

# **ENVIRONMENTAL MANAGEMENT PLAN**

of

## **“LEGISLATIVE ASSEMBLY BUILDING PROJECT” AMARAVATI GOVERNMENT COMPLEX, AMARAVATI, ANDHRA PRADESH**



**PICTORIAL VIEW OF THE LEGISLATIVE ASSEMBLY BUILDING**

**SEPTEMBER - 2017**

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## CHAPTER – 1: INTRODUCTION

### 1.0 LEGISLATIVE ASSEMBLY BUILDING PROJECT

**ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY (APCRDA)** proposes to construct the Legislative Building for Government of Andhra Pradesh. The proposed building project is part of the Amaravati Government Complex. The project is titled as “**Legislative Assembly Building Project**” forming Part of Survey Nos. 105, 76, 70, 77, 54, 55, 53, 58, 56 of Kondamarajupalem Village, Amaravati Capital City, Andhra Pradesh and is part of Amaravati Master Plan 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 14<sup>th</sup> Sep 2006 and SO 3999 dated 9<sup>th</sup> Dec, 2016. As per the said notifications, all building/construction projects/area development projects and townships are identified as Category ‘B’, 8 (a)/8(b) 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 Building project titled “**Legislative Assembly Building 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 following is the Environmental Management Plan developed to implement the various mitigation measures along with necessary budget.

### 1.3 PRESENT PROPOSAL

**APCRDA** proposes to construct the proposed building project titled “**Legislative Assembly Building Project**” on a plot area of 12.85 Ha. (31.76 Acres) at Survey Nos. Part of 105, 76, 70, 77, 54, 55, 53, 58, 56 of Kondamarajupalem Village, falling in Government Zone – S1 as per approved Master Plan of Amaravati Capital City, Andhra Pradesh. The estimated cost of the project is Rs. 907 Crores.

Total Plot area of the proposed project is 12.85 Ha. (31.76 Acres). The built-up area of project is 96099.74 Sq.m. It is proposed to construct Legislative Assembly Building with 3 floors + Ground + Basement. A total of 400 four wheeler parking 450 two wheeler parking are provided in basement. Surface parking is provided for 900 cars. The salient features of the proposed project are given in **Annexure – 1**.

**Fig – 1** shows the Master Plan of Amaravati Capital City and the location of proposed Legislative Assembly Building Project in Govt Zone – S1.

