Divyasree Orion B8

M/s Divyasree NSL Infrastructure Pvt. Ltd.,

SURVEY NO. 66/1, RAIDURGA,
SERILINGAMPALLY, RANGA REDDY DISTRICT

1. FORM I

2. FORM I A

Submitted By
M/s Divyasree NSL Infrastructure Pvt. Ltd.,
Plot No-19, 8-2-684/3/k/19,
Road No-12, Kaushik society,
Banjarahills, Hyderabad-34.
Phone: 040- 23310404.

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SUBMITTED TO
STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY
TELANGANA
GOVERNMENT OF INDIA

APPENDIX I

(See paragraph – 6) FORM 1

S.No	Item	Details
1	Name of the Project/s	***Divyasree Orion B8 by M/s Divyasree NSL Infrastructure Pvt. Ltd.***
2	S.No. in the Schedule	B category
3	Proposed capacity/area/length/ tonnage to be handled/command area/lease area/number of wells to be drilled	Annexure I *Expected cost of the project: 377 crores*
4	New/Expansion/Modernization	New
5	Existing Capacity/Area etc.	NA
6	Category of Project i.e 'A' or 'B'	B category
7	Does it attract the general condition? If yes, please specify	No
8	Does it attract the Specific condition? If yes, please specify.	No
9	Location	
	Plot/Survey/Khasra No.	Survey Nos. 66/1
	Village	Raidurga
	Tehsil	Serilingampally
	District	Ranga Reddy
	State	Telangana
10	Nearest railway station/airport along with distance in kms.	Hitech city railway station at a distance of 5.0 km
11	Nearest Town, City, District Headquarters along with distance in kms.	Hyderabad
12	Village Panchayats, Zilla Parishad, Municipal Corporation, Local body (complete postal address with telephone nos. to be given)	HMDA
13	Name of the Applicant	**Mr. Jagan Mohan**
14	Registered Address	**M/s Divyasree Holdings Pvt. Ltd.** Plot No-19, 8-2-684/3/k/19, Road No-12, Kaushik society, Banjarahills, Hyderabad-34
15	Address for Correspondence:	**M/s Divyasree Holdings Pvt. Ltd.** Plot No-19, 8-2-684/3/k/19, Road No-12, Kaushik society, Banjarahills, Hyderabad-34
	Name	**Mr. Jagan Mohan**
	Designation(Owner/Partner/CEO)	**AGM Corporate Sales**
	Address	**M/s Divyasree Holdings Pvt. Ltd.** Plot No-19, 8-2-684/3/k/19,

S.No	Item	Details
		Road No-12, Kaushik society, Banjarahills, Hyderabad-34
	Pin Code	500 034
	E-mail	jagan@divyasree.com
	Telephone Number	040- 23310404
	Fax No.	
16	Details of alternative Sites examined, if any. Location of these sites should be shown on a topo sheet.	Village-District-State NA
17	Interlinked Projects	No
18	Whether separate application of interlinked project has been submitted?	
19	If yes, date of submission	
20	If no, reason	
21	Whether the proposal involves approval/clearance under: if yes, details of the same and their status to be given. (a) The Forest (Conservation) Act, 1980? (b) The Wildlife (Protection) Act, 1972 ? (c) The C.R.Z Notification, 1991 ?	No
22	Whether there is any Government Order/Policy relevant/relating to the site?	No
23	Forest land involved (hectares)	No
24	Whether there is any location pending against the project and /or land in which the project is propose to be set up? (a) Name of the Court (b) Case No (c) Orders/directions of the Court, if any and its relevance with the proposed project.	No

(I) Activity

1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	Yes	The site area is located in Hyderabad Metropolitan Development Authority area under Raidurgam, Serilingmaplally. The present land use is Commercial Office. Presently the land is barren and is not used for any productive purpose. The proposed project shall enhance the land cover.
1.2	Clearance of existing land, vegetation and buildings?	No	The land is barren containing mainly shrubs and bushes. The same shall be cleared.
1.3	Creation of new land uses?	No	The present land use is Commercial Office space, Mall & Multiplex.
1.4	Pre-construction investigations e.g. bore houses, soil testing?	Yes	Bore holes shall be drilled for ground water abstraction, subject to the permission from the State Ground Water Authority.
1.5	Construction works?	Yes	The project is a construction project of Commercial Office space.
1.6	Demolition works?	No	
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	Labour force will be provided with temporary accommodation within the site.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	No	Built up Area: **Annexure I** Cut and Fill quantity: **Annexure II**
1.9	Underground works including mining or tunneling?	No	
1.10	Reclamation works?	No	
1.11	Dredging?	No	
1.12	Offshore structures?	No	

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.13	Production and manufacturing processes?	No	Commercial Office space construction project.
1.14	Facilities for storage of goods or materials?	Yes	Construction materials like cement, steel, sand, paints, aggregate etc shall be stored on site. The cement and paints are stored indoor, while the remaining is stored out doors.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	The wastewater shall be treated and reused for flushing and on land irrigation purpose. The excess treated water if any shall be let out into municipal sewer lines. The water balance, water recycling quantities and the design details of sewage treatment plant are presented in **Annexure –III.** The garbage shall be collected, collected garbage shall be sent to Municipal solid waste management facility. The garbage management plan is enclosed in **Annexure – IV.**
1.16	Facilities for long term housing of operational workers?	No	Required labour shall be drawn from neighboring areas/ villages**.**
1.17	New road, rail or sea traffic during construction or operation?	No	
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No	
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	
1.20	New or diverted transmission lines or pipelines?	No	
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	The local hydrology shall be considered while designing the storm water drains.

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.22	Stream crossings?	No	
1.23	Abstraction or transfers of water form ground or surface waters?	Yes	The domestic water requirement during occupation shall be drawn from HMWSSB. Ground water/treated wastewater if available, shall be used during construction.
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	No	The proposed storm water drains shall consider increased run off due to the project and shall be provided with sufficient number of collection sumps.
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Trucks shall be used for transporting the materials.
1.26	Long-term dismantling or decommissioning or restoration works?	No	
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	
1.28	Influx of people to an area in either temporarily or permanently?	Yes	The local area is developing at a faster pace due to industrialization and commercial/ Residential development in the surrounding areas.
1.29	Introduction of alien species?	No	
1.30	Loss of native species or genetic diversity?	No	
1.31	Any other actions?	No	

2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):

S.No.	Information/checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural land (ha)	Yes	Undeveloped land of **1.4825 hectares**
2.2	Water (expected source & competing users) unit: KLD	Yes	HMWSSB. Water requirement during occupation is **355.5** KLD. During construction the water requirement is 40 KLD. The availability of water for Hyderabad city are presented in **Annexure – V.**
2.3	Minerals (MT)	No	
2.4	Construction material – stone, aggregates, and / soil (expected source – MT)	Yes	**Annexure – VI**: Lead distances of construction materials. **Annexure – VII**: Quantity of construction material requirement.
2.5	Forests and timber (source – MT)	Yes	Local authorized Suppliers
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	DG sets and construction equipment shall be used during construction, which shall use mainly HSD as fuel. The energy requirement during occupation is presented in **Annexure – VIII.** DG sets (1500KVAX 8nos.) shall be used during occupation in the event of power shut down by TSTRANSCO to provide power for lifts, street lighting, common lighting and Effluent treatment plants.
2.7	Any other natural resources (use appropriate standard units)	No	

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	No	Hazardous materials used are; HSD, Paints etc.
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	
3.3	Affect the welfare of people e.g. by changing living conditions?	Yes	The project shall provide occupation facility for 7500-8200 employees.
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	
3.5	Any other causes	No	

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	No	
4.2	Municipal waste (domestic and or commercial wastes)	Yes	**2370.0** kg/day
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	Used oil: 210 l/year Used Batteries: 18 nos. /year
4.4	Other industrial process wastes	No	
4.5	Surplus product	No	
4.6	Sewage sludge or other sludge from effluent treatment	Yes	17.5 kg/day sludge from STP shall be reused as manure.
4.7	Construction or demolition wastes	Yes	
4.8	Redundant machinery or equipment	No	
4.9	Contaminated soils or other materials	No	
4.10	Agricultural wastes	No	
4.11	Other solid wastes	No	

5.0 Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	Emissions from DG sets, operated only during load shut down by TSTRANSCO. Emissions quantities are presented in **Annexure – IX.**
5.2	Emissions from production processes	No	Vehicular transport is the other source of emission.
5.3	Emissions from materials handling including storage or transport	No	
5.4	Emissions from construction activities including plant and equipment	Yes	Construction equipment and DG sets which mainly use HSD, as fuel shall generate emissions.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste	No	
5.6	Emissions from incineration of waste	No	
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	
5.8	Emissions from any other sources	No	

6.0 Generation of Noise and Vibration, and Emissions of Light and Heat:

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	Construction activity and the construction equipment are the main sources of noise and vibration during construction. While there are no major sources of noise during occupation phase.
6.2	From industrial or similar processes	No	
6.3	From construction or demolition	Yes	
6.4	From blasting or piling	No	No blasting activity envisaged.
6.5	From construction or operational traffic	Yes	There will be an increase in the traffic density, which shall increase the noise levels of the area both during construction and occupation phases.
6.6	From lighting or cooling systems	No	
6.7	From any other sources	No	

7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	No	Used batteries and waste oil shall be stored separately and shall not lead to contamination of land during normal operation.
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	No	The sewage shall be treated to achieve the standards prescribed by MoEF during operation phase. While the discharges from temporary toilets during construction shall be sent to septic tank followed by sewer lines.
7.3	By deposition of pollutants emitted to air into the land or into water	No	The project shall not emit substantial quantities of pollutants to have an impact on the air quality.
7.4	From any other sources	No	
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	No	

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances	No	Precautionary measures shall be adopted. Fire plan shall be put in place before occupation of the property.
8.2	From any other causes	No	
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?	No	The site is located at a higher elevation and the seismic zone for the project area is Zone II, which is considered safe,

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality

S. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of supporting. Lities, ancillary development or development Stimulated by the project which could have impact on the environment e.g.: • Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.) • Housing development • Extractive industries • Supply industries • Other	Yes Yes Yes No No No	The area is presently developing into a prime residential and commercial locality in view of the thrust given by Government of Andhra Pradesh for the development of IT and ITES services.
9.2	Lead to after-use of the site, which could have an impact on the environment	No	
9.3	Set a precedent for later developments	Yes	The surrounding areas shall develop as residential/ commercial areas.
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	

(II) Environmental Sensitivity

S.No.	Areas	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	Yes	KVB botanical park is located a distance of 3.5 km. KBR National Park 3.8 km. Mrugavani National Park is at a distance of 6.9 Km.
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	No	
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	No	
4	Inland, coastal, marine or underground waters	No	
5	State, National boundaries	No	
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	No	
7	Defense installations	No	
8	Densely populated or built-up area	Yes	The area is developing into a densely populated area due to industrialization in the surrounding areas and other major commercial developments in the vicinity.
9	Areas occupied by sensitive man-made land uses *(hospitals, schools, places of worship, community facilities)*	Yes	Hospitals, Schools, Places of worship and community facilities are located in the project impact area.
10	Areas containing important, high quality or scarce resources	No	

S.No.	Areas	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary
	(Ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)		
11	Areas already subjected to pollution or environmental damage. *(Those where existing legal environmental standards are exceeded)*	No	
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (*Earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions*)	No	

(IV).Proposed Terms of Reference for EIS/EMP studies

Scope of Work of EIS/EMP

"...The EIS/EMP shall cover the following:

Description of the proposed project

The first task:" Description of the proposed project" forms a vital component of the Environmental Impact Statement (EIS) as it provides the basis for evaluating the likely causes of Environmental Impacts. Land use issues dictate the significance of land loss/change. It is essential that the key components of the project shall be clearly determined as far as possible at this stage.

Assessment of Environmental Impacts

Based upon the results from the review of existing information, field visits, site data collection and consultation, for each component of environment (physical, biological and socio economic) the positive, negative, direct and indirect, temporary and permanent impact s will be evaluated along with an indication of the degree of impact, i.e., whether the impact is significant, moderate, minor or negligible.

Environment Management Plan and Mitigation Plan

For each significant negative impact identified, specialist shall work closely with the engineering team/technical consultants to suggest practicable measures to avoid or mitigate the impact. Suggestions for compensation shall be given where there is no other alternative course of action.

The mitigation of environmental impacts will be by three mechanisms.
=>Introduction of mitigation features through the engineering practices.
=>Implementation of environmental controls during construction and operation.
=>Legislative control involving compliance with Indian environmental laws.

The Environmental management plan shall include an estimate of capital and recurring costs of mitigation measures and will identify the parties and institutional framework for implementation.

Monitoring Plan

Having identified the significant environmental impact that are likely to arise as a result of the construction of Commercial Office Building project, the project team shall specify what monitoring is required during the various phases of the project cycle.

The monitoring plan will identify parameters and frequency of monitoring and responsible organization

I hereby give the undertaking that data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance give, if any to the project will be revoked at our risk and cost.

