Construction Phase Development Work Plan Chart

Task	Start Date	End Date	Duration
Site Preparation	01 Aug 2024	30 Sep 2024	2 months
Clearing and Excavation	01 Aug 2024	15 Aug 2024	0.5 months
Foundation Work	16 Aug 2024	30 Sep 2024	1.5 months
Basement Construction			
Basement 1 Construction	01 Oct 2024	30 Dec 2024	3 months
Basement 2 Construction	01 Jan 2025	31 Mar 2025	3 months
Superstructure Construction			
Lower Ground Floor	01 Apr 2025	30 May 2025	2 months
Upper Ground Floor	01 Jun 2025	31 Jul 2025	2 months
1st Floor Construction	01 Aug 2025	30 Sep 2025	2 months
2nd Floor Construction	01 Oct 2025	30 Nov 2025	2 months
3rd Floor Construction	01 Dec 2025	31 Jan 2026	2 months
4th Floor Construction	01 Feb 2026	31 Mar 2026	2 months
5th Floor Construction	01 Apr 2026	31 May 2026	2 months
6th Floor Construction	01 Jun 2026	31 Jul 2026	2 months

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Roof Construction	01 Aug 2026	30 Sep 2026	2 months
Finishing Work			
External Finishing	01 Oct 2026	31 Dec 2026	3 months
Internal Finishing	01 Jan 2027	31 Mar 2027	3 months
MEP Installation	01 Apr 2027	31 May 2027	2 months
Fire Safety Systems Installation	01 Jun 2027	30 Jun 2027	1 month
Quality Control and Safety	01 Aug 2024	22 Jun 2027	Ongoing
Regular Inspections	01 Aug 2024	22 Jun 2027	Ongoing
Safety Measures	01 Aug 2024	22 Jun 2027	Ongoing
Post-Construction Phase			
Testing and Commissioning	01 Jul 2027	15 Jul 2027	0.5 months
Final Inspections and Handover	16 Jul 2027	22 Jun 2027	0.25 months

Cost Chart (Approximate Budget: ₹27 Crores)

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Quarter	Timeline	Key Activities	Estimated Cost (₹)	Cumulative Cost (₹)
Q3 2024	Aug 2024 - Sep 2024	Site Preparation	1.5 Crores	1.5 Crores
Q4 2024	Oct 2024 - Dec 2024	Basement 1 Construction	3 Crores	4.5 Crores
Q1 2025	Jan 2025 - Mar 2025	Basement 2 Construction	3 Crores	7.5 Crores
Q2 2025	Apr 2025 - Jun 2025	Lower Ground & Upper Ground Floor	3 Crores	10.5 Crores
Q3 2025	Jul 2025 - Sep 2025	1st & 2nd Floor Construction	3 Crores	13.5 Crores
Q4 2025	Oct 2025 - Dec 2025	3rd Floor Construction	1.5 Crores	15 Crores
Q1 2026	Jan 2026 - Mar 2026	4th Floor Construction	1.5 Crores	16.5 Crores
Q2 2026	Apr 2026 - Jun 2026	5th & 6th Floor Construction	3 Crores	19.5 Crores
Q3 2026	Jul 2026 - Sep 2026	Roof Construction	1.5 Crores	21 Crores
Q4 2026	Oct 2026 - Dec 2026	External Finishing	1.5 Crores	22.5 Crores
Q1 2027	Jan 2027 - Mar 2027	Internal Finishing	1.5 Crores	24 Crores
Q2 2027	Apr 2027 - Jun 2027	MEP Installation & Fire Safety Systems	2 Crores	26 Crores
Q3 2027	Jul 2027	Testing, Commissioning, & Handover	1 Crore	27 Crores

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Explanation:

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Notes:

- **Site Preparation and Basement Construction form the foundation of the project and are front-loaded in terms of cost.**
- **The Superstructure Construction involves a steady financial outlay spread over multiple quarters.**
- **Finishing Work costs are spread over the last quarters with a focus on both internal and external finishing.**
- **Quality Control and Safety are ongoing throughout the project and are included within each phase's cost.**
- **The Final Inspections and Handover require minimal but essential financial resources to ensure successful project completion.**

Notes:

- **Cost Estimation**: The cost is distributed across quarters, with consideration of the work scope in each phase.
- **Flexibility**: Budget adjustments may be required based on actual expenditures and unforeseen circumstances.
- **Contingency**: It is recommended to keep a contingency of 5-10% of the total budget for unexpected costs.