**Fig – 2** shows the Typical layout plan of Legislative Assembly Building Project.

**Fig – 3** depicts the perspective view of the proposed Legislative Assembly Building Project.



FIG - 2  
TYPICAL LAYOUT PLAN OF ASSEMBLY BUILDING

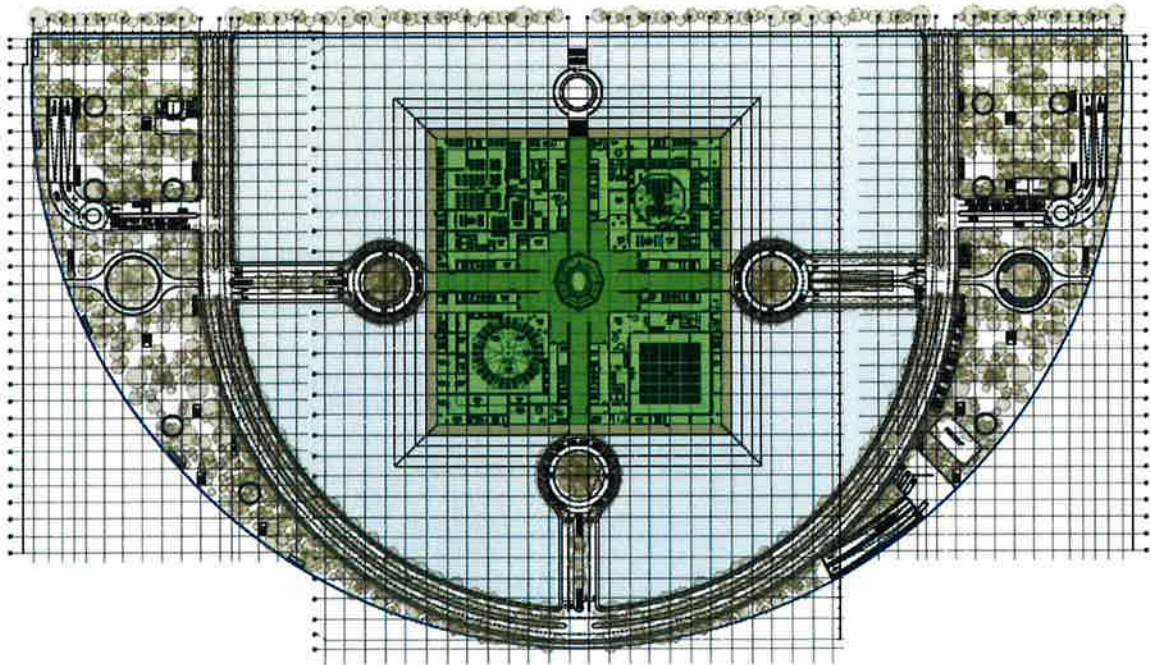
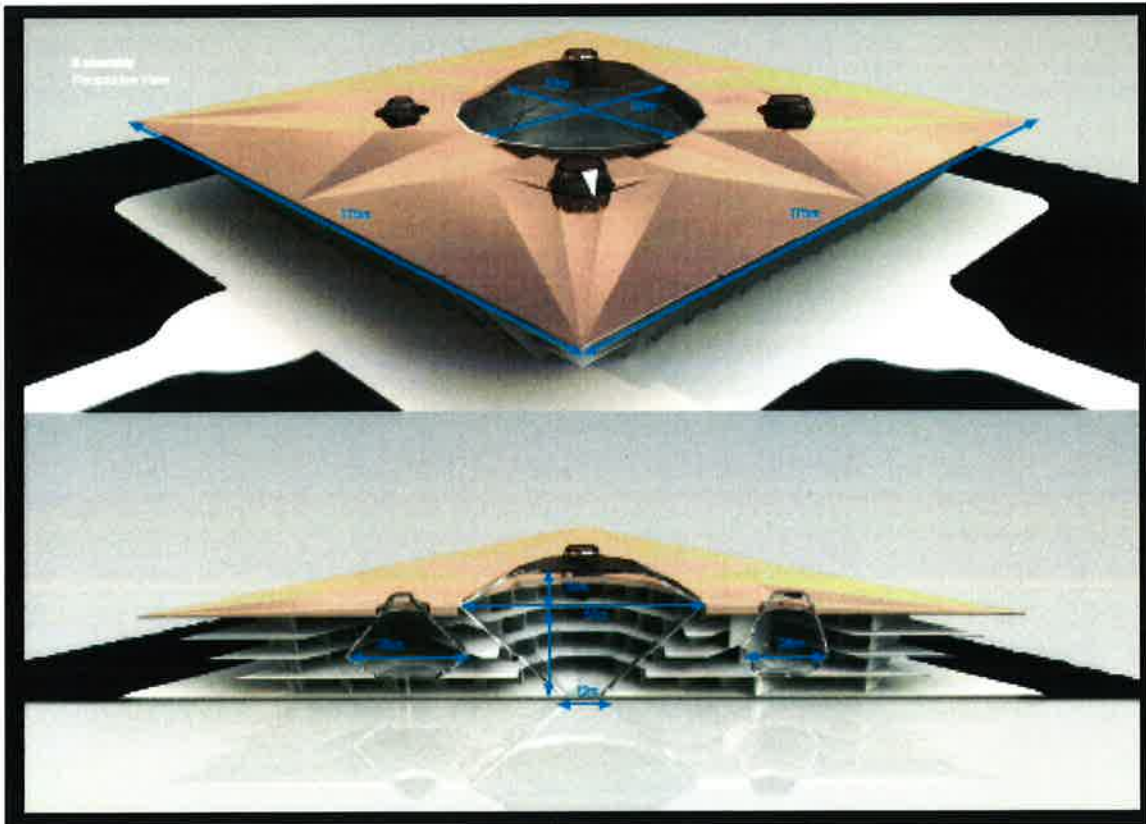