Date:

Place:

Signature of the applicant

Mr. Jagan Mohan
(AGM Corporate Sales)
M/s Divyasree NSL Infrastructure Pvt. Ltd.
Plot No-19, 8-2-684/3/k/19,
Road No-12, Kaushik society,
Banjarahills, Hyderabad-34

Annexure-I

Area Statement for the proposed Building

Land Use	Total Site Area (m^2)	Built up area (m^2)		
		Parking	Office	Total
Basement - 1	5406.8	3045.7	1430.3	4476.0
Basement - 2		3260.3	896.2	4156.5
Basement - 3		3818.9	1438.0	5256.9
Ground Floor		4211.4	828.5	5039.9
1st floor		4490.2	890.7	5380.9
2nd Floor		4563.7	818.3	5382.0
3rd floor		4508.3	873.8	5382.0
4th floor		4421.9	835.6	5257.5
5th floor		4508.3	873.8	5382.0
6th floor		4508.3	873.8	5382.0
7th floor		4472.2	909.8	5382.0
8th floor		4458.0	799.5	5257.5
9th floor		4452.5	928.8	5381.3
10th floor to 26th floor			86060.1	86060.1
Terrace			424.4	424.4
Green area	3110.9			
Open area	2509.0			
Road area	3798.3			
Total	**14825.0**	**54719.5**	**98881.6**	**153601.17**

Annexure-II

Cut & Fill Quantities

S No	Area	Qty. of fill (m^3)	Qty of cut (m^3)	Surplus fill (m^3)	Surplus cut (m^3)
1	Site	12085	20142		8057

Annexure-III

Water Requirement of the Project

Description	Total No. of Persons	Water requirement lpd	Total Water Requirement in KLD
Office	7900	45	355.5
Total	**7900**		**355.5**

The water requirement shall be reduced by adopting **Dual plumbing system:** Separate tank is provided to store the treated water; the tank shall be 1 foot below the overhead tank. Separate pipe system is provided to pump the treated water for flushing. All the treated water pipelines shall be colored blue. Separate line in the blocks to use treated wastewater for flushing purpose. The total saving is as follows;

Water Savings Proposed

Description	No. of Persons	Water Requirement in KLD	Treated water reuse KLD	Effective Water Requirement in KLD
Office	7900	355.5	158.0	197.5
Total	**7900**	**355.5**	**158.0**	**197.5**

Note: Treated water reuse assumed @ 20 l/head. Approximately **158** KL/day water will be saved by adopting recycling of treated water in the toilet flush.

The effective water consumption is reduced by **158** kl/day and the requirement will be in the order of **197.5** kl/day.

Water Balance during occupation stage

Input	KL/Day	Output	KL/Day
Domestic water Municipality	197.5	Treated waste water For HVAC	122.5
Recycled water	158.0	Recycle water (Flushing)	158.0
		Water requirement for green belt during non monsoon	3.9
		Losses approx 20%	71.1
Total	**355.5**	**Total**	**355.5**

The water used in the order of 355.5 KL/day would generate 284.4 KL/day of wastewater which has to be treated for reuse and remaining unused excess treated water is given to municipality for roadside plantation or used for construction of other buildings /given to other developers.

PROCESS DESCRIPTION:

The raw sewage will be collected in a collection sump and pumped to mechanical bar screen chamber for removal of large floating matter followed by grit removal in Grit Chamber. The raw sewage will then be collected in an equalization tank for homogenization of hydraulic load. The tank contents will be kept in suspension by means of course bubble serration through pipe grid. The equalization tank, with air flow indicator for continuous monitoring of air supply to the tank in order to avoid septic conditions, will be covered from top (RCC or FRP) to avoid nuisance. The equalized effluent will then be pumped to two Fluidized Aerobic Bio Reactors (FAB) in series where BOD/COD reduction can be achieved by virtue of aerobic microbial activities. The oxygen required will be supplied through coarse air bubble diffusers. The bio-solids formed in the biological process will be separated in the down stream Tube Settler. The clear supernatant will gravitate to the chlorine contact tank where sodium hypochlorite will be dosed for disinfection of treated water prior to disposal.

The biological sludge generated in the FAB and settled in the tube settlers will be collected in a sludge sump and then pumped to sludge drying bed for de watering. The dried sludge will then be disposed off suitably as manure. The schematics of the process are shown. The two main components of the treatment system viz. The FAB reactor and tube settler are described in the following sections.

Fluidized Aerobic Bio Reactor (FAB)

Conventional effluent treatment plants are large sized, power intensive and require a lot of monitoring. Scarcity of open space and rising land a power costs have forced the industries to look our for space saving, compact and efficient treatment options. This has led to the development attached growth processes where the bio mass is retained within the aeration tank obviating the need for recycle. These plants are not only compact but also user friendly. The endeavor to have a continuously operating, no-clogging biofilm reactor with no need for back washing, low head-loss and high specific biofilm surface area culminated in the most advanced technology of aerobic biological fluidized bed treatment where the biofilm (biomass) grows on small carrier elements that move along with the water in the reactor. The movement is normally caused by aeration in the aerobic version of the reactor.

The reactor combines all the advantages and best features of Trickling filters, Rotating biological contractors, activated sludge process and submerged fixed film reactors while eliminating the drawbacks of these systems. The plants are more compact and more energy efficient.

The Fluidized Aerobic Bio Reactor (FAB) consists of a tank in any shape filled up with small carrier elements. The elements are made up of special grade PVC or polypropylene of controlled density (shown in plate). For media of specific gravity 0.92-0.96 the overall density could be expected to increase up to 9.5% when full of biomass such that they can fluidize using an aeration device. A biofilm develops on the elements, which move along the effluent in the reactor. The movement within the reactor is generated by providing aeration with the help of diffusers placed at the bottom of the reactor. Then thin biofilm on the elements enables the bacteria to act

upon the biodegradable matter in the effluent and reduce the BOD/COD content in the presence of oxygen available from the air that is used for fluidization.

Characteristics of Waste water

Parameter	Quantity in mg/l
PH	6 – 7
Total Suspended Solids	400 – 600
BOD	200 – 300
COD	450 – 500

Design of the unit

Basic data

Flow	:	284	KLD
Capacity	:	350	m^3
Peak factor	:	3.5	
Peak flow Q peak	:	1225	m^3/day
Influent BOD	:	200	mg/lit
Influent Suspended Solids	:	200	mg/lit
Influent COD	:	350	mg/lit
Effluent BOD	:	30	mg/lit
Effluent COD	:	200	mg/lit
Effluent Suspended Solids	:	100	mg/lit

1. Bar Screen Chamber

Average flow	:	0.004	m^3/sec
Peak factor	:	3.5	
Peak flow	:	0.014	m^3/sec
Velocity at peak flow	:	0.75	m/Sec
Effective area of screen Required			
At average flow	:	0.005	m^2
At Peak flow	:	0.0175	m^2
Provide Effective area of screen	:	0.0175	m^2

Considering the bar of dia. 10 mm(w) and clear spacing of 20 mm (b)

Overall area required	:	0.34	m^2
Considering screen depth as	:	0.024	m
Number of clear spacing	:	0.3	
Number of bars	:	3	Consider 5 Nos.

Hence Provide 5 bars

Provide a screen of 0.5 m X 0.5 m at an inclination of sin 60^0. In a screen channel of one meter (1 m) length.

2. Grit Chamber :

The flow from the bar screen chamber is let into the Grit Chamber of minimum 2 hours capacity. This tank is provided to even out the flow variation, and to provide a continuous feed into the secondary biological treatment units.

Peak flow Q	:	0.014	m^3/sec

Providing a flow through velocity of 0.30 m/sec

Cross sectional area of Channel	:	0.046	m^2
Surface area of channel	:	0.66	m^2
Assuming depth d	:	0.2	m
Width of channel	:	0.1	m (say 0.3m)
Length of channel	:	4. 6	m (say 4.6 m)

Provide two channels each of 0.3 m wide and 4.6 m long with depth of waste water 0.2 m.

3. Equalization tank:

The flow from the bar screen chamber is let into the equalization tank of minimum 2hours capacity. This tank is provided to even out the flow variation, and to provide a continuous feed into the secondary biological treatment units.

Average flow	:	14.58	m^3/hr
Peak factor	:	3.5	
Peak flow	:	51.04	m^3/hr
Hydraulic retention tank = 2 hrs at Peak flow			
Hence required volume of the tank	:	102.08	m^3
Provide tank of	:	102.08	m^3 Capacity
Assuming depth	:	3	m
Area	:	34.02	m^2
Assuming length to width ratio (1:1) ; l=b			
length of the tank	:	5.8	m
width of the tank	:	5.8	m
Air required for agitation	:	0.01	m^3/ m^2 min
Total air required	:	61.25	m^3/hr
Air blower required	:	100	m^3/hr @ 3.8 mwc
Effluent transfer pump	:	14.58	m^3/hr @ 8 mwc

4. Fluidized Aerobic Bio Reactor (FAB):

The polypropylene media have been provided with a specific surface area of 350 – 520 m^2 /m^3. This allows micro-organisms to get attached and biomass concentration can be increased to four folds as compared to Activated Sludge Process. This enables to consider higher Organic loading rates.

The micro-organisms attached to media are kept in a fluid state thereby maintaining the CSTR (continuous Stirrer tank reactor) regime as well as two tanks are provided in series making the plug – flow system. This will enhance the efficiencies and have the merits of both CSTR and plug-flow regimes.

Organic loading rate	:	3.2	kg BOD/ m^3 d
Organic load	:	60	kg/day
Volume of the tank	:	21.86	m^3
Assume the depth	:	3	m
No. of tanks in series	:	1	
Size of the tank	:	1.8 m dia. x 3.0 SWD	
Specific gravity of media	:	0.92 to 0.96	
Specific surface area of media	:	350 – 520 m^2 /m^3	
Media filling	:	30 – 50 % of tank volume	
Oxygen required	:	2	kg / kg BOD

Oxygen in air	:	23%	
Specific gravity of air @ 30 deg.	:	1.65	
Aeration	:	Coarse bubble	
Oxygen transfer efficiency	:	12%	
Air required	:	77.7	m^3/hr
Air blower required	:	80	m^3/hr @ 6.5 m wc

5.Tube settler

Surface loading rate	:	48	m^2 /m^3 d
Surface area required	:	7.29	m^2
Tank size	:	3.0 m x 6.0 m x 2.7 m SWD With 55 deg. hopper bottom	
Tube Modules	:	3.0m x 6.0 m x 0.6 m ht.	
Tube inclination	:	60	deg.
Settling area for 60 deg slope	:	11	m^2 /m^3
Cross sectional area of tubes	:	120 mm x 44 mm Hexagonal	
Hydraulic radius	:	1/61 cm (1.5 cm)	
Shape factor	:	0.6 – 0.7 *for media settleable solids*	

6. Pre Filtration tank

The flow from the each individual settling tank i.e., the supernatant liquid is let into the respective Pre-Filtration Tank, which has a minimum 1.5 hours holding capacity. This tank is provided to hold the treated effluent and give an even flow to the pressure sand filter.

Average flow	:	14.58	m^3/hr
Peak factor	:	2	m^3/hr
Peak flow	:	29.16	m^3/hr
Provide min 1.5 hours holding capacity.			
Hence required volume of the tank	:	43.75	m^3

7. Pressure Sand Filter:

Vertical down flow type with graded/sand bed under drain plate with polysterene strains.

Flow	:	350	m^3/day
Rate of filtration assumed as	:	10	m^3/m^2/hr
Requirement of treated water for usage in 20 hrs	:	17.5	m^3/hr
Dia. of filter of 1 nos.	:	2286	mm

Provide pressure sand filter of 2500 mm dia. and 2800 mm HOS with sand as media layer, under drain pipe, laterals face piping etc for each stream.

8. Activated Carbon Filter:

Vertical down flow type with graded/sand bed under drain plate with polysterene strains.

Flow	:	350	m^3/day
Rate of filtration assumed as	:	10	m3/m2/hr
Requirement of treated water for usage in 20 hrs	:	17.5	m^3/hr
Dia of filter of 1 nos.	:	2286	mm

Provide Activated Carbon filter of 2500 mm dia with granular Activated carbon as media and 2800 mm HOS with sand as media layer, under drain pipe, laterals face piping etc for each stream.

9.Final Treated Water Holding Tank

It is always preferred to provide one final holding tank of minimum one day holding capacity, so that the treated effluents can be stored and used back for gardening or other tertiary purposes.

Capacity: 350 m^3

10. Sludge Filter Press:

The biomass in the aeration tank stabilizes BOD in wastewater by consuming the organic matter in the wastewater. The metabolic activity results in growth of the biomass population in the Fluidized Aerobic Bio Reactor (FAB). Sludge holding tank has been provided with filter press for dewatering sludge. The filtrate drains off through the media, which is again let into equalization tank. The dewatered sludge is collected in trays, which can be used as manure in the garden.

