ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY
Lenin Center, Governorpet, Vijayawada, Andhra Pradesh - 520002
Phone: 0866 – 2577475 Fax: 0866 – 2577357

Rc. No.1389/LSE/APCRDA/2015, Date. 14.3.18

To
Additional Principal Chief Conservator of Forests (C),
Ministry of Environment, Forest and Climate Change,
Regional Office (SEZ),
Ist and IInd Floor, Handloom Export Promotion Council,
34, Cathedral Garden Road, Nungambakkam,
Chennai – 34

Sir,

Sub: APCRDA – Environmental clearance – 1st half yearly Compliance report – 2017 for the EC issued for Greenfield Capital city, Amaravati – submission – Regarding.

Ref: Environmental Clearance Order No. SEIAA/AP/GTN-151/2015 – dated 09-10-2015

Adverting to the reference cited above and as per the General Condition No. (vii) of the Environmental clearance I am herewith submitting the 1st half yearly compliance report for the year 2017 for Greenfield Capital city, Amaravati.

Commissioner
APCRDA & CA
Vijayawada
Andhra Pradesh.

14/3/18

1. Copy to the Chairman, State Level Environment Imfact Assesment Authority (SEIAA) A-3, Prayavarna Bhavan, Industrial Estate Sanath Nagar, Moosapet, Hyderabad, 500018.

2. Copy to the Regional Director, Zonal Office ,Central pollution control board, A-Block, Nisarga Bhavan, 1st and 2nd Floors, 7th D Cross, Thimmaiah Road, Shivanagar, Bengaluru,Karnataka-5600879.

3. Copy to the Environmental Engineer, A.P. Pollution Control Board, Regional Office, D.no :4-5-4/5C, 4/3, Navabharath Nagar, Ring Road, Guntur, Andhra Pradesh 522006

4. Copy to Joint Chief Environmental Engineer A.P. Pollution Control Board, Zonal Office, Plot No. 41,Gurunanak Road, Opp. State Bank of Hyderabad, Sri Kanakadurga Officer's Colony, Vijayawada – 520 008.

Greenfield Capital City Amaravati

1st Half yearly Compliance report for 2017

SPECIFIC CONDITIONS:

WATER ENVIRONMENT

Sl.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.	Measures are being taken to ensure no harmful discharges enter into River Krishna while preparing master plans of water, waste water and storm water drainage systems
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 i.e., 24×7, meeting the drinking water quality standards as per IS 10500.	Water supply master plan has been prepared to comply the condition. Source of water: Refer details in Annexure 1 Water treatment plant: Refer details in Annexure 2 Water supply 24x7: Refer details in Annexure 3
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 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 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.	Internal detention ponds and two reservoirs are planned to achieve twin objectives – combat of inundation and utilization of water and storm water drainage network is being designed to avoid flood and water logging problems. Measures are being taken regarding climate change considerations and capacities of drains while preparing storm water drainage network. Protecting and improving of existing natural drains and strengthening of Krishna River bund will be complied.
4	Detailed studies on the flood management of the Storm water drains, mainly Kondaveeti vagu 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 DPR on flood management has been prepared by M/s Arcadis a Dutch consulting firm and M/s TCE Refer details in Annexure 4
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	It will be complied with.

	cleaned after first heavy shower (iii) subsequently, after retreating of rain i.e., in the post monsoon.	
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.	It is complied. RWHS are mandatory in Zoning Regulations of CRDA. Refer details in Annexure 5
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.	It will be complied with.
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.	Provisions will be incorporated as a guideline in the bye-laws.
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 lying dedicated pipeline for supply of treated grey water as committed in the EIA report. The 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	Measures are being taken to ensure 100% collection of sewage with underground network and to ensure treat entire waste water. Treated waste water will be used for greenery and other purposes. There will be no contamination of fresh water as dedicated pipelines are proposed for both fresh and treated waste water. Refer details in Annexure 6
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.	It will be complied with simultaneous development of city in the 1st phase.
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.	It will be complied with proposed SCADA system. Refer details in Annexure 7

12	All roads should have rain water drains connected separately (from the sewage network) to the treatment facility of the zone.	Proposals are made and will be complied.
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.	It is proposed and sites are identified to establish STPs zone wise.
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.	It will be complied with.
15	The proponent shall prepare water footprint and carry auditing every year.	It will be complied with.

AIR ENVIRONMENT

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.	Plans are made to construct the roads with walking, cycling and public transport system and it is proposed to use cleaner fuels and fuel efficient vehicles. Refer details in Annexure 6
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 to50 kmph and on collector 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	Plans are made for footpaths with a width of 2-3 mts and plantation intervals are 2-3 mts and 5 mts for small trees and big trees respectively. The proposals were made for major road classes with recommended speed limits, proper safety measures, road infrastructure, street level crossings, vending spaces and greenery development.

	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.	
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. - Promote and implement public sharing schemes.	It is planned to construct dedicated bicycle tracks for all streets with necessary crossings and proposed to promote Public Bike Sharing (PBS) system in the City .
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.	Provisions are made for dedicated Non-Motorized Transport (NMT) and local grid pattern is being planned for LPS layouts and major roads. Refer details in Annexure 6
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.	Arterial and sub-arterial roads are planned with dedicated public transport systems which are planned adjacent to one another with a walking distance of 400 mts.
6	The proponent shall encourage battery operated vehicles by providing separate lane with a provision for recharging.	Proposals are being made to encourage battery operated vehicles.
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 use cleaner fuels like LPG/CNG for public transport vehicles to encourage usage of low sulphur diesel and unleaded petrol by vehicles.
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)	Public transport systems and non motorized transport systems are planned and will be encouraged and it will be discouraged the usage of

	and physical (like levies on car, fuels, congesting charges).	personal cars.
9	The proponent shall provide adequate parking facilities by giving priority to public vehicles and non motorized transport vehicles.	It is identified necessary parking facilities for public vehicles and non motorized transport vehicles.
10	The proponent shall ensure that all utility lines (electricity, telephone, cable, water supply, sewerage, 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.	It will be complied with.
11	The proponent shall ensure that DG sets shall comply with noise and emission norms prescribed by MoEF& CC in Environment (Protection) Rules.	It will be complied with noise and emission norms prescribed by MoEF& CC in Environment (Protection) Rules.
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, atleast 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 committed.	Measures will be taken to meet 10% energy needs from the renewable energy sources.
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.	It will be incorporated e in the bye-laws.
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. All point light sources shall be CFL or LEDs or equivalent. All linear light sources shall be T-5 or atleast 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 atleast 15% of total external lighting load through renewable energy sources and all commercial, institutional, industrial and mixed use buildings shall meet atleast 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 atleast 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.	It will be complied with and the energy efficiency guidelines will be incorporated in the bye laws.

	All major buildings land complexes shall meet Energy Performance Index of less than 150kWh/Sq.m per year. All commercial buildings with 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 there 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 $km^2$of area, located strategically considering the wind rose of the area and terrain conditions.	An online Ambient Air Quality station is established in Interim government complex, Velagapudi by SPCB and other stations will be established with simultaneous development. Refer details in Annexure 8
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.	Greenery is being developed in the capital city along all roads, water tanks and newly developed projects for the both purposes of aesthetic view and carbon sequestration. The carbon stock will be monitored and will be submitted. The details of the greenery developed in the Interim Govt Complex and Capital city area are attached in Refer details in Annexure 9
17	The proponent shall prepare carbon footprint for the city and strive for carbon neutrality.	It will be complied with.

SOLID WASTE MANAGEMENT

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.	An integrated solid waste management plan is being prepared and two bin system will be followed for both biodegradable and non biodegradable waste. Hazardous waste generated by households will be collected separately in suitable container as and when such a waste is generated.
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	It will be complied with and the waste management is contractors' responsibility which is incorporated

	ensures segregation at the origin level only.	in the bid documents.
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.	It will be complied in Integrated solid waste management plan.
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.	Suitable spaces will be allocated for sorting of recyclable materials while preparing integrated solid waste management plan.
5	The proponent shall identify and allocate adequate land for Multiple Transfer Stations with mechanical Material Recovery Facility for secondary segregation and storage of dry waste as committed. Transfer Stations shall be properly covered and hygienically maintained to minimize Environmental and Health Hazards.	Adequate number of transfer stations will be allocated for the mechanical recovery facility for secondary segregation and storage of dry waste with in integrated solid waste management plan. Transfer stations will be maintained as per the rules.
6	The proponent shall ensure daily sweeping of all public streets and periodical cleaning of all public places.	It will be complied in integrated solid waste management plan.
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.	It will be complied in integrated solid waste management plan.
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.	Provision will be incorporated in building bye laws.
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.	It will be complied with.
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.	It will be complied with.
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.	A common biomedical waste treatment and disposal facility will be established with in integrated solid waste management plan.
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	It will be provided within the integrated solid waste management plan.

	proponent shall allocate suitable and adequate site for setting up of plastic recycling, processing and disposal facilities.	
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.	It will be provided within the integrated solid waste management plan.
14	The proponent shall identify and allocate suitable site for establishment of common Hazardous Waste Treatment and Disposal Facility.	It will be complied with.
15	The proponent shall facilitate establishment of used battery Collection Centers by manufactures / importers / assemblers / reconditioners and canalize the used batteries to register recyclers. Proponent shall allocate suitable site for setting up of used battery recycling facilities.	It will be complied with.
16	Proponent shall ensure proper collection and scientific disposal of sludge from the water treatment plants, sewage treatment plants, water seal latrines and septic tanks.	The sludge generated from different sources will be collected and disposed scientifically as per standard guidelines.
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.	It will be complied with in integrated solid waster management plan.
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.	An adequate and suitable site will be allocated for integrated solid waste management facility with all necessary facilities in the first phase as committed.
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 mtrs width.	A greenbelt with a minimum width of 100m around integrated solid waste management facility and common hazardous waste treatment and disposal facility will be developed.
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.	It will be ensured that the utilization of fly ash in different forms will be done in the capital city development works in compliance with fly ash notification issued by MoEF. Usage of flyash based products will be incorporated as guideline in bye laws.

ECOLOGY

1	A list of all existing water bodies (including ponds, tanks, drains, irrigating channels) falling in the proposed area, shall beprepared 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;	All the water bodies that were mentioned in the EIA report are being protected and maintained.
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;	It will be complied with.
3	Improvement or rehabilitation of existing natural streams, channels / nallas shall be carried out without disturbing the ecological habitat.	It will be complied with.
4	No untreated or treated wastewater shall be discharged in any of the water bodies including Krishna River under any circumstances.	It will be complied and all the treated waste water will be reused for greenery and other purposes.
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.	Around 30 % of the capital city Area is planned for open green spaces and recreational spaces. Refer details in Annexure 10
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.
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.	It will be complied with and all the existing water bodies have been protected and two large water bodies are being developed in the City to store upto 1 TMC in total.
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 will be complied with.
9	The proponent shall encourage urban agriculture to meet the city food requirements and reserve high value agriculture land wherever possible for this purpose ass committed.	Urban Agriculture is not allowing as per city zoning regulations and however necessary steps will be taken to increase productivity of farm lands within the Capital Region area to compensate the loss within the city area.