FIG - 3  
PERSPECTIVE VIEW OF LEGISLATIVE ASSEMBLY BUILDING



## 1.4 APPLICABLE ENVIRONMENTAL STANDARDS AND REGULATIONS

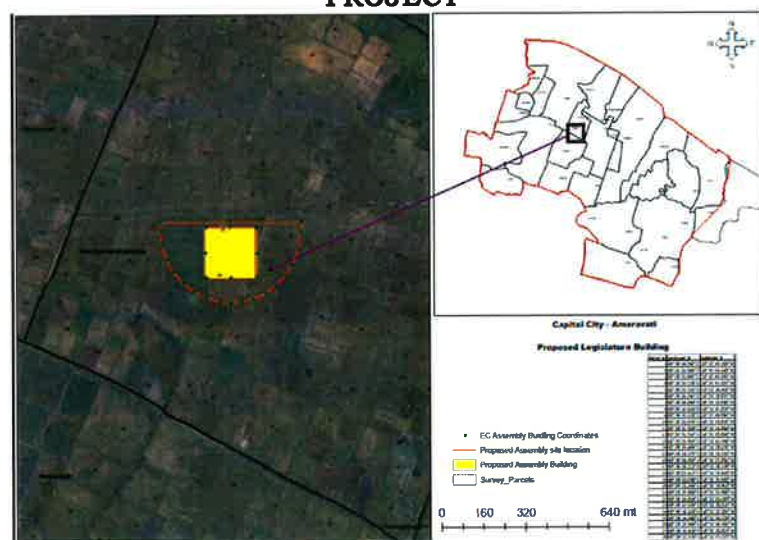
With respect to prevention and control of environmental pollution, the project is governed by the following Acts and Rules of MoEF&CC:

- 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 Legislative Assembly Building Project as per Master Plan of Amaravati Capital City are shown below in **Fig - 4**

**FIG - 4  
COORDINATES OF THE PROPOSED LEGISLATIVE ASSEMBLY BUILDING PROJECT**





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

**TABLE – 1**  
**SALIENT FEATURES OF THE PROJECT**

<b>FEATURE</b>	<b>DETAILS</b>
Altitude	24 m above MSL
Temp., °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 1250 kVA of power will be required for the project during construction phase, which will be sourced from the APCPDCL/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 500 - 600 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 11250 kVA and the maximum demand is 12280 kVA of power for the proposed Legislative Assembly Building Project and will be sourced from the APCPDCL/APTRANSCO. It is planned to have a substation with 5 No.s of transformers with 2250 kVA capacity to receive and distribute the power.

During periods of power outages, it is proposed to supply emergency power through 6 DG sets each of 1800 kVA capacity.

#### **B WATER SUPPLY**

The total water requirement of the project during operation phase is estimated to be 357 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 31.76 acres with a built up area of 96,100 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**

<b>Construction materials</b>	<b>Maximum storage (approx)</b>	<b>Mode of storage</b>
Reinforcement steel (MT)	8920	Will be stored in open area
Cement (m <sup>3</sup> )	2100	Cement bags will stored separately under cover in bales.
Sand (MT)	48000	Sand will be stacked under tarpaulin cover.
Concrete (m <sup>3</sup> )	92000	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 APSPDCL/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**

It is estimated about 500 - 600 kld. of water is required during construction. 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 12.85 Ha. (31.76 Acres). The built-up area of project is 96099.74 Sq.m. It is proposed to construct Legislative Assembly Building with 3 floors+ basement. A total of 400 four wheeler parking 450 two wheeler parking are provided in basement. Surface parking is provided for 900 cars.

### **2.2.1 POWER**

The estimated total connected demand is 11250kVA and the maximum demand is 12280 kVA of power for the proposed Legislative Assembly Building Project and will be sourced from the APCPDCL/APTRANSCO. It is planned to have a substation with 5 No.s of 2250 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 1800 kVA capacity.

### **2.2.3 WATER SUPPLY SYSTEM**

Total water requirement during the operation phase is about 357 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 500 - 600 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 construction 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 12.85 Ha. (31.76 Acres). It is planned to develop landscaping in an area of 10.48 Acres (42416.3 Sq.m). 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 357 kld and the estimated waste water generation is 249 kld.