This work plan and cost chart should help in managing the project timeline and budget effectively. Regular monitoring and updates will ensure the project stays on track and within the allocated budget.

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PROJECT REPORT

FOR THE

UNIWEST HUB

PROPOSED COMMERCIAL BUILDING PROJECT

AT

KH-113M, MIRJAPUR PARGANA DANKAUR, TH-GAUTAM BUDDH NAGAR NAGAR,

DISTT- GAUTAM BUDDH NAGAR

INDEX

CHAPTER 1: PROJECT DESCRIPTION

Project in a Nut Shell

Project Name	Commercial Building
Location	UNIWEST HUB KH - 113 M,MIRZAPUR PARGANA DANKAUR,GAUTAM BUDDH NAGAR
Total Plot Area	2000 Sqm
Total buildup area	7365 Sq.m
Total cost of project	
No. of floors proposed	Project consists of commercial building with Two basement floor and Eight floors.
Car parking Details	Total No. of car parking space proposed is Nos. 114
Water supply	Water supply from Bore well in the premises
Sanitation	Underground sanitary system facility for conveying the waste water to the proposed sewage treatment plant.
Solid water management **Air pollution/noise pollution generation source**	Collection and segregation at source of generation and the organic waste will be treated in organic converter and the inorganic waste will be sent for recycling 2 No. 500KVA DG set with acoustics are proposed.

1.1: Introduction:

Uniwest Infratech is a premier real estate company based in Greater Noida, renowned for its commitment to quality and innovation in the property market. With a diverse portfolio of residential, commercial, and mixed-use developments, Uniwest Infratech focuses on creating sustainable and aesthetically pleasing spaces. The company prioritizes customer satisfaction, ensuring that each project meets the highest standards of design and construction. Leveraging advanced technologies and a customer-centric approach, Uniwest Infratech has established itself as a trusted name in the industry. Its strategic location in Greater Noida allows it to capitalize on the region's rapid growth, offering modern and convenient living and working environments to its clients.

1.2 : Contact Information:

Contact information of the project proponent is as below:

Sl. No.	Description	Information
1	**Proponent**	UNIWEST INFRATECH Pvt. Ltd.
2	**Address**	6th floor, office no-606, kasana tower, alpha-1st, commercial belt greater
3	**Telephone No.**	9811335758
4	**e-mail ID**	uniwestinfratech2023@gmail.com
5	**Website**	https://uniwestarcade.com/

1.3: Project Location:

The Site is located KH-113M,MIRJAPUR PARGANA DANKAUR TH-GAUTAM BUDDH NAGAR,DISTT- GAUTAM BUDDH NAGAR between Latitude 28°18'18.5"N 77°33'19.3"E and located at a distance of about 6.00 km from Ernakulam north railway station.

The general topographical features of the area reveal that the proposed project site and its surroundings is generally a plain land with gentle slope. The soil nature observed is generally alluvial soil. The land around the project site indicates a mixed land use pattern. There are residential Apartments, villas, and commercial Establishments surrounded by areas like Supertech Aerocaity, Gaur Galleria etc. The project site is a vacant land.

Transportation : The project site is located at 290M from GYC Exit point at Yamuna Expressway.