No. of plates	:	24
Size of plates	:	600 mm X 600 mm
Plate moc (material of construction)	:	PP (poly propline)
Type of operation	:	Hydraulic
Power pack capacity	:	2 HP

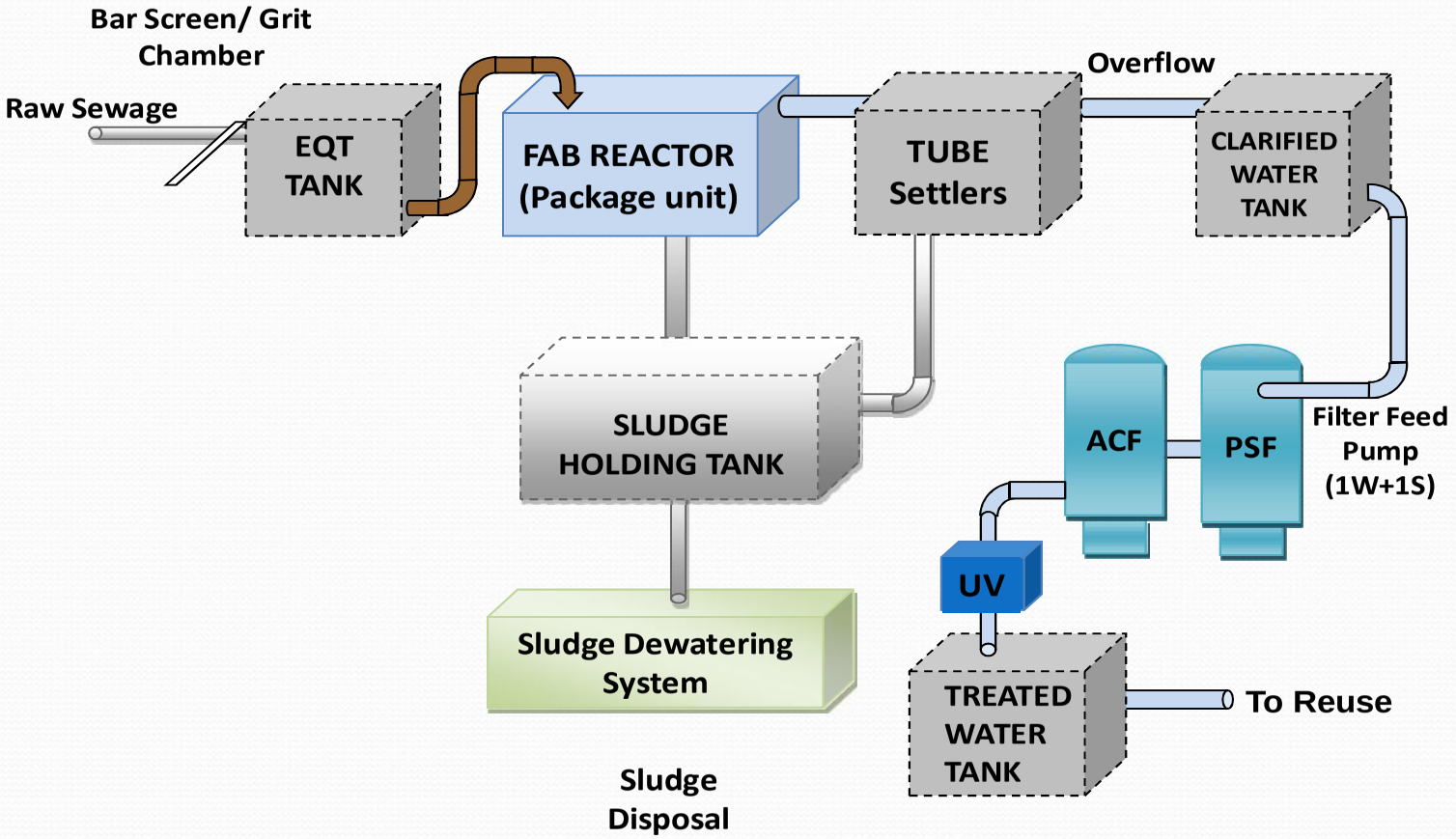
Characteristics of Treated Waste water

Parameter	Quantity in mg/l
pH	7.3
Total Suspended Solids	20
BOD	10
COD	50

Disposal of Treated Wastewater: The wastewater shall be treated and the treated water shall be reused for flushing the toilets, on land irrigation and HVAC make up water requirement, and on land irrigation. Hence all the recycled water is utilized completely and is considered as a zero discharge.

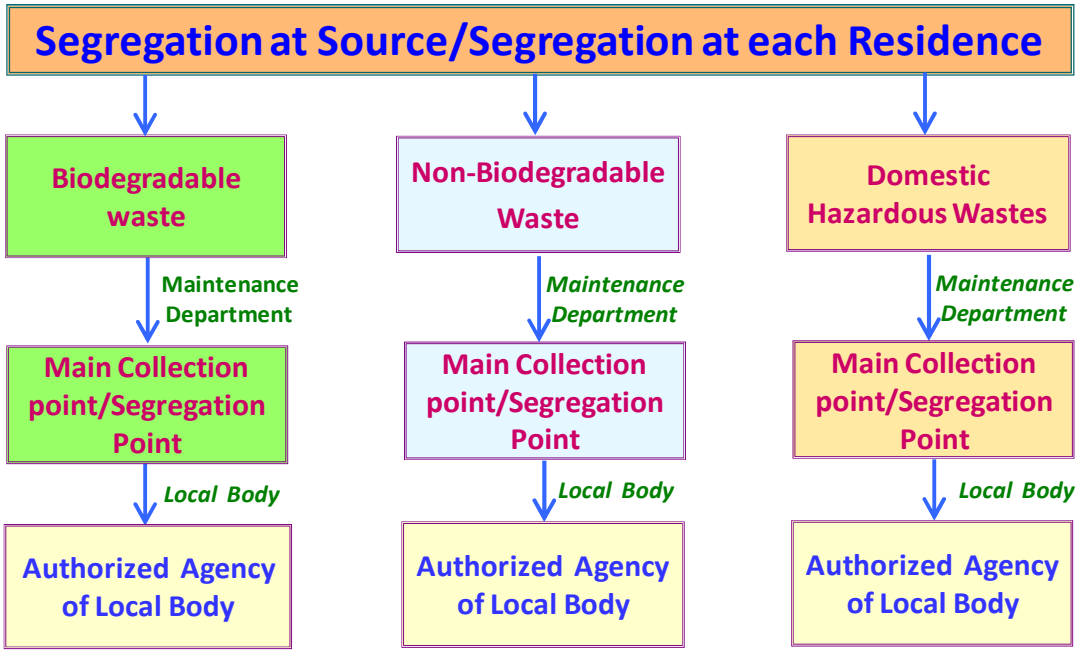
SEWAGE TREATMENT PLANT

FLUIDIZED AEROBIC BIO REACTOR TECHNOLOGY (FAB)



Annexure-IV

GARBAGE MANAGEMENT PLAN



Segregation at each residence into bio-degradable, non bio- degradable and domestic hazardous wastes. Facilitation by owners co-operative to dispose recyclable waste to Authorized Waste Pickers / Authorized Recyclers. Balance segregated waste given to Authorized Agency of Local Body for disposal.

Annexure-V

Present resources available with HMWSSB

Source Name	River	Year	Impoundment Name	Distance from city km	Installed Capacity MGD
Osmansagar	Musi	1920	Osmansagar	15	27
Himayatsagar	ESI	1927	Himayatsagar	9.6	18
Manjira Phase I	Manjira	1965	Manjira barrage	58	15
Manjira Phase II	Manjira	1981	Manjira barrage	59	30
Manjira Phase III	Manjira	1991	Singur Dam	80	37
Manjira Phase IV	Manjira	1993	Singur Dam	80	38
Krishna Phase I	Krishna	2005	NagarjunaSagar	116	90
Krishna Phase II	Krishna	2008	NagarjunaSagar	116	90
Krishna Phase III	Krishna	2015	NagarjunaSagar	116	90
Godavari Phase I	Godavari	2016	Yellampally	186	172

Source: Hyderabad Metropolitan Water Supply & Sewerage Board, www.hyderabadwater.gov.in

Annexure-VI

Lead Distance for Construction Materials

S.No.	Material	Source	Lead Distance (Km)
1	Sand	ROBOSAND and or Krishna or Godavari river bed areas permitted by Govt. of Telangana	160 – 250
2	Aggregate	With in the site	0 – 5
3	Cement	Manufacturing units	150 – 200
4	Reinforcement Steel	SAIL/TATA god owns	5-10
5	Bricks	Local suppliers/ Manufacturers	50
6	Plumbing Material	Local suppliers	2 – 9
7	Electrical Material	Local Suppliers	2 – 8
8	Sanitary Material	Local suppliers	2 – 8
9	Flooring and Pavement Tiles	Manufacturers	50– 150
10	Paints	Local Manufacturers	10 – 30
11	Ready Mix Concrete	Local Batch Plants	3 - 7

Annexure-VII

Material Consumption for Project

Land Use	BUA per unit in (m^2)	Ready Mix Concrete (m^3)	Cement (bags)	Sand (m^3)	Aggre gate (m^3)	Water (m^3)	Brick (Nos) x 1000	Reinfor cement steel (MT)
Total BUA	153601	660485	537604	55296	46080	414723	21043	5376
Total	**153601**	**660485**	**537604**	**55296**	**46080**	**414723**	**21043**	**5376**

Annexure-VIII

Energy Consumption Statement

S.No	Description	Total area in m2	Power allocated in watts per m2	Total Power required in (KW)	
1	Commercial & Common area	69217	69.00	4775.98	
	Total			**4775.98**	
Maximum demand in kw at 0.6 diversity factor				**2865.6**	
Consumption of power for 12 hours per day				**34387.1**	
Maximum demand in kw at 0.1 diversity factor				**477.6**	
Consumption of power for 12 hours per day				**5731.2**	
Total consumption of power per day				**40118.3**	**KW**
Total consumption of power per year				**146.4**	**Lakh Units**

Energy Saving by using copper wound transformers for Comm.

Power loss using CU. wound transformer	1.20%	
Savings in power loss using CU wound transformer	**1.8**	**Lakh Units**

Energy Saving by using HF Ballast

Power loss using conventional ballast				25%	
Power loss using HF ballast				14%	
Savings in power loss using HF ballast				11%	
S.No	**Description**	**Total area in m^2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	Basement	98882	3.00	296.64	
2	Common Area	10944	5.00	54.72	
	Total			**351.36**	
Maximum demand in kw at 0.8 diversity factor				**281.1**	
Consumption of power for 12 hours per day				**3373.1**	
Maximum demand in kw at 0.2 diversity factor				**70.3**	
Consumption of power for 12 hours per day				**843.3**	
Total consumption of power per day				**4216.4**	**KW**
Total consumption of power per year				**15.4**	**Lakh Units**
Savings in power loss using HF ballast				**1.7**	**Lakh Units**

Electrical Power savings using CFL/T5 for lighting

Savings in power Using CFL/T5 as against Fluorescent Lamps					30%
S.No	**Description**	**Total area in m2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	Basement	98882	3.00	296.64	
2	Common Area	10944	5.00	54.72	
	Total			**351.36**	
Maximum demand in kw at 0.8 diversity factor				**281.1**	
Consumption of power for 12 hours per day				**3373.1**	
Maximum demand in kw at 0.2 diversity factor				**70.3**	
Consumption of power for 12 hours per day				**843.3**	
Total consumption of power per day				**4216.4**	**KW**
Total consumption of power per year				**15.4**	**Lakh Units**
Savings in power using CFL				**4.6**	**Lakh Units**

Electrical Power savings using Solar Power for External lighting

S.No	**Description**	**Total area in m2**	**Power allocated in watts per m2**	**Total Power required in (KW)**	
1	External Lighting			10.00	
	Total			**10.00**	
Maximum demand in kw at 1.0 diversity factor				**10.0**	
Consumption of power for 6 hours per day				**60.0**	
Maximum demand in kw at 0.5 diversity factor				**5.0**	
Consumption of power for 6 hours per day				**30.0**	
Total consumption of power per day				**90.0**	**KW**
Total consumption of power per year				**0.33**	**Lakh Units**
Savings in power using Solar Power				**0.33**	**Lakh Units**

Electrical Power savings using water Cooled Chillers

Savings in power by using Water Cooled Chillers as against Air cooled Chiller					40%
S.No	**Description**	**Total area in m^2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	Commercial	69217	32.00	2214.95	
	Total			**2214.95**	
Maximum demand in kw at 0.6 diversity factor				**1329.0**	
Consumption of power for 12 hours per day				**15947.6**	
Maximum demand in kw at 0.1 diversity factor				**221.5**	
Consumption of power for 12 hours per day				**2657.9**	
Total consumption of power per day				**18605.6**	**KW**
Total consumption of power per year				**67.9**	**Lakh Units**
Savings in power using water Cooled Chillers and heat recovery wheel				**27.16**	**Lakh Units**

Total Saving

S.No	**Description**	**Savings in lakh kwh units**	**Savings in percentage**
1	With Cu wound Transformer	1.8	1.2
2	with HF Ballast	1.7	0.01
3	With CFL	4.6	3.2
4	With Water Cooled Chillers	27.2	18.6
5	With Solar Power for External lighting	0.3	0.2
	Total Saving	**146.4**	
	Total Consumption	**35.6**	**24.3**

Annexure-IX

Details of DG Set emissions

Stack connected to DG set capacity	Height m*	Dia m	Temp. of Exhaust Gases (^{O}C)	Exit Velocity m/sec	Pollutant Emission Concentration (g/sec)		
					PM	SO_2	NO_X
1500 kVA X 8 Nos.	8	0.6	675	14	0.005	0.09	0.12

- ***DG sets to be used when there is power shut down by TSTRANSCO***
- *** Stack Height above roof level**

APPENDIX II

(See paragraph 6)

FORM-1 A (only for construction projects listed under item 8 of the Schedule)

CHECK LIST OF ENVIRONMENTAL IMPACTS

(Project proponents are required to provide full information and wherever necessary attach explanatory notes with the Form and submit along with proposed environmental management plan & monitoring programme)

1. LAND ENVIRONMENT

(Attach panoramic view of the project site and the vicinity): Location Plan enclosed.