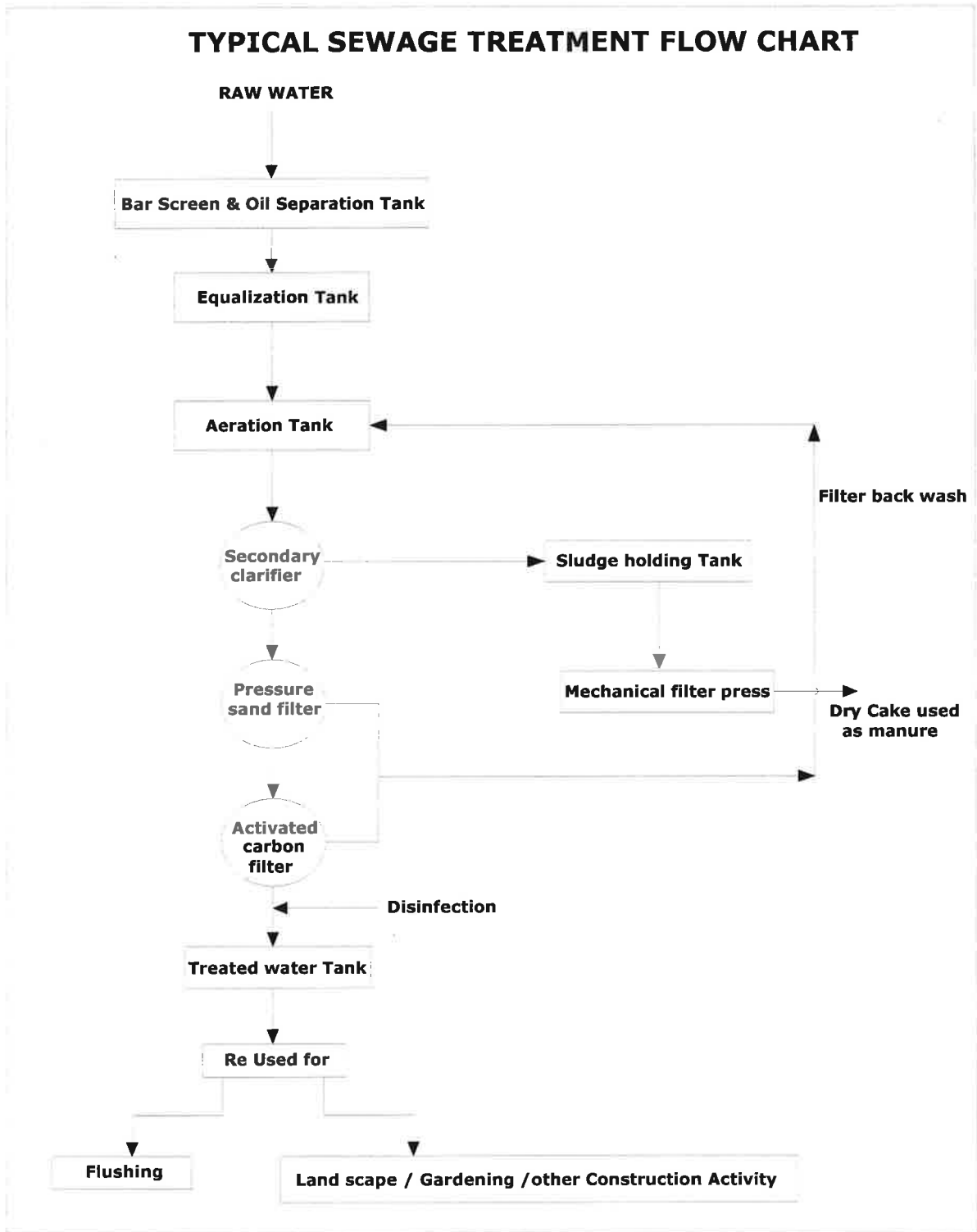
The wastewater generated from the Legislative Assembly building will be collected through network of pipes. The collected wastewater will be routed to the sewage treatment plant through pipes provided with inspection chambers. Wastewater generation from the project is about 249 kld. STP of 300 kld capacity 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 211 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



### 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 1800 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 10.48 Acres (42416.3 Sq.m). 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, and organic food waste. The quantity of solid waste generated from the Assembly is 1,320 kg/day.

The detail of the solid waste generation is given in **Annexure - 4**.

#### ➤ **Sludge from waste-water treatment**

The STP sludge quantity (175.8 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.



