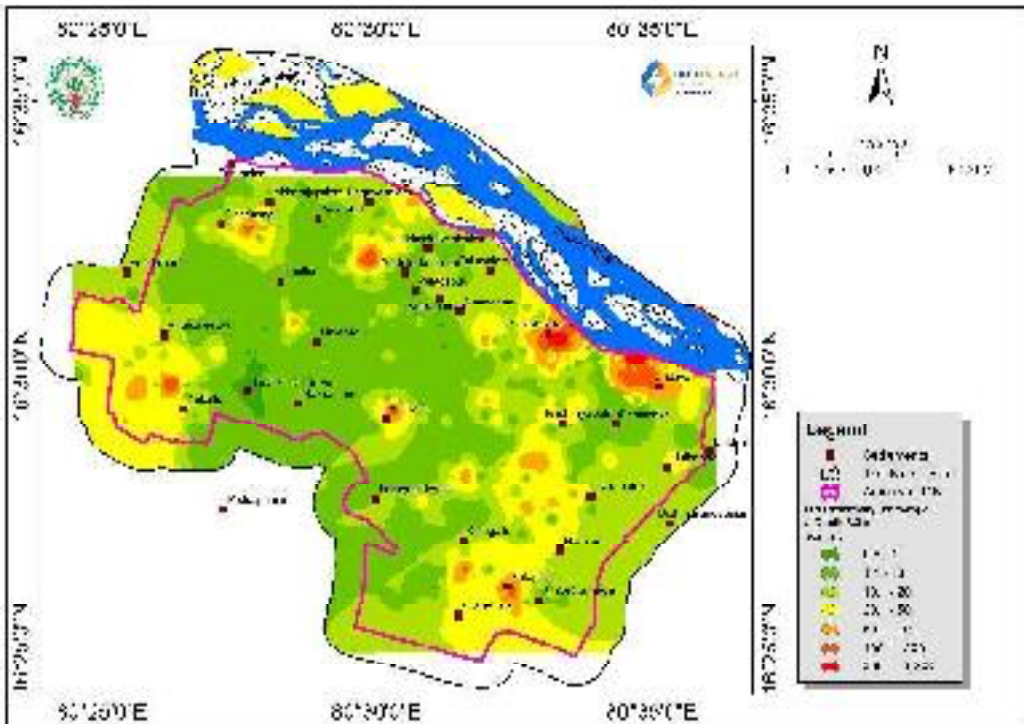


Figure 43: Iso Resistivity contour map at 5 m depth

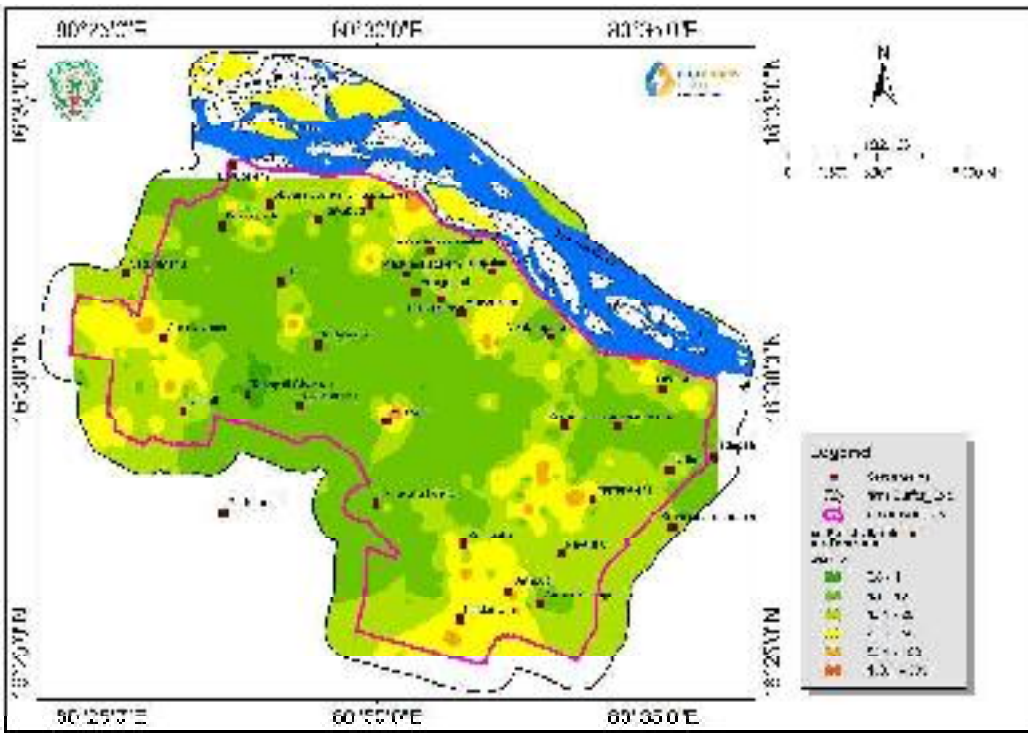


Figure 44: Iso Resistivity contour map at 8 m depth

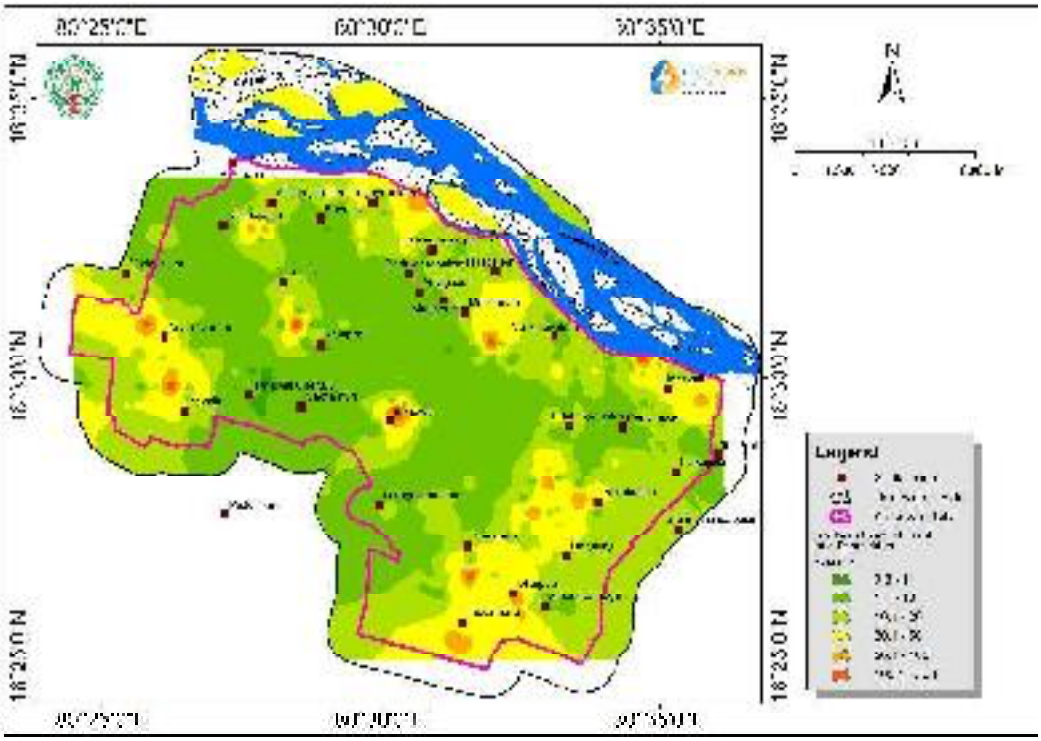


Figure 45: Iso Resistivity contour map at 10 m depth

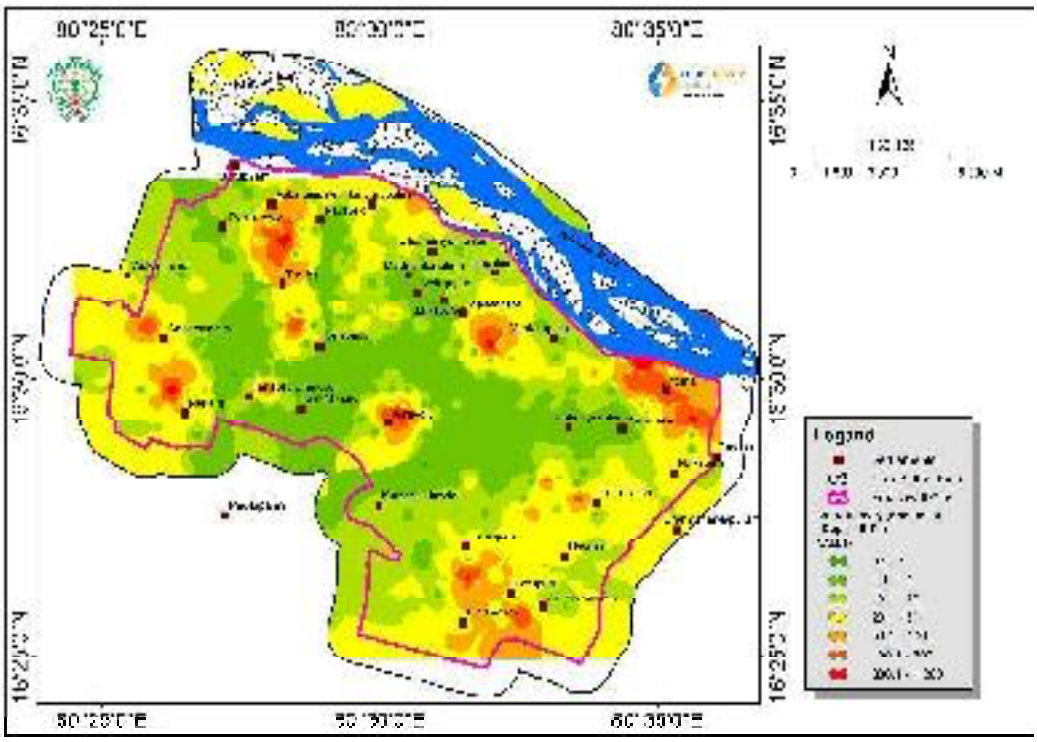


Figure 46: Iso Resistivity contour map at 17 m depth

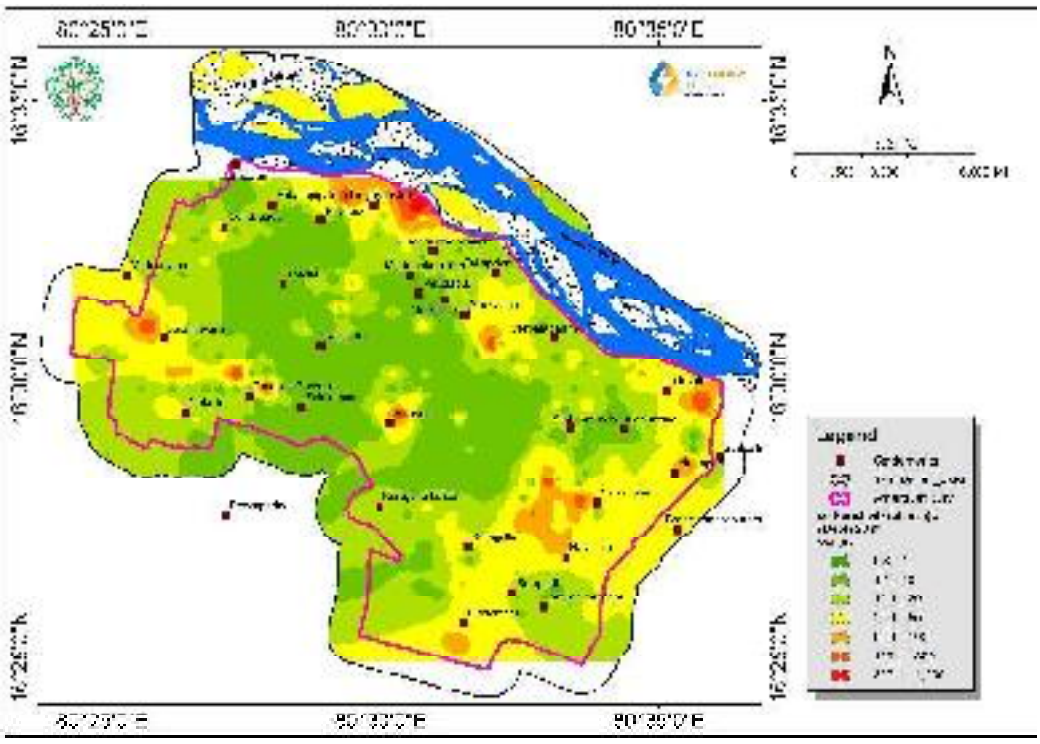


Figure 47: Iso Resistivity contour map at 20 m depth

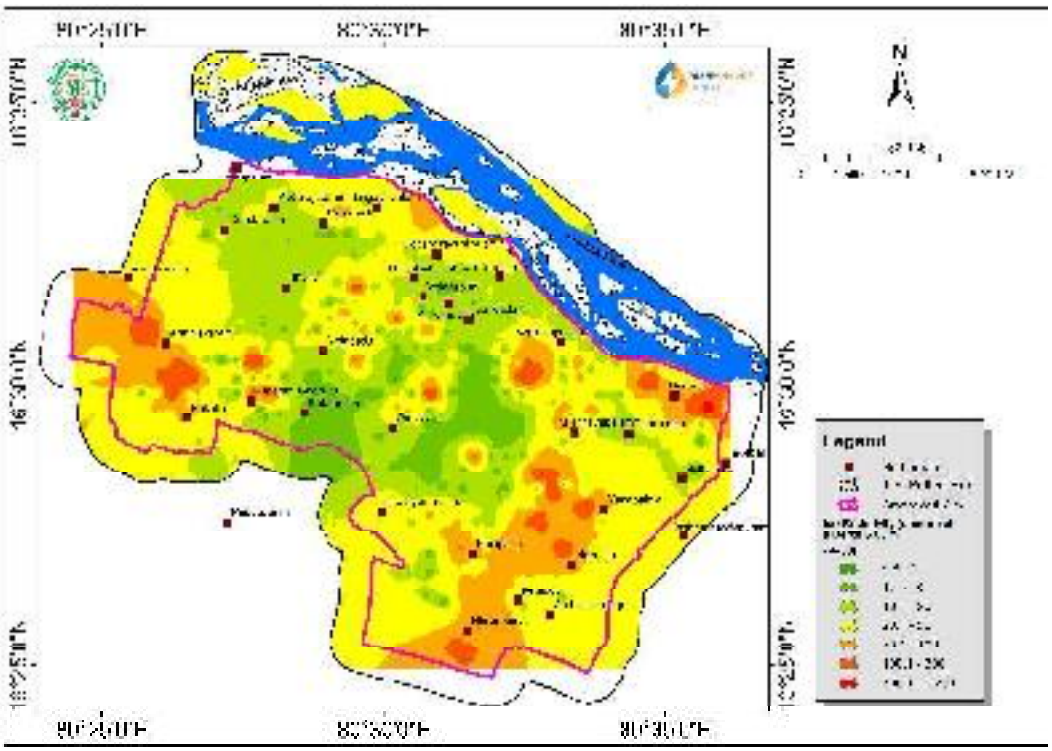


Figure 48: Iso Resistivity contour map at 53 m depth

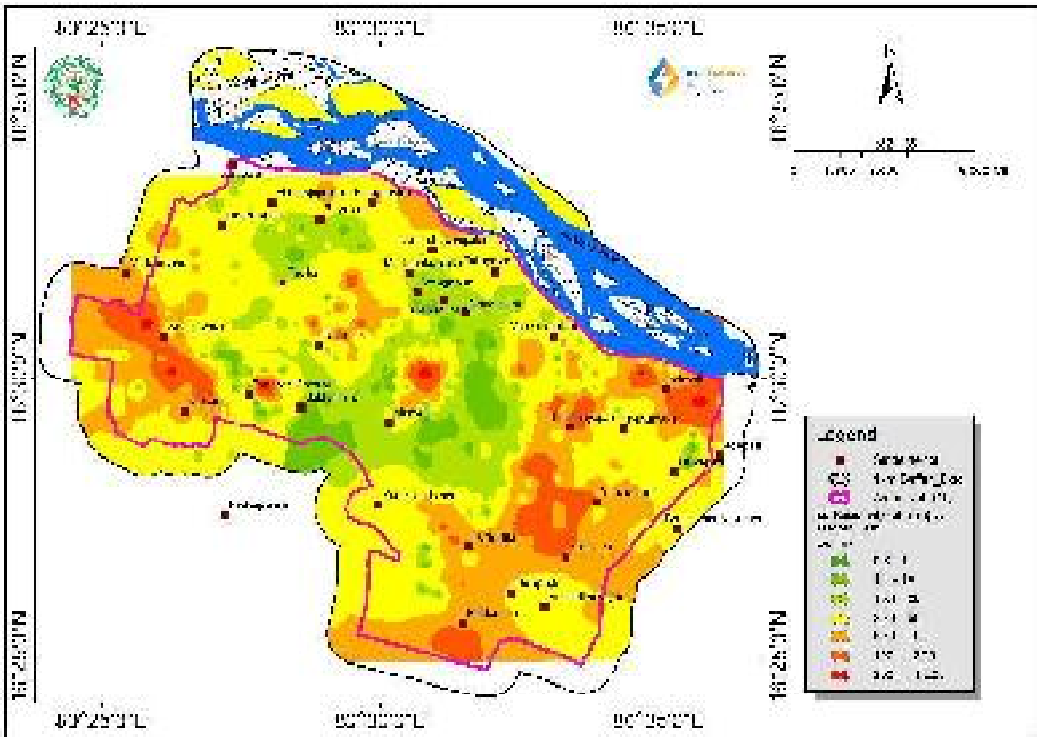


Figure 49: Iso Resistivity contour map at 80 m depth

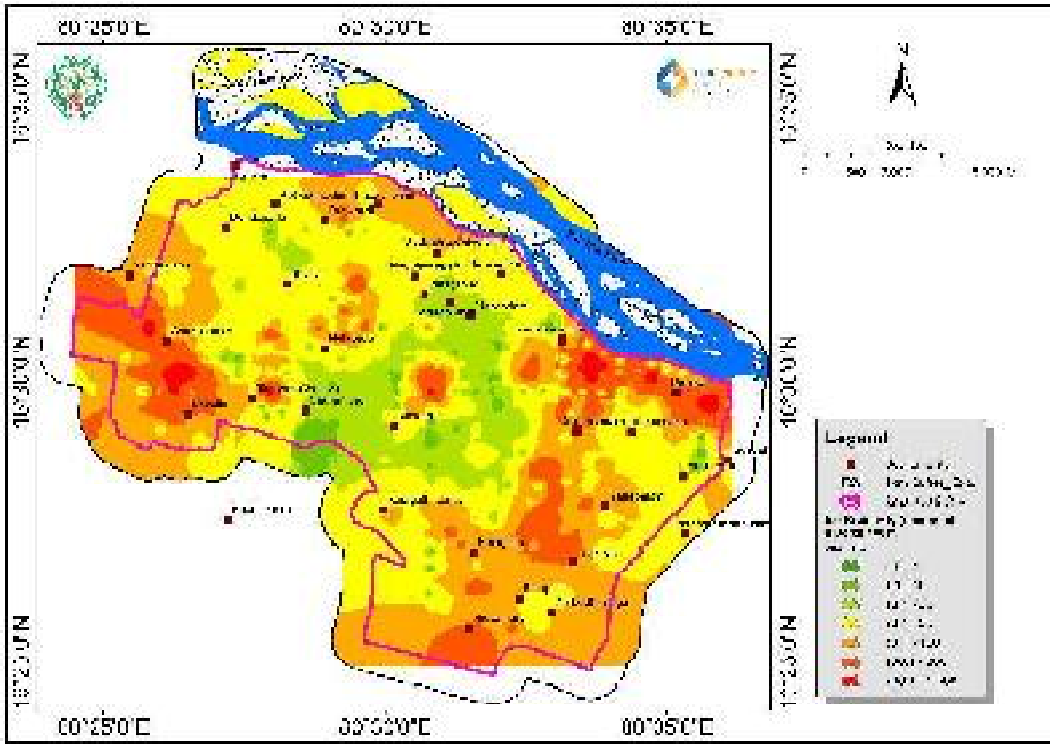


Figure 50: Iso Resistivity contour map at 100 m depth

4.13. MAGNETIC SIGNATURES OVER NNE-SSW SHEAR ZONE

Further, the NNE-SSW trending inferred and concealed shear zone from Uddandarayunipalem to Ainavolu, reflected well in the form of low dominant magnetic anomalies and moderate gravity gradients. From the magnetic anomalies, the width of the concealed shear zone may be around 400m approximately in the northern part. It seems the shear zone may be affected by strike-slip fault mechanism in the form of block movement along NNE-SSW direction, and western part may be down thrown block, as evidenced by presence of thick sediments in the western part, elevation and drainage density data.

Detailed magnetic measurements have been made across NNE-SSW trending concealed shear zone inferred from Seismic Zonation Map of India, IS: 1893 – Part-1, 2002, passing through the centre of the area between Uddandarayunipalem in the north to Ainavolu in the south and extending further in both the directions.

Nine traverses (Figure 51) were laid at 200 m interval across the shear zone, trending in WNW-ESE direction at a traverse length of 1 km each and station interval of 20m.

Figure 51: Geophysical Traverses across Concealed Shear Zone (Lines-1 to 9)

Magnetic Response along Line-2

Magnetic profile along Line-2 from west to east indicates an overall relief of 3957nT from +1293nT to -2664nT. In general, magnetic lows are noticed over western part, and highs are recorded in the eastern part. Whereas bipolar magnetic anomalies observed over concealed shear sone in central part, having a width of 400m (Figure 52).

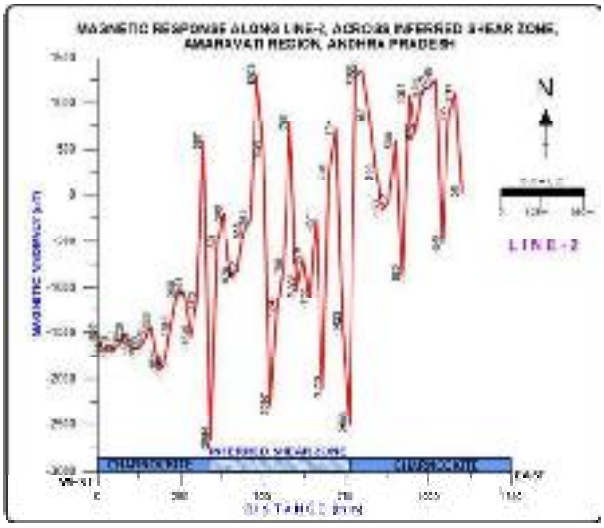


Figure 52: Magnetic Response along Line-2

Magnetic Response along Line-3

Magnetic profile along Line-3 from west to east indicates an overall relief of 5977nT from +2110nT to -3867nT. In general, magnetic lows are noticed over western part, and highs are recorded in the eastern part. Whereas bipolar magnetic anomalies observed over concealed shear sone in central part, having a width of 200m (Figure 53).

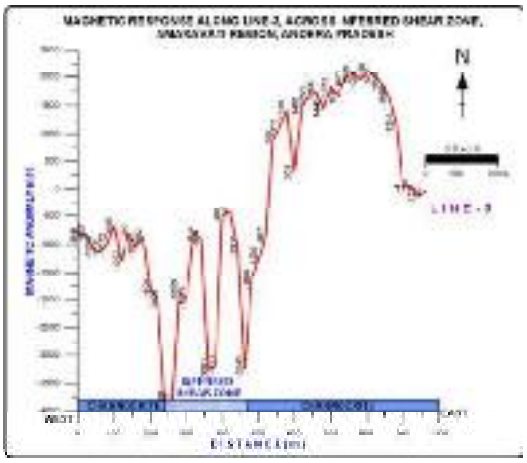


Figure 53: Magnetic Response along Line-3

Magnetic Response along Line-4

Magnetic profile along Line-4 from west to east indicates an overall relief of 2711nT from +1338nT to -1373nT. In general, magnetic lows are noticed over western part, and highs are recorded in the eastern part. Whereas bipolar magnetic anomalies observed over concealed shear sone in central part, having a width of 160m (Figure 54).

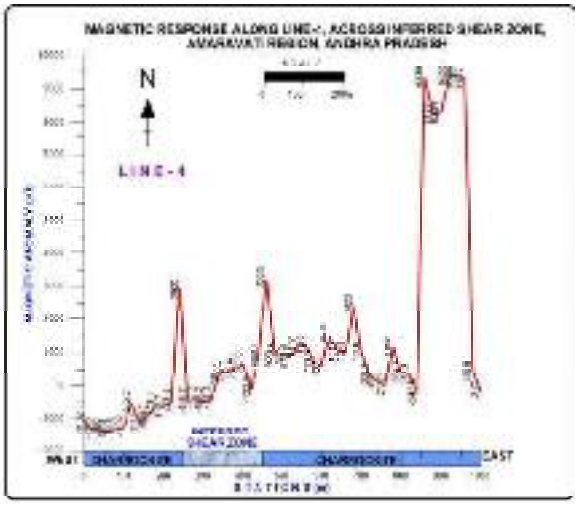


Figure 54: Magnetic Response along Line-4

Magnetic Response along Line-5

Magnetic profile along Line-5 from west to east indicates an overall relief of 3644nT from +3073nT to -571nT. In general, magnetic lows are noticed over western part, and highs are recorded in the eastern part. Whereas bipolar magnetic anomalies observed over concealed shear sone in central part, having a width of only 290 m (Figure 55).

