ENVIRONMENTAL MANAGEMENT PLAN

of

"HON'BLE HON'BLE MLA & MLC HOUSING PROJECT"
AMARAVATI, ANDHRA PRADESH.

PICTORIAL VIEW OF THE HON'BLE MLA & MLC HOUSING PROJECT

SEPTEMBER – 2017

PROJECT PROPONENT	ENVIRONMENTAL CONSULTANT
Andhra Pradesh Capital Region Development Authority Vijayawada, Andhra Pradesh	**B.S. ENVI-TECH PVT. LTD.,** Secunderabad, Telangana. NABET Accreditation: NABET/EIA/1316/RA002

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CHAPTER – 1: INTRODUCTION

1.0 HON'BLE MLA & MLC HOUSING PROJECT

ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY (APCRDA) proposes to construct residential buildings to accommodate the Hon'ble MLA & MLC families. The proposed building project is part of the Amaravati Government Complex. The project is titled as "**HON'BLE MLA & MLC HOUSING PROJECT**" forming Part of Survey Nos. 361 362 of Rayapudi & 10, 11, 12, 14 of Kondamarajupalem Villages, Amaravati Capital City, Andhra Pradesh being developed by APCRDA, Andhra Pradesh.

1.1 GOVERNMENT OF INDIA – LEGISLATION - BUILDING/ CONSTRUCTION PROJECTS /AREA DEVELOPMENT PROJECTS AND TOWNSHIPS

Ministry of Environment, Forests and Climate Change (MoEF & CC) New Delhi, Government of India has issued an Environmental Impact Assessment (EIA) Notification SO 1533, on 14th Sep 2006 and SO 3999 dated 9th Dec, 2016. As per the said notifications, all building/construction projects/area development projects and townships are identified as Category 'B', 8 (a) which necessitates obtaining the Environmental Clearance (EC) from SEIAA-AP. The notification has exempted the above category from Public Hearing. The Environmental Clearance for the Amaravati Master Plan had already been received from SEIAA-AP.

1.2 ENVIRONMENTAL MANAGEMENT PLAN

Towards complying with above statutory requirements of MoEF&CC, **APCRDA** has proposed to obtain the Environmental clearance for its proposed residential housing project titled **"HON'BLE MLA & MLC HOUSING PROJECT**, Amaravati Government Complex, Amaravati Capital city, Andhra Pradesh**.** The proposed plot is falling in **Government Zone** – **S1** as per the Approved Master plan of Capital City – **'Amaravati'** by APCRDA. The subject report is the Environmental Management Plan developed to implement various mitigation measures along with necessary budget.

1.3 PRESENT PROPOSAL

APCRDA proposes to construct the proposed residential housing project titled **"HON'BLE MLA & MLC HOUSING PROJECT"** at Survey Nos. Survey Nos. 361 362 of Rayapudi & 10, 11, 12, 14 of Kondamarajupalem Villages , falling in Government Zone – S1 as per approved Master Plan of Amaravati Capital City, Andhra Pradesh. The estimated cost of the project is Rs. 420 Crores.

Total Plot area of the proposed project is 4.23 Ha. (10.45 Acres). The built-up area of project is 1,46,240 Sq.m. It is proposed to construct 18 towers with each tower having Stilt + 12 floors. About 288 apartments are planned in the 18 towers for MLA & MLC.

A total of 581 covered car parkings and 53 open car parkings are provided.

The salient features details of the proposed project are given in **Annexure – 1**.

Fig – 1 shows the Master Plan of Amaravati Capital City and the location of proposed Hon'ble MLA & MLC housing project in Govt. Zone –S1.

Fig – 2 shows the typical layout plan of MLA / MLC Housing Project.

Fig – 3 depicts the perspective view of the proposed Hon'ble MLA & MLC Housing Project.