1.1. Will the existing land use gets significantly altered from the project that is not consistent with the surroundings? (Proposed land use must conform to the approved Master Plan / Development Plan of the area. Change of land use if any and the statutory approval from the competent authority are submitted). Attach Maps of (i) site location, (ii) surrounding features of the proposed site (within 500 meters).

The site area is a classified Commercial zone of Hyderabad Metropolitan Development Authority. The location plan is enclosed.

1.2. List out all the major project requirements in terms of the land area, built up area, water consumption, power requirement, connectivity, community facilities, parking needs etc.

Parking Space Provision of the Project

Floor	4-Wheelers
Basement - 1	60
Basement - 2	66
Basement - 3	73
Ground floor to to 9th floor	1022
9th floor stack	92
Total	**1313**

Connectivity: The project will be spread over an area of **15.17 hectares** of which **10.65 hectares** is for SEZ and remaining **4.52 hectares** is for Non SEZ development. Present development (**ORION – B8**) is **1.4825 hectares** is in SEZ area. It is proposed to develop **ORION – B8** in an area of **1.4825 hectares** in survey nos. 66/1 at Raidurgam, Serilingampally,Ranga Reddy District. The site is surrounded by open lands in all directions which are converted into plots for commercial as well as for residential purpose. A 24 m wide road (Old Bombay road) in southwest direction connecting Khajaguda/Raidurgam Junction and Shaikpet. The nearest railway station is the Hi-tech City railway Station at a distance of 5.0 km.

Area Statement for the proposed Building

Land Use	Total Site Area (m^2)	Built up area (m^2)		
		Parking	Office	Total
Basement - 1	5406.8	3045.7	1430.3	4476.0
Basement - 2		3260.3	896.2	4156.5
Basement - 3		3818.9	1438.0	5256.9
Ground Floor		4211.4	828.5	5039.9
1st floor		4490.2	890.7	5380.9
2nd Floor		4563.7	818.3	5382.0
3rd floor		4508.3	873.8	5382.0
4th floor		4421.9	835.6	5257.5
5th floor		4508.3	873.8	5382.0
6th floor		4508.3	873.8	5382.0
7th floor		4472.2	909.8	5382.0
8th floor		4458.0	799.5	5257.5
9th floor		4452.5	928.8	5381.3
10th floor to 26th floor			86060.1	86060.1
Terrace			424.4	424.4
Green area	3110.9			
Open area	2509.0			
Road area	3798.3			
Total	**14825.0**	**54719.5**	**98881.6**	**153601.17**

Water Requirement of the Project

Description	Total No. of Persons	Water requirement lpd	Total Water Requirement in KLD
Office	7900	45	355.5
Total	**7900**		**355.5**

The water requirement shall be reduced by adopting **Dual plumbing system:** Separate tank is provided to store the treated water; the tank shall be 1 foot below the overhead tank. Separate pipe system is provided to pump the treated water for flushing. All the treated water pipelines shall be colored blue. Separate line in the blocks to use treated wastewater for flushing purpose. The total saving is as follows;

Water Savings Proposed

Description	No. of Persons	Water Requirement in KLD	Treated water reuse KLD	Effective Water Requirement in KLD
Office	7900	355.5	158.0	197.5
Total	**7900**	**355.5**	**158.0**	**197.5**

Note: Treated water reuse assumed @ 20 l/head. Approximately **158.0** KL/day water will be saved by adopting recycling of treated water in the toilet flush.

The effective water consumption is reduced by **158.0** kl/day and the requirement will be in the order of **197.5** kl/day.

Water Balance during occupation stage

Input	KL/Day	Output	KL/Day
Domestic water Municipality	197.5	Treated waste water For HVAC	122.5
Recycled water	158.0	Recycle water (Flushing)	158.0
		Water requirement for green belt during non monsoon	3.9
		Losses approx 20%	71.1
Total	**355.5**	**Total**	**355.5**

The water used in the order of 355.5 KL/day would generate 284.4 KL/day of wastewater which has to be treated for reuse and remaining unused excess treated water is given to municipality for roadside plantation or used for construction of other buildings /given to other developers.

Amenities Proposed

Amenity	Nos. or Description
Sewage Treatment Plants	1
Garbage Collection Bin	1
DG Sets	1500KVAX6nos.
Green area	1489.0 m^2

ENERGY CONSUMPTION STATEMENT

S.No	Description	Total area in m2	Power allocated in watts per m2	Total Power required in (KW)	
1	Commercial & Common area	26704	69.00	1842.56	
	Total			**1842.56**	
Maximum demand in kw at 0.6 diversity factor				**1105.5**	
Consumption of power for 12 hours per day				**13266.4**	
Maximum demand in kw at 0.1 diversity factor				**184.3**	
Consumption of power for 12 hours per day				**2211.1**	
Total consumption of power per day				**15477.5**	**KW**
Total consumption of power per year				**56.5**	**Lakh Units**

Energy Saving by using copper wound transformers for Comm.

Power loss using CU. wound transformer	1.20%	
Savings in power loss using CU wound transformer	**1.5**	**Lakh Units**

Energy Saving by using HF Ballast

Power loss using conventional ballast				25%	
Power loss using HF ballast				14%	
Savings in power loss using HF ballast				11%	
S.No	**Description**	**Total area in m^2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	Basement	98882	3.00	296.64	
2	Common Area	10944	5.00	54.72	
	Total			**351.36**	
Maximum demand in kw at 0.8 diversity factor				**281.1**	
Consumption of power for 12 hours per day				**3373.1**	
Maximum demand in kw at 0.2 diversity factor				**70.3**	
Consumption of power for 12 hours per day				**843.3**	
Total consumption of power per day				**4216.4**	**KW**
Total consumption of power per year				**15.4**	**Lakh Units**
Savings in power loss using HF ballast				**1.7**	**Lakh Units**

Electrical Power savings using CFL/T5 for lighting

Savings in power Using CFL/T5 as against Fluorescent Lamps					30%
S.No	**Description**	**Total area in m2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	Basement	98882	3.00	296.64	
2	Common Area	10944	5.00	54.72	
	Total			**351.36**	
Maximum demand in kw at 0.8 diversity factor				**281.1**	
Consumption of power for 12 hours per day				**3373.1**	
Maximum demand in kw at 0.2 diversity factor				**70.3**	
Consumption of power for 12 hours per day				**843.3**	
Total consumption of power per day				**4216.4**	**KW**
Total consumption of power per year				**15.4**	**Lakh Units**
Savings in power using CFL				**4.6**	**Lakh Units**

Electrical Power savings using Solar Power for External lighting

S.No	Description	Total area in m2	Power allocated in watts per m2	Total Power required in (KW)	
1	External Lighting			10.00	
	Total			**10.00**	
Maximum demand in kw at 1.0 diversity factor				**10.0**	
Consumption of power for 6 hours per day				**60.0**	
Maximum demand in kw at 0.5 diversity factor				**5.0**	
Consumption of power for 6 hours per day				**30.0**	
Total consumption of power per day				**90.0**	**KW**
Total consumption of power per year				**0.33**	**Lakh Units**
Savings in power using Solar Power				**0.33**	**Lakh Units**

Electrical Power savings using water Cooled Chillers

Savings in power by using Water Cooled Chillers as against Air cooled Chiller					40%
S.No	**Description**	**Total area in m^2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	Commercial	26704	32.00	854.52	
	Total			**854.52**	
Maximum demand in kw at 0.6 diversity factor				**512.7**	
Consumption of power for 12 hours per day				**6152.5**	
Maximum demand in kw at 0.1 diversity factor				**85.5**	
Consumption of power for 12 hours per day				**1025.4**	
Total consumption of power per day				**7178.0**	**KW**
Total consumption of power per year				**26.2**	**Lakh Units**
Savings in power using water Cooled Chillers and heat recovery wheel				**10.48**	**Lakh Units**

Table 2.23 Total Saving

S.No	Description	Savings in lakh kwh units	Savings in percentage
1	With Cu wound Transformer	0.7	1.2
2	with HF Ballast	1.7	0.03
3	With CFL	4.6	8.2
4	With Water Cooled Chillers	10.5	18.6
5	With Solar Power for External lighting	0.3	0.6
6	**Total Consumption**	**56.5**	

7	**Total Saving**	**17.8**	**31.5**

1.3. What is the likely impact of the proposed activity on the existing facilities adjacent to the proposed site? (Such as open spaces, community facilities, details of the existing land use and disturbance to the local ecology).

The local area is developed as commercial Office is going on. No major impact on the local ecology is anticipated.

1.4. Will there are any significant land disturbance resulting in erosion, subsidence & instability? (Details of soil type, slope analysis, vulnerability to subsidence, Seismicity etc may be given).

a. Soil type: clayey or clay loam

b. Slope analysis:

c. Vulnerability to Subsidence: No subsidence is anticipated in Rocky areas.

d. Seismicity: The site area is classified as Zone II as per the IMD.

1.5. Will the proposal involve alteration of natural drainage systems? (Give details on a contour map showing the natural drainage near the proposed project site)

No, the site area is **1.4825 Ha** only**,** and forms part of Khajaguda lake drainage system.

1.6. What are the quantities of earthwork involved in the construction activity cutting, filling, reclamation etc. (Give details of the quantities of earthwork involved, transport of fill materials from outside the site etc.)
Cut and fill activity is involved.

Earth Work Quantities

S No	Area	Qty. of fill (m^3)	Qty of cut (m^3)	Surplus fill (m^3)	Surplus cut (m^3)
1	Site	12085	20142	----	8057

The excess cut material in the order of 8057 m^3 will be used for construction of roads within the site.

1.7 Give details regarding water supply, waste handling etc during the construction period.
The water requirement during construction shall be drawn from either ground water or treated sewage from treatment plants from other occupied areas, surrounding the

project. The maximum expected drawl of ground water would be in the order of 50 KLD during construction.

Construction debris like cement, sand, RCC, Aggregate, steel etc. are the waste generation during construction and these waste materials are used for road development.

1.8. Will the low-lying areas & wetlands get altered? (Provide details of how low lying and wetlands are getting modified from the proposed activity)

-NO-

1.9. Whether construction debris & waste during construction cause health hazard? (Give quantities of various types of wastes generated during construction including the construction labour and the means of disposal).

Construction Debris

The construction debris consists of various types of materials. The construction debris will be in both hazardous and non-hazardous categories. The hazardous debris consists empty containers of adhesives, thinners, paints, and petroleum products. These empty containers will be sold to authorize recycling agencies. The non hazardous wastes contain recyclable debris like iron and other metal, glass, plastics, cartons of paper, wood etc. These wastes will be sent for reuse/recycle. The waste percentage will be in the order of 2%. Construction debris containing bricks, demolished RCC will be used for land filling in the place of subgrade.

2. WATER ENVIRONMENT

2.1. Give the total quantity of water requirement for the proposed project with the breakup of requirements for various uses. How will the water requirement met? State the sources & quantities and furnish a water balance statement.

Water Requirement of the Project

Description	Total No. of Persons	Water requirement lpd	Total Water Requirement in KLD
Office	7900	45	355.5
Total	**7900**		**355.5**

The water requirement shall be reduced by adopting **Dual plumbing system:** Separate tank is provided to store the treated water; the tank shall be 1 foot below the overhead tank. Separate pipe system is provided to pump the treated water for flushing. All the treated water pipelines shall be colored blue. Separate line in the blocks to use treated wastewater for flushing purpose. The total saving is as follows;

Water Savings Proposed

Description	No. of Persons	Water Requirement in KLD	Treated water reuse KLD	Effective Water Requirement in KLD
Office	7900	355.5	158.0	197.5
Total	**7900**	**355.5**	**158.0**	**197.5**

Note: Treated water reuse assumed @ 20 l/head. Approximately **158.0** KL/day water will be saved by adopting recycling of treated water in the toilet flush.
The effective water consumption is reduced by **158.0** kl/day and the requirement will be in the order of **197.5** kl/day.