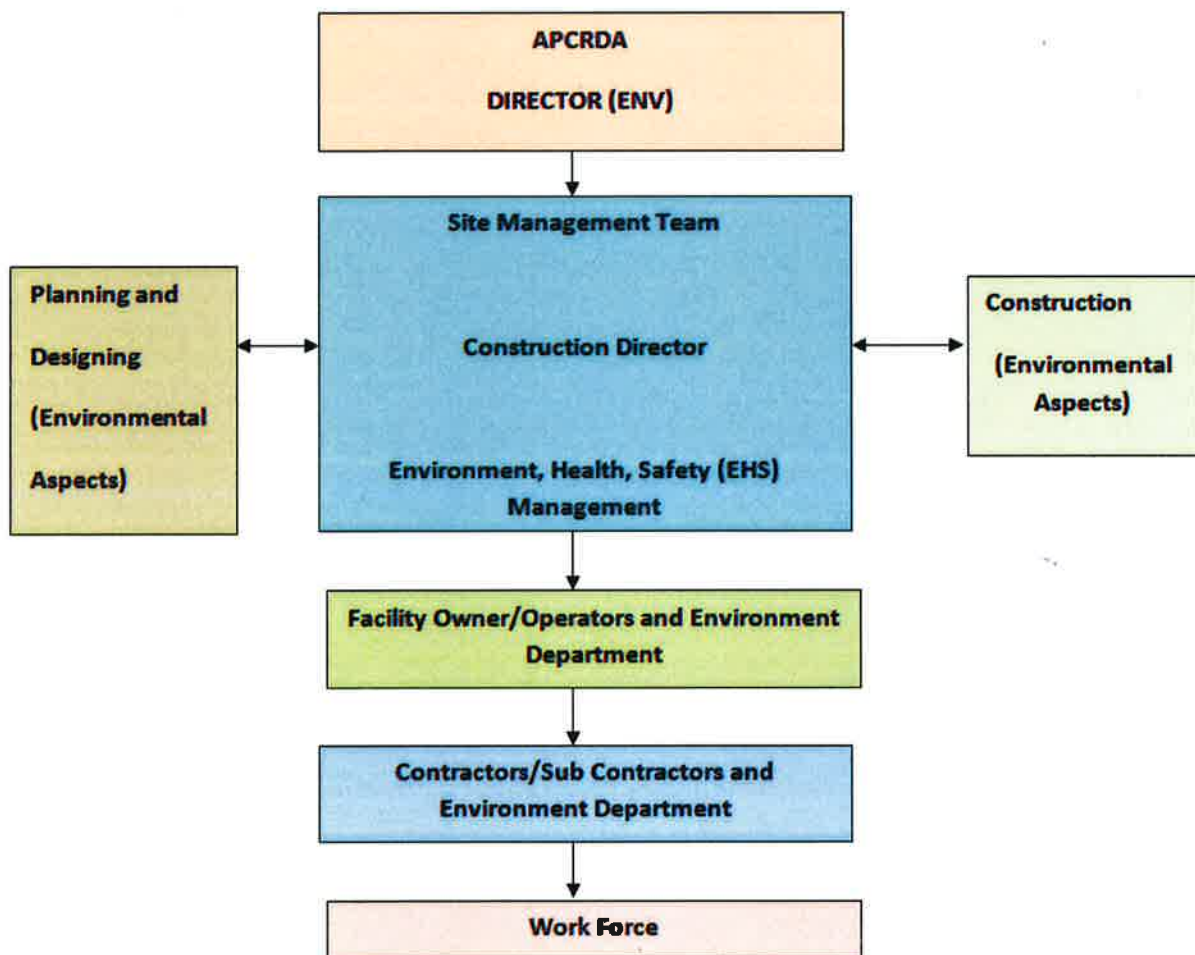
## CHAPTER – 4: ENVIRONMENTAL MONITORING PROGRAMME & EMP BUDGET