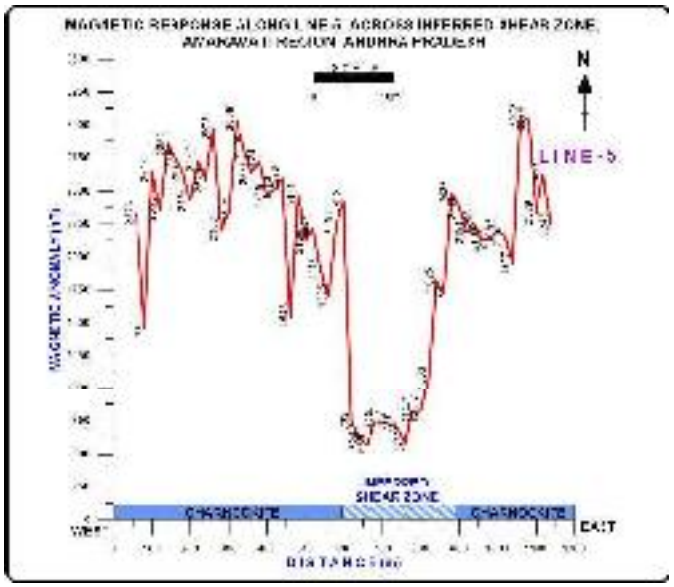


Figure 55: Magnetic Response along Line-5

Magnetic Response along Line-6

Magnetic profile along Line-6 from west to east indicates an overall relief of 3888nT from +1899nT to -1989nT. In general, magnetic lows are noticed over western part, and highs are recorded in the eastern part. Whereas bipolar magnetic anomalies observed over concealed shear sone in central part, having a width of only 200 m (Figure 56).

Magnetic Response along Line-7

Magnetic profile along Line-7 from west to east indicates an overall relief of 2470nT from +278nT to -2462nT. In general, magnetic lows are noticed over western part, and highs are recorded in the eastern part. Whereas bipolar magnetic anomalies observed over concealed shear sone in central part, having a width of only 350 m (Figure 57).

Magnetic Response along Line-9

Magnetic profile along Line-9 from west to east indicates an overall relief of 3753nT from +1204nT to -2549nT. In general, magnetic lows are noticed over western part, and highs are

recorded in the eastern part. Whereas bipolar magnetic anomalies observed over concealed shear sone in central part, having a width of only 600 m (Figure 58).

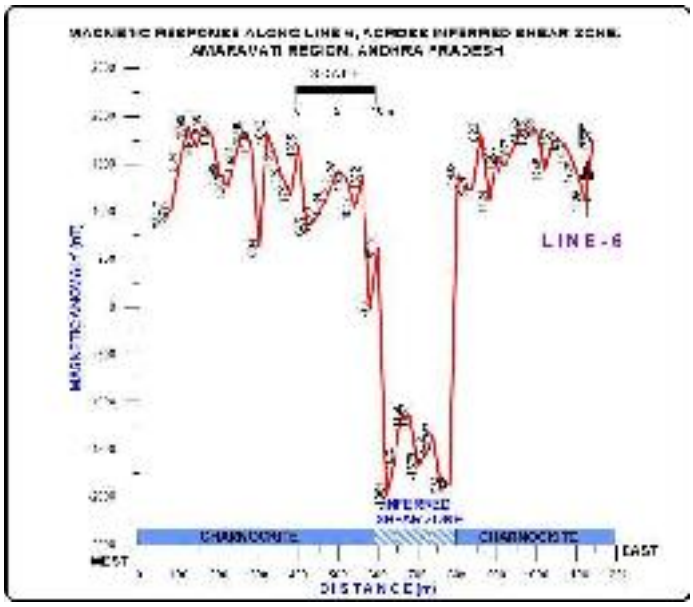


Figure 56: Magnetic Response along Line-6

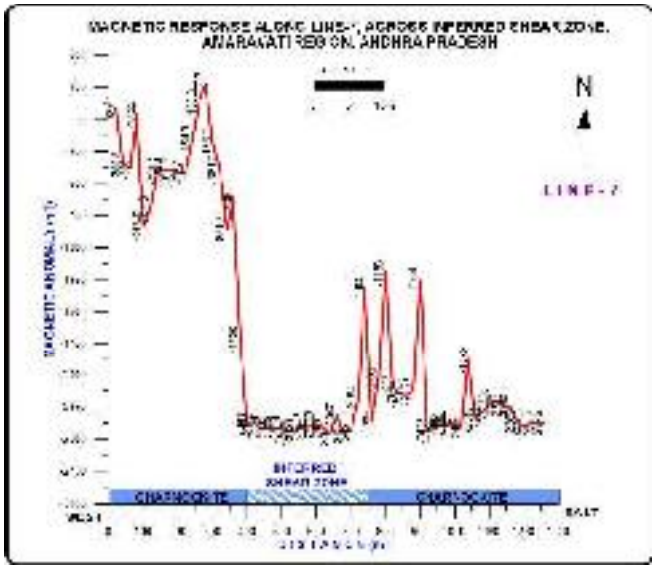


Figure 57: Magnetic Response along Line-7

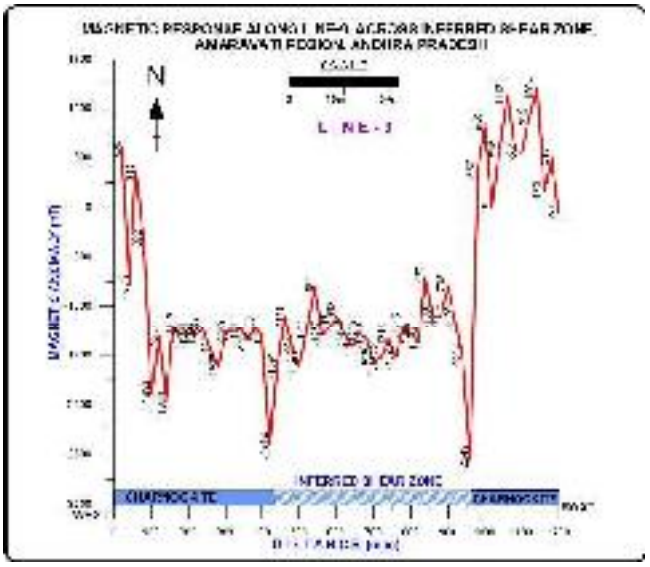


Figure 58: Magnetic Response along Line-9

Magnetic profiles from Line-1 to Line-9 indicate low magnetic signatures in the western part of shear zone, and high signatures in the eastern part of shear zone, may indicate the basement is shallow in the east and deeper in the west, may be due to fault. Strong bipolar magnetic anomalies recorded over central part of the shear zone. The width of the concealed shear zone may increase from 160 m in the south to 600m in the north.

4.14. REGIONAL MAGNETIC (TF) SURVEYS OVER AMARAVATI CITY

Carried out regional magnetic surveys at 1km station interval (approximately) at Amaravati City and generated total field magnetic Image with a contour interval of 100nT. Derivative maps viz., regional, residual, low & high frequency, analytical signal, horizontal derivative, vertical integration and directional filter maps have also been generated by applying necessary corrections. Magnetic (TF) maps are well brought out the structural fabric of Amaravati City.

Magnetic surveys can detect variations in the earth's magnetic field caused by differences in the magnetic properties of rocks. Magnetic image of Amaravati City is overlay on google image shown in Figure 59. Magnetic anomaly map (Figure 60) with 100nT contour interval has indicated an overall relief of 5923nT varying from +3100nT to -2623nT with strong bipolar magnetic signatures, trending in NNE-SSW, NE-SW, NW-SE, N-S and E-W directions in the study area.

Prominent high dominant magnetic anomaly zones trending in NNE-SSW direction is located around Krishnayapalem in the eastern part, Mangalagiri, Nidamarru and

Neerukonda areas in the southern part, between east of Vaddamanu to Nekkallu trending in N-S direction in the western part and between east of Tadepalli and Undavalli trending in N-S direction in the eastern parts. Further, moderate high dominant magnetic signatures noticed around Borupalem, west of Uddandarayunipalem, east of Thullur and Sakhamuru areas.

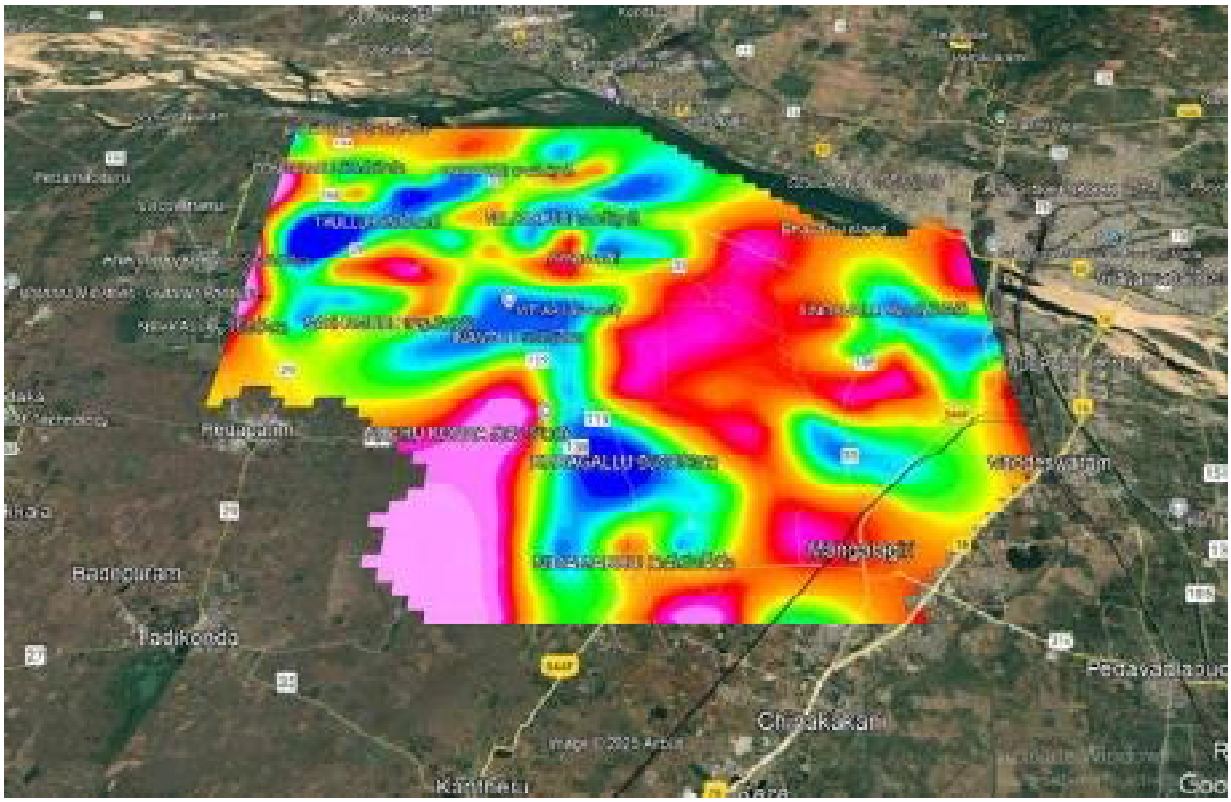


Figure 59: Magnetic Anomaly map overlay on Google Image

These high magnetic signatures may be indicating the presence of basement highs within the charnockites in the central part, khondalites in the eastern part, pyroxene/calc granulites in the western part (Figure 60).