Water Balance during occupation stage

Input	KL/Day	Output	KL/Day
Domestic water Municipality	197.5	Treated waste water For HVAC	122.5
Recycled water	158.0	Recycle water (Flushing)	158.0
		Water requirement for green belt during non monsoon	3.9
		Losses approx 20%	71.1
Total	**355.5**	**Total**	**355.5**

The water used in the order of 355.5 KL/day would generate 284.4 KL/day of wastewater which has to be treated for reuse and remaining unused excess treated water is given to municipality for roadside plantation or used for construction of other buildings /given to other developers.
It is proposed to draw domestic water from the Hyderabad Metropolitan water supply and Sewerage Board (HMWSSB), which has been encouraging the bulk consumers. The water shortage if any during summer season will be drawn from ground water sources. The water requirement during construction will be from ground water sources and the requirement is in the order of 30 cum/day. The water requirement of the project during occupation stage is in the order of 355.5 KLD.

2.2 What is the quality of water required, in case, the supply is not from a municipal source? (Provide physical, chemical, biological characteristics with class of water quality)

Water shall be drawn from municipal supply only.

2.3 How much of the water requirement can be met from the recycling of treated wastewater? (Give the details of quantities, sources and usage)

Water Savings Proposed

Description	No. of Persons	Water Requirement in KLD	Treated water reuse KLD	Effective Water Requirement in KLD
Office	7900	355.5	158.0	197.5
Total	**7900**	**355.5**	**158.0**	**197.5**

Note: Treated water reuse assumed @ 20 l/head. Approximately **158.0** KL/day water will be saved by adopting recycling of treated water in the toilet flush.

The effective water consumption is reduced by **158.0** kl/day and the requirement will be in the order of **197.5** kl/day.

2.4. Will there be diversion of water from other users? (Please assess the impacts of the project on other existing uses and quantities of consumption)

NO, the required water shall be drawn from HMWSSB, during non-availability of municipal water; water shall be drawn from ground sources.

2.5 What is the incremental pollution load from wastewater generated from the proposed activity? (Give details of the quantities and composition of wastewater generated from the proposed activity)

Characteristics of Waste water

Parameter	Quantity in mg/l
PH	6 – 7
Total Suspended Solids	400 – 600
BOD	200 – 300
COD	450 – 500

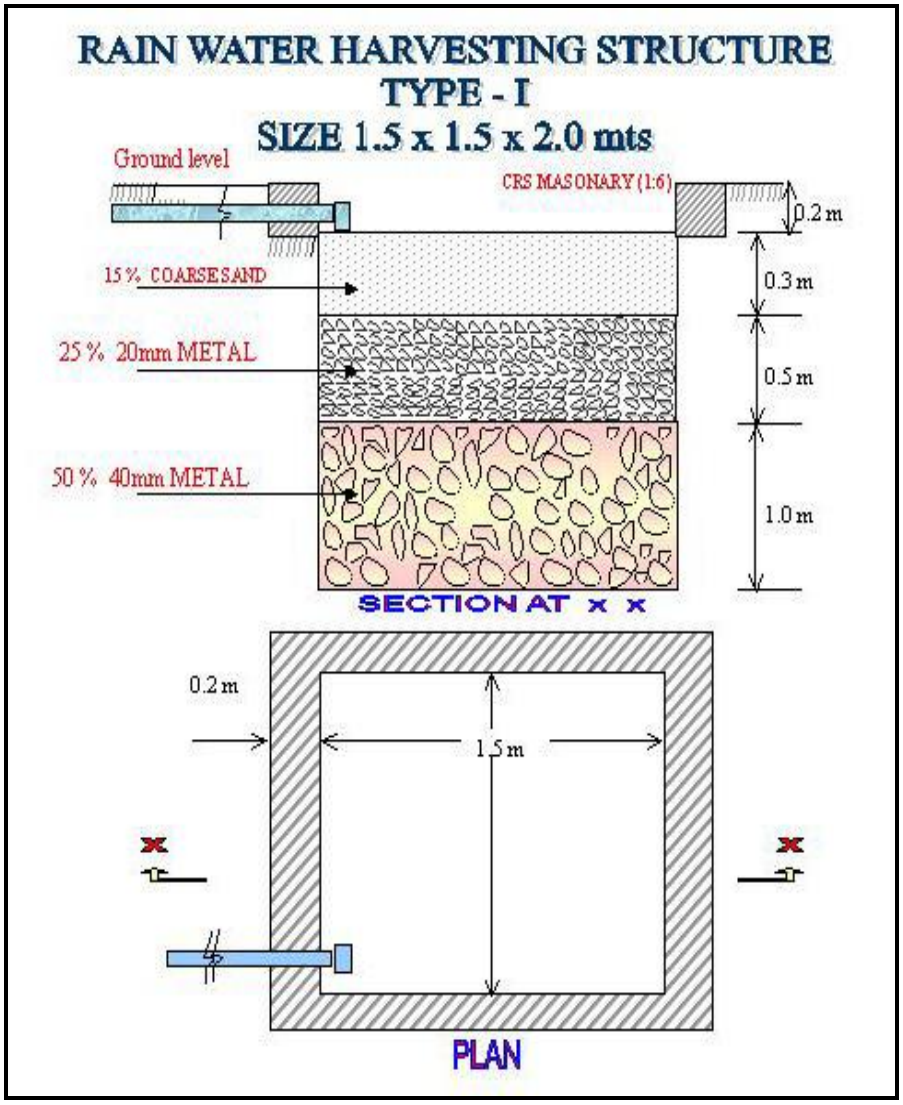
The sewage shall be treated and reused for flushing, HVAC and on land irrigation. The treated sewage shall meet the standards for disposal into surface water bodies, and hence there shall not be any major additional load on the sewer lines, and may facilitate dilution of the sewage.

2.6. Give details of the water requirements met from water harvesting? Furnish details of the facilities created.

The storm water drain would also ensure that the sedimentation does not occur, as rainwater-harvesting structures will also help in controlling the sedimentation. The rainwater harvesting system proposed would enhance the water retention and increases the water table. The drainage would in effect reduce the runoff and increase the percolation. The gradient of the channel will be maintained throughout its length so that water does not pond within it. Flows will be maintained at velocities that will scour the channel of debris. For instance, runoff velocities should not be less than 1 m/s nor should they exceed 3 m/s. Based on the catchment area, potential inflows and rainfall intensity, determine the drain size so as to minimize damage resulting from high intensity storms. Energy dissipaters such as drop structures will be provided along the channel where runoff velocities may become excessive. The overflow from the storm water drains at rainwater harvesting structures shall be provided with an overflow channel to drain into the roadside plantation, which will act as a bios wale.

Rainwater Harvesting:

The quantity of rainwater, which can be harvested, depends upon the annual rainfall, the area of the plot (catchment area) and soil characteristics. The amount of water infiltrated into soil varies with the condition of soil surface and the moisture content of the soil at the time of rainfall. The total amount of water infiltered depends on the infiltration opportunity time, which depends mainly on the slope of the land and the field structure like contour bunds, terraces and other structures, which tend to hold the runoff water over long periods on the land surface.



2.7. What would be the impact of the land use changes occurring due to the proposed project on the runoff characteristics (quantitative as well as qualitative) of the area in the post construction phase on a long-term basis? Would it aggravate the problems of flooding or water logging in any way?

The impact of project on physiography is a function of the rocky terrain of the area. The project area has a plain land and the design stage deliberations have ensured that the major contours are not disturbed. However the physiography impact will be significant and non-reversible, as the contours of the area will be disturbed. The cut and fill operations may cause air pollution, clogging of drains and solid waste for disposal.
The project will have a positive impact on the soils and soil quality as project will have landscaping and the soils will be protected due to conservation. During the occupation stage, compaction will not occur, and the compaction if any will be restricted to road ROW. And the road ROW compaction cannot be said to be an impact of the operation stage as the pavement itself is a function of compacted base and sub base.

During the occupation stage, soil pollution due to garbage dumping at unauthorized locations may have temporary negative impact leading contamination of soil. The accidental spills or leaks are also a low probability incident.

The other major impact will be due to the increased run off and may have negative impact on the receiving body if the same is not properly managed. Impacts due to surface runoff include increased soil erosion and local flooding or water logging. Hence the project will be designed with adequate storm water drains and cross drainage structures. The project activity will be provided with a Sewage treatment plant to treat the domestic wastewater and necessary infrastructure will be provided for the safe disposal of domestic wastes to protect the water bodies.

2.8. What are the impacts of the proposal on the ground water? (Will there be tapping of ground water; give the details of ground water table, recharging capacity, and approvals obtained from competent authority, if any)

Ground water shall be used as a secondary source during non-availability of water from HMWSSB. The ground water table is at a depth of 10m to 15m. State ground water board is approached for necessary permission.

2.9. What precautions/measures are taken to prevent the run-off from construction activities polluting land & aquifers? (Give details of quantities and the measures taken to avoid the adverse impacts)

Construction activity is taken up only during non-monsoon season. There are no major drains in the site. All material dumps shall be located away from the natural drains. Storm water drains shall be constructed before the construction of the buildings.

2.10. How is the storm water from within the site managed? (State the provisions

made to avoid flooding of the area, details of the drainage facilities provided along with a site layout indication contour levels)

Storm water drains: Storm water drains will be provided all over the site to meet the expected increase in the runoff during rainy seasons due to the impervious nature of the roads and other paved areas. The site is uneven and it is proposed to maintain the levels as much as possible.
For each plot rainwater pipes shall be designed for rainfall intensity of 100mm/hour (for 12 minutes storm) from terrace floor to be harvested by storm water sumps adjacent to each building, excess disposed to external storm water lateral drain running adjacent to the periphery of the campus. The storm water drain has been worked taking into consideration the site profile (contour).

Storm water drains will be provided all over the site to meet the expected increase in the runoff during rainy seasons due to the impervious nature of the paved areas. The site is uneven and it is proposed to maintain the levels as much as possible, hence storm water outlets from the site are anticipated. The expected runoff is calculated for the design of the storm water management is presented in following table.

CALCULATION FOR STORM WATER DRAIN:

Quantity of storm water:

(a) With out project:			
Area of Catchment, 'A'	:	1.4825	Ha
Run off Coefficient, 'C'	:	0.6	
Maximum intensity of rainfall, 'I'	:	40	mm/hr
Therefore Q	:	0.099	m^3/sec
(b) With project:	:		
Area for catchment for roof and road	:	1.097	Ha
Area of Catchment, 'A'	:	1.097	Ha
Run off Coefficient, 'C'	:	0.9	
Maximum intensity of rainfall, 'I'	:	40	mm/hr
Therefore Q =	:	0.110	m^3/sec
Area for catchment for open areas	:	0.386	Ha
Run off Coefficient, 'C'	:	0.6	
Maximum intensity of rainfall, 'I'	:	40	mm/hr
Therefore Q =	:	0.026	m^3/sec
Total Discharge	:	**0.135**	**m^3/sec**
But, Discharge, Q = A/V	:		

Where,	:			
A= Area of the Drain,	:			
V= Max. Permissible Velocity	:	6	m/sec for concrete drain	
Area of drain, 'A' = Q/V	:	0.023	m^2	
Taking depth of drain as 0.6 m at the starting point	:	**0.6**		
Width of drain = Area/depth =		**0.038**	**m**	**38 mm**

Width of the drain is to taken 38 mm and depth varies according to the slope of ground.

Storm Water Calculation

Land Use	Area in Hectares	Vol./hr (KL) after development C=0.8	Vol./hr (KL) before development C=0.6	Difference in Discharges (KL)	Remarks
Roof Area	0.62	197.31	147.98	16.24	Harvested in 1 sump of capacity 50 m^3 & used for domestic utility
Road Area	0.48	153.73	115.30	16.40	Harvested about 10 nos. of RHP of size 1.5 m X 1.5m X 2m
Open Area	0.39	46.26*	92.52	-13.68	
TOTAL	**1.48**			**18.96**	

**C=0.3 after development of greenery*

2.11. Will the deployment of construction laborers particularly in the peak period lead to unsanitary conditions around the project site (Justify with proper explanation)

No, Temporary toilet facilities shall be provided and the same shall be connected to septic tank followed by soak pit.

2.12 What on-site facilities are provided for the collection, treatment & safe disposal of sewage? (Give details of the quantities of wastewater generation, treatment capacities with technology & facilities for recycling and disposal)

The complex shall be provided with appropriate plumbing for transfer of sewage to the sewage treatment plant. The total quantity of sewage anticipated is in the order of 284.4 KLD. The Sewage Treatment Flow Diagram is presented below.

It is proposed to set up a water pollution control and re-use system for the wastewater generated from entire complex and also propose to harvest and recharge ground water as storm water management. The only sources of wastewaters are from toilets, Kitchens and washbasins and washrooms etc in the complex and therefore domestic in nature.

This report details the following from the proposed facility. Collection, Treatment and Disposal of Domestic Effluents.

PROCESS DESCRIPTION:

The raw sewage will be collected in a collection sump and pumped to mechanical bar screen chamber for removal of large floating matter followed by grit removal in Grit Chamber. The raw sewage will then be collected in an equalization tank for homogenization of hydraulic load. The tank contents will be kept in suspension by means of course bubble serration through pipe grid. The equalization tank, with air flow indicator for continuous monitoring of air supply to the tank in order to avoid septic conditions, will be covered from top (RCC or FRP) to avoid nuisance. The equalized effluent will then be pumped to two Fluidized Aerobic Bio Reactors (FAB) in series where BOD/COD reduction can be achieved by virtue of aerobic microbial activities. The oxygen required will be supplied through coarse air bubble diffusers. The bio-solids formed in the biological process will be separated in the down stream Tube Settler. The clear supernatant will gravitate to the chlorine contact tank where sodium hypochlorite will be dosed for disinfection of treated water prior to disposal.