### 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**

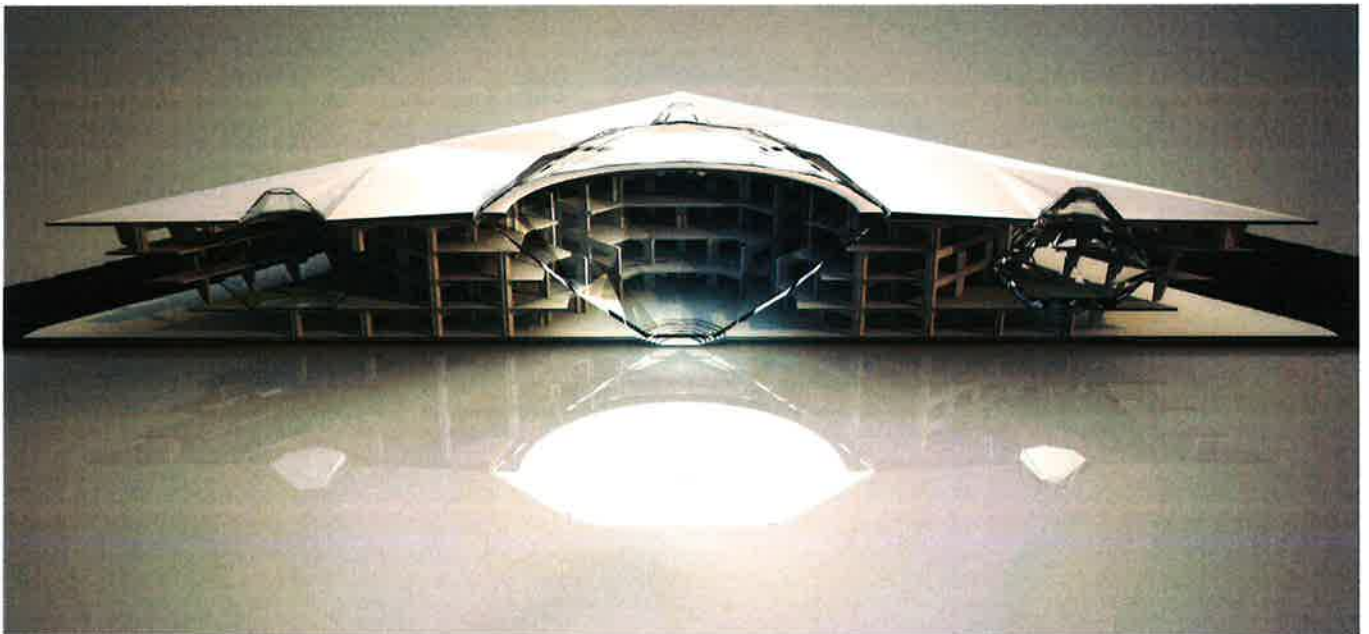
An amount of Rs 6.07 Crores is budgeted as capital cost and Rs. 0.7 Crore/annum towards operation and maintenance cost for implementation of Environmental Management Plan. Details of the same are given below:

##### **ENVIRONMENTAL MANAGEMENT PLAN (BUDGET)**

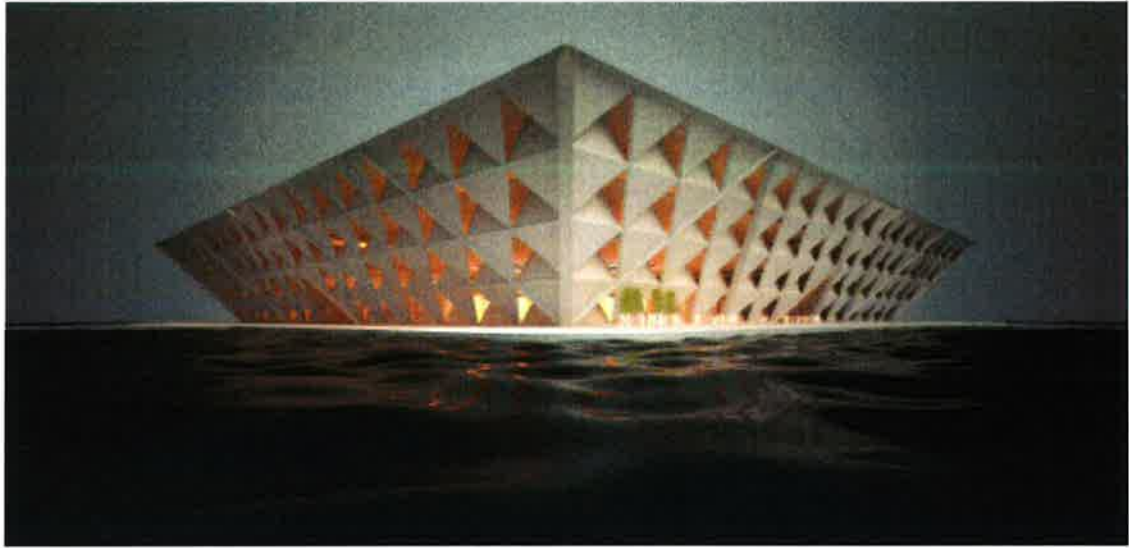
<b>S.No</b>	<b>Description</b>	<b>Capital Cost (Rupees in Crores )</b>
1	Sewage Treatment Plant	1
2	Dual Plumbing	1.63
3	Landscaping	2.12
4	Storm water drains	1.32
<b>Total</b>		<b>6.07</b>