10	The proponent shall utilize natural features such as forest and hills to create regional green network as committed.	It will be Complied with.
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 friendly activities only.	The city master plan proposes 13.62% of total city area as 'Protected area' that comprise of 'Reserve Forest land'. The reserve forest land will be utilized only after obtaining diversion approval.
12	The proponent shall utilize treated sewage water for irrigation of primary and secondary green areas by laying pipeline network.	The treated sewage water will be utilised for the development and maintenance of the greenery areas by laying a pipeline network.
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.	Complied as per City master plan.
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.	It will be complied with.
15	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.	It is proposed to take up greenery based on the agro climatic zone of Guntur and Krishna district with native species of these districts along with native species of AP and India only will be planted.
16	The proponent shall reserve most of the waterfront along the Krishna River for public use as committed.	Water front along the Krishna river is planned in city master plan. Refer details in Annexure 11
17	The proponent shall create 780 Ha recreational landscapes including Theme Parks, Golf Courts, Sports and Recreational Spaces.	Active recreational zones of 7% and passive recreational zones of 9.8 % has been proposed in City master plan.
18	The proponent shall create green and blue network interconnecting all reservoirs, water bodies and green spines as committed.	Green and blue network has been proposed in City master plan. Refer details in Annexure 12
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.	It will be complied with.
20	A major part of the development of the water bodies and green areas be completed before the end of the construction phase;	The development of water bodies and green areas will be developed simultaneously and will be completed before the construction

		phase.
21	All construction activities by the proponent should ensure that the activities do not adversely affect the water bodies and their ecology.	It will be complied with.
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 blue master plan is prepared with no lining concept. However, considering the soil nature additional measures will be taken up after due technical study.
23	Improvement or rehabilitation of existing natural streams, channels / nallas shall be carried out without disturbing the ecological habitat.	Improvement or rehabilitation of existing natural streams, channels/nallas 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.	Measures to avoid soil erosion will be taken up and the top soils at borrow areas will be preserved and utilized for landscape works.
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.	It is being complied.
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.

RESETTLEMENT AND REHABILITATION

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;	Noted and being adopted.
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.	It is being complied with Amaravati skill development centre. There are 15 skill development programs are conducted in which 612 persons were trained and 366 placements have been completed. Refer details in Annexure 13

DISASTER MANAGEMENT

1	The proponent shall prepare and implement proper flood management plan to overcome threats posed by the Kondaveeti Vagu and its tributaries, Krishna River, heavy rains (more than 1000 mm) and cyclones.	The major intervention areas of the flood management plan of the capital city are as follows- Construction of detention ponds, construction of reservoirs, river training works, bund strengthening works, water level monitoring etc.
2	The proponent shall prepare earth quake 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.	GoAP has considered all the measures pertaining to city resilience. The ADCL has appointed M/s Arcadis a Dutch consulting firm and M/s TCE for the preparation of Blue Master Plan.
3	The proponent shall create adequate infrastructure for emergency fire fighting.	It will be complied with.
4	The proponent shall prepare emergency Health Management Plan.	The health management plan will be developed at city level.

ENVIRONMENT MANAGEMENT DURING CONSTRUCTION PHASE

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.	The contractors have been mandated to have labour camps with adequate basic amenities, welfare and sanitary facilities for workers engaged in respective projects.
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 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	All the materials transporting vehicles are covered with tarpaulin during transportation. Regular water sprinkling is being done to suppress dust generation during construction. Regular servicing of equipment and vehicles used in construction activity is being done to maintain the gaseous emission from these equipment. Personnel Protective Equipments have been provided to all workers and precautionary measures have been taken for safety of workers on site. Refer details in Annexure 14

	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.	
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.	For all the construction activities only surface water is being used and it will be ensured that a policy on water usage by different users will be brought up.

ENVIRONMENT MANAGEMENT MONITORING SYSTEM

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.	An Environmental Management Regulatory Authority is established by APCRDA to carry out functions relating to environmental management.

GENERAL CONDITIONS

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 Environment Impact Assessment Authority, as per provisions of Environment Impact Assessment Notification 2006.	It will be complied with.
2	The proponent shall incorporate penal provision in the bye laws / regulations for any violation of environmental issues. The proponent shall also create proper institutional mechanism to ensure continual environmental awareness among all stakeholders.	It will be complied with. The penalties for violating the norms relating to the environment will be incorporated in the bye laws.
3	The proponent shall obtain consent from Andhra Pradesh Pollution Control Board.	It is complied. CFE has been obtained by APPCB. Refer details in Annexure 15

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, Storage and Import of Hazardous Chemical Rules, Fly ash notification and standards notified by MoEF under Environment (Protection) Act, wherever applicable.	On going.
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. Refer details in Annexure 16
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 same periodically.	Submitting and uploading half yearly reports on the status of compliance of the stipulated environmental clearance conditions.
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.	Noted and it will be complied.
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 Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules.	Noted.

Commissioner
APCRDA
Vijayawada
Andhra Pradesh

14/3/18

Annexure - 1

Proposed Master Plan For Water Supply

1. City Coverage & Population Served

Water supply system will cover the entire city of 217.50 sq.km. area. The population estimation is based on the planned land use for the city and Floor Surface Index (FSI) method. The proposed water supply system will serve the projected population as per the following break-up:

S. No	Service Category	Population 2050
1	Residential	35,52,950
2	Commercial	5,45,032
3	Institutional	5,07,051
4	Industrial Work force	1,21,485

2. Water Supply Demand

The water supply demand for the city is assessed based on the projected population for different years and per capita rate of water supply for different land uses and utility services, using

(i) Standard assumptions specified in the CPHEEO Manual,

(ii) Comparative studies made on international best practices

S. No	SERVICE CATEGORY	RATE OF SUPPLY	BASIS
1	Residential	150 LPCD	CPHEEO Manual on Water supply
2	Commercial	45 LPCD	CPHEEO Manual on Water supply/NBC/ URDPFI
3	Institutional	45 LPCD	
4	Industrial Non-Polluting Industries	35,000 Litres/ha/ day	Various Industrial Corridors Study DMICDC
5	Fire Fighting	1800 LPM for 2 hours i.e., 216 KL/Sq. Km	IS 9668
6	Landscaping	5mm/Sq. m/day	Development Plan (DMICDC)
7	Avenue Plantation	28 KL/KM/ Day	DMICDC

(iii) Recommendations of the Technical Expert Committee.

Besides the above, following additional demands are considered:

- 10% demand for each service category to suffice floating population and infrastructure cushion.
- 10% demand for 'Unaccounted Flow of Water'.
- 2%demand for transmission losses.
- 3% demand for treatment losses.

The total water demands for residential and workforce population for Commercial / Institutional / Industrial (I3 category) and additional demands as stated above thus arrived is given below:

- Total raw water demand: 776 MLD (10.0 TMC)
- Total clear water demand: 752 MLD

As per MoUD, Govt. of India guidelines of service level benchmarking, extent of reuse/ recycling of treated waste water is 20%. Total capacity of all the STPs proposed in 20 zones in the capital city is estimated as 675 MLD by horizon year 2050. The extent of reuse proposed is 198 MLD from the selected 7 zones which is 29.33% of the proposed sewerage capacity. This additional water source of 198 MLD is proposed to be used as 'reuse / recycle water application for:

- 'Urban Irrigation' & 'Fire Fighting' : 158 MLD
- 'District Cooling' : 21 MLD
- Transmission & re-use Losses: 19 MLD

3.Water Quality Standards

The water quality of the capital city shall maintain potable water quality standards prescribed by CPHEEO and WHO. Generally, water quality of Krishna River (as the source) is moderate except turbidity which is high during the monsoon season. Water of Krishna River are being used for long for water supply to Vijayawada and Guntur towns. Therefore, water quality of source locations is fairly known.

4.Water Supply Source

At the Concept Plan stage, all potential water sources are examined from the point of view of comparative merits and demerits. These potential sources are:

1. Prakasam Barrage on Krishna River
2. Pulichintala Dam on Krishna River
3. Proposed Vaikuntapuram Barrage on Krishna River
4. Lift Irrigation Schemes (now abandoned due to coming up of the capital city
5. Proposed Flood Water Storage Tanks on Kondaveeti Vagu
6. Ground Water
7. Desalination of Sea Water

Selection criteria used to identify the best possible source is 'Source Scaling' which expresses the weightage of the source in terms of different comparable parameters with scale ranging from 1(excellent) to 5 (worse). These

Annexure - 1

parameters are: turbidity storage capacity, source sustainability, distance from city, capital cost, power requirement, O & M cost, land requirement and ease of construction. The source with the lowest weightage score is considered as the best for the project.

FACTOR	Source-1 PULICHINTALA DAM	Source-2 PRAKASAM Barrage	Source-3 GROUND WATER	Source-4 PROPOSED STORAGE TANKS	Source-5 VAIKUNTAPURAM BARRAGE	Source-6 DESALINATION
Turbidity	2	2	1	2	2	5
Storage Capacity	1	4	5	4	2	1
Source Sustainability	1	3	4	4	2	1
Distance from City	4	2	1	1	3	5
Capital Cost	4	2	4	3	5	5
Power Requirement	4	2	5	3	1	5
O & M Cost	4	2	5	3	1	5
Land Requirement	4	1	2	5	3	5
Ease of Construction	4	2	2	3	4	5
Total	**28**	**21**	**29**	**26**	**24**	**37**

Water supply source suggested for the capital city are identified as Prakasam barrage and proposed Vaikuntapuram barrage. Advantages of these sources are: (i) vicinity to the capital city and hence reduced capital cost for pipe line infrastructure to convey water (ii) perennial storage Net Dependable yield in Prakasam Barrage with last 45 years inflow records shows 1.00 – 2.0 TMC after providing all existing allocations. After the construction of the Polavaram dam on Godavari River and diversion of water.to Krishna River, the inflows to the Prakasam barrage will increase. Vaikuntapuram barrage is to be proposed exclusively for the capital city project with an expected storage capacity of 4 to 8 TMC.

Phase-wise water supply source development is proposed to be:

- Prakasam barrage as source with 2.0 TMC of water supply to cater to Govt. complex area and existing 29 villages.
- Vaikuntapuram barrage as source with 8.00 TMC of water supply for balance water supply demand for the capital city.
- If proposed Vaikuntapuram barrage does not come up due to various reasons, water supply for 8.5 TMC is proposed to be drawn from Pulichintala reservoir (Gross Storage capacity:45.77 TMC).

Raw water proposed to be drawn from each source is given below:

S. No	Source	Raw Water Demand
1	Prakasam Barrage	155 MLD
2	Prop. Vaikuntapuram Barrage	621 MLD

5. Water Supply System Components

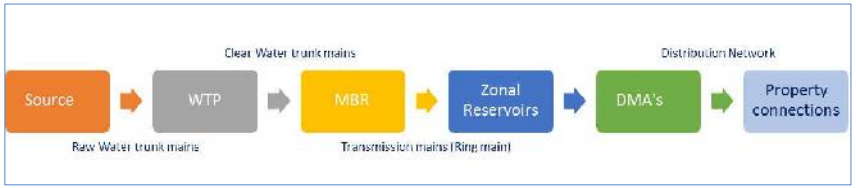
Water supply system components are shown below in the figure. Design of each component is performed following guidelines in CPHEEO Manual.

5.1. Raw Water Intake Well cum Pumping Station

1. RCC Intake cum Collection Well of 15m diameter -1 number, with provision of storage and pump house on the south bank of Krishna River at Prakasam barrage to draw 155 MLD of water.
2. RCC Intake cum Collection Well of 15m diameter – 4 number, with provision of storage and pump house on the south bank of Krishna River to draw 621 MLD of water.

5.2. Pumping Main

1. Raw water pumping main: 1400 mm Φ MS pipe of of 2.10 km length to transport raw water from Intake Well at Prakasam barrage to WTP at Undavalli.



Annexure - 2

- Centrifugal Pump

A broad comparison on the working of the pumps is given below:

6.24 Water Treatment Plant

All surface waters have the potential to carry pathogenic microorganisms and must be disinfected prior to human consumption. Since the adequacy of disinfection cannot be assured in the presence of turbidity, it is first necessary to remove the suspended solids causing the water to be turbid. This is accomplished by a sequence of treatment processes that typically includes coagulation, flocculation, sedimentation, and filtration. The available raw waters must be treated and purified before they can be supplied to the public for the potable and other uses. The extent of treatment required to be given to the particular water depends upon the characteristics and quality of the available water, and also upon the quality requirements for the intended use.

Depending on the magnitude of the treatment required, proper unit operations are selected and arranged in the proper sequential order for the purpose of modifying the quality of raw water to meet the desired standards.

For Amaravati capital city, the consultants are exploring latest water treatment technologies with smart operating system linked with C4. The unit operations are to planned to obtain the desired potable water quality.