FIG – 1

MASTER PLAN

MAP SHOWING LOCATION OF HON'BLE MLA & MLC HOUSING PROJECT

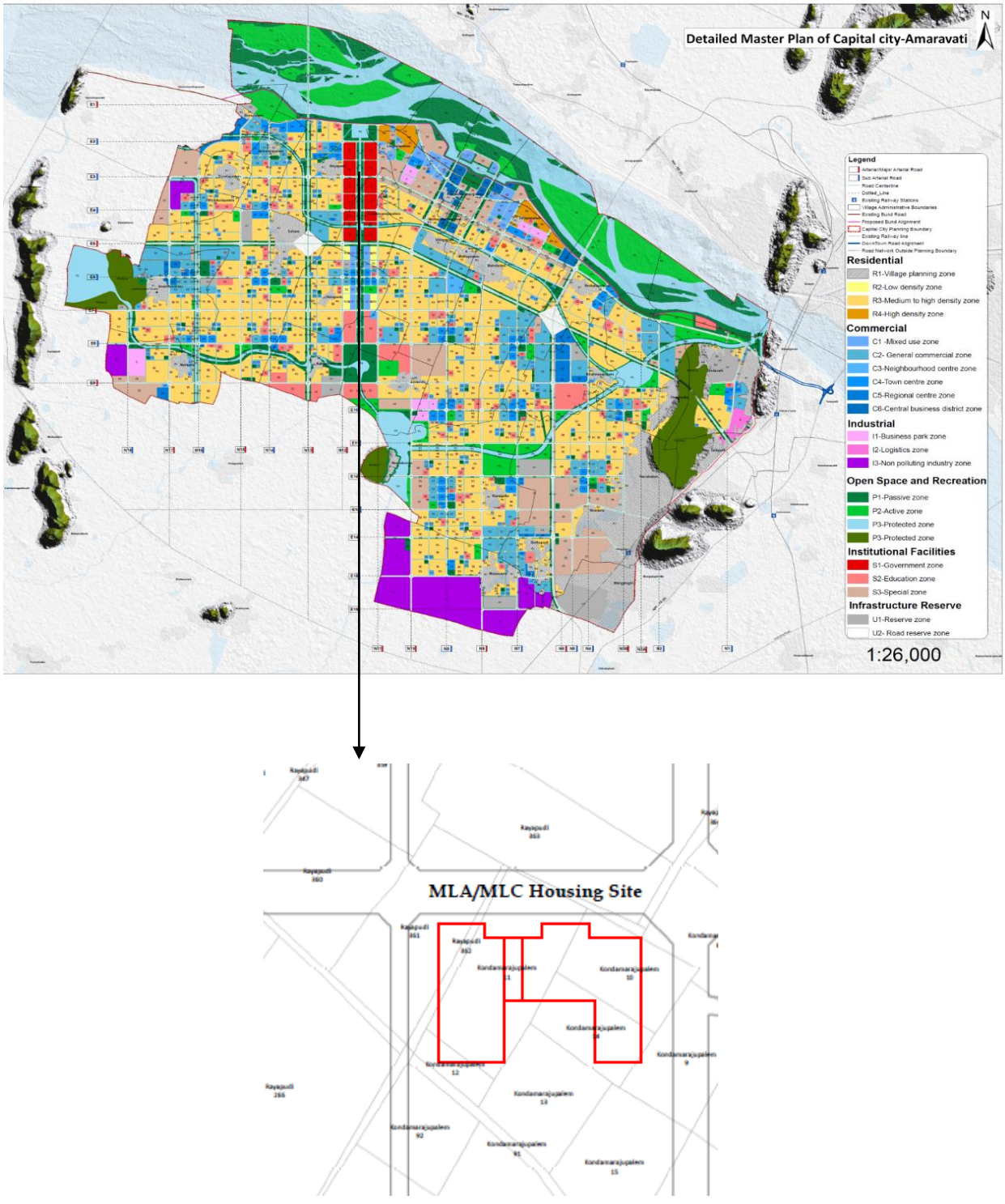


FIG – 2

Typical layout plan of MLA / MLC housing

FIG -3

PERSPECTIVE VIEW OF TOWER OF HON'BLE MLA & MLC HOUSING PROJECT.

SIDE ELEVATION REAR ELEVATION

1.4 APPLICABLE ENVIRONMENTAL STANDARDS AND REGULATIONS

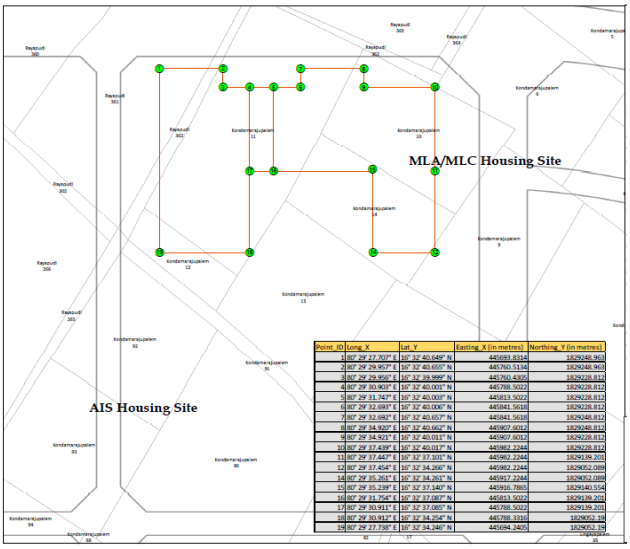
With respect to prevention and control of environmental pollution, the project is governed by the following Acts and Rules of MoEF&CC:

- Environmental Impact Assessment (EIA) Notifications SO 1533 dated 14-09-2006 and SO 3999 dated 09-12-2016 and amendments thereof.
- Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof.
- Air (Prevention and Control of Pollution) Act, 1981 and amendments thereof.
- Environment (Protection) Act, 1986 amended 1991 and Environment (Protection) rules, 1986 and amendments thereof.
- Hazardous Waste (Management & Handling) Rules, 1989, and amendments thereof.
- Municipal Solid Wastes (Management and Handling) Rules, 2000 and amendments thereof.
- E-Waste (Management) Rules, 2015 and amendments thereof.
- The Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof.