Prominent low dominant magnetic anomaly zones trending in NNE-SSW directions around Thullur in the western part and between Uddandarayunipalem to Ainavolu in the central part, trending in NNW-SSE direction between Ainavolu to Kurugallu in the southern part, trending in NW-SE direction around Undavalli and trending E-W direction just south of Yerrabalem areas, may be due to presence of basement lows (Figure 60).

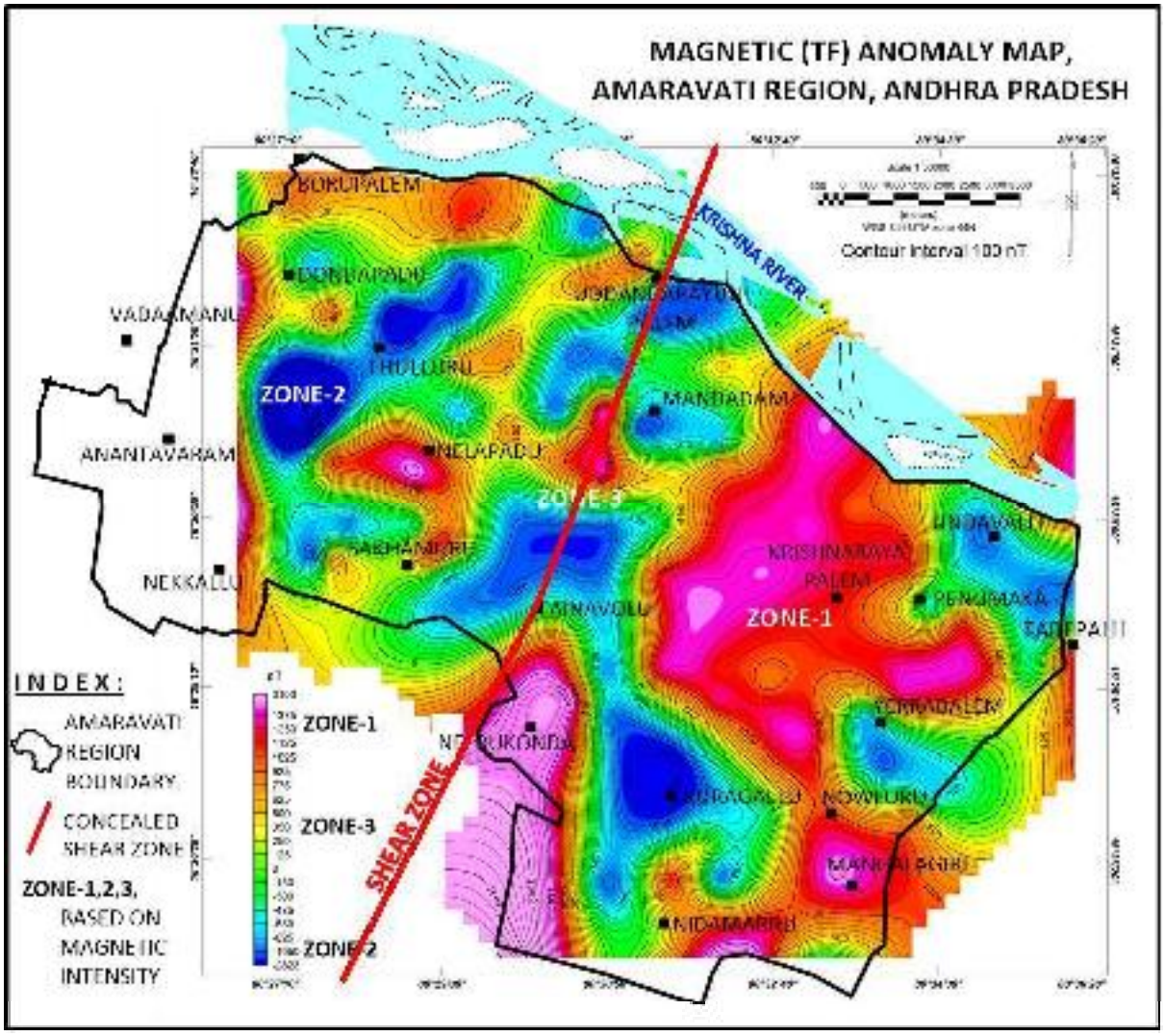


Figure 60: Magnetic (TF) Anomaly Map, Amaravati City

In addition, a number of magnetic linear features in the form of magnetic gradients trending in NNE-SSW and NNW-SSE directions on either side of Amaravati City, may indicate the presence of concealed structural features viz., fracture / fault /contact / shear zones, corroborating well with the magnetic derivative maps and gravity signatures in the form of gradients .

Geologically marked Shear zone, trending in NNE-SSW direction from Uddandarayunipalem in the north to Ainavolu in the south, adjacent to the concealed magnetic high zone, falls along the low dominant magnetic signatures associated with low resistivity anomalies and NNE-SSW trending gravity gradients. North-south trending dissected Khondalite hills near Tadepalli in the east, pyroxene granulite / calc-granulites out crops near Anantavaram in the

western part are reflected well in the form of linear high dominant magnetic anomalies, on either side of the study area.

Magnetic data was further subjected to Radially Averaged Power Spectrum (RAPS) for wavelength filtering, for making derivative maps at different depths.

Residual Magnetic Anomaly Map (Figure 61) or the high pass filter map of Amaravati City helps in enhancing the shallow and near surface geological features, such as magnetic highs may be reflected as basement highs, magnetic lows may be reflected as basement lows. In addition, near surface geological structures on either side of Amaravati City viz., concealed fault / fracture / shear / contact zones are delineated well in the form of linear magnetic anomalies.

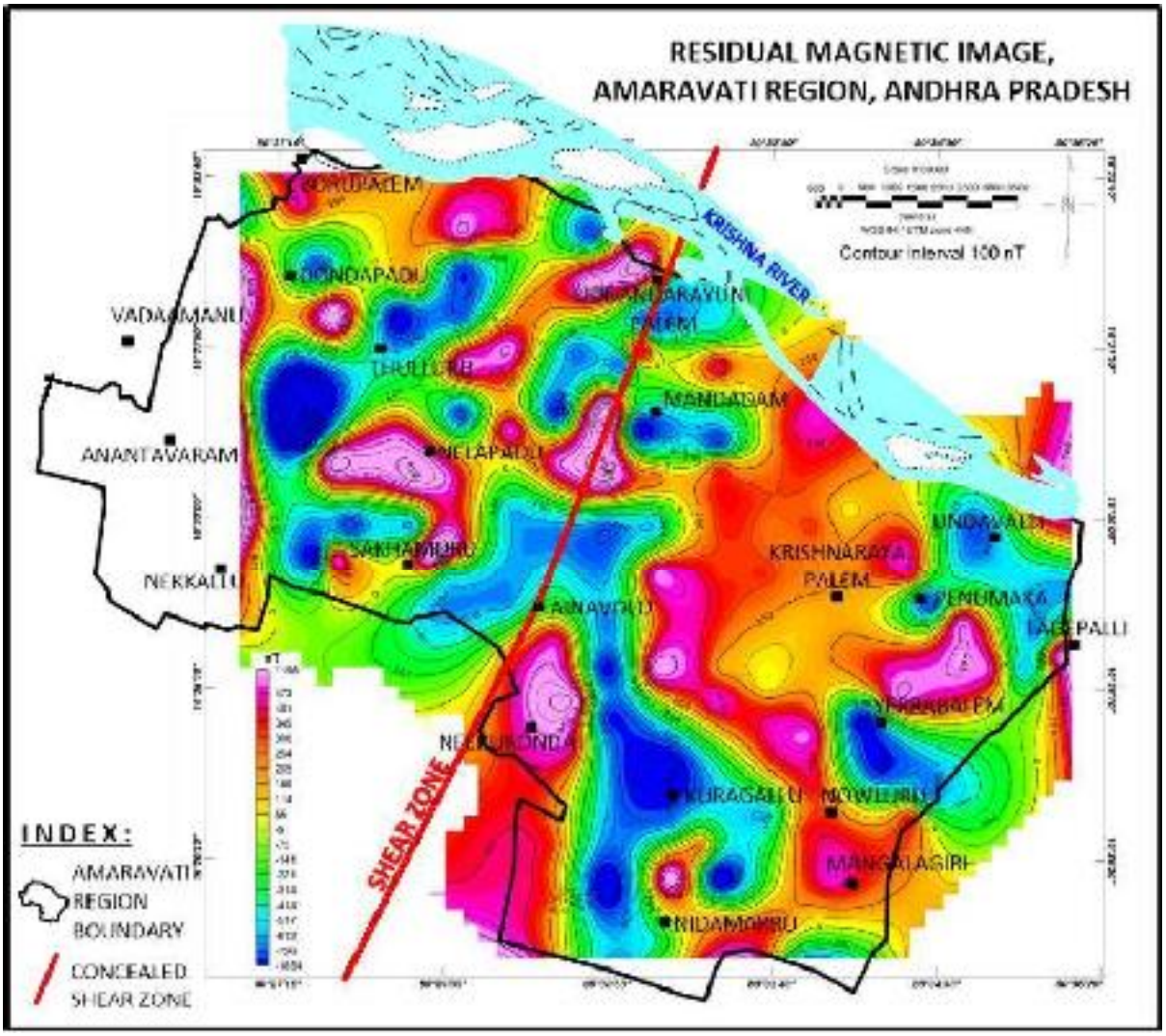


Figure 61: Magnetic Residual Map, Amaravati City

Regional Magnetic Map (Figure 62) or low pass filter map of Amaravati City, helps in understanding the tectonic history of the city by removing the shallow near surface features or high frequency anomalies and understanding the subsurface geology and deep-seated structural features. The structural features reflected in the regional magnetic map having depth continuity.

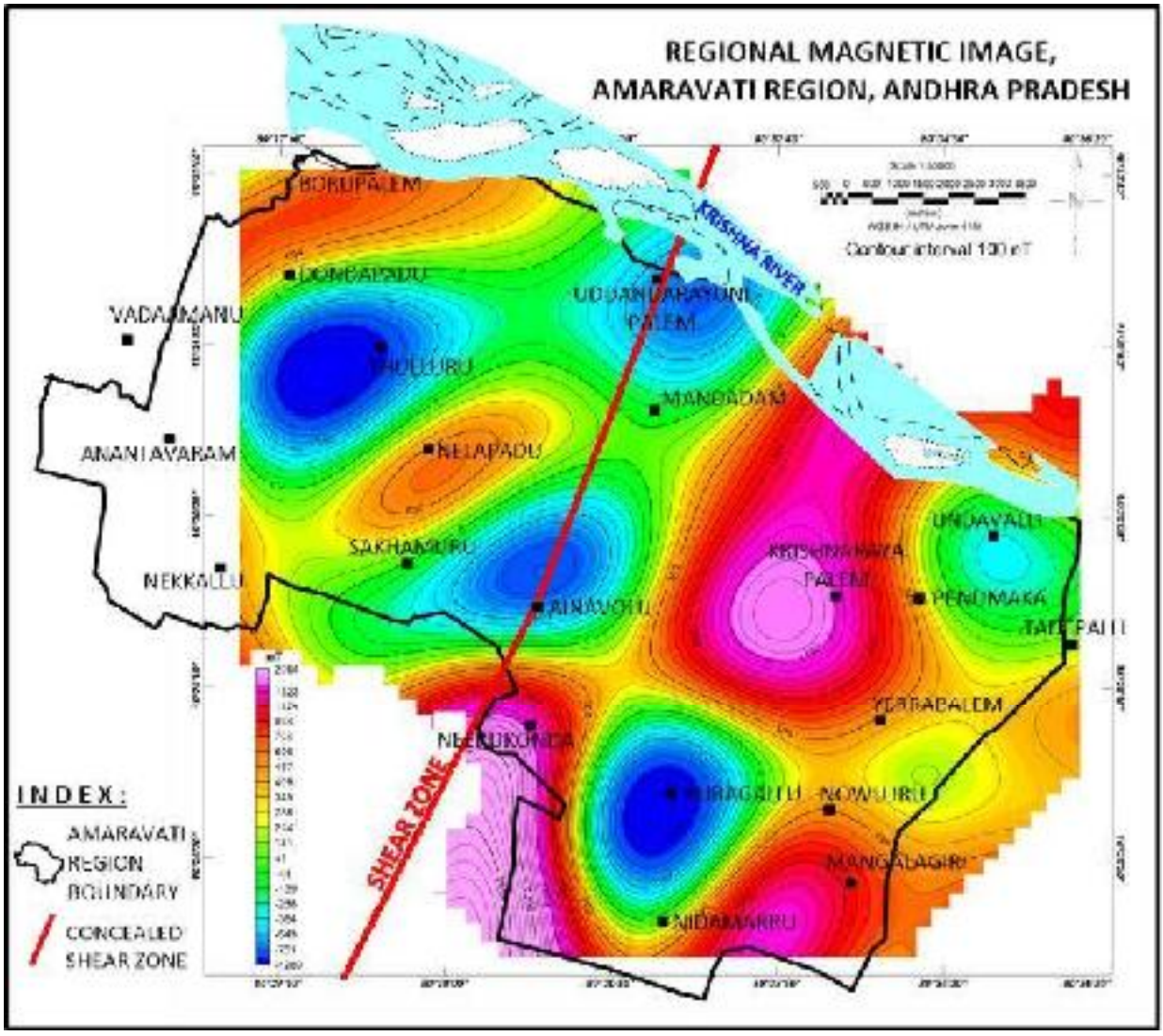


Figure 62: Magnetic Regional, Amaravati City

Analytic Signal Map (Figure 63) highlights the edge detection of magnetic sources and precise location of geological contacts / faults on either side (eastern and western parts) of Amaravati City and mapping of subsurface and concealed structures.

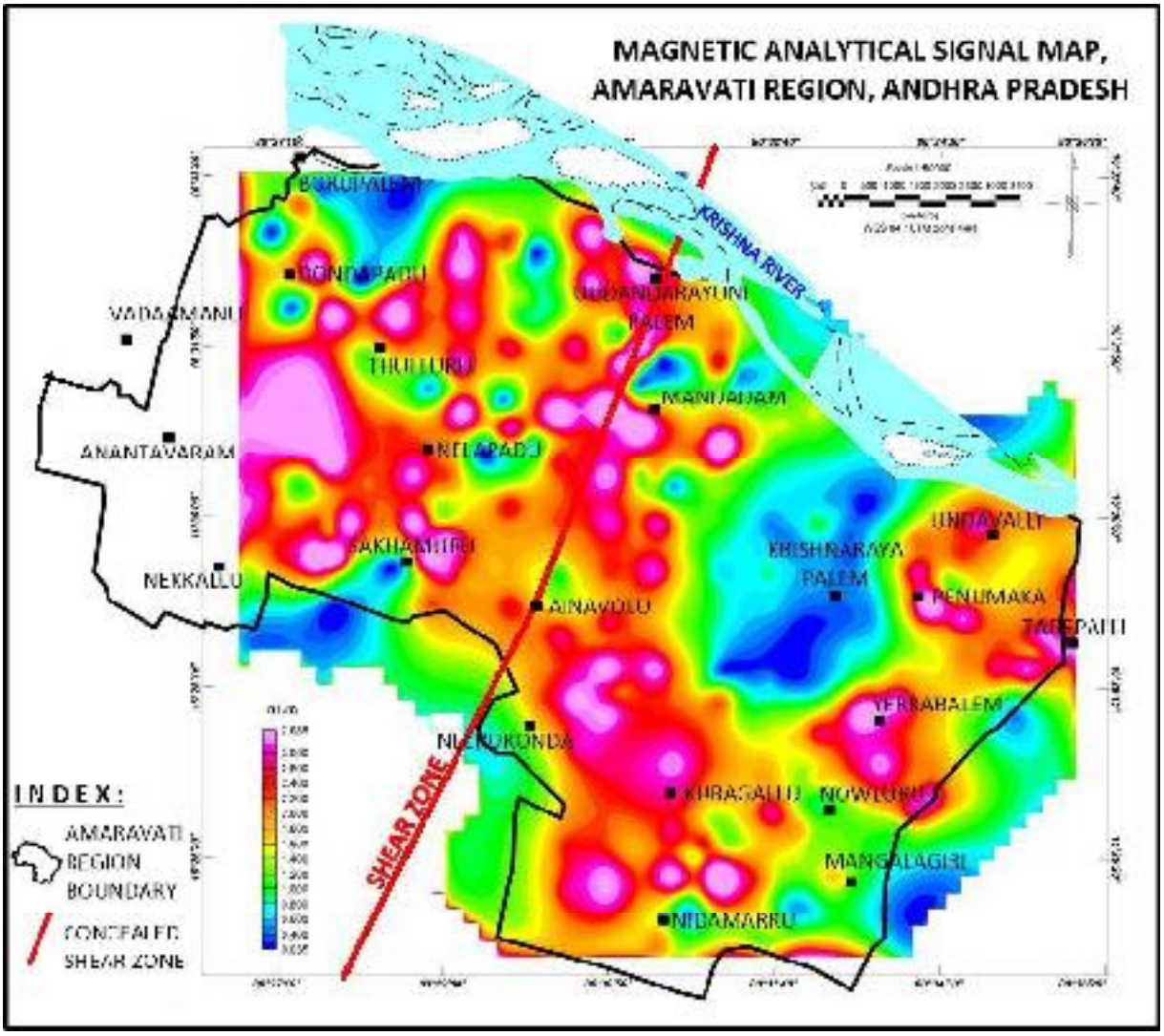


Figure 63:Magnetic Analytical Signal Map, Amaravati City

Magnetic Horizontal Derivative Map (Figure 64) of Amaravati City, particularly helps in structural mapping. They enhance the subtle anomalies, delineate geological contacts and provide insights into the continuity and geometry of subsurface structures.