6.25 Raw Water Quality

The factor that most influences the selection of unit operations used in the treatment is the quality both of the "Raw water" and of the final product, "Treated water". The suitability of water for domestic and drinking water supply is determined by a limited number of quality indicators and assessment criteria.

The main traditional indicators for drinking water quality are: physical, chemical and biological components, some of which are of decisive significance for public health aspects of water treatment.

In view of the public health standpoint, the safety of drinking water is determined by indirect indicators such as total bacteria, coliforms, viruses and pathogenic bacteria because of their possibility of survival in relatively high temperature surface water found in most developing countries. In this study E. Coli is used as an indicator, as well as unit operation selection parameter.

Raw water is drawn from Krishna river from two different locations which is the only feasible source of supply to the capital city. Raw Water quality parameters of Krishna river at four different locations are attached in the Annexure-VI of this report.

6.26 Water Treatment

Water treatment is any process that makes water more acceptable for a specific end-use. The end use may be drinking, industrial water supply, irrigation, river flow maintenance, water recreation or many other uses including being safely returned to the environment. Water treatment removes contaminants or reduces their concentration so that the water becomes fit for its desired end-use. The desired end use for the capital city is potable water characteristics and in order to attain it, basic treatment operations are required.

6.26.1 Treatment Methods

Treatment methods include unit operations on raw water to attain the end use quality. These parameters can be attained by organizing the sequential operations of treatment units in a systematic manner. The operation includes:

Unit operations – Conventional Treatment Process

Water treatment involves removal of undesirable constituents from water and dispose them in easiest and safest manner. To achieve these goals, a variety of treatment operations and process are utilized, which exploit various physical and chemical phenomena to remove or reduce the undeliverable constituents from water. Those operations used in this treatment of water in which change is brought about by means of or through application of physical forces are known as **Unit operation (UO)**. Those processes used for the treatment of water in which change is brought about by means of chemical reaction are known as **Unit Processes (UP).**

There are a number of unit operations for water treatment. The choice of unit operations depends primarily on the substances needed to be removed. Removal of undissolved substances (solids) is effected by mechanical processes. Dissolved substances can be removed by either biological or physical/chemical processes.

The process units involved in the conventional treatment process are

- Aeration
- Clariflocculation
- Sedimentation
- Filtration
- Disinfection

Annexure - 2

6.26.1.1 Aeration

Aeration brings water and air in close contact in order to remove dissolved gases (such as carbon dioxide) and oxidizes dissolved metals such as Iron, Hydrogen Sulphide, and volatile organic chemicals (VOCs). Aeration is often the first major process at the treatment plant. During aeration, constituents are removed or modified before they can interfere with the treatment processes.

Chemicals removed or oxidized by aeration

Constituents commonly affected by aeration are:

- Volatile organic chemicals, such as benzene (found in gasoline), or trichloroethylene, dichloroethylene, and perchloroethylene (used in dry-cleaning or industrial processes)
- Ammonia
- Chlorine
- Carbon dioxide
- Hydrogen sulphide
- Methane
- Iron and Manganese

6.26.1.2 Clariflocculation

The clariflocculation is a chemical and physical water treatment process and it mainly consists in the removal of suspended substances. Its application is in the water treatment of surface water, industrial and municipal wastewater treatment, filtration pre-treatment, Reverse Osmosis, both in the municipal and industrial sectors.

The clariflocculation allows the removal of organic compounds, sedimenting particles and heavy metals.

The clariflocculation process is a traditional and consolidated treatment. The sequence of operations sedimentation-precipitation-coagulation-flocculation is the most common technique used in the world for the production of potable water. The process requires low costs for high volumes of purified water. It is a reliable process suitable for automatic control.

6.26.1.3 Sedimentation

The microbial quality of water sometimes can be improved by holding or storing it undisturbed and without mixing long enough for larger particles to settle out or sediment by gravity. The settled water can then be carefully removed and recovered by decanting, ladling or other gentle methods that do not disturb the sedimented particles. Sedimentation has been practiced since ancient times using small water storage vessels or larger settling basins, reservoirs and storage tanks. The advantages and disadvantages of plain sedimentation for household treatment of water are summarized in Table

Factors that influence sedimentation are

a) Size, shape, density and nature (discrete or flocculent) of the particles;

b) Viscosity, density and temperature of water.

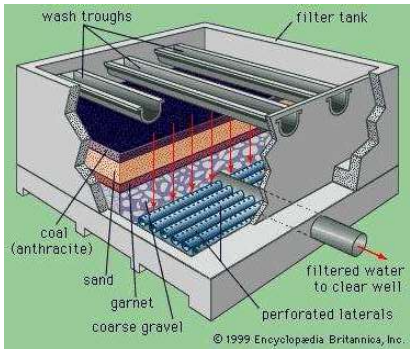
c) Surface over flow rate;

d) Velocity of flow;

e) Inlet and outlet arrangements;

f) Detention period and

g) Effective depth of settling.



6.26.1.4 Filtration

Filtration is a process for separating suspended and colloidal impurities from water by passage through a porous medium or porous media. Filtration, with or without pre-treatment, has been employed for treatment of water to effectively remove turbidity (e.g., silt and clay), colour, microorganisms, precipitated hardness from chemically softened waters and precipitated iron and manganese from aerated waters. Filtration of municipal water supplies normally is accomplished using Rapid sand filters.

Filtration process in Rapid Sand Filters (RSF)

Rapid sand filtration is a purely physical drinking water purification method. Rapid sand filters (RSF) provide rapid and efficient removal of relatively large suspended particles. Two types of RSF are typically used: rapid gravity and rapid pressure sand filters. For the provision of safe drinking water, RSFs require adequate pre-treatment (usually coagulation-flocculation) and post-treatment (usually disinfection with chlorine). Both construction and operation is cost-intensive. It is a relatively sophisticated process usually requiring power-operated

Annexure - 2

pumps, regular backwashing or cleaning, and flow control of the filter outlet. Rapid sand filtration is common in developed countries for the treatment of large quantities of water where land is a strongly limiting factor, and where material, skilled labour, and continuous energy supply is available. RSF can provide a very efficient method in larger urban water supply systems if preconditions are met.

6.26.1.5 Disinfection

The post treatment required after RSF is disinfection with chlorine. The filtered water may normally contain some harmful disease producing bacteria in it. These bacteria must be killed in order to make the water safe for drinking. The process of killing these bacteria is known as Disinfection or Sterilization.

The bacterial contamination because of unessential microorganisms present in treated water may be taken care by germicidal action of chlorine as explained by the recent theory of *Enzymatic hypothesis*, according to which the chlorine enters the cell walls of bacteria and kill the enzymes which are essential for the metabolic processes of living organisms.

The major disadvantage of the chlorination is the formation of harmful bi products such as Bromoform and Dibromo-chloromethane which are mainly responsible for health hazards. Hence, it is essential to maintain the maximum residual chlorine limit of 2ppm at the consumers tap by maintaining proper control on operations of disinfection process.

6.26.2 Process Selection Consideration

The following criteria has been adopted for the selection of unit operations and Water Treatment Plant types,

a) Raw water quality
b) Coagulation and Flocculation
c) Type of community
d) Capacity of Operation and Maintenance

The O & M of the treatment plant operation is considered for the durability and sustainability of the system. The elements required for the operation of the system are

1. Manpower for the maintenance of the plant
2. Expenditure incurred for power supply to run the system
3. Maintenance cost of the smart systems and other fixtures used in the plant.
4. Expenditure incurred for the raw materials that are used in the plant such as Chlorine, Sand, Gravel etc., used in filtration.

In order to maintain the water treatment unit in a long-term basis for at least design period, it is essential to plan proper revenue generation strategies and Operation & Maintenance structure. Also, the revenue generation strategies are to be organized by the local government with cooperation of the stake holders, communities, Industrialists and residents of the proposed city.

6.26.3 Other Advanced Water Treatment Technologies

1. Flocculation & Clarification by MULTIFLOW Technology

MULTIFLO technology is a universal and multi-purpose clarification process that can be adapted under different forms to meet the various needs of our municipal and industrial clients.

2. Submerged Ultra Filtration Technology

Ultra-Filtration technology is the most advanced water treatment technology using Membranes used in developed cities of the United States.

3. YSJ-B Stype Technology

YSJ-B stype technology is efficient in sediment removal, automatic filter and backwash applications on raw water within a smaller footprint. This technology is developed as per Water Supply engineering planning standards of China.

The details of the above technologies with costing are attached in Annexure – X.

Annexure - 3

Piped water supplies for communities should provide adequately for the following requirements:

- Domestic needs such as dinking, cooking, bathing, washing, flushing of toilets, gardening etc.
- Institutional needs.
- Industrial & Commercial needs.
- Floating Population demand.
- Fire Fighting.

Unit norms for water supply recommended and finalized by the Technical Expert Committee for Amaravati Capital City is provided in Table 6-3.

For Amaravati city, additional **10%** of water demand is considered on each category of per capita supply for floating population demand and infrastructure cushion.

6.4 Hours of Supply

The water supply system is proposed to be designed for 24 x 7 basis, which means, supply of water for 24 hours a day, 7 days in a week and 365 days in a year to have continuous water supply for the capital city. Advantages of 24 x 7 water supply system are stated below:

24x7 supply delivers better quality water for public health.

High levels of bacterial contamination are experienced in the first 10 minutes of re-pressurization of an intermittent system, in some cases persisting for up to 20 minutes. Maintaining full pressure removes that risk.

S. No	SERVICE CATEGORY	RATE OF SUPPLY	BASIS
1	Residential	150 LPCD	CPHEEO manual on water supply
2	Commercial	45 LPCD	CPHEEO manual on water supply /NBC/URDPFI
3	Institutional	45 LPCD	
4	Industrial Non-Polluting Industries	35,000 Litres/ha/day	Various Industrial Corridors Study (DMICDC)

Table 6-3 :Unit Norms of Water Supply for different service categories

- **24x7 supply gives significantly better service to all consumers.**

Access to clean water with improved quantity, timing and pressure, including effective supply to 'tail ends' of service pipes.

- **24x7 supply reduces the burden on water resources.**

Continuous supply reduces water wastage arising from overflowing storage systems and open taps. It saves on stored household water that is usually discarded when new supply comes in. Because the network is renewed where needed, it also reduces losses arising from leaks.

- **24x7 supply delivers effective supply management' and 'demand management'.**

Continuous supply makes possible the effective management of leakage through pressure management and flow measurement. Water conservation is also encouraged through metering and pricing via volumetric tariff to consumers.

- **24x7 supply enables improved efficiency of service provision.**

Operational efficiencies are achieved because of a reduced need for valve operators, and a conversion of these jobs into more efficient ones of meter reading and customer care. It also makes possible prevention of illegal connections.

6.5 Water Quality Standards

The objective of Water Works Management is to ensure that the water supplied is free from pathogenic organisms, clear, palatable and free from undesirable taste and odour, of reasonable temperature, neither corrosive nor scale forming and free from minerals which could produce undesirable physiological effects. The establishment of minimum standards of quality for public water supply is of fundamental importance in achieving this objective.

As per the directive of National Capital Region Planning Board, following standards are recommended for the potable use of water:

Physical & Chemical Standards

The recommended guidelines for physical and chemical parameters on the principle that safe water is an obligatory standard and physical and chemical qualities are optional within a range are Annexed in the report.

Bacteriological Quality

The recommended guidelines for the Bacteriological quality are Annexed in this report therein.

Annexure - 4

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.

Annexure-4

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

Annexure-4

Nagarukonda 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

Annexure – 4

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.