The biological sludge generated in the FAB and settled in the tube settlers will be collected in a sludge sump and then pumped to sludge drying bed for de watering. The dried sludge will then be disposed off suitably as manure. The schematics of the process are shown. The two main components of the treatment system viz. The FAB reactor and tube settler are described in the following sections.

Fluidized Aerobic Bio Reactor (FAB)

Conventional effluent treatment plants are large sized, power intensive and require a lot of monitoring. Scarcity of open space and rising land a power costs have forced the industries to look our for space saving, compact and efficient treatment options. This has led to the development attached growth processes where the bio mass is retained within the aeration tank obviating the need for recycle. These plants are not only compact but also user friendly. The endeavor to have a continuously operating, no-clogging biofilm reactor with no need for back washing, low head-loss and high specific biofilm surface area culminated in the most advanced technology of aerobic biological fluidized bed treatment where the biofilm (biomass) grows on small carrier elements that move along with the water in the reactor. The movement is normally caused by aeration in the aerobic version of the reactor.

The reactor combines all the advantages and best features of Trickling filters, Rotating biological contractors, activated sludge process and submerged fixed film reactors while eliminating the drawbacks of these systems. The plants are more compact and more energy efficient.

The Fluidized Aerobic Bio Reactor (FAB) consists of a tank in any shape filled up with small carrier elements. The elements are made up of special grade PVC or polypropylene of controlled density (shown in plate). For media of specific gravity 0.92-0.96 the overall density could be expected to increase up to 9.5% when full of biomass such that they can fluidize using an aeration device. A biofilm develops on the

elements, which move along the effluent in the reactor. The movement within the reactor is generated by providing aeration with the help of diffusers placed at the bottom of the reactor. Then thin biofilm on the elements enables the bacteria to act upon the biodegradable matter in the effluent and reduce the BOD/COD content in the presence of oxygen available from the air that is used for fluidization.

Characteristics of Waste water

Parameter	Quantity in mg/l
PH	6 – 7
Total Suspended Solids	400 – 600
BOD	200 – 300
COD	450 – 500

Design of the unit

Basic data

Flow	:	284	KLD
Capacity	:	350	m^3
Peak factor	:	3.5	
Peak flow Q peak	:	1225	m^3/day
Influent BOD	:	200	mg/lit
Influent Suspended Solids	:	200	mg/lit
Influent COD	:	350	mg/lit
Effluent BOD	:	30	mg/lit
Effluent COD	:	200	mg/lit
Effluent Suspended Solids	:	100	mg/lit

1. Bar Screen Chamber

Average flow	:	0.004	m^3/sec
Peak factor	:	3.5	
Peak flow	:	0.014	m^3/sec
Velocity at peak flow	:	0.75	m/Sec
Effective area of screen Required			
At average flow	:	0.005	m^2
At Peak flow	:	0.0175	m^2
Provide Effective area of screen	:	0.0175	m^2

Considering the bar of dia. 10 mm(w) and clear spacing of 20 mm (b)

Overall area required	:	0.34	m^2
Considering screen depth as	:	0.024	m
Number of clear spacing	:	0.3	
Number of bars	:	3	Consider 5 Nos.

Hence Provide 5 bars

Provide a screen of 0.5 m X 0.5 m at an inclination of sin 60^0. In a screen channel of one meter (1 m) length.

2. Grit Chamber :

The flow from the bar screen chamber is let into the Grit Chamber of minimum 2 hours capacity. This tank is provided to even out the flow variation, and to provide a continuous feed into the secondary biological treatment units.

Peak flow Q	:	0.014	m^3/sec
Providing a flow through velocity of 0.30 m/sec			
Cross sectional area of Channel	:	0.046	m^2
Surface area of channel	:	0.66	m^2
Assuming depth d	:	0.2	m
Width of channel	:	0.1	m (say 0.3m)
Length of channel	:	4. 6	m (say 4.6 m)

Provide two channels each of 0.3 m wide and 4.6 m long with depth of waste water 0.2 m.

3. Equalization tank:

The flow from the bar screen chamber is let into the equalization tank of minimum 2hours capacity. This tank is provided to even out the flow variation, and to provide a continuous feed into the secondary biological treatment units.

Average flow	:	14.58	m^3/hr
Peak factor	:	3.5	
Peak flow	:	51.04	m^3/hr
Hydraulic retention tank = 2 hrs at Peak flow			
Hence required volume of the tank	:	102.08	m^3
Provide tank of	:	102.08	m^3 Capacity
Assuming depth	:	3	m
Area	:	34.02	m^2
Assuming length to width ratio (1:1) ; l=b			
length of the tank	:	5.8	m
width of the tank	:	5.8	m
Air required for agitation	:	0.01	m^3/ m^2 min
Total air required	:	61.25	m^3/hr
Air blower required	:	100	m^3/hr @ 3.8 mwc
Effluent transfer pump	:	14.58	m^3/hr @ 8 mwc

4. Fluidized Aerobic Bio Reactor (FAB):

The polypropylene media have been provided with a specific surface area of 350 – 520 m^2 /m^3. This allows micro-organisms to get attached and biomass concentration can be increased to four folds as compared to Activated Sludge Process. This enables to consider higher Organic loading rates.

The micro-organisms attached to media are kept in a fluid state thereby maintaining the CSTR (continuous Stirrer tank reactor) regime as well as two tanks are provided in series making the plug – flow system. This will enhance the efficiencies and have the merits of both CSTR and plug-flow regimes.

Organic loading rate	:	3.2	kg BOD/ m^3 d
Organic load	:	60	kg/day
Volume of the tank	:	21.86	m^3
Assume the depth	:	3	m
No. of tanks in series	:	1	

Size of the tank	:	1.8 m dia. x 3.0 SWD	
Specific gravity of media	:	0.92 to 0.96	
Specific surface area of media	:	350 – 520 m^2 /m^3	
Media filling	:	30 – 50 % of tank volume	
Oxygen required	:	2	kg / kg BOD
Oxygen in air	:	23%	
Specific gravity of air @ 30 deg.	:	1.65	
Aeration	:	Coarse bubble	
Oxygen transfer efficiency	:	12%	
Air required	:	77.7	m^3/hr
Air blower required	:	80	m^3/hr @ 6.5 m wc

5.Tube settler

Surface loading rate	:	48	m^2 /m^3 d
Surface area required	:	7.29	m^2
Tank size	:	3.0 m x 6.0 m x 2.7 m SWD With 55 deg. hopper bottom	
Tube Modules	:	3.0m x 6.0 m x 0.6 m ht.	
Tube inclination	:	60	deg.
Settling area for 60 deg slope	:	11	m^2 /m^3
Cross sectional area of tubes	:	120 mm x 44 mm Hexagonal	
Hydraulic radius	:	1/61 cm (1.5 cm)	
Shape factor	:	0.6 – 0.7 *for media settleable solids*	

6. Pre Filtration tank

The flow from the each individual settling tank i.e., the supernatant liquid is let into the respective Pre-Filtration Tank, which has a minimum 1.5 hours holding capacity. This tank is provided to hold the treated effluent and give an even flow to the pressure sand filter.

Average flow	:	14.58	m^3/hr
Peak factor	:	2	m^3/hr
Peak flow	:	29.16	m^3/hr
Provide min 1.5 hours holding capacity.			
Hence required volume of the tank	:	43.75	m^3

7. Pressure Sand Filter:

Vertical down flow type with graded/sand bed under drain plate with polysterene strains.

Flow	:	350	m^3/day
Rate of filtration assumed as	:	10	m^3/m^2/hr
Requirement of treated water for usage in 20 hrs	:	17.5	m^3/hr
Dia. of filter of 1 nos.	:	2286	mm

Provide pressure sand filter of 2500 mm dia. and 2800 mm HOS with sand as media layer, under drain pipe, laterals face piping etc for each stream.

8. Activated Carbon Filter:

Vertical down flow type with graded/sand bed under drain plate with polysterene strains.

Flow	:	350	m^3/day
Rate of filtration assumed as	:	10	m3/m2/hr

Requirement of treated water for usage in 20 hrs	:	17.5	m^3/hr
Dia of filter of 1 nos.	:	2286	mm

Provide Activated Carbon filter of 2500 mm dia with granular Activated carbon as media and 2800 mm HOS with sand as media layer, under drain pipe, laterals face piping etc for each stream.

9.Final Treated Water Holding Tank

It is always preferred to provide one final holding tank of minimum one day holding capacity, so that the treated effluents can be stored and used back for gardening or other tertiary purposes.

Capacity: 350 m^3

10. Sludge Filter Press:

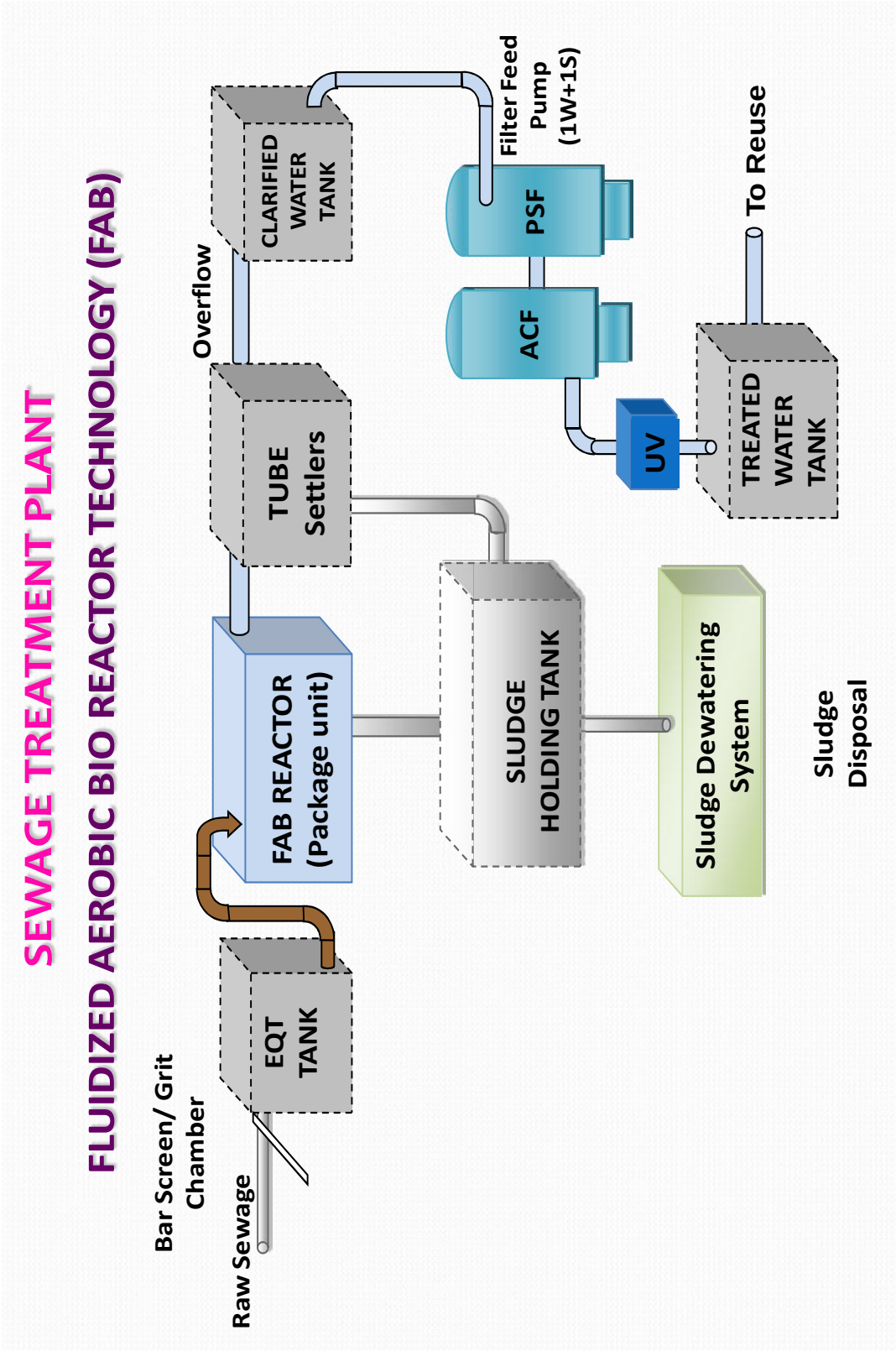
The biomass in the aeration tank stabilizes BOD in wastewater by consuming the organic matter in the wastewater. The metabolic activity results in growth of the biomass population in the Fluidized Aerobic Bio Reactor (FAB). Sludge holding tank has been provided with filter press for dewatering sludge. The filtrate drains off through the media, which is again let into equalization tank. The dewatered sludge is collected in trays, which can be used as manure in the garden.