1.5 LOCATION OF THE PROJECT

The coordinates of the proposed HON'BLE MLA & MLC housing project as per Master Plan of Amaravati Capital City are shown below in **Fig - 4**

FIG – 4
COORDINATES OF THE HON'BLE MLA & MLC HOUSING PROJECT



Point_ID	Long_X	Lat_Y	Easting_X (in metres)	Northing_Y (in metres)
1	80° 29' 27.707" E	16° 32' 40.649" N	445691.8314	1829248.963
2	80° 29' 29.957" E	16° 32' 40.655" N	445760.5134	1829248.963
3	80° 29' 29.956" E	16° 32' 39.999" N	445760.4305	1829228.812
4	80° 29' 30.903" E	16° 32' 40.005" N	445788.5022	1829228.812
5	80° 29' 31.747" E	16° 32' 40.003" N	445813.5022	1829228.812
6	80° 29' 32.698" E	16° 32' 40.006" N	445841.5618	1829228.812
7	80° 29' 32.692" E	16° 32' 40.657" N	445841.5618	1829248.812
8	80° 29' 34.920" E	16° 32' 40.662" N	445907.6012	1829248.812
9	80° 29' 34.921" E	16° 32' 40.017" N	445907.6012	1829228.812
10	80° 29' 37.439" E	16° 32' 40.017" N	445982.2244	1829228.812
11	80° 29' 37.447" E	16° 32' 37.103" N	445982.2244	1829139.201
12	80° 29' 37.454" E	16° 32' 34.266" N	445982.2244	1829052.089
14	80° 29' 35.261" E	16° 32' 34.263" N	445917.2244	1829052.089
15	80° 29' 35.239" E	16° 32' 37.140" N	445916.7865	1829140.554
16	80° 29' 31.754" E	16° 32' 37.087" N	445813.5027	1829139.201
17	80° 29' 30.911" E	16° 32' 37.085" N	445788.5022	1829139.201
18	80° 29' 30.912" E	16° 32' 34.254" N	445788.3316	1829052.19
19	80° 29' 27.738" E	16° 32' 34.246" N	445694.2405	1829052.19

Salient features of 10 km radius in and around the project site are given in **Table – 1.**

TABLE – 1

SALIENT FEATURES OF THE PROJECT

FEATURE	DETAILS
Altitude	24 m above MSL
Temp., ^{o}C	9.4 - 47.2
Relative Humidity,%	35-83
Annual rainfall,	1031.6 mm
Nearest Water Bodies	Krishna river on the northern fringes of the Amaravati Capital Master Plan.
Nearest Highway	National Highway (NH-5) change to (NH-16) connecting Vijayawada – Guntur – Passing inside the Project Site – E direction
Nearest Railway station	Mangalagiri RS, KC RS
Nearest Industries	NTTPS (Vijayawada Thermal Power Plant)-5.0km - N
Nearest Village	Namburu – 5.2 km – S Tadikonda – 3.7 km - SW Amaravati – 8.7 km – W Vaikunthapuram – 2.9 km - WNW
Inter State Boundary	Andhra Pradesh – Telangana – 51.0 km - NW
Nearest Air port	Gannavaram (Vijayawada) – 21.0 km - ENE
Nearest Forest	Tadepalli R.F within the project site Mangalagiri RF – adjacent Motadaka RF– WE Karlapudi RF – W Pedda Madduru RF – WNW
Historical places	Undavalli Caves

All distances mentioned in the above table are aerial distances from the Boundary of APCRDA approved Master Plan of Amaravati Capital City.

1.6 RESOURCE REQUIREMENT

1.6.1 CONSTRUCTION PHASE

The duration of construction phase of the project is about 15 months from the date of commencement of the work after receipt of all statutory clearances.

The major requirements of the construction phase include:

a. Construction machinery
b. Power
c. Fuel
d. Water
e. Manpower

A CONSTRUCTION MACHINERY:

The typical construction machinery proposed to be used for construction of the project is given below.

1.	Bar bending	2.	Concrete Mixer truck
3.	Concrete Pumper	4.	Concrete vibrators
5.	Cranes – mobile	6.	Trucks
7.	Pile Driver	8.	Radial Arm saw
9.	Hammering	10.	Air Compressor
11.	Welding	12.	Pneumatic equipment

B POWER

About 1200 kVA of power will be required for the project during construction phase, which will be sourced from the Andhra Pradesh Central Power Distribution Company Limited (APSPDCL)/ APTRANSCO or alternatively suitable number of DG sets will be utilized at the site.

C WATER

The source of water for construction and operation phase is planned from Thulluru Lift Irrigation scheme being operated by Andhra Pradesh Irrigation Development Corporation (APIDC). Currently the Interim Government Complex (IGC) and other educational institutes like NID, VIT, SRM, AMRUTA are receiving the supply from the Thulluru Lift Irrigation scheme.

The water requirement during construction phase has been worked out considering concrete curing, Mortar mixing and curing for block work, Mortar mixing and curing for plastering, Floor finishes, Roof

works/screed, sprinkling for dust suppression and Domestic use in labour colony. The consumption of water per day during peak construction period is estimated to be about 900 - 1000 kld.