Annexure - 4

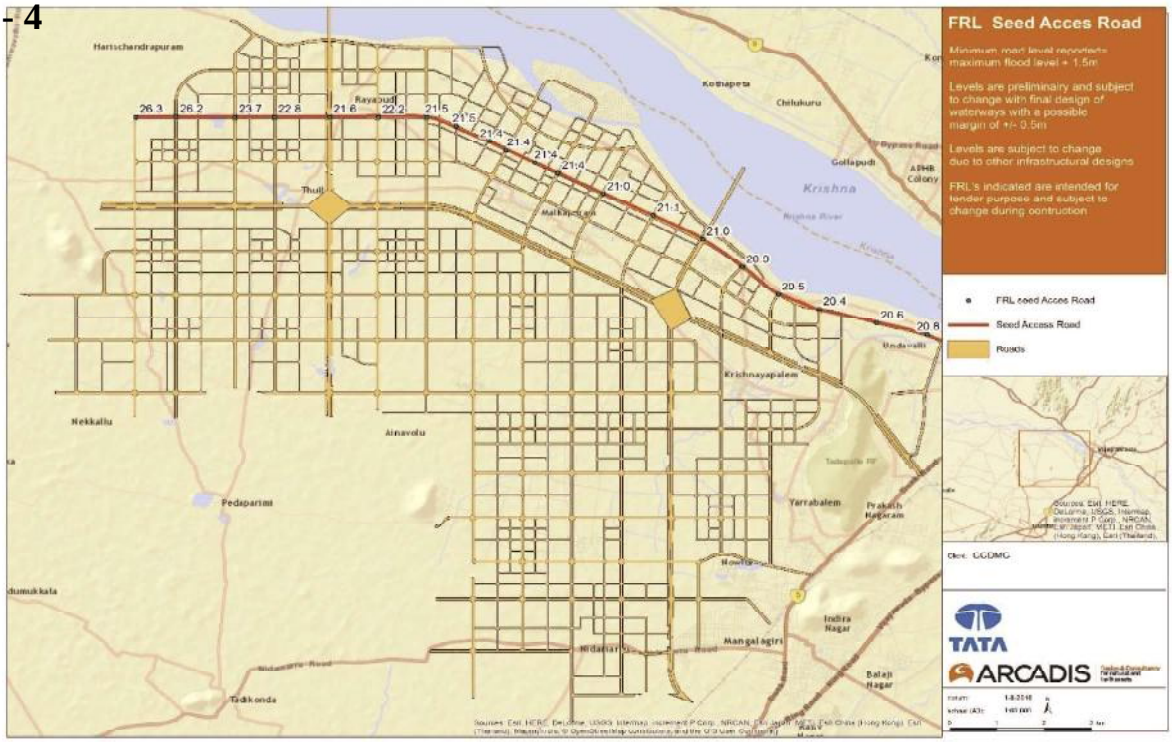


Figure 3.1 Finished Road Levels along the Seed Access Road of the Capital City

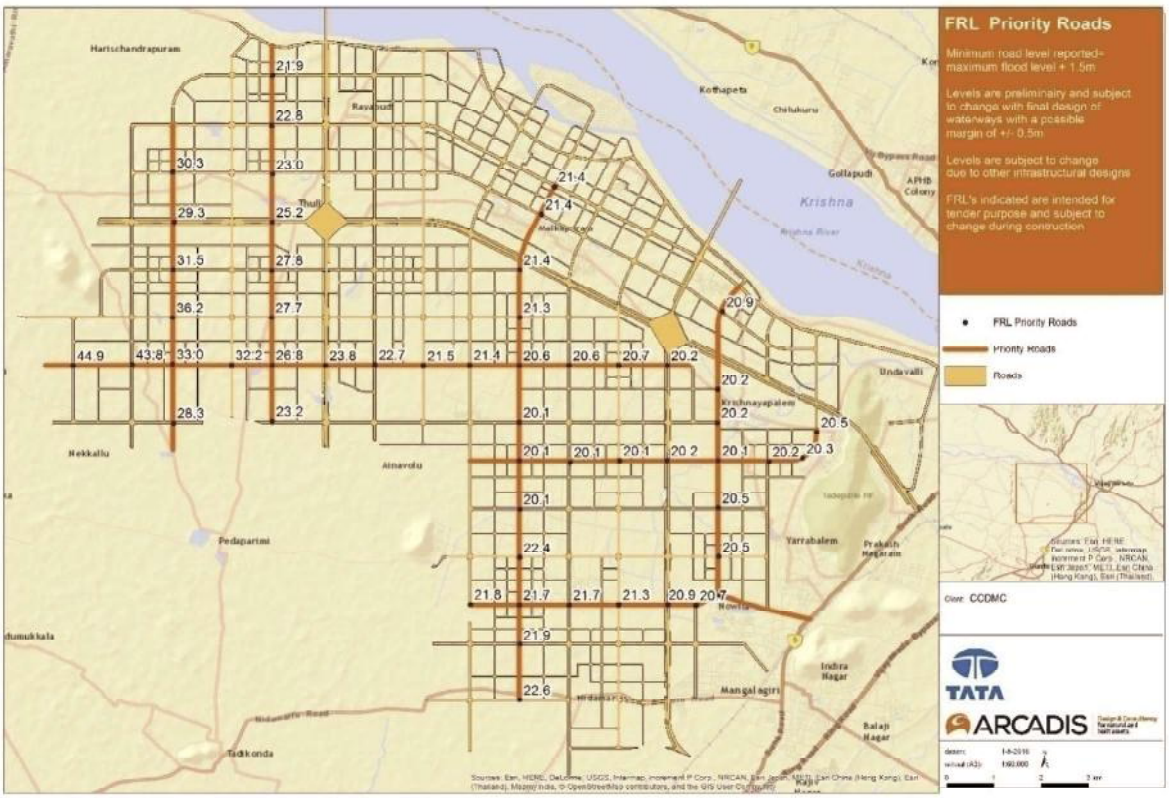


Figure 3.2 Finished Road Levels along the Main Priority Roads of the Capital City

Annexure 3.74 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.

Annexure - 4

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;

606 OTHER CONDITIONS

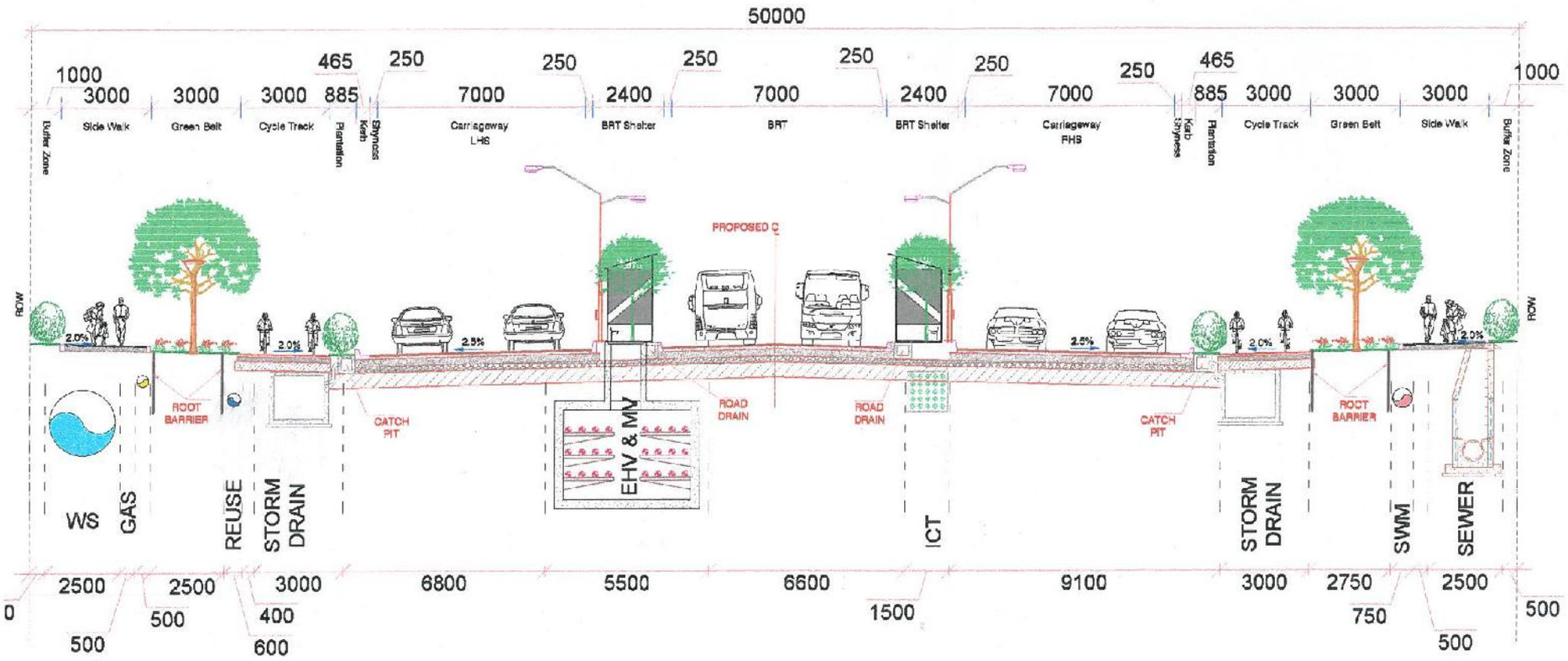
1. All existing Acts/Rules restricting development activities near Water bodies, Railways, Electrical lines, Airport, Oil / Gas Pipelines, Heritage Structures, Religious Structures and EIA Notification shall be followed in all zones, example
    - Rain Water Harvesting Structures shall be provided as 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.

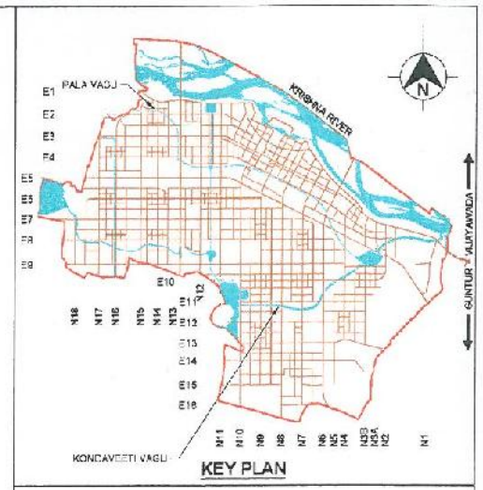
607.2 Intent. These regulations are to encourage and provide means for effecting desirable and quality development by permitting greater

Annexure - 6



TYPICAL CROSS SECTION OF 4 - LANE FOR SUB-ARTERIAL ROADS WITH BRT (50M)

ER UPTO CROWN OF PIPE	
	MINIMUM DEPTH
	1.00 M
	1.00 M
	1.00 M
	1.00 M
	1.00 M
	1.00 M
	1.60 M



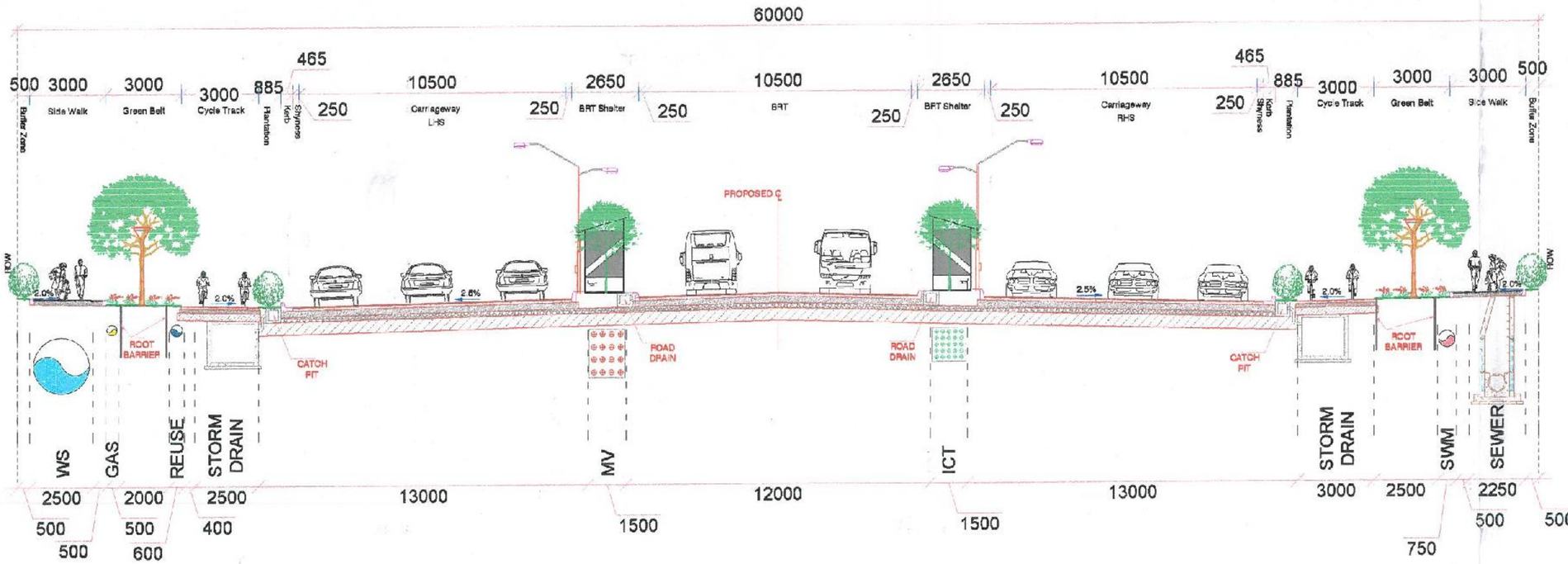
K.V.R.B.