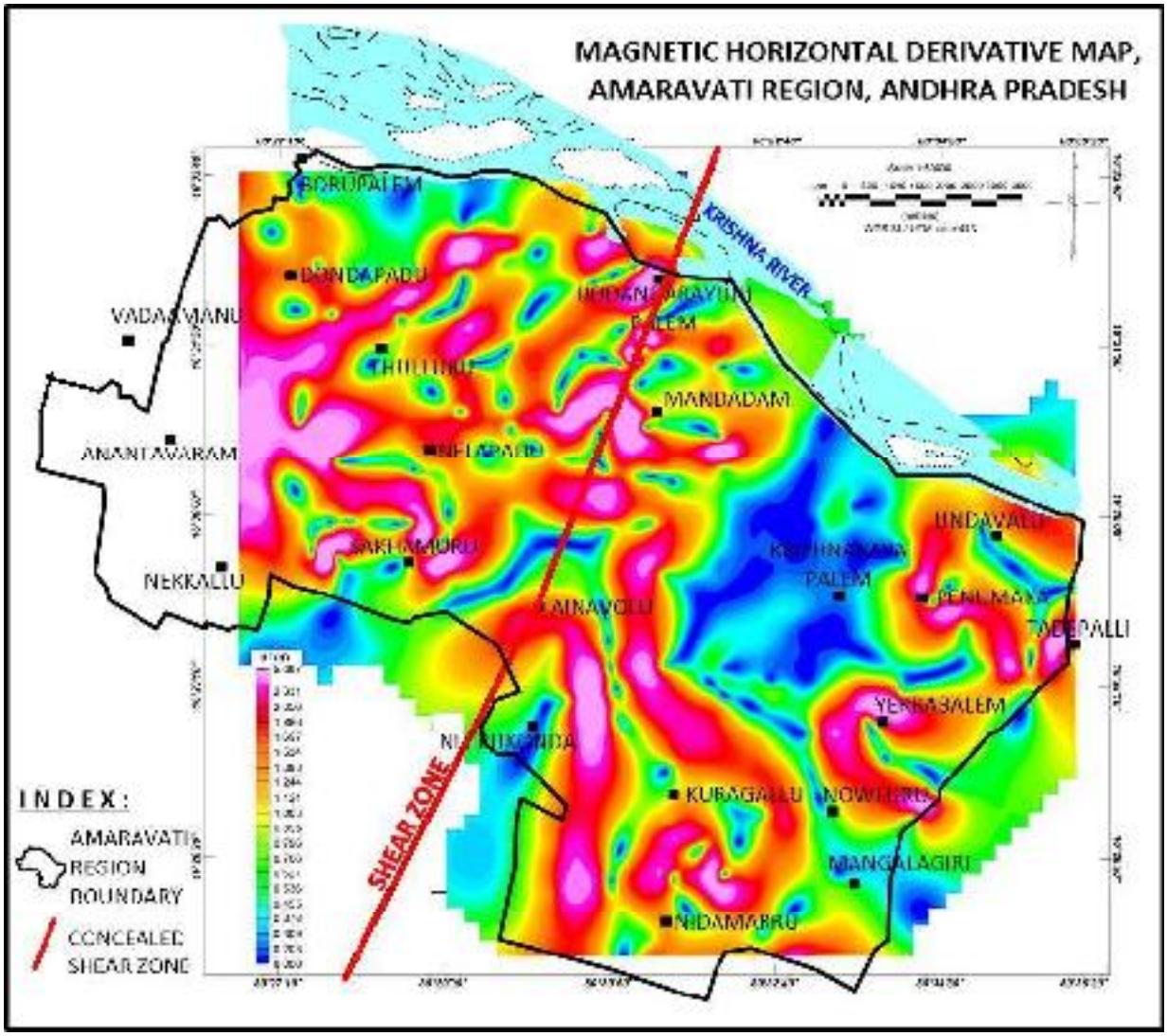


Figure 64:Magnetic Horizontal Derivative Map, Amaravati City

Magnetic Vertical Derivative map (Figure 65) and Vertical Integration map (Figure 66) visualize the vertical component of the magnetic field intensity and direction at different depths. They also help in identifying subsurface structures in the form of fault / fracture / joint / shear zones and geological formations.

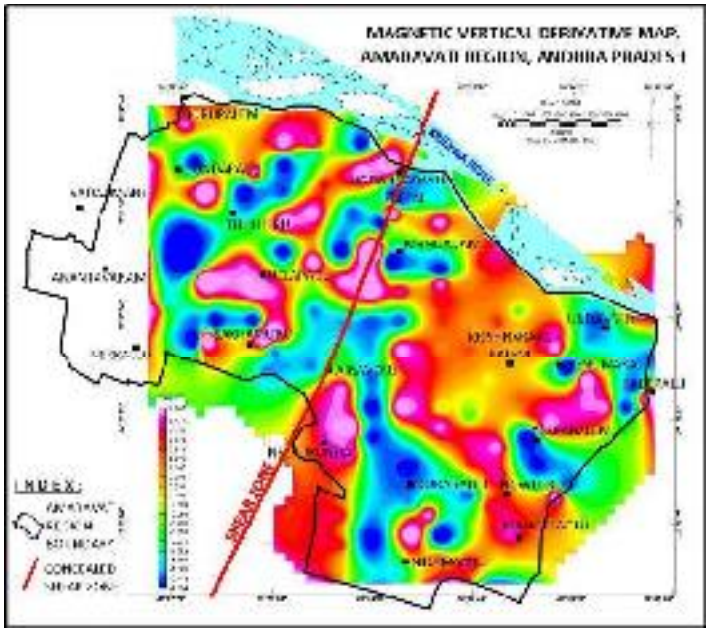


Figure 65: Magnetic Vertical Derivative Map, Amaravati City

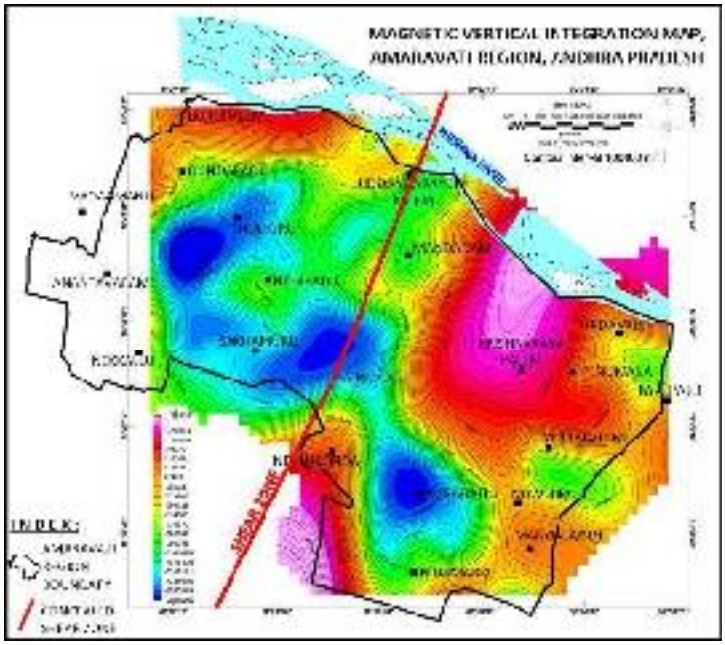


Figure 66: Magnetic Vertical Integration Map, Amaravati City

Radially Averaged Power Spectrum (Figure 67) is used primarily for analyzing spatial data, particularly to determine the depths of subsurface parameters like magnetic susceptibility by analyzing the slope of the spectrum. Based on the wavelength filtering of magnetic data, three interfaces have been identified in the study area. Top layer or weathered bed rock at an average depth of 30 - 50m, followed by intermediate layer or semi-weathered bed rock at a depth between 50 - 270m followed by third layer or hard, massive and compact bed rock up to a depth of 760m and beyond.

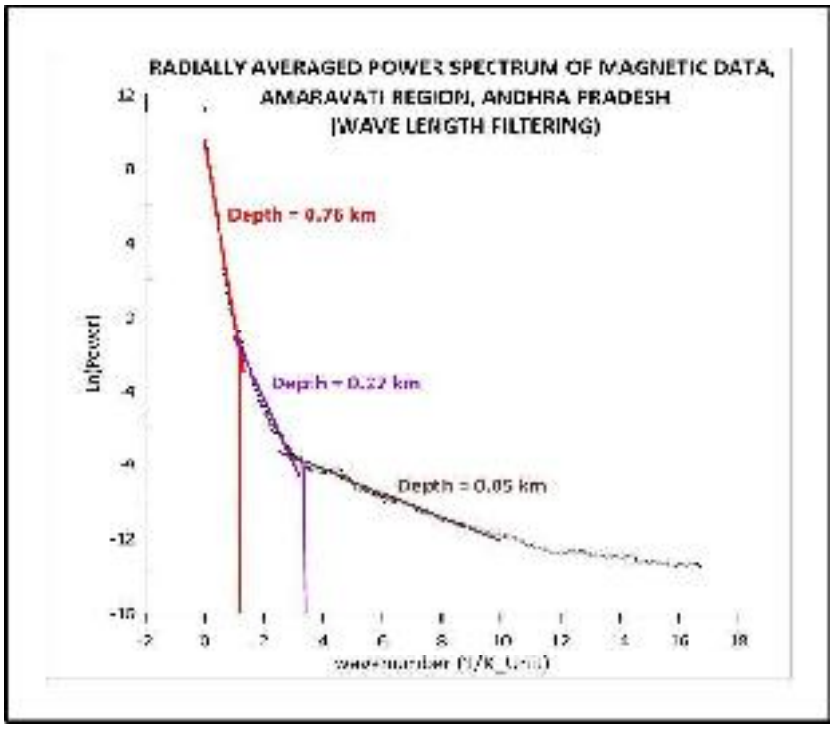


Figure 67: Radially Averaged Power Spectrum of Magnetic data

The average width of the geologically marked concealed shear zone in the central part trending NNE-SSW direction may be around 400m, inferred from detailed magnetic profiles associated with low dominant magnetic anomalies in the same direction.

Both Gravity and Magnetic signatures are well brought out the concealed structural information and correlating well with the basement highs inferred from depth sections of Vertical Electrical Resistivity Soundings (VES).

4.15. INTERPRETATION OF GRAVITY ANOMALY MAP (after GSI, 2006)

Bouguer gravity anomaly map of Amaravati City, Andhra Pradesh (secondary data) with contour interval of 1 mGal (digitized from Gravity Map of India Series – 2006, GSI) shown below (Figure 68 and Figure 69) is well brought out the structural fabric of Amaravati City, falls in parts of 65D/6, 65D/7, 65D/10 and 65D/11 toposheets. The inferred and salient features are mentioned below.

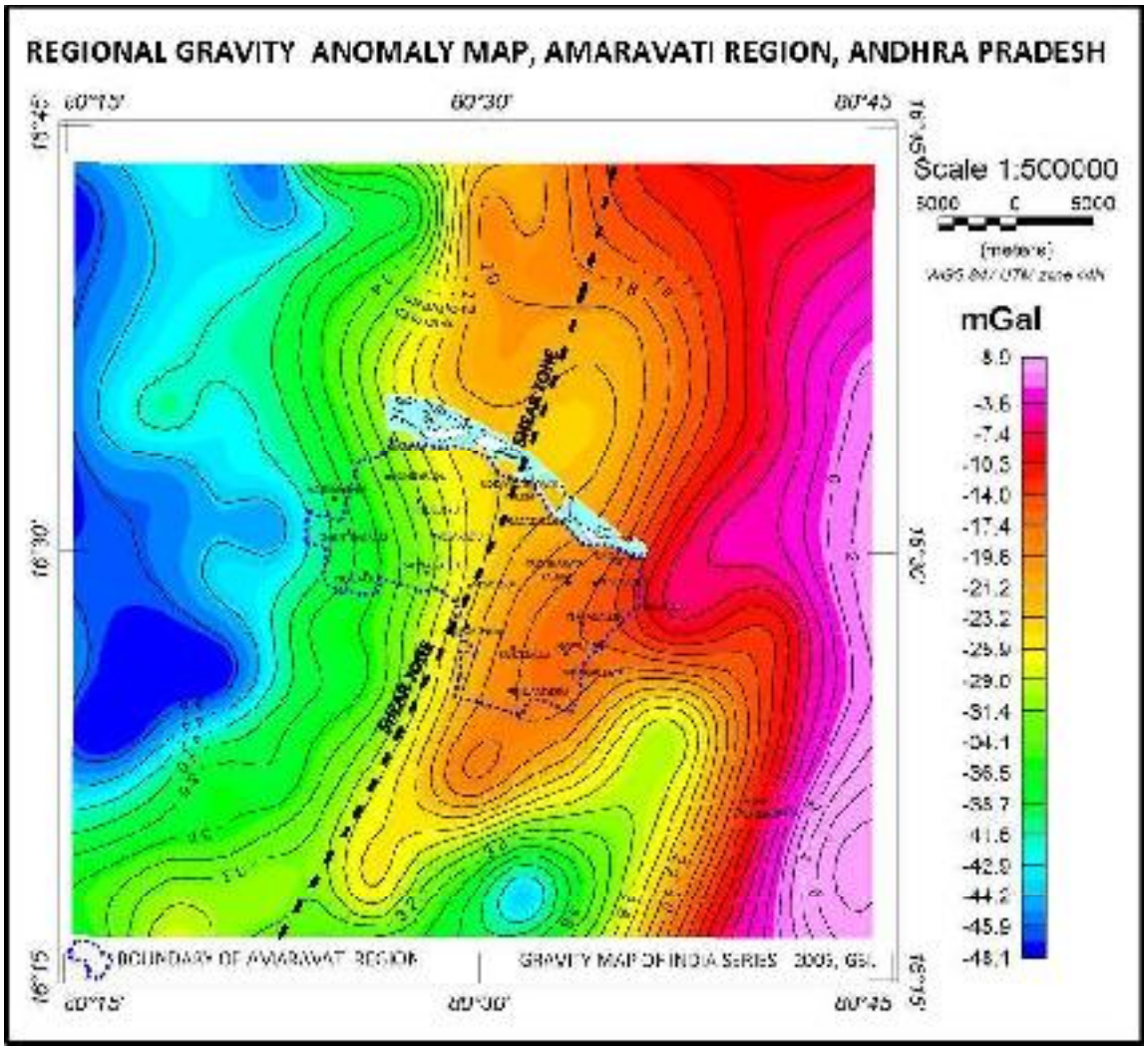


Figure 68: Regional Gravity Map of Amaravati City and adjoining areas

Gravity map has indicated an overall relief of 54 mGals from east to west, with prominent NNE-SSW trending gravity highs in the east and gravity lows in the west.

Prominent gravity high (+8 mGal) is noticed in the eastern part (around Tadepalli) and prominent lows (-46 mGal) in the western part (around Anantavaram).

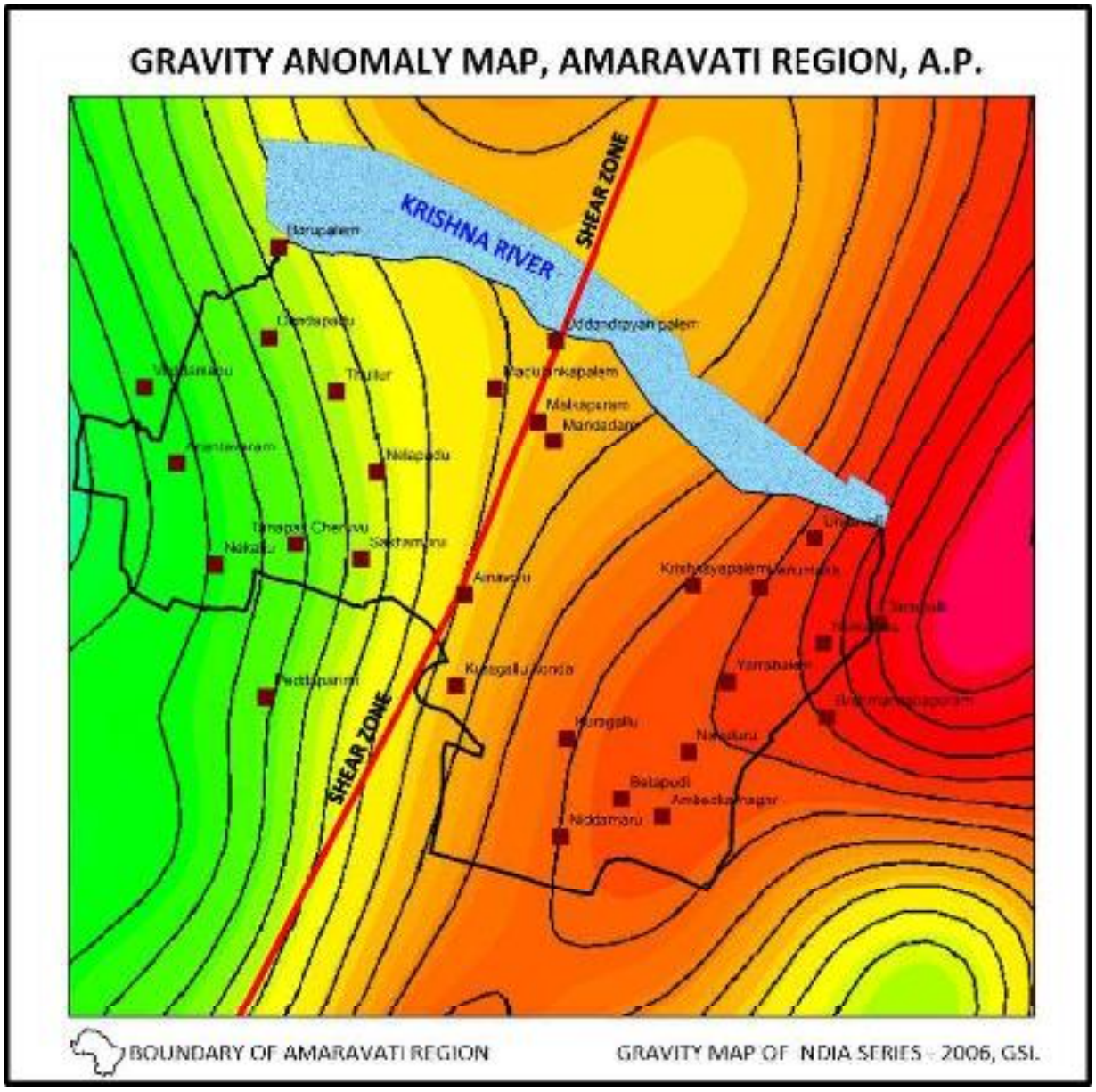


Figure 69: Gravity Anomaly Map of Amaravati City

Khondalite suite of rocks exposed in the eastern part in the form of gravity highs and pyroxene / calc granulites are exposed in the western part in the form of gravity lows. Whereas, charnockite occupied in the central part of the study area, below the sediments in the form of moderate gravity signatures.