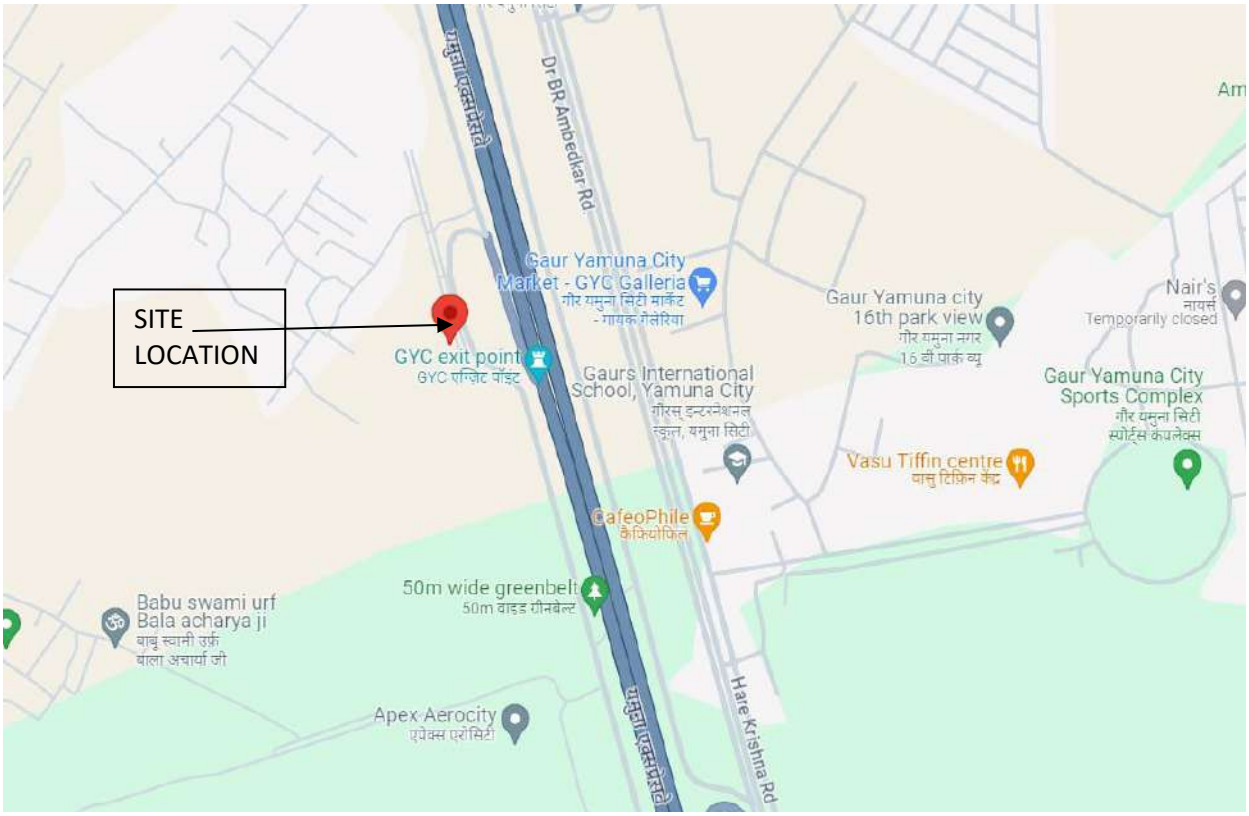
Agricultural Lands : Mixed land with agricultural lands are seen in the surrounding area.

Airport : **Jewar International Airport at 20Km**

Water Bodies : Yamuna river is at 12.00Km from project site.

Sl. No.	Description	Bearings with respect to site
1	Adjacent properties APEX AEROCITY NH Bypass GYC GALLERIAA	 South North West East

Location Map



1.44: Pre-Project Appraisal:

Any activity involving construction and operation is expected to cause impacts on surrounding environment. The impact may be adverse or beneficial, short term or long term and reversible or irreversible.