NOTE:-

1. ALL DIMENSIONS ARE IN MM.
2. ONLY UTILITY CORRIDOR WIDTHS ARE MARKED.
3. SIZE OF UTILITIES SHOWN ARE REPRESENTATIVE AND ACTUAL SIZES WILL VARY AT DIFFERENT LOCATIONS AS PER DETAILED DESIGNS.
4. ROOT BARRIERS ARE CONSIDERED IN GREEN BELTS TO PROTECT UTILITIES.

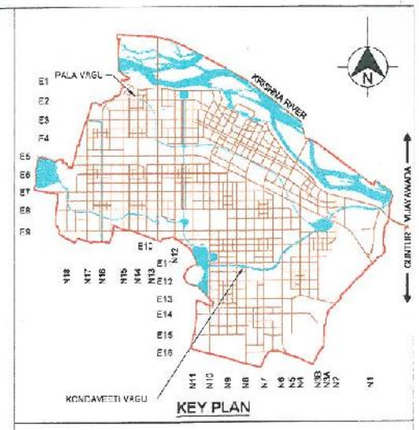
ISSUED FOR SUBMISSION

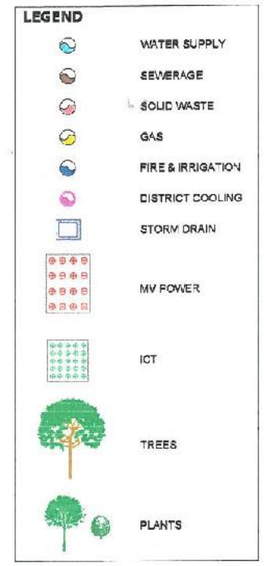
Annexure - 6



SEED ACCESS ROAD TYPICAL 6 LANE CROSS SECTION WITH BRT (60m ROW)

MINIMUM COVER UPTO CROWN OF PIPE	
ITEM	MINIMUM DEPTH
WATER SUPPLY	1.00 M
WASTE WATER	1.00 M
POWER MV	1.00 M
ICT	1.00 M
GAS	1.00 M
REUSE	1.00 M
SOLID WASTE	1.50 M





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4. ROOT BARRIERS ARE CONSIDERED IN GREEN BELTS TO PROTECT UTILITIES.

ISSUED FOR SUBMISSION

Rev	Description	By	Verified	Date
R0	ISSUED FOR SUBMISSION	RR	MK	20.01.2017

Scales: 0 1.0 2.0 4.0 8.0m — SCALE - A1 = 1:100 A3 = 1:200 — SCALES SHOWN ARE FOR AN A1 SIZE ORIGINAL DRAWING

Consultants: aarvee associates architects engineers & consultants pvt. ltd. — 贵州海上丝路国际投资有限公司 GUIZHOU MARITIME SILK ROAD INTERNATIONAL INVESTMENT CORPORATION — JV

Client: Andhra Pradesh Capital City Development and Management Corporation (CCDMC)

Drawn	BHARATH
Checked	RAMARAJU
Designed	VEERAJ
Approved	M KISHORE
Date	20.01.2017

Project: SMART INTEGRATED INFRASTRUCTURE MASTER PLAN AND DETAILED PROJECT REPORTS FOR PHASE-I INFRASTRUCTURE WORKS FOR/AT AMARAVATI CAPITAL CITY

Drawing Title: TYPICAL CROSS SECTION OF SEED ACCESS ROAD FOR AMARAVATI MASTER PLAN

Drawing No: AG-1957-DMP-AM-UT-TCS-001

Rev: R0

Annexure - 7

8. SCADA SYSTEMS

Supervisory control and data acquisition (SCADA) is a system that allows an operator to monitor and control the water supply system. SCADA systems allow remote sites to communicate with a control facility and provide the necessary data to control processes. SCADA provides an economic advantage over its application on the maintenance of the system. SCADA identifies

the faults or defects in the system which is spread over large area and operates to repair the system from the control centre. Distance and accessibility to the site where the defect is identified are the major factors to implement SCADA system.

Typically, there are three major elements that make up a SCADA system:

1. The master terminal unit (MTU)
2. The remote terminal unit (RTU)
3. The communications equipment

Master Terminal Unit (MTU)

At the heart of the system is the master terminal unit (MTU). The master terminal unit initiates all communication, gathers data, stores information, sends information to other systems, and interfaces with operators. The major difference between the MTU and RTU is that the MTU initiates virtually all communications between the two.

Remote Terminal Unit (RTU)

Remote terminal units gather information from their remote site from various input devices, like valves, pumps, alarms, meters, etc. Essentially, data is either analog (real numbers), digital (on/off), or pulse data (e.g., counting the revolutions of a meter). Many remote terminal units hold the information gathered in their memory and wait for a request from the MTU to transmit the data.

Communications Equipment

Communication equipment is required for bi-directional communications between an RTU and the MTU. This can be done through public transmission media or atmospheric means.

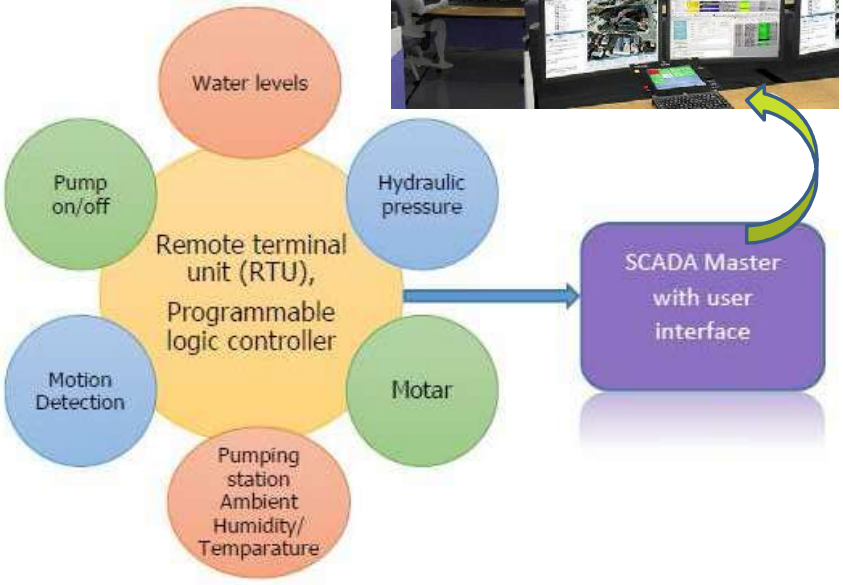
8.1 CENTRAL COMMAND AND CONTROL CENTRE (C4)

Central Command and Control centre is a part of communication programme in SCADA system.

In order to ensure a regular supply of quality water, command and control systems are necessary, which allow automatic remote control of the water facilities. Control over the water system in Amaravati capital city requires the establishment of a control centre, from which all the command and control systems will be operated. The data is gathered by the control center using instruments in the field, through the local and remote command and the command, control and operating systems.

Command and control systems will involve in smart management of water facilities. Using such systems, boreholes, pumping stations, industrial pumps, water treatment plants, desalination plants and sewage treatment plants can be efficiently, easily and simply controlled from the control center, saving manpower and operating and maintenance expenses. The data flows in to the command

Figure 28: SCADA master control over the Water supply components /equipment integrated with smart systems which can be monitored through CCC



and control center, 24/7, and provides an accurate picture of the situation at the facilities at the various sites.

8.1.1 Components of CCC

A holistic and integrated Command Control Centre will include Video surveillance system, Video Management Software, Video Analytics and Operation Command Control Centre. Geographic Information System (GIS) based Command & Control Decision Support System plays a vital role in assisting water quality and water management team to monitor, manage, plan and execute the water supply processes effectively.

8.2 Data Collection in Scada

SCADA systems will have probes/sensors which will sense and generate signals for the level, pressure and flow in a given unit and transmit the signals for storage and analysis in the computer. The signals are transmitted by radio, by Telephone, microwave satellite or fibre-optic transmission systems. The signals transmitted are stored as data, analysed and presented as information. SCADA systems can include the network diagrams of the distribution system of which detailed sketches of a particular area can be viewed by the operator if necessary to observe the current operating data such as flow, pressure, level or residual chlorine.

SCADA systems in Water distribution are programmed for collection and processing of following information.

- To monitor levels in Service reservoirs, pressures and flows in a distribution system
- To monitor and store data on levels in SRs, or flows/quantity of delivered into a SR or pressures of distribution system and generate alarms for threshold values of levels, flows and pressures to initiate operation of valves and pumps
- To monitor and store data on operation of pumps such as Voltage, amperes, energy consumed, operating times and down times of pumps
- To measure and record chlorine residuals and generate alarms at thresh hold values of residual chlorine in the distribution systems.

8.3 Analysis of Data from Scada

SCADA systems can be designed to analyse the data and provide daily, weekly, monthly and or Annual reports or schedules. It also helps in monitoring the inventories on spare parts and plan requirement of spares. Responses for different scenarios such as seasonal changes or any emergencies can be programmed into SCADA. The information stored in the SCADA can be easily retrieved and analysed. Typical information that could be generated in the system include: Consumption patterns linked to the weather conditions, plots on pressures against 322 flows, electrical energy consumption linked to consumer demands, record on system leaks, record on pump failures, areas with less chlorine residuals etc.

8.4 Smart Metering

In order to support the automation systems in the collection and transfer of the data, some measuring devices such as smart meters are essential which are to be established at necessary locations over the water supply components. Let us have a brief study over the smart systems in the following text:

8.4.1 Water Meters

A water meter is a scientific instrument for accurate measurement of quantity of water distributed to the consumers. It also fulfils the need to know accurately the water produced and distributed. Consumption based water rates require periodic reading of meters except in remote or automated meter reading of meters.

8.4.2 Flow Meter

Flow meters are devices which measures the flow through the conduit. In water works, normally, following types of flow meters are used. They can be classified in to:

A. Differential Pressure/Head Flow Meter

B. Linear Flow Meter

Instrumentation

8.4.3 Level Measuring Devices

Instrumentation facilitates coordination of various water parameters, which are essential for optimization of water supply & treatment plant. One of the important parameters amongst them is water level measurement, which is carried out at various locations vis. water reservoir, inlet chamber, open channel, alum feeding tank, lime tank, filter beds, air vessel, sump well etc.