Further, few isolated gravity high closures and high nosing's in the study area may be due to the presence of isolated basement highs.

Entire study area falls within a fault / fracture zone, in the form of NNE-SSW (eastern part) and NNW-SSE trending gravity gradients (western part) observed on either side of entire Amaravati City, may indicating a graben like structure in the center.

Further, the study area was bisected by an NNE-SSW trending geologically marked concealed shear zone, (may be a strike slip fault ?) reflected in the form of NNE-SSW trending gravity gradients and high nosing's from Uddandarayunipalem in the north to Ainavolu in the south, associated with resistivity lows and low dominant magnetic anomalies.

Based on the interpretation of gravity image and study of the inferred lineament analysis, the entire area may be affected not only by strike slip fault along NNE-SSW trending geologically marked shear zone, but also western part may be a down thrown block compared with the eastern block, as evidenced by presence of thick sediments, elevation and drainage density data.

The linear NNE-SSW gravity high nosings in the northern and southern parts associated with the NNE-SSW trending concealed shear zone, may indicating the strike slip mechanism along the shear zone. The western block may be moved further NNE direction, whereas, the eastern block may be moved towards SSW direction along the shear zone.

Krishna river is passing right angles to this shear zone, trending ENE-WSW direction, in the form of feeble gravity nosings, cutting across the regional trend.

4.16. GRAVITY, MAGNETIC & RESISTIVITY PROFILES

Regional gravity profile across Amaravati City from west to east (longitudes from 80^0 15' 00" to 80^0 45' 00") indicating an overall relief of 53mGal observed in the area. A prominent gravity high of +4mGal in the eastern part may be due to the presence of high-density rocks at shallow depth. Whereas a prominent low of -48mGal in the western part may be due to the presence of low-density material at deeper depths, occupied with thick sediments.

It is important to note that, a residual gravity low of the order of 0.5mGal identified at Tadepalli within the regional gravity profile, at the contact between Khondalite and charnockite units in the eastern part, may be due to structural disturbances in the form of fault / fracture / shear zone between the two formations.

Another residual gravity low of the order of 0.5mGal observed at Anantavaram within the regional gravity profile, at the contact between charnockite and pyroxene / calc granulite units in the western part, may be due to fault / fracture / shear zone.

In addition, another residual gravity low noticed in the central part at Uddandarayunipalem within the regional gravity profile trending in NNE-SSW direction, which continues further south-west between Ainavolu and Sakhamuru, within the charnockite basement may be due to presence of concealed shear zone, corroborating well with low magnetic and low resistivity signatures.

Regional Magnetic profile of Amaravati City from Anantavaram in the west to Tadepalli in the east, overlay on regional gravity profile shown in Figure 70. Faulted contact on either side of the Amaravati City and concealed NNE-SSW trending shear zone in the central part are reflected well in the form of strong bipolar magnetic anomalies, corroborating well with residual gravity signatures and low resistivity anomalies.

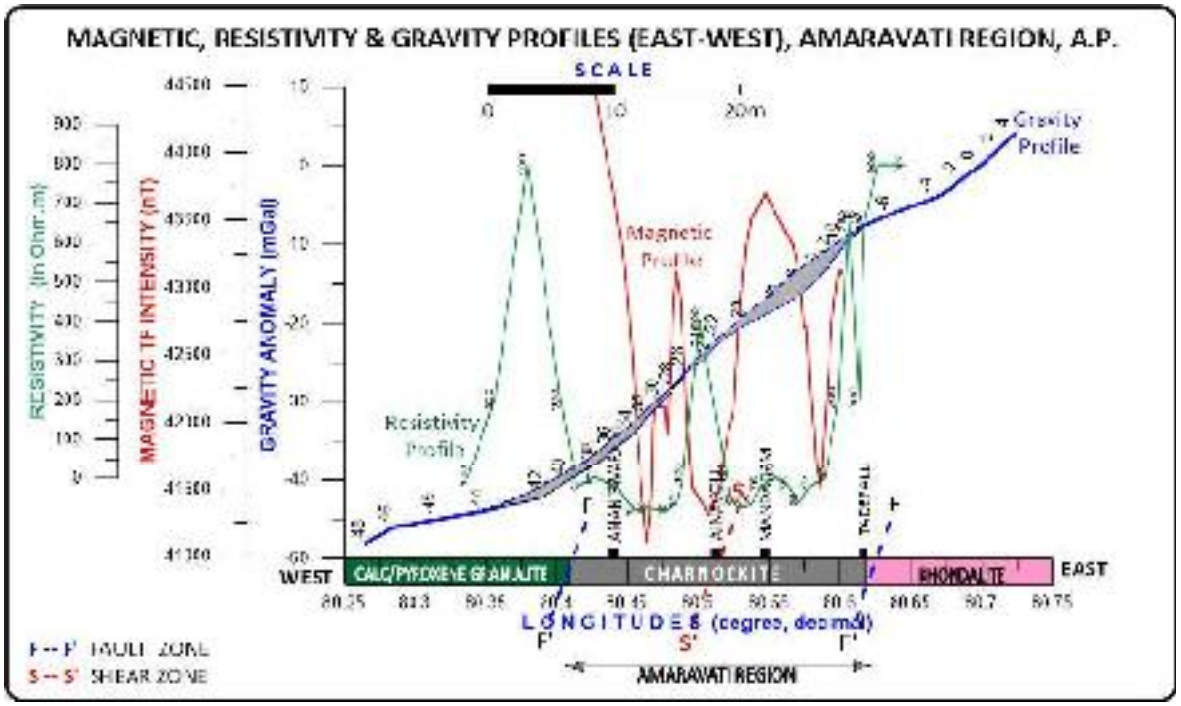


Figure 70: Gravity, Magnetic & Resistivity Profiles

4.17. LINEAMENT ANALYSIS

Lineament analysis is a powerful tool used in Amaravati City to delineate and study the concealed linear or curvilinear features from satellite imagery, gravity, magnetic and drainage density images, such as fault, fracture, shear zone, joint and geological boundaries, that indicate underlying geological and structural significance. These features, often

appearing as straight or slightly curved lines, and provide valuable insights into structural / tectonic activity of Amaravati City (Figure 71a, b & c).

Lineament analysis is a method aimed at detecting, classifying, and measuring linear features in Amaravati City helps in understanding the basement configuration and structural fabric of the City. Mapping lineaments helps identify potential groundwater recharge zones and fracture systems that helps in delineation of important features for groundwater resources. Identifying lineament zones also indicate pathways for fluid migration for mineral deposits and can indicate areas prone to earthquakes and other geohazards (Figure 71).

Lineaments from Drainage Network

In the study area, lineaments identified and analyzed from drainage network aligned in NW-SE, NE-SW, NNE-SSW and E-W directions formed by streams and nalas of Kondaveeti Vagu and Kottella vagu insights into the subsurface structure and groundwater resources (Figure 71 a). The drainage pattern is sub parallel to sub-dendritic. The sub-parallel drainage in the eastern part appears to be controlled by fractures and structures possibly of tectonic origin and the dendritic pattern in the western part large controlled by erosional nature of terrain, corroborating well with the linears inferred from magnetic and gravity images.

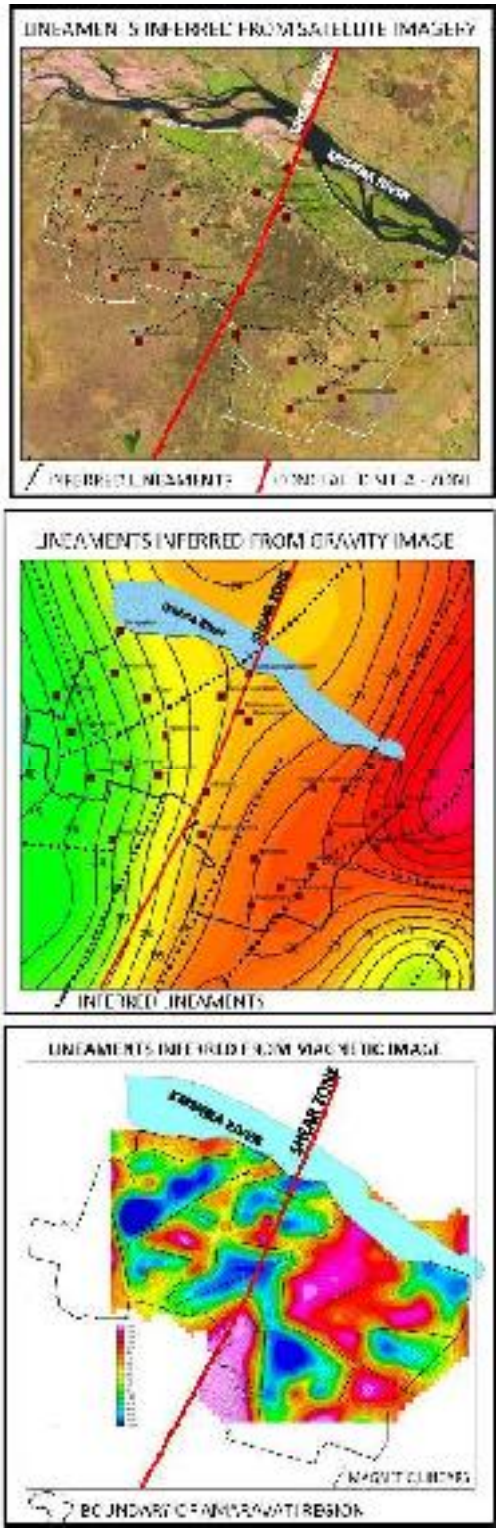


Figure 71: Inferred Lineaments from Stream Network (First Image), Gravity Map (Second image) and Magnetic Map (Third image)

Lineaments from Gravity Image

Based on analysis of gravity linears, the study area falls within a fault / fracture zone, in the form of NNE-SSW trending gravity gradients in the eastern part over Khondalite basement and NNW-SSW trending gravity gradients in the western part over calc granulite / pyroxene granulite basement, may indicating the faulted contact with charnockites in the central part (Figure 71 b). A prominent NNE-SSW trending linear with moderate gravity gradients in the central part, corresponding to presence of a concealed shear zone from Uddandarayunipalem in the north to Ainavolu in the south and it may extend further in both the directions. Krishna river is passing right angles to this shear zone, trending WNW-ESE direction, in the form of feeble gravity nosings, cutting across the regional trend. Few E-W and NE-SE trending gravity linears inferred from gravity nosings, correlating well with magnetic linears.

Lineaments from Magnetic Image

Structural / lineament analysis plays an important role in identifying the concealed movements and structural disturbances within the basement. Steep magnetic gradients, discontinuities, contacts, dilated zones, truncation, offsets and intersections of lineaments are reflected well in the form of magnetic lineaments. The structural elements inferred from gravity image are corroborating well with magnetic signatures.

The NNW-SSE trending magnetic linears in the western part over calc granulite / pyroxene granulites and NNE-SSW trending linears in the eastern part over khondalites, may indicate the faulted contact with charnockite basement in the central part. Further, a concealed NNE-SSW trending magnetic linear, falls along the low dominant magnetic anomalies in the central part of the study area, corresponding to presence of a concealed shear zone from Uddandarayunipalem in the north to Ainavolu in the south and it may extends further in both the directions (Figure 71 c).

In addition, few E-W, NW-SE and NE-SE trending magnetic linears inferred low dominant magnetic signatures, correlating well with lineaments inferred from gravity and drainage density maps.

4.18. STRUCTURAL FABRIC AND BASEMENT CONFIGURATION

To suppress the near surface high frequency anomalies and to enhance basement structures, magnetic low-pass anomaly maps are helped in delineation of basement configuration. Based on the intensity of magnetic and gravity signatures, the study area is divided into 3 zones. Zone-1 indicating high dominant magnetic and gravity anomalies in the

eastern part over khondalite basement. Zone-II indicates the presence of low dominant gravity and magnetic anomalies in the western part over calc granulite / pyroxene granulite basement. Whereas Zone-III indicates moderate gravity and magnetic signatures noticed in the central part over charnockite basement (Figure 72 a & b).

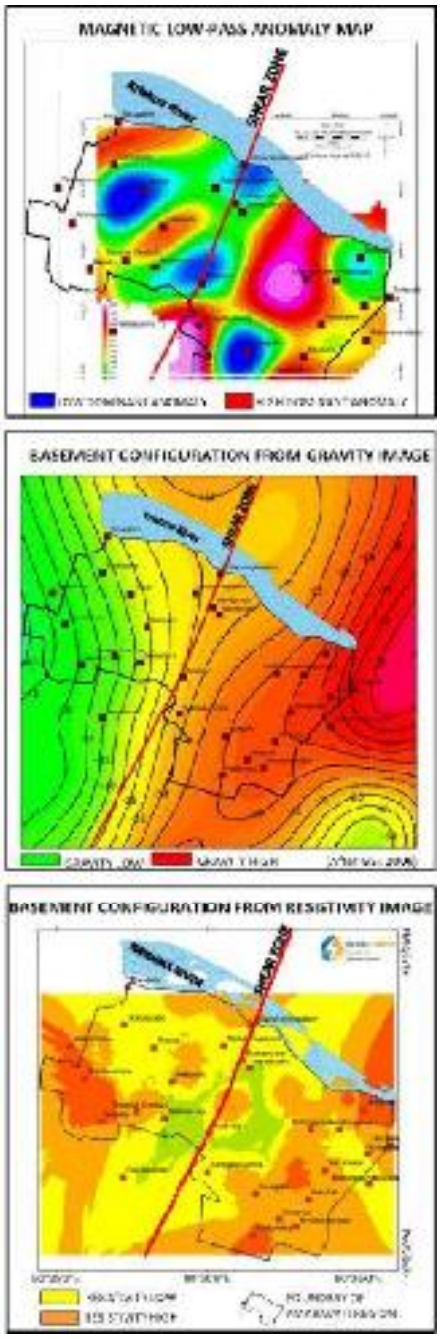


Figure 72: Inferred Basement configuration Magnetic (First Image), Gravity Map (Second image) and Resistivity Map (Third image)

These NNW-SSE trending linears in the western part may indicate faulted contact between calc granulite / pyroxene granulites with charnockites. Whereas the NNE-SSW trending linears in the eastern part may indicate the faulted contact between Khondalite with Charnockites. Gravity highs correlating with isolated magnetic high anomalies in the eastern part may indicate the basement highs at shallow depth (Figure 72 a & b). These isolated basement highs are corroborating well with magnetic highs and resistivity highs (Figure 72 a & b) confirmed by vertical electrical sounding data (Figure 72 c). Whereas gravity lows associated with low dominant magnetic anomalies in the western part may indicate the basement at deeper depths.

A concealed NNE-SSW trending moderate gravity and low magnetic signatures falls along the central part of the area, from Uddandarayunipalem in the north to Ainavolu in the south corresponding to the presence of a concealed shear zone. Based on the interpretation of lineament analysis and basement configuration, the entire NNE-SSW trending concealed shear zone, not only displaced by strike slip fault but also western part may be down thrown block (graben like structure?), as evidenced by the elevation data, drainage density map and increased thickness of sediments (Figure 72 c).

It is interesting to note that, along this concealed NNE-SSW trending geologically marked shear zone having a width of 200m to 600m. increasing the width from south to north, associated with magnetic lows and resistivity highs. Water quality along this shear zone is good and tds content is less along the shear zone, when compared to the quality of groundwater from the western or south-western parts.

Because of magnetic susceptibility, density and resistivity variations, all the inferred structural features identified from magnetic, gravity and resistivity signatures, are corelating well with the residual gravity lows, as indicated in the gravity profile.

Based on the qualitative interpretation of geophysical data consisting of gravity, magnetic and resistivity anomalies (Figure 73), structural fabric and basement configuration of Amaravati City have been delineated. Basement highs and lows in the form of gravity highs / high dominant magnetic anomalies / resistivity highs and gravity lows / low dominant magnetic anomalies / resistivity lows are shown in Figure 72, indicating the presence of basement undulations.