As per the EIA Notification issued by MOEF, Govt. of India, the project d o e s n o t needs to obtain consent from the state pollution Board and Environmental Clearance (EC) from the State Level Environment Impact Assessment Authority (SEIAA) The Built-up area of the project is 5000 Sq.M. which doesnot comes under serial No.8(a) of Schedule, EIA 2006, Notification (Building and Construction Projects with a built up area
>1,50,000Sq.M. and < 3,00,000 Sq.M.
Hence Environmental Clearance is n o t sought.

1.56: Land Use Pattern for the Proposed Project:

Sl. No.	Particulars	Area in Sq.M.	Area in Acres	Percentage
1	Total plot Area	2000	0.494	
2	Road Widening	---	---	---

3	Ground coverage area	725	0.18	36

1.67: Area Statement for the Proposed Project:

Area Chart					
S No	Description	Area		Unit	Percentage
	PLOT AREA(KH - 113 M)	2006		SQM	
	Total Plot Area	2000		Sqm	
	PERMISSIBLE GROUND COVERAGE	800		SQM	40%
	PERMISSIBLE BUILT-UP AREA	5000		SQM	250%
	PROPOSED GROUND COVERAGE & BUILTUP AREA	F.A.R. AREA	NON F.A.R. AREA		
1	BASEMENT 1		950	Sqm	
2	BASEMENT 2		950	Sqm	
3	LOWER GROUND FLOOR	725	0	Sqm	
4	UPPER GROUND FLOOR	673	61	Sqm	
5	FIRST FLOOR	673	61	Sqm	
6	SECOND FLOOR	673	61	Sqm	
7	THIRD FLOOR	656	61	Sqm	
8	FOURTH FLOOR	656	61	Sqm	
9	FIFTH FLOOR	656	61	Sqm	
10	SIXTH FLOOR	283	52	Sqm	
11	MUMTY AND MACHINE ROOM		52		
	Total Ground Coverage Area	**725**		Sqm	36%
	Total F.A.R AREA	**4995**		SQM	250%
	Non-FAR Area		2370		
	TOTAL COVERED AREA		**7365**	SQM	
	Open Area	1275		SQM	
	Boundary Wall	192.6		Meter	

1.78: Floor Wise Activity Breakup:

Sl. No.	Floor	Activity
1	Basement1	Car parking, MEP services, Fire Fighting equipments Room
2	Basement2	Car parking, MEP services, Fire Fighting equipments Room
3	Lower Ground Floor	Retail Shop
4	Upper Ground Floor	" "
5	First Floor	" "
6	Second Floor	Office
7	Third Floor	Studio
8	Fourth Floor	Studio
9	Fifth Floor	Studio
10	Sixth Floor	Studio
11	Terrace Floor	

1.90: Car Parking Statement:

Sl. No.	Description	Car parking
1	Basement 1+2	86 Nos
3	Building premises	10 Nos

1.100: Resource and Construction Material Requirements:

Construction of the proposed building will require the use of renewable and non renewable resources including wood, gravel, sand, steel, concrete, cement and concrete blocks. The materials will be used during construction period only and will not be required during the operation phase of the project. The estimated quantities of major construction materials required are given in table below.

Fuel such as diesel and oil will be used during the construction and operation of the project for mechanical and electrical equipments.

Electricity will be used during construction to provide power to construction equipment and during operation for lighting of building and running utility equipment.

Estimated Quantities of construction Materials:

Sl. No.	Description	Unit	Quantity
1	Reinforced steel	Metric ton	350
2	Concrete	cum	3000

1.111: Landscaping:

The landscaping of project has been planned to provide a clean, healthy and beautiful green environment for the people within the proposed project site. In the present project sufficient space has been designated for greenery development.

CHAPTER 2: WATER ENVIRONMENT

2.11: Source of Water Utilization:

The most important aspect under the water supply scheme is the selection of source of water, which should be reliable and potable.