8.4.4 Pressure Measuring Devices

In water supply network pressure parameter plays very important role in order to get sufficient water to the consumers. Similarly, in flow measurement by differential pressure type flow meter, differential pressure measurement

Annexure - 8


Gas Concentrations
PARAMETER
VALUE
STANDARD
Ammonia
19.93 µg/m3
400 µg/m3 24 Hrs
Ozone
11.30 µg/m3
180 µg/m3 1 Hrs
Benzene
0.03 µg/m3
05 µg/m3 1year

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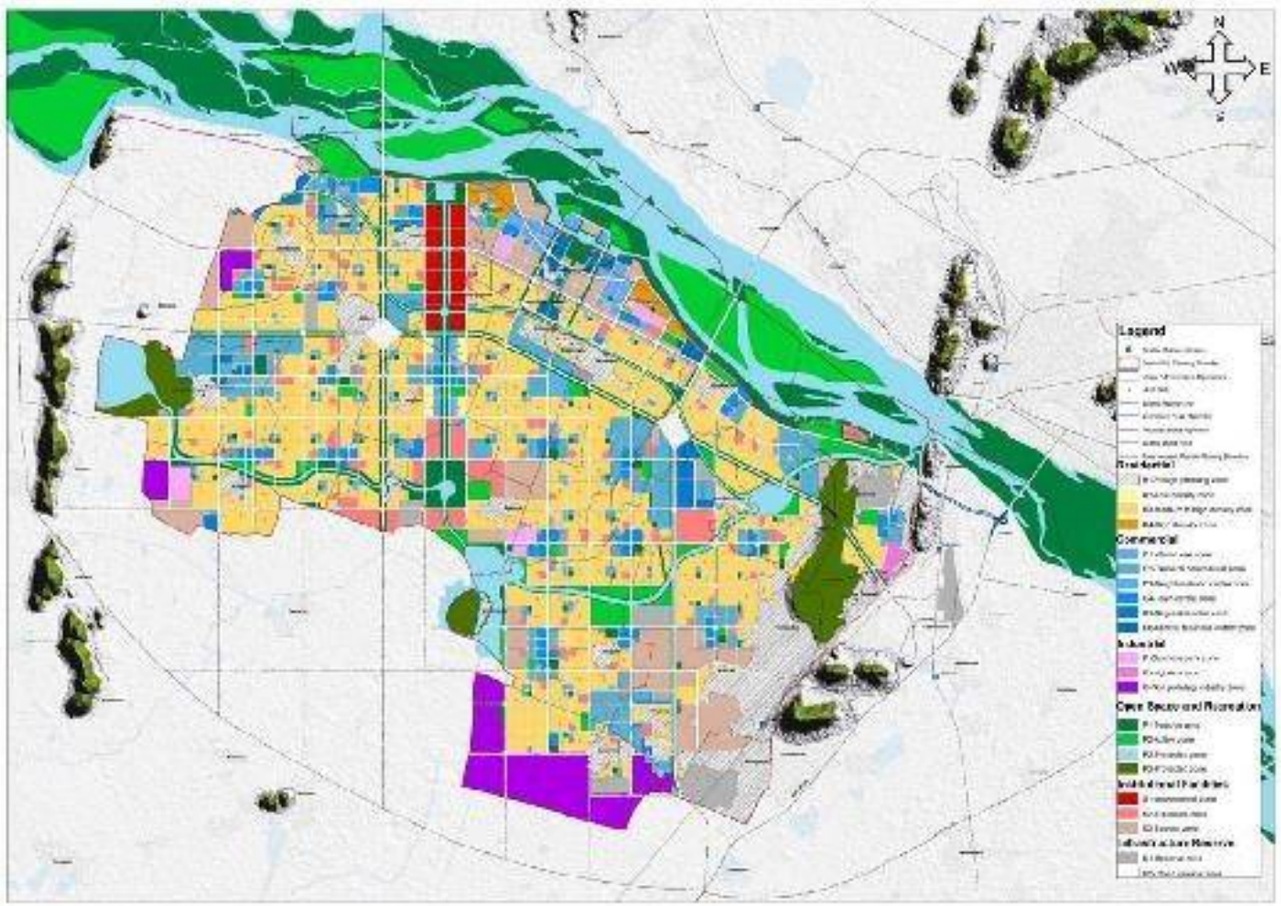
Annexure - 9

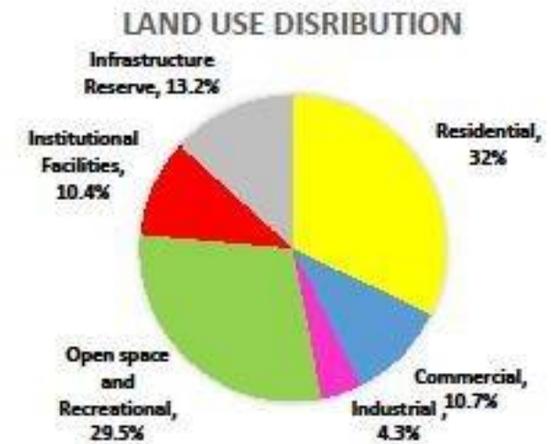
Annexure - 9

Annexure - 9

Annexure - 9

Amaravati Master Plan





Annexure - 11

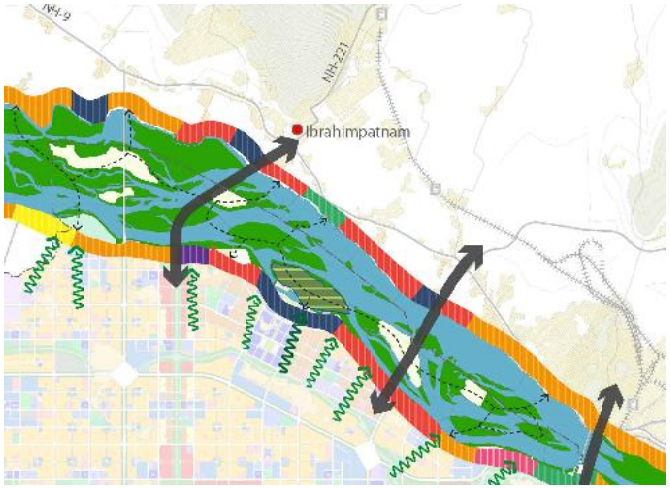


Fig.9.6 Proposed water engagement strategy

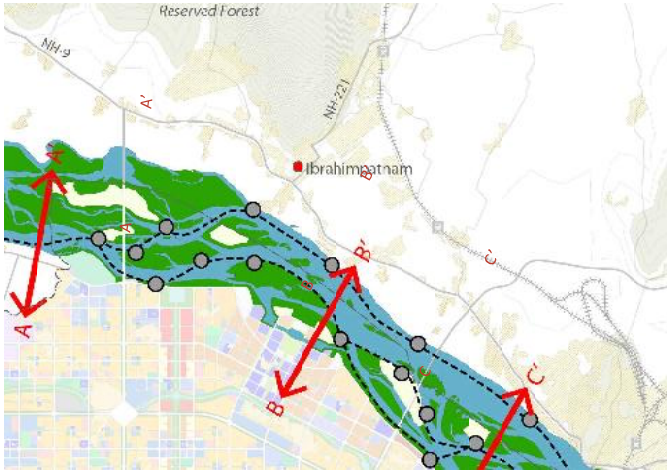


Fig.9.7 Proposed water taxi map to connect the cluster of islands

9.4 KRISHNA RIVERFRONT

River Krishna waterfront is one of the key assets for the Amaravati Capital city. Key recommendations and strategies for the waterfront and island clusters include:

KRISHNA RIVERFRONT DEVELOPMENT

- The riverfront along river Krishna is planned as a vibrant city edge housing a number of commercial, recreational, entertainment and housing facilities. These activities will both interact and engage with the waterfront as illustrated in Figure 9.6
- The riverfront will house the city's iconic civic core and central business district (CBD).
- All the green spines of the city terminate on the waterfront. This is done to draw people to the vibrant multi-functional waterfront.
- The master plan encourages tourism developments along the water front by proposing hotels, theme parks and other tourism related activities.

BUND ALONG THE WATERFRONT

- In order to mitigate flooding issues along the water edge a Bund has been proposed along the river Krishna waterfront.
- As illustrated in the site sections (Figure 9.8), the waterfront plan engages the Bund by utilizing it as a road sloping into the park and as an active public space. The plan proposes integration of the Bund with the development. The Bund will also help in activating the waterfront as a continuous waterfront promenade.

ENGAGEMENT OF ISLANDS

- Attractive eco tourism themed facilities such as an island theme park, island resorts, recreational parks and golf courses have been proposed on the clusters of islands on river Krishna.
- The islands house a number of high end waterfront residential clusters to tap on the market demand of these scenic natural landscapes.

WATER-TAXI

- A well connected network of water taxis is also proposed to connect the various eco-tourism attractions on the cluster of islands on river Krishna. These water taxis will inter connect the islands and mainland within the city.

CONNECTIONS TO THE TOURISM CIRCUIT

- The iconic waterfront & eco tourism focused islands are an integral part of the city tourism circuit.
- Bhavani island, one the largest river islands, will connect the cluster of islands to the capital region's religious tourism circuit.

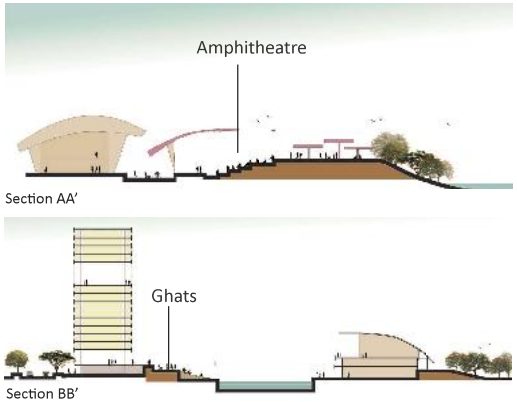


Fig.9.8 Bund sections along the Waterfront

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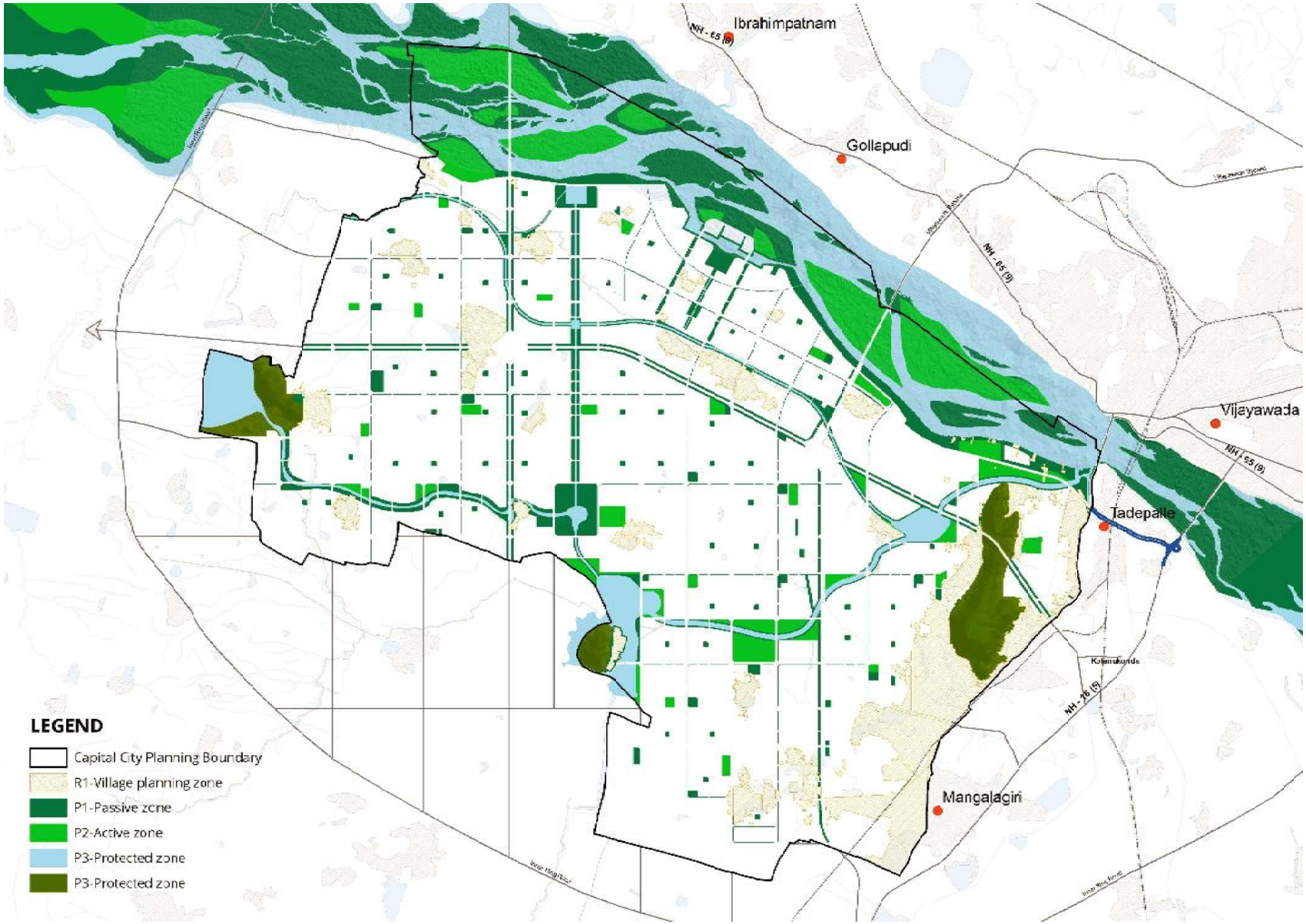