Structural analysis of inferred linears from potential field data and resistivity signatures may indicating the faulted contact on either side of Amaravati City between Khondalite-Charnockite in eastern part and between calc / pyroxene granulite–charnockite in the western part. Based on the anomaly pattern, the NNE-SSW trending concealed shear zone in the central part may indicate not only a strike slip fault mechanism, in the form of gravity

nosing's on either side of the fault plane, but also the western part of the study area may be a down-thrown block, while compared to eastern part. These structural disturbances may be confirmed by elevation data, drainage density map and presence of thick sediments in the western part. Whereas, the eastern part may be an up-thrown block, due to shallow basement and thin sediment thickness.

Figure 73: Structural Fabric and Basement Configuration

4.19. SEISMIC HAZARD & MICROZONATION STUDIES

Amaravati City falls in the south-western fringe portion of Seismic Zone–III of the Seismic Zonation Map of India (IS: 1893 – Part 1 (2002)). The soil in general is broadly classified as sandy loamy, red loamy and black cotton.

Seismic Hazard and Microzonation studies were carried out by GSI, SR (2010) to determine the site response parameters, viz., the predominant frequencies, the amplification of the ground motion and decipher vulnerable zones of damage in case of an earthquake occurring in and around Vijayawada / Amaravati. The objective is to assess and delineate the microzones of varying seismic site response in the event of a moderate earthquake (≈ 6 magnitude) occurring in the proximal source area. Microzonation plays a vital role as a proactive strategy in cities where high seismic risk is involved. Microzonation information can be used to incorporate earthquake damage control / reduction measures in planning land-use and designing of heavy structures.

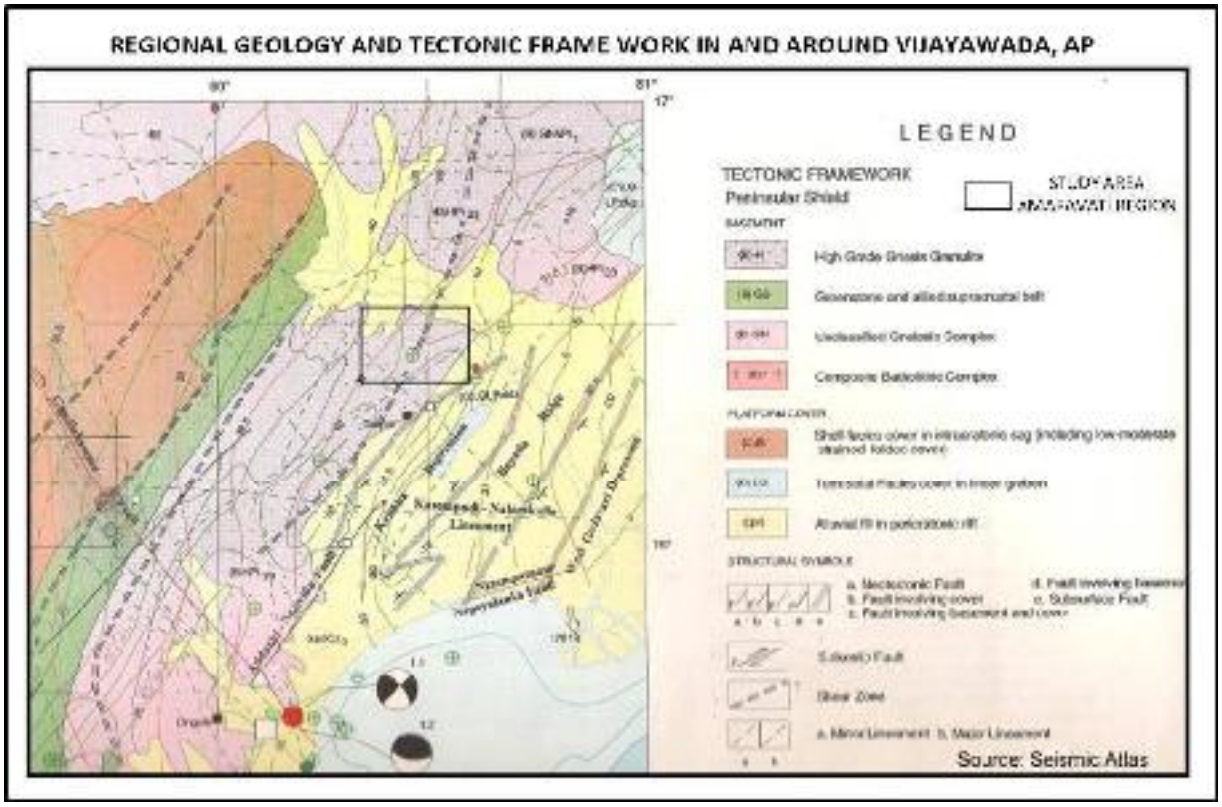


Figure 74: Regional Geology and Tectonic Framework

The City is traversed by a fairly dense network of medium and mega lineaments (Figure 74). Records of earthquake tremors / seismic events located around Mangalagiri of 3.4M, 3.2M, around Vijayawada of 3M and moderate magnitude of 5.2M with its epicentre at Ongole town indicating the occasional occurrence of seismic activity in the study area. Hence, evaluating the seismic hazard microzonation is an important input to earthquake disaster mitigation. Peak amplification image parts of Amaravati City (GSI, 2019) indicates high amplification zones around Nowluru, Yerrabalam, Krishanyapalam and Tadepalle areas, which are vulnerable for damage during an earthquake (Figure 75). This indicates near homogeneous

nature of top layer. The top layer consists of clay, sandy silt, sand and silt layers with poor compactness. Thick pile of sediments is present in the area at depth with shallow groundwater conditions. The peak amplification values range from 1.5 to 4 corresponding to frequency range of 1.5 to 8 Hz indicating that the overburden is thick in the area. Due to the presence of ground water at shallow depths, in some of the areas there is more damping. Because of damping, even though there is a good acoustic impedance contrast between top layer and bottom layer at places, the peak amplification is reduced. Variation of peak frequency lies between 1.5 and 10 (Figure 76).

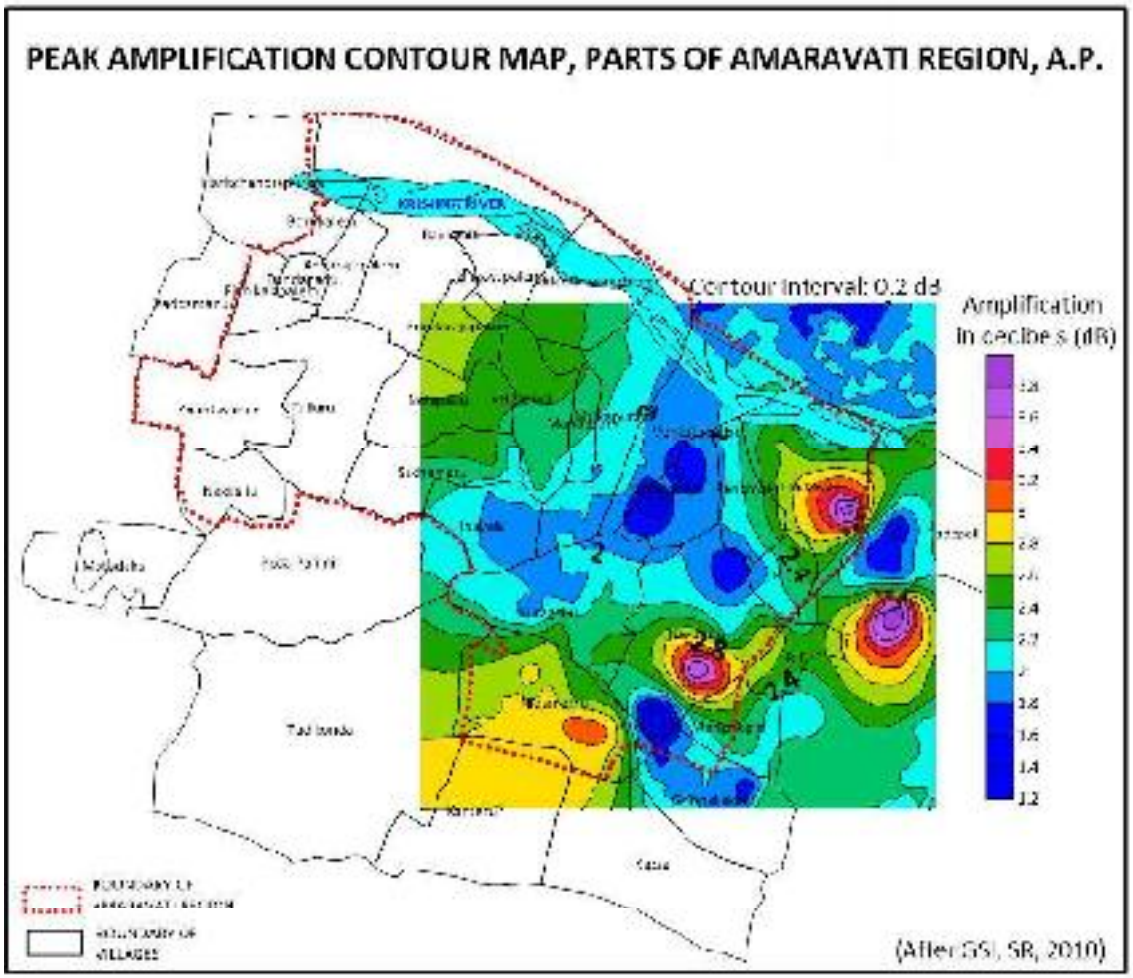


Figure 75: Peak Amplification contour map, parts of Amaravati City

The higher peak frequencies are observed over the areas having overburden is thin. Whereas, from Yerrabalam to Mandadam the thickness of the sediments is more, hence it has reflected low frequency values. From Nowluru to Nidamarru there is not much change of frequency values indicating the gentle increase of overburden above the rock (Figure 75 and

Figure 76). Rest of the area, the amplification of the order of 1.6 to 2.4 is observed indicating the presence of the semi-compact (thick) sediments. Vertical Electrical Soundings (VES) conducted in the study area confirmed the depth of sediments varying from 5m to more than 30m.

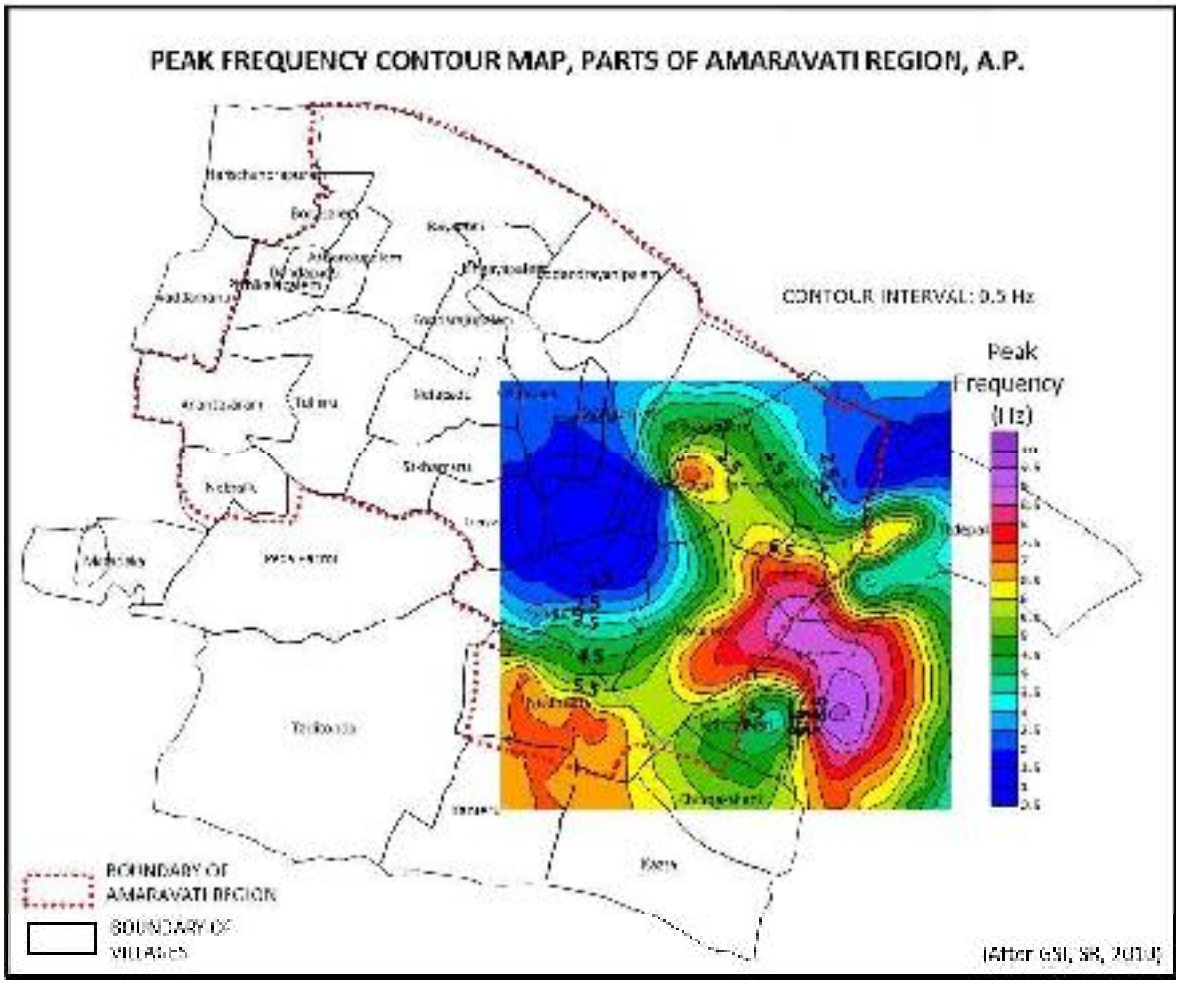


Figure 76: Peak Frequency contour map, parts of Amaravati City

Studies for site response determinations have brought out zones which could be vulnerable for major damage in case of earthquakes in the zones of influence. The peak amplification values range from 1.5 to 4, corresponding to peak frequency range of 5 to 10 Hz, indicating that the overburden thickness is large and is unconsolidated. Hence, it can be said that structures with natural frequency greater than 5Hz are safe and suitable in this area. It is interesting to note that high peak amplification values correlate well with low dominant and high peak frequency values correlate well with the high dominant magnetic anomalies.

CHAPTER 5: HYDROGEOLOGICAL STUDIES

5.0. GENERAL

This chapter defines a complete hydrogeological investigation package for Amaravati city and its peri-urban area to support groundwater resource assessment, sustainable management, recharge planning, and infrastructure design. The study covers:

- aquifer characterization, groundwater occurrence and flow, water-quality status, recharge/discharge dynamics, and sustainable yield;
- inputs for the groundwater recharge plan, well siting, regulatory decisions, and monitoring.

5.1. GROUNDWATER DYNAMICS

Groundwater levels are dynamic in nature and vary from place to place based on the seasonal rainfall, usage, physiographical and geological conditions. Groundwater levels represent the vertical distance from the ground surface to the top of the saturated zone, which is called the water table in unconfined aquifers and the potentiometric surface in confined aquifers.

They are dynamic and vary with recharge, pumping, and seasonal changes, making them a critical parameter for assessing aquifer storage status, identifying recharge and discharge zones, and determining groundwater flow direction, which always occurs from areas of higher hydraulic head to lower.

Measurement is typically carried out before and after the monsoon using water level indicators. Units in fts below ground level (ft bgl) or ft above mean sea level (ft amsl), and the data is plotted to create water level contour maps, where contours connect points of equal water level elevation and help in visualizing flow patterns. Aquifer boundaries define the physical limits of an aquifer, both laterally, where permeable layers meet impermeable or low-permeability formations, and vertically, where aquifers are separated from aquitards or aquicludes. These boundaries can be identified through borehole lithologs, geophysical surveys like VES and ERT, pumping test interpretations, remote sensing analysis of geomorphic and structural features, and changes in groundwater chemistry.

Integrating groundwater level data with mapped aquifer boundaries allows the preparation of aquifer maps that depict both the spatial extent and hydraulic characteristics of each aquifer system. In multi-aquifer areas, separate maps are made for shallow, intermediate,

and deep systems, and cross-sections are prepared to show aquifer thickness, disposition, and hydraulic connectivity.

Such combined mapping provides the foundation for hydrogeological planning, enabling the delineation of flow directions, recharge and discharge areas, and sustainable groundwater management strategies.

Table 6: Groundwater levels of the study area during 11th and 12th of June, 2025

Borewell No.	Latitude	Longitude	Depth to Water Table (ft)
1	16.529870	80.526360	7.26
2	16.530990	80.524070	9.80
3	16.496910	80.585880	14.03
4	16.493000	80.595700	19.54
5	16.497180	80.580810	3.60
6	16.491880	80.552780	15.02
7	16.486020	80.557190	21.02
8	16.455860	80.524530	18.94
9	16.457900	80.524710	17.03
10	16.448900	80.526670	21.19
11	16.451859	80.525565	23.86
12	16.455213	80.527375	11.78
13	16.486679	80.502118	8.58
14	16.487549	80.501779	19.83
15	16.488110	80.504444	10.86
16	16.524781	80.469004	17.33
17	16.515858	80.466336	27.00

The post-monsoon groundwater level data for the study area was obtained from the published Smart City of Amaravati report by the Geological Survey of India (GSI, 2021). This dataset, representing measurements from November 2019, was utilized to assess the prevailing groundwater conditions. The analysis indicates that groundwater levels are relatively shallow along the stretches adjoining the Krishna River, reflecting the influence of riverine recharge. Additionally, a notable shallow water table trend is observed along the North–North-East (NNE) to South–South-West (SSW) direction, coinciding with a mapped shear zone that extends from Uddandarayapalem to Sekhamuru villages. This alignment suggests that the structural features, particularly the shear zone, play a significant role in controlling groundwater occurrence and movement within the area (Figure 77).