**SALIENT FEATURES OF THE PROJECT**

<b>S.No</b>	<b>TITLE</b>	<b>DETAIL</b>
1.	Project	<b>LEGISLATIVE ASSEMBLY BUILDING PROJECT</b>
2.	Location	Amaravati government complex, Amaravati, Andhra Pradesh.
3.	Survey No.s	S.Nos. 105, 76, 70, 77, 54, 55, 53, 58, 56 of Kondamarajupalem Village,
4.	Plot Area	1,28,532 sq.m
5.	Built-Up area	96,100 sq.m
6.	No. of Buildings	1
7.	Water Requirement	357 KLD
	Source	Thulluru Irrigation Scheme
8.	Power Requirement	8171 kVA
	Source	APCPDCL
9.	DG sets	1800 kVA - 6No.s

**PERSPECTIVE VIEW**

## CONCEPTUAL PLAN OF LEGISLATIVE ASSEMBLY BUILDING PROJECT



## LEGISLATIVE ASSEMBLY BUILDING PROJECT

## a. WATER REQUIREMENT (KLD)

Sl. No	DESCRIPTION	Number of persons	DOMESTIC WATER L/day/person)	FLUSHING WATER (L/day/person)	DOMESTIC WATER (@5L/day/person)	FLUSHING WATER (@2 L/day/person)	TOTAL WATER REQUIREMENT
1	Permanent Staff	5025	5	40	25	201	226
2	Visitors	1275	2	20	3	26	28
<b>TOTAL</b>					<b>28</b>	<b>227</b>	<b>254</b>

	AREA (sq.m)	WATER REQUIREMENT (KLD)
<b>Greenbelt requirement</b>	41090	<b>103</b>

**Total water requirement is 254 + 103 = 357 kld**

## b. Waste water generation

Sl. No	DESCRIPTION	TOTAL WATER REQUIREMENT	WASTE WATER GENERATION ( 80% of Domestic & Flushing Requirement)
1	Permanent Staff	226	221
2	Visitors	28	28
<b>TOTAL</b>		<b>254</b>	<b>249</b>

- **Total waste water generation = 249 KLD**
- **Proposed STP Capacity = 300 KLD**
- **Treated Waste Water from STP= 211 KLD**

## TREATED WASTE WATER UTILISATION (KLD)

S. No	DESCRIPTION	TOTAL WATER
1	Flushing	211
<b>TOTAL</b>		<b>211</b>

Wastewater generation is only 211 m<sup>3</sup>/day which will be recycled totally for flushing. Additional water required for flushing and greenbelt development is 119 m<sup>3</sup>/day (surplus treated wastewater generated from other buildings will be used).