The project being a commercial development with office space and retail activities, water demand is for domestic purpose, public uses and firefighting purposes. It includes the quantity of water required for drinking, flushing, land scaping etc. The quantity of water required depends on the habits, social status and climatic conditions. In India on an average the water requirement for commercial establishment is 45 LPCD. The anticipated water demand is worked out by taking into consideration that the project is fully developed.

2.22: Water Consumption of the Proposed Project:

Sl. No.	Occupants	Area excluding car parking	Total No. of occupants considering 1 person per 10 sq.m	Water required considering 45 LPCD
1	Occupants	5000 M^2	500	22,500
2	Visitors per day	--	1000 Nos.	15000 (15Ltrper visitor)
3			Total water consumption per day	37,500 Ltrs.

From the above demand, about 80% of water converts into sewage which amounts to 30000 Ltrs. Hence a sewage treatment plant of 30 KLD is proposed.

2.33: Quality & Portability of Available Water Source:

The quality of water from the source of origin is good and only disinfection is envisaged. After the treatment of the water, it is distributed through a net work of distribution system. The distribution system consists of pipes of

various sizes, valves, meters, pumps and hydrant valves. The valve provided in the distribution network will control flow of water through the system. Fire hydrants are provided to connect water to fire-fighting equipment during fire.

2.44: Waste Water Discharge Details:

Wastes of different types such as spent water from toilets, water closets, semi liquid waste of human excreta are produced daily. If proper arrangements for collection, treatment and disposal of the wastes produced are not made, unsanitary conditions will develop and it will become impossible for the public to live. Therefore, it is most essential to collect, treat and dispose all the sanitary waste produced. Generally 80% of the water supplied comes out as sewage. Therefore, the total quantity of waste water generated from the proposed project is worked out as below:

Total water demand for the proposed project	37500 Liters.
Waste water generated from the project (assuming waste water generation to be about 80% of the total water)	30000 Liters Say 30 KLD

2.55: Water Saving Practices & Methods:

Many measures can be adapted to reduced water demand through use of water efficient practices and devices; these would result in significant saving of water. Some of the common practices and devices than can save water are given below.

a) Water conserving flushing fixtures operating on sensors shall be used for urinals.
b) Dual flushing cistern, low flow fixtures and faucets shall be used.
c) Water closet with low volume flushing cistern/flush valve shall be used.
d) Water conserving means like pop-up sprinklers, drip irrigation etc shall be employed to irrigate the land-scape areas.
e) Stored rain water shall be used for domestic purposes after necessary treatment.

2.66: Green Concepts Proposed In The Project:

The proposed commercial development will be constructed by adopting the following green concepts.

a) Dual flushing system & low flow water saving fixtures.
b) 100% reuse of waste water treated on site.
c) Rain water storage and its reuse on site.
d) Reducing the impervious cover by using perforated pavement system.
e) Variable speed fans on AHU, Heat recovery, free cooling and CFC free efficient chiller and cooling tower.

2.77: Design Details of Proposed Treatment Plant:

SEWAGE TREATMENT PLANT FOR THE COMMERCIAL COMPLEX

Design Details of STP:

Total Plinth Area **Total area excluding car parking**	**5000 Sq.m** **5000 Sq.m**
Number of occupants @ 1 person/ 10 m2	**500**
Water consumption @ 45 Liters/head	**22,500**
Number of visitors per day	**1000**
Water consumption @ 15 Liters/visitor	**15000**
Total water consumption in the complex	**37,500**
Waste water generation (80% of water consumption)	**30,000 Liters**
Quantity of sewage water (30% of wastewater quantity)	**9000 Liters/Hour**
Quantity of sullage water (70% of wastewater quantity)	**21000 Liters/hour**
Capacity Proposed = 30KLD	

Raw water Characteristics:

The wastewater is generated in the project is from the toilets, bathing area and kitchen area. The effluent character is expected as below.

BOD	300 mg/l
COD	540 mg/l
pH	6.5 to 8

Proposed Treatment system:

The wastewater treatment system suggested will have the following components and expected reductions in the pollutants are given below.