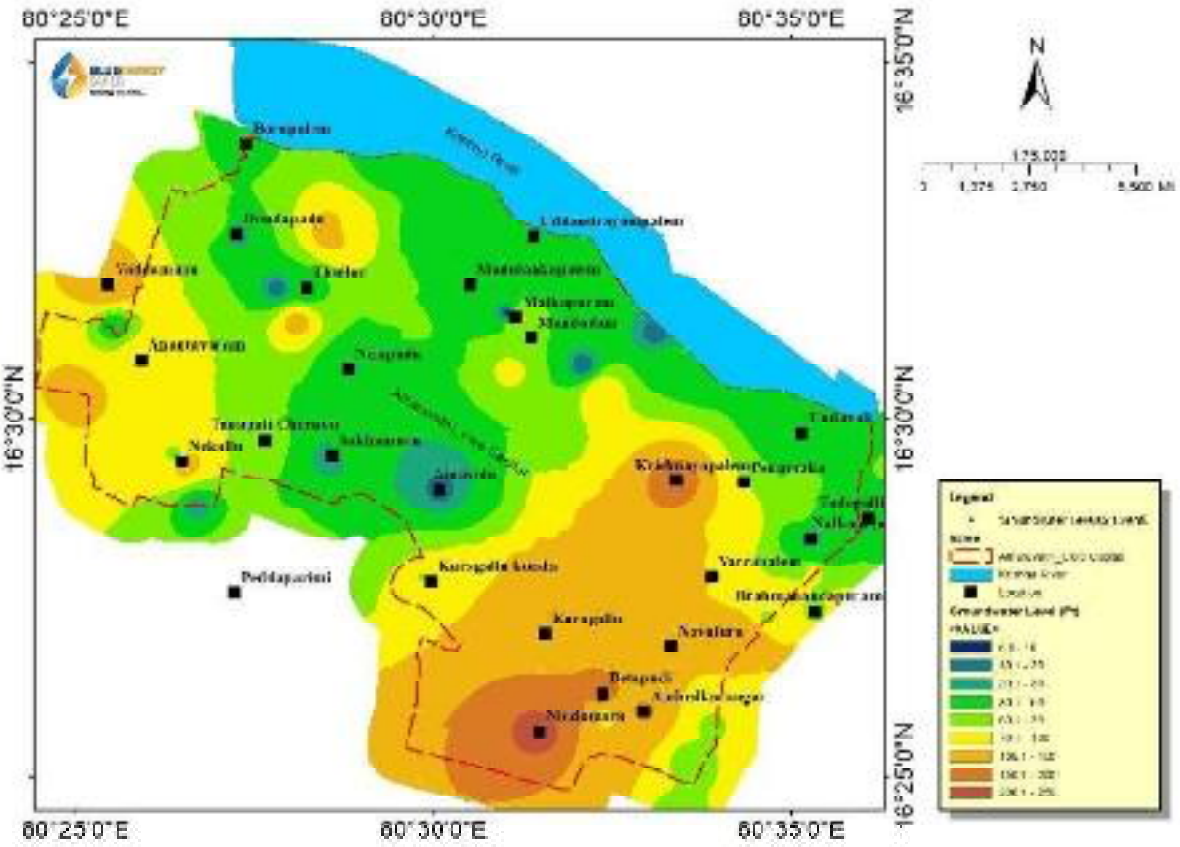


Figure 77: Water table (ft) below ground level.

5.2. PUMPING TESTS

Purpose of Pumping Tests are-

1. To determine the Aquifer hydraulic parameters, include Transmissivity (T), Storativity (S), and Specific Capacity.
2. To identify aquifer boundaries, connectivity between wells, and degree of confinement.
3. To assess well performance (safe yield) for irrigation, domestic, and industrial supply.
4. To validate aquifer layers interpreted from lithologs, resistivity surveys, and drilling data.

Pumping tests are Conducted on Exploratory Wells (EW) and Observation Wells (OW).

Step Drawdown Test (SDT) is done to determine well efficiency. Data analysed using methods like Theis, Cooper–Jacob, or Neuman (for unconfined aquifers).

Hydraulic parameters from pumping tests are plotted spatially to delineate high- and low-yield zones. Combined with geophysical, lithological, and water-level data to prepare Aquifer Management Plans.

Table 7: Aquifer parameters of different aquifer systems in Amaravati Area

Aquifer Type	Transmissivity (T) *(m^2/day)*	Storativity (S)	Yield *(lps)*	Remarks
Alluvium (sand, gravel)	200 – 1,200+	1×10^{-3} to 1×10^{-4}	5 to 15+	High potential: Krishna River floodplain shows best values
Granite / Gneiss	5 – 80	1×10^{-3} to 1×10^{-5}	1 to 5	Yield from weathered zone (8–15 m) & fracture zone (40–120 m)
Khondalite	3 – 30	1×10^{-3} to 5×10^{-5}	0.5 to 3	Low–moderate; yields improve where intersecting shear/fracture zones
Charnockite	2 – 25	1×10^{-3} to 5×10^{-5}	0.5 to 2.5	Generally low; deep fracture zones (>100 m) improve yield marginally

5.3. WATER QUALITY ANALYSIS

Based on the onsite water sample analysis methods and Smart City of Amaravati report (GSI, 2021), the water quality assessment was carried out through detailed physico-chemical analysis of 100 groundwater samples collected across the study area. The parameters measured included pH, electrical conductivity (EC), total dissolved solids (TDS), total hardness (TH), major cations (Ca^{2+}, Mg^{2+}, Na^{+}, K^{+}) and anions (HCO_3^{-}, Cl^{-}, SO_4^{2-}, NO_3^{-}, F^{-}, PO_4^{3-}, SiO_2), and the results were evaluated using BIS standards and the Water Quality Index (WQI) method.

Water Quality Status

- Most samples showed **alkaline nature**, with pH generally within permissible limits.
- TDS and hardness values in many samples indicated suitability for drinking, though **localised pockets** exhibited higher concentrations, reflecting mineral dissolution from host rocks.
- Elevated **nitrate (NO_3^{-})** was recorded in about 40% of samples, exceeding permissible limits in some locations—an indicator of contamination from fertilisers, domestic wastewater, and leaching from agricultural lands.
- **Fluoride (F^{-})** exceeded safe limits in about 7% of samples, most likely due to leaching from fluoride-bearing minerals in the bedrock.

- According to WQI classification, **54%** of the area falls under the "excellent" category, **19%** as "good", **10%** as "poor", **6%** as "very poor", and **11%** as "unsuitable for drinking".

Reasons for Poor Water Quality

1. **Geogenic Sources –** The lithology of the area, dominated by Eastern Ghats granulite facies rocks such as Khondalite, charnockite, and pyroxene granulite, contributes ions like sodium, potassium, calcium, and magnesium through rock–water interaction.
2. **Agricultural Activities –** Intensive irrigation and heavy use of fertilisers lead to nitrate enrichment in groundwater, particularly in shallow aquifers and areas with high infiltration rates.
3. **Urbanisation & Wastewater Disposal –** Expanding built-up areas without adequate sewage infrastructure cause local contamination from untreated domestic wastewater and solid waste dumping.
4. **Over-extraction and Reduced Recharge –** Excessive pumping in some parts has altered natural flow patterns, encouraging the ingress of poor-quality water from adjacent brackish zones, especially in the deltaic alluvium.
5. **Structural Controls –** Shear zones and fracture networks act as conduits, sometimes transmitting water from deeper layers with higher dissolved solids.

CHAPTER 6: GROUNDWATER MODELING

6.0. GENERAL

Amaravati, the planned capital city of Andhra Pradesh, lies on the right bank of the Krishna River within Guntur district. The region is under rapid urbanization, resulting in increased water demand for domestic, industrial, and institutional needs. A reliable understanding of groundwater resources is essential to ensure sustainable water supply and to minimize risks of over-extraction, waterlogging, or contamination.

Groundwater modelling provides a scientific framework to simulate aquifer behavior under different stress conditions and to evaluate the impacts of urbanization, climate variability, and recharge interventions.

6.1. AQUIFER CHARACTERISTICS INFERRED FROM RESISTIVITY SOUNDINGS

Based on the resistivity signatures from different soundings, the aquifer characteristics are classified into hydro-geological parameters and hydro-stratigraphic units, which include degree of fracturing, weathering and presence of geological structures (joint / fault / fracture / shear / contacts), that favor groundwater storage. Weathered layer forms an important zone for infiltration of water, if its thickness and holding capacity increases. Thick weathered zones with porous residual material forms in topographic lows, act as potential groundwater repository. The depth of water level is a subdued replica of the topography of the area. Shallow water level conditions are commonly observed in valley areas, topographic lows and flat terrain, whereas the deeper water table conditions noticed near water divides and the topographic highs. Hence, the depth to water levels under unconfined conditions mainly dependent on the thickness of the weathered zone, permeability, topographic set up, the nature of aquifer material and the functions of recharge and discharge.

Based on geo-electric sections, two major aquifer systems are said to exist in this terrain, which are the shallow / unconfined aquifer within the sediments, and the fractured / deeper / confined aquifer within the weathered basement. Highest groundwater yields are obtained where the overburden, weathered columns overlies the fractured zones.

On the basis of occurrence of aquifer system and movement of ground water in the study area, hard rock units are classified into three categories; Archean crystalline granitic basement underlies by charnockite in the central part, Khondalite in the eastern part and

calc granulites in the western part of the Amaravati City. Weathered and fractured Archean crystalline rocks form the semi-confined / confined aquifer system. Sedimentary aquifer system (unconfined) overlies Archean crystalline rocks. The main aquifers constitute the weathered zone at the top, followed by a discrete anisotropic fractured zone at the bottom followed by semi-weathered and hard, massive, compact basement. Ground water occurs under unconfined and semi-confined conditions and flows downward from the weathered zone into the fracture zones. The aquifer units identified includes shallow aquifer and deeper aquifer.

Interpretation of resistivity vs thickness of sedimentary data of Amaravati City well brought out the disposition of concealed and unconfined aquifer geometry. In general, the trend of the shallow and unconfined aquifer system is almost parallel to the Krishna River, which is trending in WNW-ESE in the study area, associated with low resistivity values. Maximum thickness inferred for unconfined aquifer is about 60 - 70m, just southern part of Krishna River (Figure 78).

Figure 78: Thickness of concealed & unconfined aquifer zone

Figure 79: Variation of Resistivity of concealed & unconfined aquifer zone

Moderate to high resistivities noticed for unconfined aquifer around Borupalem, Lingayapalem, NE of Velagapudi, SW of Uddandarayunipalem, Venkatapalem and north of Undavalli areas. Aquifer thickness of >40m noticed around Rayapudi, south of Uddandarayunipalem, north of Velagapudi, Malkapuram, Venkatapuram and Undavalli areas. Isolated high zones (>40m) also observed around Nekkallu, south of Nelapadu and Velagapudi areas. Moderate aquifer thickness of around 15 - 35m inferred around Dondapadu, Thullur, north of Anantapuram, Krishnayapalem, Penumaka, Navaluru and Kurugallu areas. Thickness of 5 – 15m observed in the remaining part of the study area. Further, it is interesting to note that, the thickness of aquifer along the concealed NNE-SSW shear zone is >45m.

Isolated high resistivities over unconfined aquifer were noticed around Anantavaram, Thullur, Nelapadu, south of Velagapudi, Krishnayapalem, Southeast of Undavalli, around Kurugallu, north of Sakhamuru, and Nekkallu areas. Whereas aquifer zones having low resistivities identified in the remaining part of the study area (Figure 79).

In addition, a confined aquifer system also exists in the Amaravati City which has a multi-layered aquifer system layered beneath the shallow / unconfined aquifer, between 30 to 100m or upto 150m

depths consist of alluvium / sand, weathered and fractured bed rock. This confined aquifer is characterized by an impermeable clay layer above and hard, compact massive bed rock below.

WEATHERED ZONE

Sounding data and available drilling data indicates that the thickness of weathered zone is in the range of 10-30m in most areas covering ~78 % of area, shallow weathering (< 10 m) occurs in 55 % of the area and deep weathering (> 20 m) occurs in rest of Amaravati City. Shallow weathering mostly seen in Khondalite rock areas in the eastern part of the area. Ground water yield from weathered charnockite aquifer varies from <100m depth are more predominant (~83 % of the area), fractures occur in ~13% of area respectively and deep fractures in the range of >150m in the central part and on either side of the Amaravati City.

FRACTURE ANALYSIS

Based on resistivity sounding data, well inventory and available drilling data up to 200m depth of Amaravati City, about ~70% of the area is covered by consolidated formation / sediments unable to demarcate any major structural features (viz., fracture, shear, folds, faults and joints) in relation with lineament study. However, based on well inventory and geophysical studies including magnetic and secondary gravity data) reveals that, the fractures are oriented in specific direction towards NNE-SSW on either side of the Amaravati City at Anantavaram in the west and Tadepalli in the eastern part. In addition, a concealed shear zone was traced, trending in NNE-SSW direction from Uddandarayunipalem in the north to Ainavolu in the south. The analysis shows that fractures having a depth range in shallow aquifers from 20m to 45m and moderate to deeper aquifer ranges from 100 to 150m depth. Fracture analysis reveals that, majority of fractures (~83 %) occur within 100m depth. Further, these fractures are mostly short distance, desecrated, disconnected and thickness in meters has led to low yield in certain parts of charnockite area.

6.2. INFERRED DEPTH SECTIONS OF ALLUVIAM / SAND LAYER FROM DRILLING DATA

Based on the geological formation, depths, fracture pattern from the geophysical surveys, well inventory and available drilling data, geo-electric cross sections were drawn along North to South (section: I to V) and East to West (section: VI) directions, covering the entire area showing aquifer / fracture delineation. Northern and north-eastern part of the area, a shallow aquifer up to the depth of 45m is more potential as it comes under alluvium formation / flood plain. The North to South geo-electric sections show aquifer and fractured

delineation in between 30 m to 150m depth. In the north-western part is completely covered by Alluvium formation up to the depth of 30m, shallow depth and aquifer is in between 15 to 23m depths, whereas in south-eastern part covers completely charnockite bed rock, giving rise to very thin fractures at certain locations and it has been extended to the thicker in western part of the area. It is found that the north-eastern part shows shallow aquifer up to the depth of 45 m is more potential as it comes under Alluvium formation.

Figure 80: Locations of lithologs used for sand layer delineation

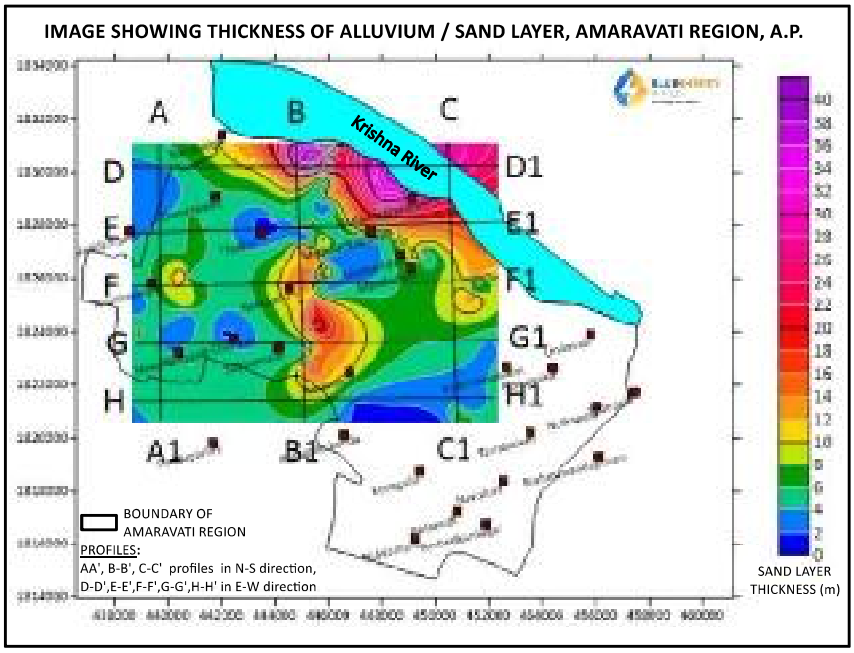


Figure 81: Contour map of Alluvium / Sand layer thickness

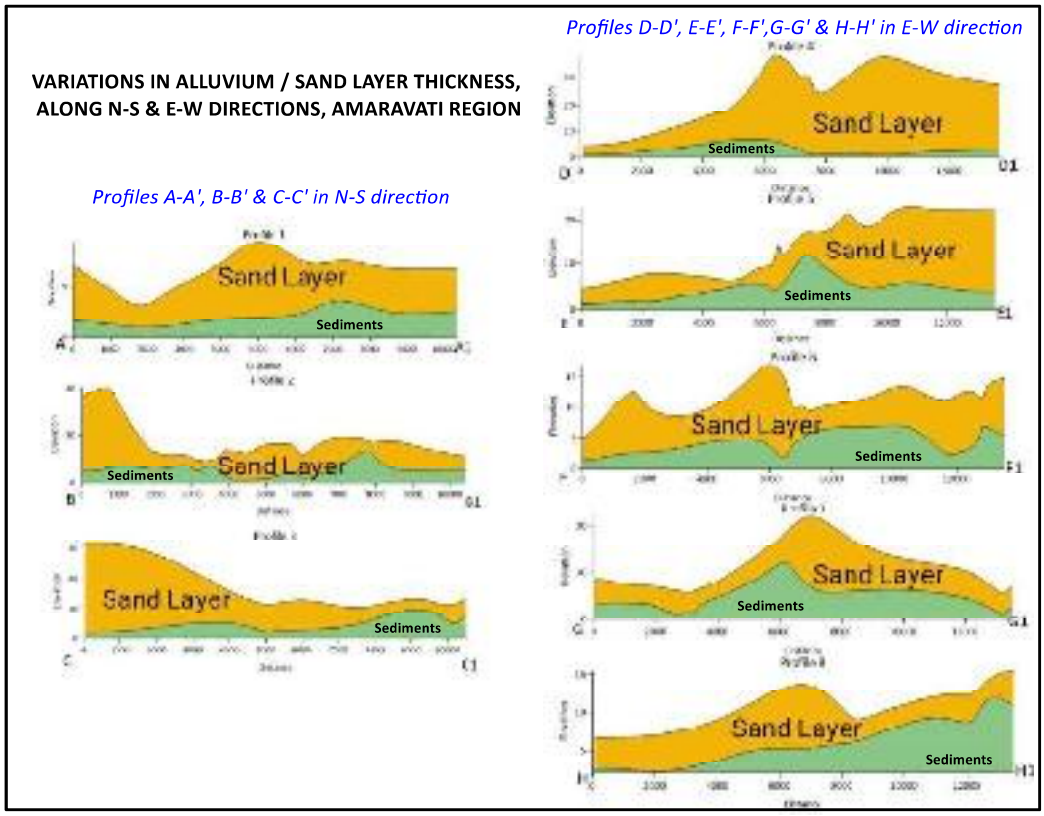


Figure 82: Inferred Sand Layer Thickness of Sections A to H

Table 8: Aquifer characteristics, its resistivity and depth range, Amaravati

	Sedimentary formations		**Crystalline basement**	
Lithology	Top black cotton soil, clay, clayey silt, silty clay, sandy clay, silty sand / sand and gravel.		Charnockite, Khondalite, Pyroxene / Calc Granulite and Granite gneiss	
Aquifer type	*Unconfined aquifer*	Weathered zone	*Confined aquifer*	Fracture zone
Thickness	1 – 30m	Upto 60m	30 – 100m	Upto 150m
Depth	30m	85% encountered within 30m	30 – 100m	85% encountered within 100m

6.3. MANDAL WISE AQUIFER DISPOSITION

Thullur Mandal

Geology & Aquifer Type: Underlain predominantly by Archaean crystalline rocks – gneisses, Khondalites, and charnockites.