## GREEN BELT SPECIES

S.No	Scientific Name	Common Name (Telugu)
1	<i>Adenanthera pavonina</i>	Bandiguruvenda
2	<i>Adina cordifolia</i>	Pasupa, kadamba
3	<i>Aegle mormelos</i>	Maaredu
4	<i>Alianthus excelsa</i>	Peddamaanu
5	<i>Anthocephalus chinensis</i>	-----
6	<i>Artocarpus heterophyllus</i>	Jack fruit tree
7	<i>Artocarpus lacucha</i>	Kammaregu
8	<i>Azadirachta indica</i>	Veepachettu
9	<i>Bridelia squamosa</i>	Bontha-yepi
10	<i>Butea monosperma</i>	Mooduga, palaasamu
11	<i>Casuarina equisetifolia</i>	Saravi sarugudu
12	<i>Cocos nucifera</i>	Narikelamu
13	<i>Cordia dichotoma</i>	Chinnanakkeru
14	<i>Dalbergia sissoo</i>	Errasissoo
15	<i>Delonix regia</i>	Seemasantkesula
16	<i>Emblica officinalis</i>	Amalakama, Raatausirika
17	<i>Erythrina variegata</i>	Baadita, Moduga
18	<i>Ficus benghalensis</i>	Peddamarri
20	<i>Ficus benjamina</i>	-----
21	<i>Ficus elastica</i>	Indian Rubber tree
22	<i>Ficus glomerata</i>	Atti, Medichettu
23	<i>Ficus hispida</i>	Vettiyati
24	<i>Ficus religiosa</i>	Ashavatham, Raavichettu
25	<i>Mangifera indica</i>	Maamidichettu, Maavi
26	<i>Millingtonia hortensis</i>	Indian cork- tree, Buch
27	<i>Phoenix sylvestris</i>	Peddaetta
28	<i>Mimuspos elengi</i>	Vakulamu
29	<i>Moringa oleifera</i>	Mulaga
30	<i>Pterygota alata</i>	-----
31	<i>Saraca asoka</i>	Asokamu
32	<i>Spathodea campalunata</i>	Indian Tulip tree
33	<i>Sterculia foetida</i>	Manjiponaku
34	<i>Syzygium cumini</i>	Neereedu
35	<i>Tamarindus indica</i>	Chintachettu
36	<i>Tectona grandis</i>	Adaviteeku
37	<i>Terminalia arjuna</i>	Yerramaddi
38	<i>Thespesia populnea</i>	Gangaraavichettu
39	<i>Kigelia africana</i>	Sausage tree
40	<i>Lagerstroemia speciosa</i>	Varagoogu
41	<i>Peltophorum Pterocarpum</i>	Copper pod tree

<b>Shrubs &amp; Small Trees</b>		
1	<i>Acacia nilotica</i>	Nallatumma
2	<i>Abutilon indicum</i>	Botlabenda
3	<i>Achras sapota</i>	Sapota
4	<i>Acacia catechu</i>	Khadirammu
5	<i>Anona squamosa</i>	Seetaaphalam
6	<i>Anona reticulata</i>	Raamaphalamu
7	<i>Bambusa vulgaris</i>	The Golden bamaboo
8	<i>Barringtonia racemosa</i>	Kanapa
9	<i>Bauhinia racemosa</i>	Ari
10	<i>Bahinia varigata</i>	Devakanchanamu
11	<i>Caesalpinia pulcherrima</i>	Sankesula, Vatanarayana
12	<i>Calotropis gigantea</i>	Peddajilleedu
13	<i>Clerodendrum infortunatum</i>	Gurrapukattiyaku
14	<i>Cassia fistula</i>	Reelachettu, Vkoollaponna
15	<i>Citrus aurantium</i>	Mallikanarangi
16	<i>Duranta repens</i>	-----
17	<i>Hamelia patens</i>	Scarlet bush
18	<i>Lantana camara</i>	Puulikampa
19	<i>Lawsonia inermis</i>	Gorinta
20	<i>Sesbania sesban</i>	Samintha
21	<i>Tecoma stans</i>	Pachagotla
22	<i>Psidium gujava</i>	Goyya
23	<i>Trema orientalis</i>	Bundamuru
24	<i>Zizyphus mauritiana</i>	Reegu



**LEGISLATIVE ASSEMBLY BUILDING****Basis****A.**

	<b>Number of Persons</b>	<b>Per-capita Waste Generation kg/person/day</b>	<b>Organic waste in kg/day</b>	<b>Inorganic waste in kg/day</b>	<b>Total Waste</b>
Domestic Waste	5025	0.2	301.5	703.5	1005
Street Sweeping	6300	0.05	94.5	220.5	315
	<b>Total</b>		<b>396</b>	<b>924</b>	<b>1320</b>

**B. Solid waste from STP = 175.8 kg/day (@ 0.035 kg/person/day)**

**SUMMARY OF SOLID WASTE GENERATION (kg/Day)**

Organic Waste Generation	:	396
Inorganic Waste Generation	:	924
STP Sludge	:	175.8
Total Waste generation	:	1496

**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.