No. of plates	:	24
Size of plates	:	600 mm X 600 mm
Plate moc (material of construction)	:	PP (poly propline)
Type of operation	:	Hydraulic
Power pack capacity	:	2 HP

Characteristics of Treated Waste water

Parameter	Quantity in mg/l
pH	7.3
Total Suspended Solids	20
BOD	10
COD	50

Disposal of Treated Wastewater: The wastewater shall be treated and the treated water shall be reused for flushing the toilets, on land irrigation and HVAC make up water requirement, and on land irrigation. Hence all the recycled water is utilized completely and is considered as a zero discharge.


SEWAGE TREATMENT PLANT
FLUIDIZED AEROBIC BIO REACTOR TECHNOLOGY (FAB)
Raw Sewage
Bar Screen/ Grit Chamber
EQT TANK
FAB REACTOR (Package unit)
TUBE Settlers
Overflow
CLARIFIED WATER TANK
Filter Feed Pump (1W+1S)
PSF
ACF
UV
TREATED WATER TANK
To Reuse
SLUDGE HOLDING TANK
Sludge Dewatering System
Sludge Disposal

3. VEGETATION

3.1. Is there any threat of the project to the biodiversity? (Give a description of the local ecosystem with its unique features, if any)

The local area biodiversity is denudated due to increased urbanization. The Kothaguda reserve forest located at a distance of 3.5 km has monoculture plantation of Eucalyptus. KVB botanical park is located a distance of 3.5 km. KBR National Park 3.8 km. Mrugavani National Park is at a distance of 6.9 Km.

3.2. Will the construction involve extensive clearing or modification of vegetation? (Provide a detailed account of the trees & vegetation affected by the project)

No, the site area has no major trees and is covered mainly with shrubs.

3.3. What are the measures proposed to be taken to minimize the likely impacts on important site features (Give details of proposal for tree plantation, landscaping, creation of water bodies etc along with a layout plan to an appropriate scale).

The landscape area is 1489.0 m^2. The plantation list is presented in the following table;

S. No	Plant Name
1	Anthocephalus Chinensis
2	Roystonea Regia
3	Tabebuia Rosea
4	Bauhinea Blakeana
5	Lagerstroemia Speciosa
6	Delonix Regia
7	Cassia Spectabilis
8	Alstonia Scholaris
9	Tabebuia Chrysantha
10	Kigelia Pinnata
11	Fillicium Decipens
12	Mimusops Elengi
13	Ficus Benjamina
14	Alstonia Scholaris
15	Cassia Fictula

4. FAUNA

4.1. Is there likely to be any displacement of fauna- both terrestrial and aquatic or creation of barriers for their movement? Provide the details.

-NO-

4.2. Any direct or indirect impacts on the avifauna of the area? Provide details.

-No major impact envisaged. However the proposed plantaion shall help in providing nesting space for the avifauna.

4.3. Prescribe measures such as corridors, fish ladders etc to mitigate adverse impacts on fauna.

-NA-

5. AIR ENVIRONMENT

5.1. Will the project increase atmospheric concentration of gases & result in heat islands? (Give details of background air quality levels with predicted values based on dispersion models taking into account the increased traffic generation as a result of the proposed constructions)

Maximum Predicted Ground Level Concentrations

S.No.	Pollutant	Direction	Distance (m)	Maximum Concentration («g/m^3)
1	SPM	SW	825	1.8
2	SOx	SW	825	8.6
3	NOx	SW	825	10.5

5.2. What are the impacts on generation of dust, smoke, odorous fumes or other hazardous gases? Give details in relation to all the meteorological parameters.

Sources of dust during Construction Activity

Vehicle and Equipment Use	Exposed Areas	Contractor Activities
Vehicle and equipment entering and leaving the project site	Areas of exposed soil that have been cleared and grubbed	Land clearing and grubbing
Vehicle and equipment movement and use within the project site	Areas of exposed soil that have been excavated, filled, compacted, or graded	Earthwork including soil compaction, rough grading and final grading.
Temporary parking lots and staging areas	Vehicle and equipment storage and service areas	Materials handling, including material stockpiling, transfer, and processing
Onsite Construction traffic	Material processing areas and transfer points	Batch dropping, dumping
	Construction roads	Conveyor transfer and stacking
	Bare ground areas of construction site	Material transferring
	Spilled materials	Milling and screening operations
	Construction stockpiles	Demolition and debris disposal
	Soil and debris piles	Tilling

OCCUPATION STAGE

No dust generation is envisaged during the occupation stage as the residential area will have greenery and all roads shall be paved and all slopes & embankments shall be turfed as per best engineering practices.

5.3. Will the proposal create shortage of parking space for vehicles? Furnish details of the present level of transport infrastructure and measures proposed for improvement including the traffic management at the entry & exit to the project site.

Parking Space Provision of the Project

Floor	4-Wheelers
Basement - 1	60
Basement - 2	66
Basement - 3	73
Ground floor to to 9th floor	1022
9th floor stack	92
Total	**1313**

Circulation Plan:

The project site is classified as commercial as per master plan. The connecting roads to the site are 24 m. The width of connecting roads is 24 m with a capability of 3600 PCU.

- Ground Floor Driveway : 9 m
- No. of Ramps : 4
- Width of Ramp : 7.0 m
- Slope of Ramp : 1 in 8
- Basement Driveway : 5.5 m
- No. of Lifts : 18
- Capacity of each Lift: 20 pax.
- Connecting Road : 24 m ROW

Modified Los & Performance

Towards	Vol	Add'l V	Mod.V	Mod V/C	LOS	Performance
Gachibowli	1166	124	1290	0.35	"C"	Good
Mehdipatnam	962	94	1056	0.29	"B"	Very Good

5.4. Provide details of the movement patterns with internal roads, bicycle tracks,

pedestrian pathways, footpaths etc., with areas under each category.
-NA-

5.5. Will there be significant increase in traffic noise & vibrations? Give details of the sources and the measures proposed for mitigation of the above.
There shall be an increase in the traffic density by 105 nos. of vehicles.

5.6. What will be the impact of DG sets & other equipment on noise levels & vibration in & ambient air quality around the project site? Provide details.
DG sets shall be provided with acoustic enclosures. The emissions from the DG sets are released at 8 m heights above the roof level.

6. AESTHETICS
6.1. Will the proposed constructions in any way result in the obstruction of a view, scenic amenity or landscapes? Are these considerations taken into account by the proponents?

-NO-
6.2. Will there be any adverse impacts from new constructions on the existing structures? What are the considerations taken into account?
-No adverse impacts are anticipated-

6.3. Whether there are any local considerations of urban form & urban design influencing the design criteria? They may be explicitly spelt out.

The layout plan is on the basis of Development rules prescribed by HMDA.

6.4. Are there any anthropological or archaeological sites or artefacts nearby? State if any other significant features in the vicinity of the proposed site have been considered.

-NO-
7. SOCIO-ECONOMIC ASPECTS
7.1. Will the proposal result in any changes to the demographic structure of local population? Provide the details.
-NO- The population distribution is presented in the following table.

Demography of Project Impact Area

Parameter	Number
No. of Households	146893

Total Population	689125
Males	332811
Females	330313
Scheduled Castes	51722
Males	26329
Females	25343
Scheduled Tribes	9195
Males	4825
Females	4480
Total Workers	224635
Male	183450
Female	41235
Total Main Workers	205227
Male	171099
Female	34198
Total Marginal Workers	19399
Male	12342
Female	7107
Total Non Workers	464409
Male	175371
Female	289218

7.2 Give details of the existing social infrastructure around the proposed project.

It is a Commercial Office

Bus Stops: 1.5 km from site

Railway station: 5.0 Km from site

7.3. Will the project cause adverse effects on local communities, disturbance to sacred sites or other cultural values? What are the safeguards proposed?

-NO-

8. BUILDING MATERIALS

8.1. May involve the use of building materials with high-embodied energy. Are the construction materials produced with energy efficient processes? (Give details of energy conservation measures in the selection of building materials and their energy efficiency)

Material Consumption for Project

Land Use	BUA per unit in (m^2)	Ready Mix Concrete (m^3)	Cement (bags)	Sand (m^3)	Aggregate (m^3)	Water (m^3)	Brick (Nos) x 1000	Reinforcement steel (MT)
Total BUA	153601	660485	537604	55296	46080	414723	21043	5376
Total	**153601**	**660485**	**537604**	**55296**	**46080**	**414723**	**21043**	**5376**

8.2. Transport and handling of materials during construction may result in pollution, noise & public nuisance. What measures are taken to minimize the impacts?

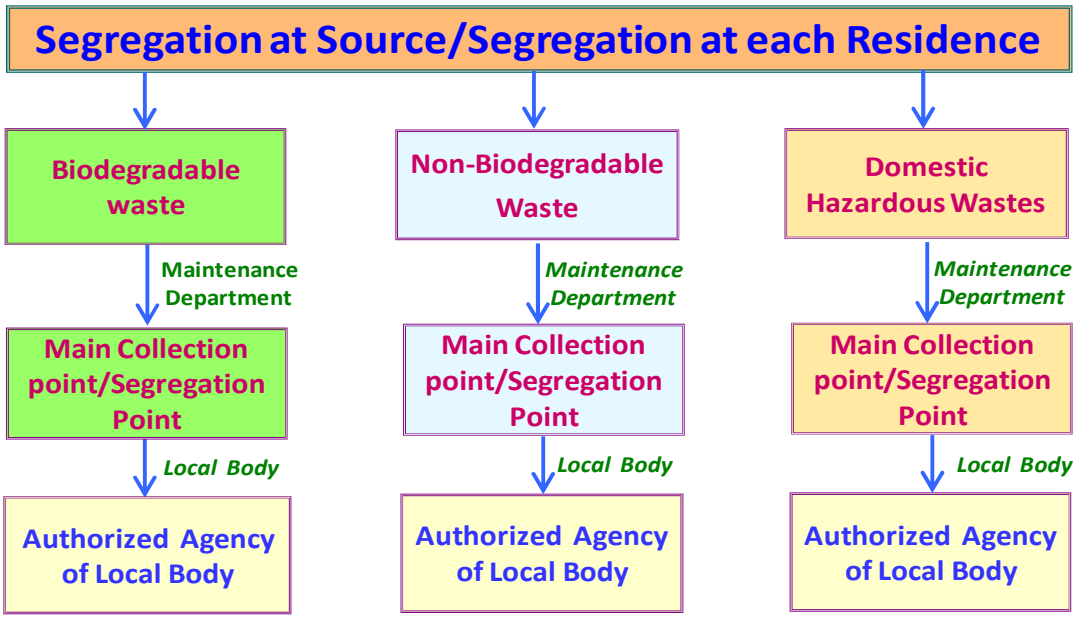
All materials shall be transported during non peak hours. Sand and aggregate are covered during transportation. Noise generating construction activity shall not be taken up during night times, adjacent to the residential area.

8.3. Are recycled materials used in roads and structures? State the extent of savings achieved?

Excess cut material in the order of 8057 m^3 will be used for construction of retaining walls and as aggregate for construction.

8.4. Give details of the methods of collection, segregation & disposal of the garbage generated during the operation phases of the project.

GARBAGE MANAGEMENT PLAN



9. ENERGY CONSERVATION

9.1. Give details of the power requirements, source of supply, backup source etc. What is the energy consumption assumed per square foot of built-up area? How have you tried to minimize energy consumption?

ENERGY CONSUMPTION STATEMENT

S.No	Description	Total area in m2	Power allocated in watts per m2	Total Power required in (KW)	
1	Commercial & Common area	69217	69.00	4775.98	
	Total			**4775.98**	
Maximum demand in kw at 0.6 diversity factor				**2865.6**	
Consumption of power for 12 hours per day				**34387.1**	
Maximum demand in kw at 0.1 diversity factor				**477.6**	
Consumption of power for 12 hours per day				**5731.2**	
Total consumption of power per day				**40118.3**	**KW**
Total consumption of power per year				**146.4**	**Lakh Units**

Energy Saving by using copper wound transformers for Comm.