Aquifer-I: Weathered zone aquifer (8–15 m bgl), tapped by dug wells; yields ~0.12–3 lps.

Aquifer-II: Fractured rock aquifer (40–120 m bgl, with deep fractures up to ~173 m bgl); yields ~1–5 lps.

Special Features: Groundwater occurs in secondary porosity; fracture density varies across Mandadam, Rayapudi, Velagapudi, Uddandarayunipalem.

Mangalagiri Mandal

Geology & Aquifer Type: Mix of crystalline rocks and minor alluvial cover along drainage zones.

Aquifer-I: Weathered zone (~10–15 m bgl) – supports irrigation through dug wells; yields up to 200 m^3/day.

Aquifer-II: Fractured aquifer at 40–100 m bgl; bore wells yield 1–3 lps generally.

Special Features: Areas like Nidamarru and Nowlur have both shallow alluvial deposits and hard rock aquifers, leading to variable yield.

Tadepalli Mandal

Geology & Aquifer Type: Located along Krishna River floodplain – dominated by alluvium (sands, clays, gravels) over crystalline basement.

Aquifer-I: Unconfined to semi-confined alluvial aquifer (5–20 m bgl); moderate to high yields (up to 10–12 lps in coarse sand/gravel zones).

Aquifer-II: Underlying weathered/fractured crystalline rocks (depth >40 m bgl); yields vary 1–5 lps.

Special Features: High recharge potential from Krishna River; better groundwater quality near riverbank filtration zones.

CHAPTER 7: RECHARGE PLAN FOR THE AMARAVATI CAPITAL CITY

7.0. GENERAL

Amaravati, the emerging capital city of Andhra Pradesh, is located on the right bank of the Krishna River and is envisioned as a modern, sustainable urban centre. With rapid urbanization and increasing water demand, groundwater has become a critical resource for domestic, industrial, and institutional sectors. However, over-dependence on borewells and limited recharge opportunities have resulted in stress on aquifers.

This chapter outlines a comprehensive **Groundwater Recharge Plan** designed to enhance aquifer sustainability, mitigate water scarcity, and support the long-term water security of Amaravati city.

7.1. OBJECTIVES

- Enhance aquifer recharge to meet future urban water demands.
- Integrate recharge measures into flood control and stormwater management.
- Improve water quality in brackish and saline-prone zones.
- Ensure long-term groundwater sustainability alongside city development.

7.2. GROUNDWATER POTENTIAL ZONES

A groundwater potential map is developed through the weighted overlay analysis (of spatial datasets, including slope, drainage density, lineament density, soil types, geology, geomorphology, and land use/land cover. Based on the weightage the groundwater potential zones classified as Very low, low, moderate, High, Very High (Figure 83).

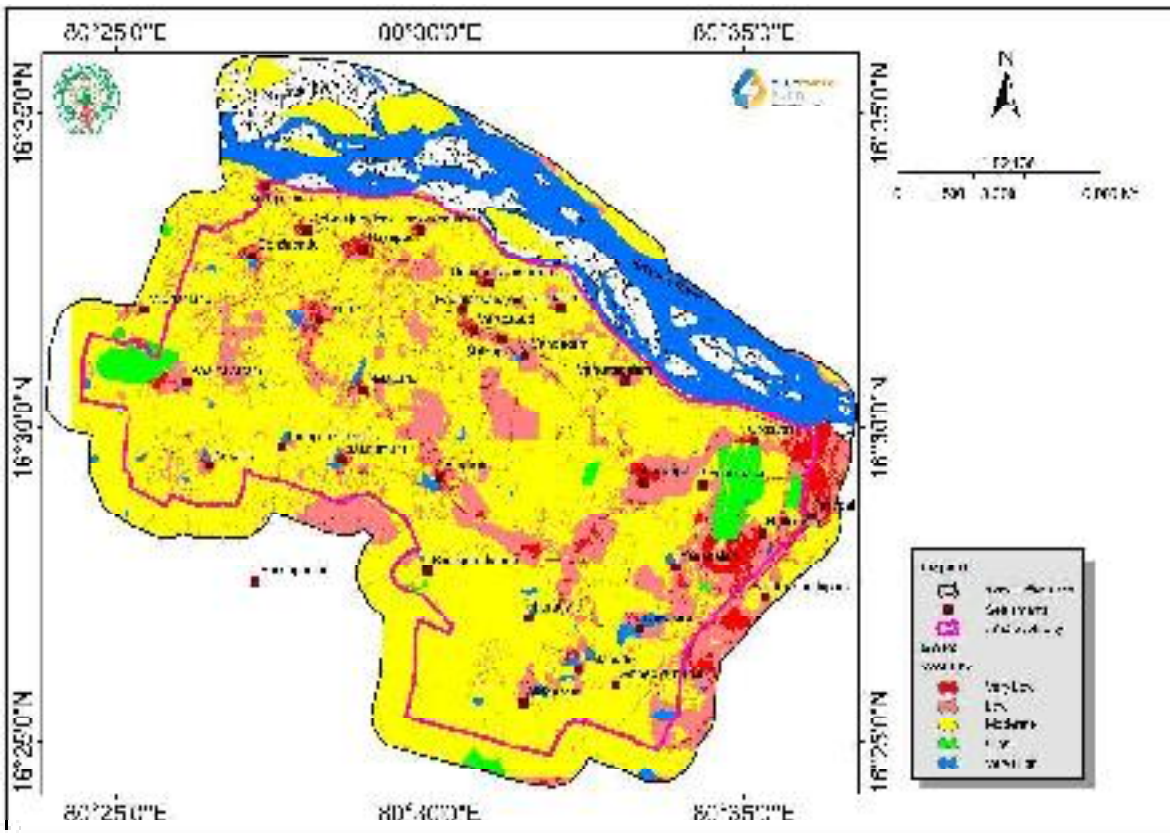


Figure 83: Groundwater Potential Zones derived from Land use land cover, Geology, Geomorphology, Drainage, Slope, Soil and Lineament Density

Table 9: Recharge zonation based on aquifer type, geomorphic setting, infiltration potential, and water quality

Zone	Key Villages	Geomorphic Setting	Aquifer Potential	Recharge Priority
High Potential Alluvial Zone	Uddandarayunipalem, Lingayapalem, Krishnayapalem, Sakhamuru	Flood plains, valley fills	Thick sand/gravel layers, shallow water table	High
Moderate Potential Pediplain Zone	Rayapudi, Velagapudi, Nelapadu, Thullur, Inavolu	Pediplains, residual soils over weathered rock	Moderate yield, deeper water table	Moderate
Structural/Shear Zone Recharge Corridor	Uddandarayunipalem–Ainavolu belt	NNE–SSW shear zone in crystalline rocks	Confined aquifer in fractured basement	High
Low Potential Rock Outcrop Zone	Mangalagiri, Anantavaram, Nidamarru	Structural hills, rocky uplands	Limited storage, fractures as recharge sites	Low–Moderate

7.3. RECOMMENDED RECHARGE STRUCTURES

Flood Plains & Valley Fill Areas (High Infiltration)

Percolation Tanks along major drainage lines (e.g., Kondaveeti vagu, Kottela vagu). Recharge Wells (30–50 m depth) to tap into shallow aquifers. Check Dams on seasonal streams to retain post-monsoon runoff.

Pediplains with Weathered Basement

Recharge Shafts (3–5 m diameter, 15–25 m deep) targeting weathered/fractured basement zones. Contour Trenches & Farm Ponds for local recharge and soil moisture retention.

Shear Zone Corridor (Uddandarayunipalem–Ainavolu)

Deep Recharge Wells (50–80 m) into fracture zones to enhance confined aquifer recharge. Injection Wells for treated stormwater to augment groundwater storage.

Rock Outcrop & Upland Areas

Rainwater Harvesting Pits in institutional/urban complexes. Roof-top to Ground Recharge Systems in built-up areas near Mangalagiri hills.

7.4. WATER QUALITY IMPROVEMENT MEASURES

Blending of poor-quality groundwater with harvested rainwater in brackish zones (e.g., Amaravati, Nekkallu). Bio-remediation trenches in recharge zones to reduce nitrate/fluoride levels.

7.5. INTEGRATION WITH FLOOD MANAGEMENT

Dual-purpose retention reservoirs at Neerukonda, Krishnayapalem, and Sakhamuru to store floodwater for controlled recharge. Staged pumping and diversion channels to recharge wells after major storm events.

7.6. IMPLEMENTATION PHASING

Phase 1 (Immediate): High-potential floodplain and shear zone recharge works before 2027.

Phase 2(Medium-term): Pediplain recharge interventions integrated with urban infrastructure rollout (2027–2032).

Phase 3 (Long-term): Low potential rocky upland recharge combined with landscaping, parks, and institutional RWH (2032 onwards).

CHAPTER 8: CONCLUSIONS

The Hydrogeomorphological studies conducted for the Amaravati Capital City area, as per the agreement with APCRDA, have successfully identified and mapped the critical geomorphological, geological, and hydrogeological characteristics influencing groundwater occurrence, recharge, and storage. The integration of field-based geophysical surveys, interpretation of satellite imagery, and analysis of existing hydrogeological data has provided a comprehensive understanding of the terrain and subsurface conditions.

Key findings indicate that the area exhibits distinct geomorphic units such as flood plains, buried pediments, valley fills, and uplands, each influencing groundwater potential differently. The shear zones trending in NNE–SSW and associated with lineaments have been identified as significant groundwater-bearing structures. The post-monsoon groundwater levels reveal shallow water tables near the Krishna River and along major structural trends, supporting higher recharge potential in these zones.

The study confirms the presence of multi-aquifer systems, with varying yield capacities depending on lithology—ranging from high-yield alluvial zones to moderate- and low-yield crystalline rock aquifers. Water quality assessments indicate that while most areas fall within permissible limits for drinking and irrigation, localized zones of poor quality require intervention through recharge enhancement and contamination control.

Recommendations from this study will aid in the scientific planning of water retention structures, recharge wells, and stormwater management systems, ensuring both flood mitigation and sustainable groundwater development. The outputs serve as a scientific baseline for APCRDA to integrate water resource management into urban planning, thereby contributing to long-term water security in the Amaravati Capital City.

Interpretation of geophysical and other data sets helped in identifying the architecture of the Amaravati City associated with structural features favorable for occurrence of groundwater aquifer system. Based on the analysis, the following have been inferred:

- In Amaravati City, delineation of aquifer system in the sediment / hard rock terrain is controlled by the nature of the weathered regolith and the fractured basement.

- Inferred hydro-geological characteristics of weathered portions and underlying bed rock depends on deep weathering and influence of structural features viz., joint / fault / fracture / shear and contacts.

- Hydrogeology of this area includes silty sand / sand layer within the sediments forming the shallow / unconfined aquifer system, weathered bed rock forms the deeper / confined aquifer system.

- Hydrogeology of this area reflects groundwater stored in the top sand layer / unconfined aquifer, whose thickness varies between 10 - 30m, weathered / fractured basement (confined), depth fluctuates between 30 - 100m.

- In Amaravati City, shallow aquifer within the sediments are characterized by low to moderate resistivities between 10–100 Ώ-m. Geo-electric characteristics depicts its nature as unconfined, vulnerable to infiltrating surface contaminants, with low groundwater potential, suitable for small community water supply projects.

- The semi-confined to confined aquifer system within the weathered / fractured basement is characterized with moderate resistivities varying from 10 to 200 Ώ-m and relatively thicker sequence of aquifer material. Groundwater potential seems to be largely moderate and aquifer is deemed suitable for industrial and irrigational purpose.

- The maximum groundwater resources in the basement complex occur along the major tectonic lineaments, mainly along NNE-SSW and E-W directions inferred from resistivity, magnetic and gravity data, which constitute the preferential flow paths for the groundwater.

- Lineament analysis from Amaravati City indicates that density of lineaments and their intersections represent higher level of fracturization, assume importance for potential zones of groundwater.

- Qualitative analysis of lineament data viz., lineament frequency, density, direction, length and their intersections vis-à-vis possible occurrence of groundwater, immensely helpful in delineating the concealed and unexplored potential zones.

- In Amaravati City, resistivity depth sections at different levels, well brought out the prominent resistivity low zones corroborating well with inferred lineaments, which are structurally favorable for presence aquifer system at different depths.

- Based on the resistivity signatures, shallow aquifers are inferred mostly from the eastern part / low lying areas and moderate aquifers are found in the south-western part having thick sediments.

- Based on the intensity of magnetic and gravity signatures, the study area is divided into: Zone-1 indicating high dominant magnetic and gravity anomalies in eastern part over Khondalites. Zone-II indicates low dominant gravity and magnetic anomalies in the western part over calc granulite / pyroxene granulite basement. Zone-III indicates moderate signatures in the central part over charnockite basement.

- Amaravati City falls within a fault / fracture zone, in the form of NNE-SSW and NNW-SSE trending steep gravity and magnetic gradients / lineaments on east and west respectively.

- A NNE-SSW trending geologically marked concealed shear zone was reflected in the form of gravity gradients and magnetic lows in the central part from Uddandarayunipalem to Ainavolu.

- Based on inferred lineament analysis, the NNE-SSW trending geologically marked concealed shear zone, may be affected not only by strike slip fault along but also western part may be down thrown block, evidenced by thick sediments, elevation and drainage map.

- Gravity highs correlating with isolated magnetic and resistivity highs in the eastern part may indicate the basement highs at shallow depth. Gravity lows associated with low dominant magnetic anomalies in the western part may indicate the basement at deeper depths. Isolated basement highs are corroborating well with isolated resistivity highs confirmed by VES data.

- Residual gravity lows inferred from gravity profile of the order of 0.5 mGal identified on either side of the regional gravity profile may be due to structural disturbances.

- The concealed NNE-SSW trending geologically marked shear zone having a width of 200m to 500m, increasing the width from south to north, associated with resistivity highs.

- Water quality along this shear zone is good and TDS content is less, when compared to the quality of groundwater from the SW part.

FIELD PHOTOGRAPHS

Amaravati, Andhra Pradesh, India

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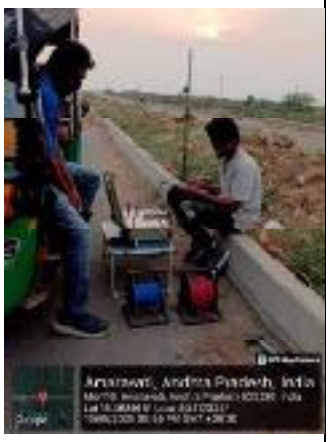
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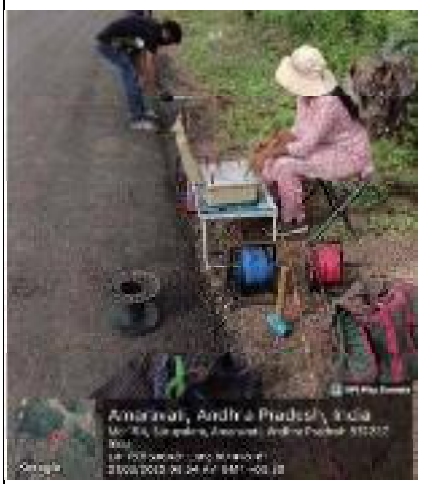
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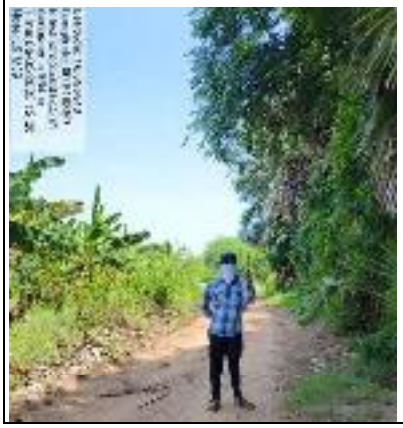

	Technical Discussion at Central Ground Water Board, Hyderabad with Regional Director Dr. Jyothi Kumar. Technical Secretary- Dr. Madhav and Dr. S Srinivasa Vittala, Scientist C.
	Technical Discussion at Central Ground Water Board, Hyderabad with Dr. S Srinivasa Vittala, Scientist C who worked in NAQUIM 2.0 project.

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