D MANPOWER

The estimated manpower is about 50 – 500 construction workers will be required during construction phase. Preference will be given to locals.

1.6.2 OPERATION PHASE

The major requirements in the operation phase are given below:

A POWER

The estimated total connected demand is 9000 kVA and the maximum demand is 6024 kVA of power for the proposed Hon'ble MLA & MLC housing project and will be sourced from the APCPDCL/APTRANSCO. It is planned to have three substations each having three transformers of 1000 kVA each to receive and distribute the power.

During periods of power outages, it is proposed to supply emergency power through 6 Nos. of DG sets each of 625 kVA capacity.

B WATER SUPPLY

The total water requirement of the project during operation phase is estimated to be 370 kld. This will be met from the Thulluru Lift Irrigation scheme which is in operation.

CHAPTER – 2: DETAILS OF PROJECT

2.0 DESCRIPTION OF THE PROJECT

The proposed project will be located in an area of 10.45 acres with a built up area of 1,46,240 Sq.m. The construction will be completed in a period of 15 months. Adequate manpower and machinery will be used for construction. The details of the proposed project are discussed in detail under the following two heads.

a) Construction phase
b) Operation phase

2.1 CONSTRUCTION PHASE:

The major requirements in the construction phase will be

a) Sufficient area for storage of raw material
b) Power
c) Fuel
d) Water

2.1.1 STORAGE OF RAW MATERIAL

Sufficient storage space for storing the construction material has been identified within the plot. The list of raw materials proposed to be used for the construction project are presented.

LIST OF MAJOR CONSTRUCTION MATERIALS STORED AT PROJECT SITE

Construction Materials	Maximum Storage (Approx.)	Mode Of Storage
Reinforcement steel (MT)	13000	Will be stored in open area
Cement (m^3)	3369	Cement bags will stored separately under cover in bales.
Sand (MT)	75561	Sand will be stacked under tarpaulin cover.
Concrete (m^3)	123787	Ready Mix concrete is used at the time of construction

2.1.2 POWER

The power requirement during construction phase will be sourced from the nearest sub-station of APCPDCL/APTRANSCO or alternatively using DG sets.

2.1.3 FUEL

High Speed Diesel (HSD) complying with BS IV specification would be used for DG sets, which shall be operated during the construction period.

2.1.4 WATER

The water requirement for construction phase is estimated to be about 900 - 1000 kld. This will be sourced from the Thulluru Lift Irrigation scheme.

2.2 OPERATION PHASE

The proposed project will be built on a plot area of 6.38 Ha. (10.45 Acres). The built-up area of project is 1,46,240 Sq.m. It is proposed to construct 18 towers with each tower having Stilt + 12 floors. About 432 apartments are planned in the 18 towers. A total of 881 covered car parkings and 75 open car parkings are provided. One club house each for HON'BLE MLA & MLC housing is proposed.

2.2.1 POWER

The total power requirement of the "HON'BLE MLA & MLC Housing Project" in the operation phase is estimated to be about 9000 kVA which will be sourced from APCPDCL/APTRANSCO. It is planned to have three substations with 9 No.s of transformers each of 1000 kVA capacity to receive and distribute the power.

2.2.2 STANDBY POWER

During periods of power outages, it is proposed to supply emergency power through 6 DG sets each of 625 kVA capacity.

2.2.3 WATER SUPPLY SYSTEM

Total water requirement during the operation phase is 370 kld which will be sourced from the Thulluru Lift Irrigation scheme.

CHAPTER – 3: ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan of the proposed project has been formulated keeping in view of current Environmental guidelines standard for Building Projects provided by Ministry of Environmental, Forests and Climate Change (MoEF&CC).

The following mitigation measures are proposed to synchronize the development of the project with the environmental protection. The construction phase impacts are mostly short term, restricted to the plot area and not envisaged on the larger scale. In the operation phase the environmental impacts are due to operation of the project and hence, the emphasis in the Environment Management Plan (EMP) is to minimize such impacts.

Following sections describe the environment management plan proposed for construction and operation phases.

3.1 ENVIRONMENTAL MANAGEMENT PLAN – CONSTRUCTION PHASE

3.1.1 LAND ENVIRONMENT

The following measures will be implemented to mitigate the impacts on land environment.

- Surplus construction debris will be used for backfilling or leveling at the site itself or sent to other areas of the Capital city for leveling or backfilling.
- Labour camp as per NBC code will be developed having proper potable drinking water facility and separate sanitation facilities for men and women
- First aid facility also will be provided at the construction site.

3.1.2 WATER ENVIRONMENT

The following measures will be implemented to control impact on water environment.

- ✓ Water requirement for construction is estimated to be 900 - 10000 kld (peak requirement). This will be sourced from the existing Thulluru Lift Irrigation Scheme. The water requirement

during construction phase is mainly for concrete curing for block work, mortar mixing and curing for plastering, floor finishes, roof works/screed, sprinkling for dust suppression and domestic use.