Power loss using CU. wound transformer	1.20%	
Savings in power loss using CU wound transformer	**1.8**	**Lakh Units**

Energy Saving by using HF Ballast

Power loss using conventional ballast				25%	
Power loss using HF ballast				14%	
Savings in power loss using HF ballast				11%	
S.No	**Description**	**Total area in m^2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	Basement	98882	3.00	296.64	
2	Common Area	10944	5.00	54.72	
	Total			**351.36**	
Maximum demand in kw at 0.8 diversity factor				**281.1**	
Consumption of power for 12 hours per day				**3373.1**	
Maximum demand in kw at 0.2 diversity factor				**70.3**	
Consumption of power for 12 hours per day				**843.3**	
Total consumption of power per day				**4216.4**	**KW**
Total consumption of power per year				**15.4**	**Lakh Units**
Savings in power loss using HF ballast				**1.7**	**Lakh Units**

Electrical Power savings using CFL/T5 for lighting

Savings in power Using CFL/T5 as against Fluorescent Lamps					30%
S.No	**Description**	**Total area in m2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	Basement	98882	3.00	296.64	
2	Common Area	10944	5.00	54.72	
	Total			**351.36**	
Maximum demand in kw at 0.8 diversity factor				**281.1**	
Consumption of power for 12 hours per day				**3373.1**	
Maximum demand in kw at 0.2 diversity factor				**70.3**	
Consumption of power for 12 hours per day				**843.3**	
Total consumption of power per day				**4216.4**	**KW**
Total consumption of power per year				**15.4**	**Lakh Units**
Savings in power using CFL				**4.6**	**Lakh Units**

Electrical Power savings using Solar Power for External lighting

S.No	**Description**	**Total area in m2**	**Power allocated in watts per m2**	**Total Power required in (KW)**	
1	External Lighting			10.00	
	Total			**10.00**	
Maximum demand in kw at 1.0 diversity factor				**10.0**	
Consumption of power for 6 hours per day				**60.0**	
Maximum demand in kw at 0.5 diversity factor				**5.0**	
Consumption of power for 6 hours per day				**30.0**	
Total consumption of power per day				**90.0**	**KW**
Total consumption of power per year				**0.33**	**Lakh Units**
Savings in power using Solar Power				**0.33**	**Lakh Units**

Electrical Power savings using water Cooled Chillers

Savings in power by using Water Cooled Chillers as against Air cooled Chiller					40%
S.No	**Description**	**Total area in m^2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	Commercial	69217	32.00	2214.95	
	Total			**2214.95**	
Maximum demand in kw at 0.6 diversity factor				**1329.0**	
Consumption of power for 12 hours per day				**15947.6**	
Maximum demand in kw at 0.1 diversity factor				**221.5**	
Consumption of power for 12 hours per day				**2657.9**	
Total consumption of power per day				**18605.6**	**KW**
Total consumption of power per year				**67.9**	**Lakh Units**
Savings in power using water Cooled Chillers and heat recovery wheel				**27.16**	**Lakh Units**

Total Saving

S.No	**Description**	**Savings in lakh kwh units**	**Savings in percentage**
1	With Cu wound Transformer	1.8	1.2
2	with HF Ballast	1.7	0.01
3	With CFL	4.6	3.2
4	With Water Cooled Chillers	27.2	18.6
5	With Solar Power for External lighting	0.3	0.2
	Total Saving	**146.4**	
	Total Consumption	**35.6**	**24.3**

No of DG sets 1500KVA X 8 nos capacity, DG sets shall be used for back up power for street lighting, lifts and sewage treatment plant. Each wing shall be provided with DG based energy for a light and a fan during load shut down.

9.2. What type of, and capacity of, power back-up to you plan to provide?

Details of DG Set emissions

Stack connected to DG set capacity	**Height m***	**Dia m**	**Temp. of Exhaust Gases (^OC)**	**Exit Velocity m/sec**	**Pollutant Emission Concentration (g/sec)**		
					PM	**SO_2**	**NO_X**
1500 kVA X 8 Nos.	8	0.6	675	16	0.005	0.09	0.12

- ***DG sets to be used when there is power shut down by TSTRANSCO***
- *** Stack Height above roof level**

9.3. What are the characteristics of the glass you plan to use? Provide specifications of its characteristics related to both short wave and long wave radiation?

The façade is not made of glass, and the glass requirement is only for windows. The glass characteristics are presented as follows;

Characteristics of Glass utilized.

		Nomal					Anti-firing type	
		Seethrough(SE)			Non-seethrough(NS)		SE	NS
Nominal thickness		6	8	10	6	10	9.8	9.8
Structure	Out glass	FL3	FL4	FL5	G3	G5	PWN 6.8	GWN 6.8
	vacuum	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	In glass	Low-E 3	Low-E 4	Low-E 5	Low-E 3	Low-E 3	Low-E 3	Low-E 3
Visible	TL(%)	75.5	74.6	73.8	75.5	73.8	72.4	72.4
	RL(%)	15.9	15.8	15.6	15.9	15.6	16.8	16.8
Solar	TS(%)	62.6	60.1	57.8	62.6	57.8	56.9	56.9
	RS(%)	14.1	13.6	13.2	14.1	13.2	14.2	14.2
	AS(%)	23.3	26.3	29.0	23.3	29.0	28.9	28.9
Solar heat gain		0.76	0.74	0.72	0.69	0.66	0.69	0.63
Thermal insulation	(W/m^2K)	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	($kcal/m^2hrC$)	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Sound reduction (JIS grade)		30	30	30	30	30	35	35
Maximum size(mm)		2,400 x 1,350			1,800 x1,200		L	M
Minimum size(mm)		350 x 200			350 x 200		350 x 200	

Details of Glass Materials:

- The proposed glass thermal conductivity "U" value will be less than 3.0 W/m^2K. The shading coefficient (SC) value will be less than 0.4 for high performance.
- The shading coefficient for the glass will be less than 0.4 as against the 0.65 used commonly used for he commercial buildings. The high energy efficient glass reduces the cooling load by 12%.

9.4. What passive solar architectural features are being used in the building? Illustrate the applications made in the proposed project.

- The width to height ratio between the apartment blocks is around 1:1.5 which is achieved as per the development control rules.
- All window openings is provided with chajjas depth as specified by the design standards (around 300mm)
- The full height openings have been designed for better lighting in the apartments units. For climatic considerations, all these openings are placed next to a balcony/sit out space, which acts as a buffer by eliminating the direct lighting and thereby avoiding heat ingress.

- Use of Large fenestrations in buildings reduces the use of mechanical light energy during daytime thereby reducing the energy consumption.

9.5. Does the layout of streets & buildings maximize the potential for solar energy devices? Have you considered the use of street lighting, emergency lighting and solar hot water systems for use in the building complex? Substantiate with details.

Solar power shall be used for external lightning (street lightning, landscape, basement, etc.).

9.6. Is shading effectively used to reduce cooling/heating loads? What principles have been used to maximize the shading of Walls on the East and the West and the Roof? How much energy saving has been effected?

Yes, the blocks are aligned north and south to maximize the shading.

9.7. Do the structures use energy-efficient space conditioning, lighting and mechanical systems? Provide technical details. Provide details of the transformers and motor efficiencies, lighting intensity and air-conditioning load assumptions? Are you using CFC and HCFC free chillers? Provide specifications.

Building Materials

The building materials chosen for the blocks are as per the recommendations of the climatic standards.

- To achieve the maximum energy value, a balance between the availability of building materials locally and skilled labourers is achieved.
- Burnt brickwork with fly ash for the walling and plastering reduces the thermal penetration by 20-30%.
- The RCC roof is covered with Brickbat concrete and terracotta weather tiles, which reduces the heat penetration by 18%.

Colour of Facades

- The colour choice for the buildings uses a maximum of white surface (nearly 84%). This increases the solar reflectivity factor.
- Emittance factor for white surfaces is around 90% compared to coloured surface (20-60%)
- 16% of wall area uses earthen colours and this space has longer thermal storage in the walls. This creates a comfortable temperature at nights due to the thicker walls designed.
- Heat Absorbance of the brick used for building is around 50%.
- The roof of the units (if not covered with terrace garden) is painted white to have a maximum reflectivity.
- The R-factor (resistance factor) for the roof with brickbats and white painted is nearly 40% more as compared to the recommended standards.

Energy Saving Measures In HVAC Design:

- The combination of high-energy efficient water-cooled centrifugal chillers & vapor absorption machine will be used for air conditioning works.
- The proposed chillers are CFC and HCFC free.
- The efficiency (Coefficient of performance – COP) of chiller will be higher than the Energy Conservation Building Code (ECBC) specification.
- The fresh air into the building will be as per ASHRAE 62.1-004 ventilation requirement standard. The building will be designed for positive pressurization to reduce the outdoor infiltration.
- High-energy efficient air-cooled screw chillers which are CFC and HCFC free chillers are being used for the building. The COP of the chiller will be more than the ECBC requirement.
- The proposed air-handling units will have compatibility for variable speed operation & variable air volume system.
- The secondary chilled water system will be with variable speed drive for energy saving.

9.8. What are the likely effects of the building activity in altering the microclimates? Provide a self-assessment on the likely impacts of the proposed construction on creation of heat island & inversion effects?

Green Roofs

Green roofs are an attractive roofing option that can reduce urban heat islands by providing shade and through evapotranspiration, the release of water from plants to the surrounding air. The benefits of green roofs include:

- Reduce sewage system loads by assimilating large amounts of rainwater.
- Absorb air pollution, collect airborne particulates, and store carbon.
- Protect underlying roof material by eliminating exposure to the sun's ultraviolet (UV) radiation and extreme daily temperature fluctuations.
- Serve as living environments that provide habitats for birds and other small animals.
- Offer an attractive alternative to traditional roofs, addressing growing concerns about urban quality of life.
- Reduce noise transfer from the outdoors.
- Insulate a building from extreme temperatures, mainly by keeping the building interior cool in the summer.

9.9. What are the thermal characteristics of the building envelope? (a) Roof; (b) External walls; and (c) Fenestration? Give details of the material used and the U-values or the R-values of the individual components.

S.NO.	COMPONENTS	U – VALUE (W/m^2K)
1	Walls	2.44
2	Roofs	3.35
3	Floors	1.13
4	Windows	5.67
5	Glass	< 3.0

9.10. What precautions & safety measures are proposed against fire hazards? Furnish details of emergency plans.

Fire Protection Plan/System

CONCEPT

It is proposed to provide Centralized Fire Fighting system and Fire detection and Public Address system designed for suitable and efficient fire fighting system. The height of the building is more than 30 M. As per National Building Code, Part IV, Table 30 the building is categorized as Business building Group E5.

1. Following provisions shall be made for fire fighting.
2. Wet riser / down comer with first aid hose reel system.
3. Automatic sprinkler system for the entire buildings.
4. Automatic fire alarm system with public address system.
5. Static storage of water for Fire Fighting.

STORAGE

Firewater static storage at ground level and at terrace level worked out on the basis of NBC requirement.

An Under Ground Static Storage Sump and Terrace Storage Tank.

FIRE HYDRANT SYSTEM

The pumping facility forms the heart of the fire hydrant system. The pumps are basically used to increase the velocity and the quantity of water required fighting fires.

Fire hydrants or hydrant outlets are installed within the building to enable fire fighters to connect their hoses to a water supply to fight fires.

Wet risers cum down comer of 150mm dia GI “C” class pipe will be provided in the fire duct located near the staircase lobbies. There will be 1 fire hose cabinet for every 1000 Sq.m of floor area comprising of the following:

a) Single headed hydrant valve

b) 2 x 15Mts. Of RRB hose

c) Gunmetal Branch Pipe with nozzle

d) Hose reel drum with 36.5Mts Rubber hose and nozzle.

YARD HYDRANT

At every 45M perimeter of the building there will be one number yard hydrant single headed type (external) around the building and one number of Four way Fire Brigade Inlet connection along with two way Fire brigade inlet connection will be provided.

PORTABLE FIRE EXTINGUISHERS

The number and location of portable fire extinguishers are dependent on the size and use of the building. Most extinguishers are water based, but there are also other types for special fires, such as carbon - di -oxide for the fire involving electrical equipment.

FIRE DETECTION & ALARM SYSTEM

The analogue addressable Fire detection and alarm system has been considered for each area, which will have a separate fire alarm and PA system. However Base Building FA&PA and fit out FA&PA Panels are provided with interfacing facility.

Suitable type of analogue addressable detectors with photoelectric type shall be installed in respective areas including corridors, lobbies etc.

Smoke detectors for below false ceiling and non false ceiling area, Photoelectric detectors in the ratio of 1:1 for above false ceiling area and Heat detectors for areas like pantry and D.G. rooms etc. The coverage of any detectors shall not exceed 50 sq. mts.

Manual pull stations with Hooter cum strobes are provided near each staircase landing on every floor.

PA SYSTEM

Dedicated two-way public address system shall be provided for the building. The system shall be consisting of floor selection console, Amplifier of suitable capacity, Microphone, P.A. speakers and Announcement speakers for car parking area.

9.11. If you are using glass as wall material provides details and specifications including emissivity and thermal characteristics.

-No-

9.12. What is the rate of air infiltration into the building? Provide details of how you are mitigating the effects of infiltration.

4 A changes = 4.

9.13. To what extent the non-conventional energy technologies are utilized in the overall energy consumption? Provide details of the renewable energy technologies used.

-Nil-

10. ENVIRONMENT MANAGEMENT PLAN

The Environment Management Plan would consist of all mitigation measures for each item wise activity to be undertaken during the construction, operation and the entire life cycle to minimize adverse environmental impacts as a result of the activities of the project. It would also delineate the environmental monitoring plan for compliance of various environmental regulations. It will state the steps to be taken in case of emergency such as accidents at the site including fire.

Furnished in EIA report.

Divyasree Orion B8

M/s Divyasree NSL Infrastructure Pvt. Ltd.,

SURVEY NO. 66/1, RAIDURGA,
SERILINGAMPALLY, RANGA REDDY DISTRICT

1. FORM I

2. FORM I A

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GOVERNMENT OF INDIA