Capital City Green and Blue Plan

Annexure - 13

SKILL DEVELOPMENT															
TRAINING & PLACEMENTS DETAILS															
S. No	Training Partner Name	Place	Course/ S	Duration	Year	Total Candidates	Training Imparted			Training Status	Dropped	Placement completed		Batch Start Date	Batch End Date
							M	F	Total						
1	APSSDC	Etcherla	IT_Java	4Months	2015-16	109	54	35	89	Completed		45	54	20-Jun-15	30-Nov-15
2	St. Jhon's Welfare	Mandadam Malkapuram	Jute Bags	45 Days	2015-16	162	0	143	143	Completed	143	137	143	5-Oct-15	12-Dec-15
3	SIMS	Bangalore	Automation	2 Months	2015-16	30	26	0	26	Completed		1	1	18-Jan-17	30-Mar-17
4	ASV & QXY	Jedcherla	Electrical	1 Month	2015-16	30	30	0	30	Completed		3		7-Apr-15	8-Aug-15
5	Stardigm	Thulluru	BCBF	2 Months	2015-16	43	15	28	43	Completed		0	0	22-Nov-15	10-Jan-16
6	L&T	Jedcherla	Electrical	1 Month	2015-16	6	6	0	6	Completed		2		7-Jun-15	6-Jan-00
7	ADS Softech	Thulluru	Logistics	2 Months	2015-16	32	10	20	30	Completed		30	30	22-Nov-15	10-Jan-16
8	APSSDC	Vijayawada	Land Surveyour-I	4 Months	2015-16	24	20	4	24	Completed		24	24	30-Oct-15	15-Feb-16
9	Dhatri Foundation	Undavalli	Herbal Making	45 Days	2015-16	45	0	40	40	Completed		40	40	12-Nov-15	30-Dec-15
10	Dhatri Foundation	Venkatapalem	Maggam Work	45 Days	2015-16	43	0	40	40	Completed		40	40	16-Oct-15	15-Dec-15
11	Involute	Lam	Electrical	1 Month	2015-16	5	5	0	5	Completed		1		9-Nov-15	10-Dec-15

Annexure - 13

12	Involute	Lam	Mechanical	1 Month	2015-16	6	6	0	6	Completed		1	1	9-Nov-15	10-Dec-15
13	KDLOA	Gannavaram	LMV Driving I	21 Days	2015-16	23	20	0	20	Completed		20	20	28-Oct-15	26-Nov-15
14	APSSDC	Nowluru	English Employbility skills	2 Months	2016-17	33	9	24	33	Completed		1	1	22-Aug-16	19-Oct-16
15	Centum Skills	Nowluru	Beautician I	2 Months	2017-18	21	0	21	21	Completed	1-Fail 2-Drop	21	21	17-Mar-17	15-May-17
		TOTAL				**612**						**366**			

Annexure - 14

Annexure - 15

ANDHRA PRADESH POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN, A - 3, INDUSTRIAL ESTATE,
SANATHNAGAR, HYDERABAD - 500 018

Phone: 23887500
Website :www.appcb.ap.nic.in

REGD.POST WITH ACK.DUE

CONSENT ORDER FOR ESTABLISHMENT

Order No. 373 /APPCB/CFE/RO-GNT/HO/2015 **Dt. 19.10.2015**

Sub: APPCB – CFE – **APCRDA & CA - Amaravati- Capital City of Andhra Pradesh, Covering an area of 217.23 Sq. Kms in Thulluru, Tadepalli and Mangalagiri Mandals of Guntur District -** Consent for Establishment (CFE) of the Board under Sec.25 of Water (Prevention & Control of Pollution) Act, 1974 and Under Sec.21 of Air (Prevention & Control of Pollution) Act, 1981 - Issued - Reg.

Ref:
1. EC order dt. 09.10.2015 issued by SEIAA, AP.
2. CFE application received on 13.10.2015
3. R.O's inspection report dt. 14.10.2015.
4. CFE Committee meeting held on 16.10.2015.

1. In the reference 2nd cited, an application was submitted to the Board seeking Consent for Establishment (CFE) for Area development project with a project cost of **Rs. 20,000 Crores.**

2. As per the application, the above project is to be located at 25 No. of villages in 3 Mandals of Guntur District and the project covering in an area of 217.23 Sq. Kms.

3. The above site was inspected by Asst. Environmental Engineer, Regional Office, Guntur, A.P Pollution Control Board on 14.10.2015 and observed that the proposed development of Capital City for State of Andhra Pradesh is in an area of 217.23 Sq. Km covered by 25 No. of villages in 3 Mandals of Guntur District as detailed below:

➢ Co-ordinates:

North East	16°30'30"N	80°37'E
South West	16°29'N	80°25'E
North West	16°31'N	80°22'30" E
South East	16°24'30"N	80°34' E

➢ The proposed city covers the following Revenue villages of Guntur District.

S. No.	Mandal	Village	Area in Sq. Km
1	Thulluru	Lingayapalem including Hamlet Villages of Modugulankapalem	14.49
2		Uddandarayunipalem	
3		Malkapuram	
4		Velagapudi	8.09
5		Nelapadu	5.74
6		Sakamuru	6.58
7		Ainavolu	4.85
8		Mandadam including Hamlet Villages of Tallapalem	20.19
9		Venkatapalem	11.09
10		Ananthavaram	10.30
11		Nekkallu	5.71
12		Thulluru	14.92
13		Dondapadu	4.97
14		Pichukala Palem	
15		Abbarajupalem	5.86
16		Borupalem	
17		Rayapudi	24.34
18		Kondaraju Palem	3.43
19	Tadepalli	Undavalli	13.05
20		Penumaka	8.85
21		Part of Tadepalli Municipality (Nulakapet, Nagar etc.,)	1.88
22	Mangalagiri	Krishnayapalem	6.34
23		Nidamarru	11.30
24		Kuragallu including Hamlet Villages of Nerukonda	14.33
25		Nowluru including Hamlet Villages of Yerrabalem & Bethapudi	20.92
		TOTAL	**217.23**

➢ Amaravati city is proposed to be developed in three phases over a period of 35 years with the following land use pattern:

Phase	Period
1	2015 – 2025
2	2025 – 2035
3	2035 - 2050

S. No.	Land Use	Area (Sq. Km)	%
1	Residential	60.77	27.98
2	Commercial	20.29	9.34
3	Public and Semi Public	11.49	5.29
4	Industrial (IT Companies, Green category of industries, and other non-polluting industries / units)	12.26	5.64
5	Open Spaces and Recreation	52.78	24.29
6	Traffic and Transportation	23.04	10.61
7	Water Bodies	25.78	11.87
8	Heritage	0.15	0.07
9	Seed Capital	10.67	4.91
	Total :	**217.23**	**100**

Annexure - 15

4. The Board, after careful scrutiny of the application, verification report of Regional Officer and recommendations of the CFE Committee, hereby issues **CONSENT FOR ESTABLISHMENT** to your project Under Section 25 of Water (Prevention & Control of Pollution) Act, 1974 and Section 21 of Air (Prevention & Control of Pollution) Act, 1981 and the rules made there under. **This order is issued to the activity as mentioned at Para (1) only.**
5. This Consent Order now issued is subject to the conditions mentioned in Schedule 'A' and Schedule 'B'.

6. This order is issued from pollution control point of view only. Zoning and other regulations are not considered.

Encl: Schedule 'A'
Schedule `B'

Sd/-
MEMBER SECRETARY

To
The Commissioner,
Andhra Pradesh Capital Region Development Authority &
Capital Area (APCRDA &CA), Lenin Center,
Governor Pet, Vijayawada
Krishna District – 520 002
Email: srikant@apcrda.org, ceo.crda@ap.gov.in

// T.C.F.B.O //

JOINT CHIEF ENVIRONMENTAL ENGINEER (UH-I)

SCHEDULE – A

1. The proponent shall obtain Consent for Operation (CFO) from APPCB, as required Under Sec.25/26 of the Water (P&C of P) Act, 1974 and under sec. 21/22 of the Air (P&C of P) Act, 1981, before commencement of the activity.

2. Notwithstanding anything contained in this conditional letter or consent, the Board hereby reserves its right and power Under Sec.27(2) of Water (Prevention and Control of Pollution) Act, 1974 and Under Sec.21(4) of Air (Prevention and Control of Pollution) Act, 1981 to review any or all the conditions imposed herein and to make such modifications as deemed fit and stipulate any additional conditions by the Board.

3. The consent of the Board shall be exhibited in the project premises at a conspicuous place for the information of the inspecting officers of different departments.

4. Rain Water Harvesting (RWH) structure (s) shall be established in the proposed area development project.

5. **This order is valid for period of 5 years from the date of issue.**

SCHEDULE – B

Water:

1. The source of water is Krishna River, Kondaveeti Vagu. The total water requirement is 1067 MLD. Water pre-treatment plants with total capacity of 1230 MLD shall be installed.

2. The maximum domestic waste water generation is 1012 MLD.

Treatment & Disposal:

Source of Effluent	Treatment proposed	Mode of final disposal (Proposed)
Domestic	The waste water shall be treated in STPs. The entire outflow from STP after treatment shall be reused and recycled. The industrial waste water shall be pre-treated on site before discharging into the municipal sewerage network.	The sewage shall be treated to meet the stringent standards and shall be used to supply directly to the industries for non potable use and irrigation of the landscape in the parks or along the road side with in the capital city.

3. STPs shall be constructed and commissioned along with the commissioning of the activity. All the units of the STPs shall be impervious to prevent ground water pollution. Separate energy meter shall be provided for Sewage Treatment Plant (STP) to record energy consumed.

4. Dual plumbing system shall be adopted and separate tanks shall be provided to store fresh water and treated wastewater.

5. During construction stage septic tank followed by soak pit shall be constructed to the temporary toilets / kitchen provided for the construction labour and shall be removed after completion of the project.

6. Separate meters with necessary pipe-line shall be provided for assessing the quantity of water used for Domestic and flushing purposes.

7. The proponent shall protect and improve the existing natural drains and construct modern storm water drainage system to avoid flooding and water logging problems. Proponent shall ensure that sewage shall not enter into storm water drainage system under any circumstances.

Annexure - 15

8. The proponent shall ensure 100% collection of sewage by covering entire area of the city with modern under ground 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 ≤ 1 mg/l and Faecal Coli / 100 ML – No detectable levels as committed in EIA report.

9. 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 proponent shall construct treated sewage storage ponds of adequate capacity with HDPE liner to store treated sewage during rainy season.

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., The proponent shall also construct 3500 MLD treated sewage storage pond for storage of treated sewage in the rainy season. The proponent shall undertake construction of Sewage Treatment Plant simultaneously with the construction of the city.

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.

12. 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.

13. No untreated or treated wastewater shall be discharged in any of the water bodies including Krishna River under any circumstances.

Air:

14. Diesel generator sets shall be installed in a closed area with silencers and suitable noise absorption systems. The ambient noise level shall not exceed 55 dB(A) during day time and 45 dB(A) during night time.