- ✓ Domestic wastewater generated during construction phase will be disposed to a package STP.

3.1.3 AIR ENVIRONMENT

The construction activity will result in increase of fugitive dust. The impact on air environment during the construction phase is due to:

- ✓ Emission of dust from clearing of the site.
- ✓ Emissions from vehicular movement.
- ✓ Emissions from handling of the construction material such as cement, sand and aggregate.

The following measures will be implemented to control dust emissions

- ✓ Construction materials will be covered with tarpaulin sheets to prevent the material from being air borne.
- ✓ The construction site will be barricaded to prevent fugitive dust emission.
- ✓ The vehicle speed will be regulated.
- ✓ The workers will be provided with Personal Protective Equipment (PPE) such as nose masks and goggles to reduce impact on health.
- ✓ Periodical maintenance of construction machinery will be done to control emission.

3.1.4 NOISE ENVIRONMENT

The impact of noise during construction is mainly on the people who are working near sources. The following measures will be implemented to control noise levels.

- ✓ The earth moving equipment will be periodically checked and maintained for noise levels.
- ✓ Periodic maintenance of vehicles will be taken up to ensure vehicular emission is under control.
- ✓ There will be marginal increase in noise levels during construction phase which is temporary.

- ✓ Personnel Protective Equipment (PPE) such as ear plugs, fall protection equipment, High visibility safety vests with reflective striping, safety shoes and helmets will be provided to the construction workers.

3.1.5 FACILITIES FOR CONSTRUCTION WORKERS

During construction phase, a temporary labour colony will be constructed in the adjacent plot. The labour colony will be provided with drinking water facilities, separate toilets for men and women, package STP, Power supply. A first aid facility will be provided.

3.1.6 SAFETY ASPECTS

Safety is given utmost importance during the construction phase. All the construction workers are given proper training. It will be ensured that the workers use the Personal Protective Equipment given to them. Safety boards and placards in local language will be displayed, and construction zones will be barricaded.

3.2 ENVIRONMENTAL MANAGEMENT PLAN DURING OPERATION PHASE

The Environmental Management Plan to be implemented during operation phase is discussed under the following heads.

a. Land Environment
b. Water Environment
c. Air environment
d. Noise Environment
e. Solid waste generation

Details of management plan of each environmental component are given below:

3.2.1 LAND ENVIRONMENT

The proposed project will be located in an area of 6.38 Ha. (10.45 Acres). It is planned to develop landscaping in an area of 0.76 Ha

(1.88 Acres). The STP treated waste water will be used for landscaping purpose.

3.2.2 WATER ENVIRONMENT

WATER CONSUMPTION AND WASTEWATER GENERATION

Total water consumption in the operation phase is about 370 kld and the estimated waste water generation is 302 kld.

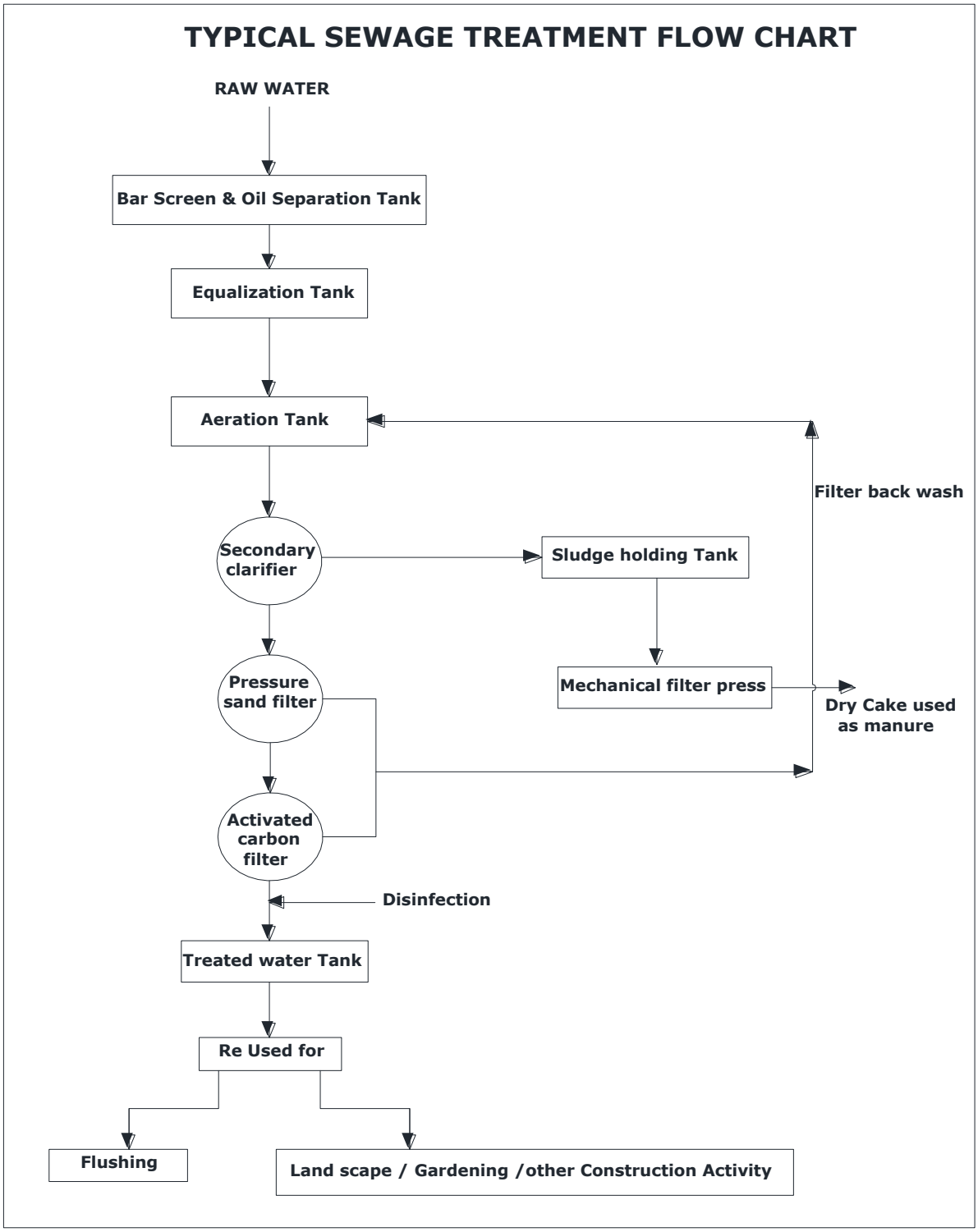
The wastewater generated from the HON'BLE MLA & MLC Housing will be collected through network of pipes. The collected wastewater will be routed to the sewage treatment plant through pipes provided with inspection chambers. Wastewater generation from the project is about 302 kld. STP of 320 kld capacity comprising the following units is proposed is shown in **Fig – 5.**

a. Bar cum screen chamber
b. Oil & Grease Trap
c. Equalization Tank
d. Aeration Tank
e. Clarifier
f. Sludge Holding tank
g. Pressure Sand Filter
h. Activated Carbon Filter

About 257 kld of treated waste water will be reused for flushing, landscaping, car wash and any construction activities or landscaping in the vicinity.

The details of the water balance and wastewater generation are given in **Annexure – 2.**

FIG - 5


TYPICAL SEWAGE TREATMENT FLOW CHART
RAW WATER
Bar Screen & Oil Separation Tank
Equalization Tank
Aeration Tank
Filter back wash
Secondary clarifier
Sludge holding Tank
Pressure sand filter
Mechanical filter press
Dry Cake used as manure
Activated carbon filter
Disinfection
Treated water Tank
Re Used for
Flushing
Land scape / Gardening /other Construction Activity

3.2.3 AIR ENVIRONMENT

The impact on air environment in the operation phase will be mainly due to the following

a. Vehicular movement
b. Operation of the DG sets which are the emergency power supply units

Vehicular movement

The emission from vehicular movement is mainly from the exhaust of two and four wheelers. However, all the vehicles will undergo pollution check to control vehicular emission.

Operation of the emergency power supply units - DG sets

6 No's of DG sets each of 625 kVA capacity will be provided to meet emergency power supply requirement.

The following measures will be implemented for control of air pollution

- DG sets will be operated only during emergency and are not in continuous operation.
- CPCB approved DG sets conforming to noise and emission standard will be provided.
- Stacks of adequate height (3m above the building height will be provided to exhaust the flue gas emission.

3.2.4 NOISE ENVIRONMENT

DG sets will be provided with acoustic enclosure conforming to CPCB norms. Noise levels will be monitored as part of compliance.

3.2.5 STORM WATER MANAGEMENT

The average ground water table in the region is about 2-5 m. The area falls under the tail end of River Krishna. Hence no rainwater harvesting is proposed.

The runoff from the paved and unpaved areas will be collected through network of storm water drains which is in turn connected to the main storm water network of capital city as per the approved Master Plan.

3.2.6 GREENBELT DEVELOPMENT

Landscaping will be developed in an area of 0.76 Ha (1.88 Acres). List of species proposed for plantation as per CPCB guidelines for this region are enclosed in **Annexure – 3.**

3.2.7 SOLID WASTE GENERATION

The solid waste generation from the project in the operation phase is mainly from the following areas:

a. Domestic Solid waste
b. Solid waste from sewage treatment plant

➲ **Domestic solid waste including Garbage**

The solid wastes generated during operation phase will consist of mainly papers, cartons, thermocol, plastics, polythene bags, glass, waste vegetables and foods etc., The quantity of solid waste generated from the HON'BLE MLA & MLC Housing Project is 1,166 kg/day.

The details of the solid waste generation calculation are given in **Annexure – 4**.

➲ **Sludge from waste-water treatment**

The STP sludge quantity (166.32 kg/day) will be conditioned and dried. The dried sludge cakes will be used as manure for greenery development.