15. Necessary provisions should be made by providing tarpaulin / GI Sheets around the construction site to reduce the fugitive emissions to the surrounding area.

16. 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.

17. 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. Proponent shall incorporate these guidelines in Bye-laws.

Solid Waste:

18. Quantity of solid waste / Hazardous Waste estimated and disposal by the year 2050

S. No	Type of waste	Quantity	Mode of Disposal
1.	Municipal Solid Waste Generation from 17 townships, downtown, railway and river edge	3662 Tones /day	Proposed to dispose into dump yards located at Naidupet, Guntur District and also proposed to improve the existing dump yard.
2.	Industrial solid wastes	796 Tones / Day	Shall be treated & disposed to the standards stipulated by MoE&F.
3.	STP sludge	214 Tones / Day	Used as manure in green belt development
4	Used batteries	----	Shall be sent to authorised recyclers / return to seller.
5.	Used lubricant / oil	----	Shall be sold to Authorised recyclers.

19. The solid waste generated shall be properly collected and segregated before disposal to the city municipal facility. Waste paper, cartons, thermocol, plastic waste, glass etc., shall be disposed to recycling units. E-waste shall be disposed to authorized recycling units. The in-vessel bio-conversion technique shall be used for composting the organic waste.

20. All the topsoil excavated during construction activities should be stored for use in horticulture/landscape development within the project site.

21. Disposal of muck during construction phase should not create any adverse effect on the neighbouring communities and shall be disposed taking the necessary precautions for general safety and health aspects of people, and it shall be disposed only in approved sites with the approval of competent authority.

22. The following rules and regulations notified by the MoE&F, GoI shall be implemented.
    a) Municipal Solid Waste (Management and Handling) Rules, 2000.
    b) Hazardous waste (Management, Handling and Transboundary Movement) Rules, 2008 and amendments thereof.
    c) Batteries (Management & Handling) Amendment Rules, 2010.
    d) E-Waste (Management & Handling) Rules, 2011.

23. 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.

24. The project proponent shall ensure that all the ***newly developed areas*** shall not have any open waste disposal sites on the roadsides and develop efficient waste collection mechanism that ensures segregation at the origin level only.

25. 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.

26. Proponent shall identify 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.

27. 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.

28. 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.

29. 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.

30. The proponent shall allocate suitable and adequate site for setting up of Common Bio Medical Waste Treatment and Disposal Facility within the city limits.

31. 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.

Annexure - 15

32. The proponent shall facilitate setting up of E-waste Collection Centers by the producers and channalize e-waste to recyclers or dismantlers. The proponent shall allocate suitable and adequate site for setting up of e-waste recycling / dismantling facilities.

33. The proponent shall ensure usage of fly ash for leveling / reclamation of low lying areas, road embankments, for raising platforms in inundated areas, and use 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.

Other Conditions:

34. The proponent shall obtain separate approval for construction projects (built up area more than 20,000 sq.m), industrial parks, hotels and hospitals etc.,

35. IT Companies, Green category of industries, and other non-polluting industries / units are only permitted in the industrial parks proposed in the jurisdiction of APCRDA & CA.

36. The proponent shall create primary green spaces of 7200 Ha., consisting of city parks, lake parks, town parks, neighborhood parks as committed. The proponent shall create primary green space of 3924.57 Ha in the 1st phase.

37. 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 for air pollutants.

38. The proponent shall utilize treated sewage water for irrigation of primary and secondary green areas by laying pipeline network.

39. 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 m around Undavalli caves as per ASI regulations.

40. The Proponent shall ensure following mitigation measures as committed, to minimize pollution problems during construction stage.

    i. All the loose material either stacked or transported shall be provided with suitable covering such as tarpaulins etc.

    ii. Water sprinkling shall be done at the location where dust generation is anticipated.

    iii. Construction equipment be maintained and serviced regularly such that the gaseous emissions from these equipments are maintained within the design specifications.

    iv. Provision for insulating caps and aids at the exit of noise source on the machinery.

    v. The use of dampening materials such as thin rubber / lead sheet for wrapping the work places like compressors, generator, etc.

    vi. Inlet and outlet mufflers shall be provided.

    vii. Earmuffs shall be provided to workers and enforced to be used by the workers.

    viii. 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.

41. 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 CFEs of APPCB under the provisions of the Water Act, 1974 and Air Act, 1981

42. The proponent shall create corpus fund and maintain separate account with adequate budget to meet operational cost of STP.

43. The proponent shall ensure that there should be proper legal frame work for meeting recurring expenses by occupants for implementation of conditions stipulated.

44. The proponent shall develop adequate greenery in the open spaces and along the periphery of the plot as per the site plan approved by the Competent Government Authorities.

45. The proponent shall obtain all other necessary permissions for the proposed activity, from the concerned Government Departments.

46. Adequate measures should be taken to prevent odour problem from solid waste processing plant and STPs.

47. The proponent shall use Ready mix concrete for construction of the building.

48. The proponent shall provide proper centralized air exhaust system in all the cellar areas to avoid suffocation.

49. The proponent shall provide sufficient parking space for visitor vehicles.

50. The proponent shall comply with Energy efficient practices and energy audit practices. Roof should meet prescriptive requirement as per Energy Conservation Building Code by using appropriate thermal insulation material to fulfill requirement. Wherever feasible, green building concepts shall be adopted.

51. Application of Solar energy should be incorporated for illumination of common areas, lighting for gardens and street lighting in addition to provision of solar water heating.

52. Concealing the factual data or submission of fabricated data and failure to comply with any of the conditions mentioned in this order attracts action under the provisions of relevant pollution control Acts.

53. The Board reserves its right to modify above conditions or stipulate new / additional conditions and to take action including revocation of this order in the interest of environment protection.

54. Any person aggrieved by an order made by the State Board under Section 25, Section 26, Section 27 of Water Act, 1974 or Section 21 of Air Act, 1981 may within thirty days from the date on which the order is communicated to him, prefer an appeal as per Andhra Pradesh Water Rules, 1976 and Air Rules,1982, to such authority (hereinafter referred to as the Appellate Authority) constituted under Section 28 of Water (Prevention and Control of Pollution)Act,1974 and Section 31 of the Air (Prevention and Control of Pollution) Act, 1981.

Sd/-
MEMBER SECRETARY

To
The Commissioner,
Andhra Pradesh Capital Region Development Authority &
Capital Area (APCRDA &CA), Lenin Center,
Governor Pet, Vijayawada
Krishna District – 520 002
Email: srikant@apcrda.org, ceo.crda@ap.gov.in

// T.C.F.B.O //

JOINT CHIEF ENVIRONMENTAL ENGINEER (UH-I)

Annexure - 16

ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY :: VIJAYAWADA.

From
Dr. Srikant Nagulapalli, I.A.S.,
Commissioner,
AP CRDA & CA,
Vijayawada.

To
The Member Secretary,
State Environmental Impact
Assessment Authority,
A3, Industrial Estate,
Sanath Nagar,
Hyderabad-18.

Rc.No. 1389/LSE/APCRDA/2015/, Dt.16.10.2015

Sub:- Amaravati Capital City Development – Publication of Public Notice on Environmental Clearance – Report submitted – Reg.

Ref:- Orders of SEIAA vide order no. SEIAA/AP/GTN-151/2015, dt. 09-10-2015.

* * *

It is submitted that as per the orders of the Hon'ble AP SEIAA given in the reference cited, Public Notice on Environmental Clearance to Amaravati Capital City got published in 'Sakshi Daily Telugu News Paper (page 2 Main Edition, dt. 16-10-2015) and Deccan Chronicle English News Paper (page 8 Main Edition, dt. 16-10-2015). The copies of the publications are here with enclosed as required.

Yours Faithfully

Encl: As above

O/C.
16.10

COMMISSIONER,
AP CRDA & CA, Vijayawada.

Copy submitted to Additional Prl.Cheif Conservator of Forests (C), MoEF & CC, Regional Office (SEZ), 1st and 2nd Floor, Handloom Export Promotion Council, 34, Cathedral Garden Road, Nungambakam, Chennai – 6000034.


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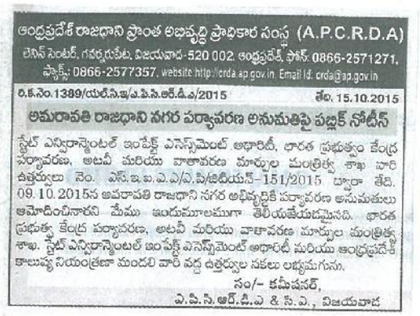
ఆంధ్రప్రదేశ్ రాజధాని ప్రాంత అభివృద్ధి ప్రాధికార సంస్థ (A.P.C.R.D.A)
లెనిన్ సెంటర్, గవర్నరుపేట, విజయవాడ-520 002 ఆంధ్రప్రదేశ్, ఫోన్: 0866-2571271,
ఫ్యాక్స్: 0866-2577357, website http://crda.ap.gov.in Email id. crda@ap.gov.in
ర.కా.నం.1389/యల్.సి.ఇ/ఎ.పి.సి.ఆర్.డి.ఎ/2015 తేది. 15.10.2015

అమరావతి రాజధాని నగర పర్యావరణ అనుమతిపై పబ్లిక్ నోటీస్

స్టేట్ ఎన్విరాన్మెంటల్ ఇంపేక్ట్ ఎసెస్మెంట్ అథారిటీ, భారత ప్రభుత్వం కేంద్ర పర్యావరణ, అటవీ మరియు వాతావరణ మార్పుల మంత్రిత్వ శాఖ వారి ఉత్తర్వులు నెం. ఎస్.ఇ.ఐ.ఎ.ఎ/ఎ.పి/జిటిఎన్-151/2015 ద్వారా తేది. 09.10.2015న అమరావతి రాజధాని నగర అభివృద్ధికి పర్యావరణ అనుమతులు ఆమోదించినారని మేము ఇందుమూలముగా తెలియజేయడమైనది. భారత ప్రభుత్వ కేంద్ర పర్యావరణ, అటవీ మరియు వాతావరణ మార్పుల మంత్రిత్వ శాఖ, స్టేట్ ఎన్విరాన్మెంటల్ ఇంపేక్ట్ ఎసెస్మెంట్ అథారిటీ మరియు ఆంధ్రప్రదేశ్ కాలుష్య నియంత్రణ మండలి వారి వద్ద ఉత్తర్వుల నకలు లభ్యమగును.

సం/- కమీషనర్,
ఎ.పి.సి.ఆర్.డి.ఎ & సి.ఎ., విజయవాడ


Amaravati PAGE 8
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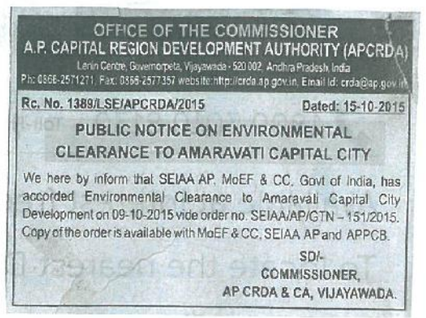
OFFICE OF THE COMMISSIONER
A.P. CAPITAL REGION DEVELOPMENT AUTHORITY (APCRDA)
Lenin Centre, Governorpeta, Vijayawada - 520 002. Andhra Pradesh, India
Ph: 0866-2571271, Fax: 0866-2577357 website: http://crda.ap.gov.in, Email id: crda@ap.gov.in

Rc. No. 1389/LSE/APCRDA/2015 Dated: 15-10-2015

PUBLIC NOTICE ON ENVIRONMENTAL CLEARANCE TO AMARAVATI CAPITAL CITY

We here by inform that SEIAA AP, MoEF & CC, Govt of India, has accorded Environmental Clearance to Amaravati Capital City Development on 09-10-2015 vide order no. SEIAA/AP/GTN – 151/2015. Copy of the order is available with MoEF & CC, SEIAA AP and APPCB.

SD/-
COMMISSIONER,
AP CRDA & CA, VIJAYAWADA.