SOLID WASTE DISPOSAL

The organic and inorganic waste will be collected and stored separately. These wastes (organic and inorganic) will be disposed to

local Municipal Authority for further disposal till the solid waste facility of Amaravati Capital City is made operational.

3.2.8 ENERGY CONSERVATION

The following energy conservation measures are proposed to be implemented:

(a) Architectural Design
   i. Maximize the use of natural lighting through design
   ii. Passive solar cooling utilizing building shading.

(b) Energy Saving Practices
   i. Energy efficient light fixtures shall be used (LEDs).
   ii. Power factor of the complete electrical system shall be maintained close to unity. This will reduce electrical power distribution losses in the installation.
   iii. Energy Efficient V3F lifts
   iv. Higher efficient UPS shall be used (95%)
   v. All ceiling fans shall be minimum BEE 3 star rated
   vi. Timers and Photo-electric sensors shall be used to switch ON/OFF lights used for landscaping

(c) Creating awareness to building users
   i. Sign boards shall be provided for promoting energy conservation where ever required
   ii. Training staff on methods of energy conservation and to be vigilant to such opportunities.

3.2.9 UTILISATION OF SOLAR ENERGY

Provision shall be provided for Roof top solar PV installation for common area lighting

3.2.10 FIRE FIGHTING SYSTEM

FIRE FIGHTING SYSTEMS

The required Fire protection systems such as fire extinguishers, hose reel, yard hydrant, automatic sprinkler system, manually operated

electronic fire alarm system, UG tank, terrace tank and pumps with capacity will be provided as per NBC 2016.

The Residential Buildings are classified as A3. Provision for overhead Fire Water reservoir pumping system and hydrant system will be provided as per as per NBC 2016 based on height of the building. External hydrants shall be provided at the street level from the Water supply distribution network as per norms.

PORTABLE FIRE EXTINGUISHERS

The Portable Fire extinguishers shall be provided as per relevant codes and requirements.

FIRE FIGHTING SERVICES INTEGRATION POINTS WITH BUILDING MANAGEMENT SYSTEMS

S. N.	Item Description	Relevant Details of Components provided	Type of Integration Proposed	Additional Requirements for BMS
1.	Fire Pumps	Common Electrical Control Panel has been provided with status of On/Off for each individual pump.	Indication of Pump On/Off status Only	NO-NC points for each pump, which can transmit a signal to the BMS system.
2.	Sprinkler System	Zonal Flow Switches are provided along with addressing units, connected to a common Annunciation Panel, for zone wise indication.	Zone-wise indication signals to be transmitted to the BMS System/Main fire Alarm system.	Integration of software/protocols, additional interface modules.
3.	Pressure in Fire & Sprinkler Lines	Pressure gauges at various locations	Pressure values to be transmitted to BMS system.	Sensors for the fire & sprinkler lines at various locations

FIRE ALARM & PUBLIC ADDRESS SYSTEM

- Conventional Fire Detection and Alarm System are envisaged with Manual call point & hooter to be provided at each floor.
- Hooter can be used as P.A. speaker during emergency.
- Tower will have a zonal panel located at stilt floor.
- The Zonal panels in each tower will be connected to Main F.A. Panel located at security gate for group of towers.
- Fire Alarm system shall be as per NBC 2016 and relevant IS codes.
- UPS system shall be provided for the entire system with minimum 60mins battery backup.

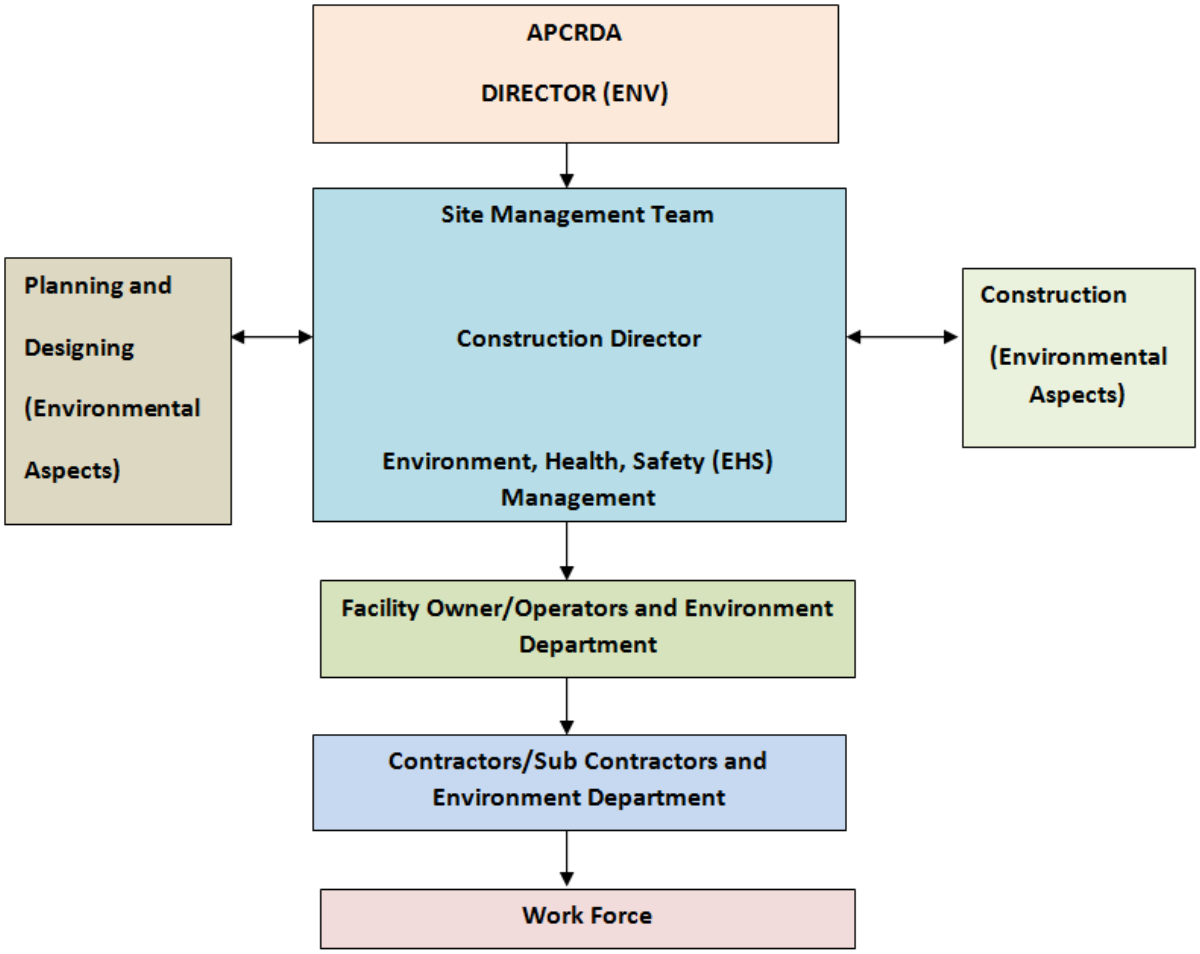
CHAPTER – 4: ENVIRONMENTAL MONITORING PROGRAMME & EMP BUDGET

4.0 ENVIRONMENTAL MONITORING PROGRAMME

Environmental monitoring programme has been drawn to ensure that all environmental resources which may be subject to contamination are kept under review for taking necessary measures to comply with the norms. APCRDA will take all measures to assess and analyze the data periodically.

APCRDA will establish an Environmental Cell to monitor the various environmental parameters and to comply with the Environmental Clearance conditions. The following is the organization structure for implementing the Environment Management Plan and monitoring of the various environmental parameters.

ENVIRONMENTAL CELL



4.1 CONSTRUCTION PHASE

Various components proposed for monitoring during construction phase are:

- Ambient Air Quality - PM10, PM2.5, SOx, NOx and Ozone
- Fugitive Dust Level - Suspended Particulate Matter
- Ambient Noise Level – Day and Night Equivalent Noise levels

4.2 OPERATION PHASE

The various components proposed for monitoring during Operation phase are:

- Establish Automatic Ambient Air Quality Monitoring stations network to monitor PM10, PM2.5, SOx, NOx and Ozone
- Regular monitoring of ambient noise levels
- Regular monitoring water quality
- Regular monitoring waste water quality comprising inlet and outlet of STPs

4.2.1 AIR EMISSIONS

DG sets will be monitored for compliance to emission standards. APCRDA will ensure that prospective manufacturers will also comply with emission standards by way of routine inspections or audits and system of reporting the Environmental Compliance at scheduled intervals.

4.2.2 WATER / WASTE WATER

Regular monitoring of water and waste water quality as per CPCB/APPCB standards

4.2.3 STORM WATER NETWORK MONITORING

The effectiveness of the storm water drainage system depends on proper maintenance of all pipes/channels. Regular cleaning of drains will be done to remove accumulated sludge/sediments. The catch-pits linked to the storm water drainage system will also be regularly

cleaned to ensure their effectiveness. This exercise will be carried out during the pre- monsoon and at regular intervals.

4.2.4 GREENBELT DEVELOPMENT

APCRDA will monitor the green belt development as envisaged in the approved Master Plan for Amaravati Capital City. Trees survival rate will be monitored in the plantation areas and will be maintained at about 80% by replacement of dead trees.

4.3 ENVIRONMENTAL MANAGEMENT PLAN BUDGET

An amount of Rs 6.7 Crores is budgeted as capital cost and Rs. 0.5 Crore/annum towards operation and maintenance cost for implementation of Environmental Management Plan. Details of the same are given below:

ENVIRONMENTAL MANAGEMENT PLAN (BUDGET)

S.No	Description	Capital Cost (Rupees in Crores)
1	Sewage Treatment Plant (320 kld)	1.0
2	Dual Plumbing	3.0
3	Landscaping	0.684
4	Storm water drains	2.0
Total		**6.684 (say 6.7)**