Sl. No.	Treatment System	Remarks
1	Grit chamber	For the removal of debris and big particles from the effluent- we suggest two grit chambers in line. We should provide the grit chambers and screen chambers for every wastewater stream leading to the collection tank.
2	Oil Trap	For removal of oil and grease from the effluent. The presence of Oil and grease in the effluent will affect subsequent treatment systems.
3	Septic Tank	The sewage should be collected in a septic tank and the over flow should be diverted to the collection sump. The septic tank should be as per IS 2970.
4	Collection Tank	It is a buffer for the treatment system. For efficient treatment of all treatment systems, the flow should be regularized to a uniform and constant flow rate. As the effluent generation is fluctuating, the collection tank will act as a buffer. The overflow from septic tank and the waste water from oil trap should be collected in the collection tank.
5	Anox Tank	The wastewater from the collection tank is

		transferred at a uniform rate to the treatment system. The anox tank is provided to nitrify the nitrogen compounds present in the wastewater. It is done in the absence of air and with agitation for better mixing.
6	Aerobic Treatment - MBBR	Effluent from the anaerobic treatment will further treat aerobically using MBBR (Moving Bed Bio- Reactor) media. In this treatment system, the aeration tanks (2 numbers) is filled with specially made (imported) plastic body (called MBBR Media) for the aggressive growth of useful bactria in the tank for the reduction of biological content. 50% fill of media is recommened. The removal efficiency is expected to be about 98%.
7	Settling Tanks / Clarifier	The effluent from MBBR tanks will contain dead cells of bacteria and high content of suspended solids. To remove these matters, a secondary settling with flocculation is suggested. In order to have a better settling and if required a chemical settling is provided. We suggest having two settling tanks.
8	Disinfectant Tank	The effluent from the settling tanks is collected in disinfection tank, where the water is disinfected with chlorine injection. A minimum contact time of 20 minutes is recommended for disinfection.
9	Filter Feed Tank	The effluent from the settling tanks is collected in filter feed tank, where it is also disinfected by injecting Sodium Hypochloride.
10	Pressure Sand Filter	The effluent from the filter feed tanks is further filtered in a pressure sand filter with the help of a float controlled filter feed pump. The filtration rate used in the sand filter fill be 10 m3/m2

11	Activate Carbon Filter	The effluent will further go through an activated filter to remove colour odour and residual chlorine.
12	Treated Water Storage	The final purified water is stored in the treated water storage tank. This water is recommended to reuse for flushing or gardening etc. The excess water can be drained to soak pit or drainage line.
13	Sludge Line	The sludge from the settling tank is further directed to a sludge digestion tank. The digested sludge from sludge tank can be compacted in a filter press and disposed or pumped out into a drying bed for further disposal.

Capacity of Tanks:

Capacity of STP	**30.0 KLD**
Capacity of STP	**4000.0 LPH**
Liquid depth recommended	**3.0 m**
Oil and grease trap	**1.2 m3**
Equalization tank	**48.0 m3**
Anaerobic digestion tank for sewage	**24.0 m3**
Chemical settling tank for sullage	**8.4 m3**
Anox tank	**8.0 m3**
Capacity of MBBR Tank-1	**10.0 m3**
Capacity of MBBR Tank-2	**10.0 m3**
Clarifier-1	**16.0 m3**
Clarifier-2 **Filter Feed tank** **Treated water storage tank**	**16.0m3** **8.0m3** **8.0m3**
UF Feed Tank	**8.0 m3**

Slurry digester tank	**8.0 m3**
Total	**100 m3**

Power Requirement for STP:

		HP	Hrs	KW/Day	KW/Month
1 Lift pump		2	20	30	**900**
2 Filter feed Pump		2	10	15	**450**
3 Blowers		5	20	75	**2,250**
4 Ultra Filtration		3	20	45	**1,350**
5 Dosing pumps		0.1	20	2	**45**
Total				167	4,995

Expected Output Quality:

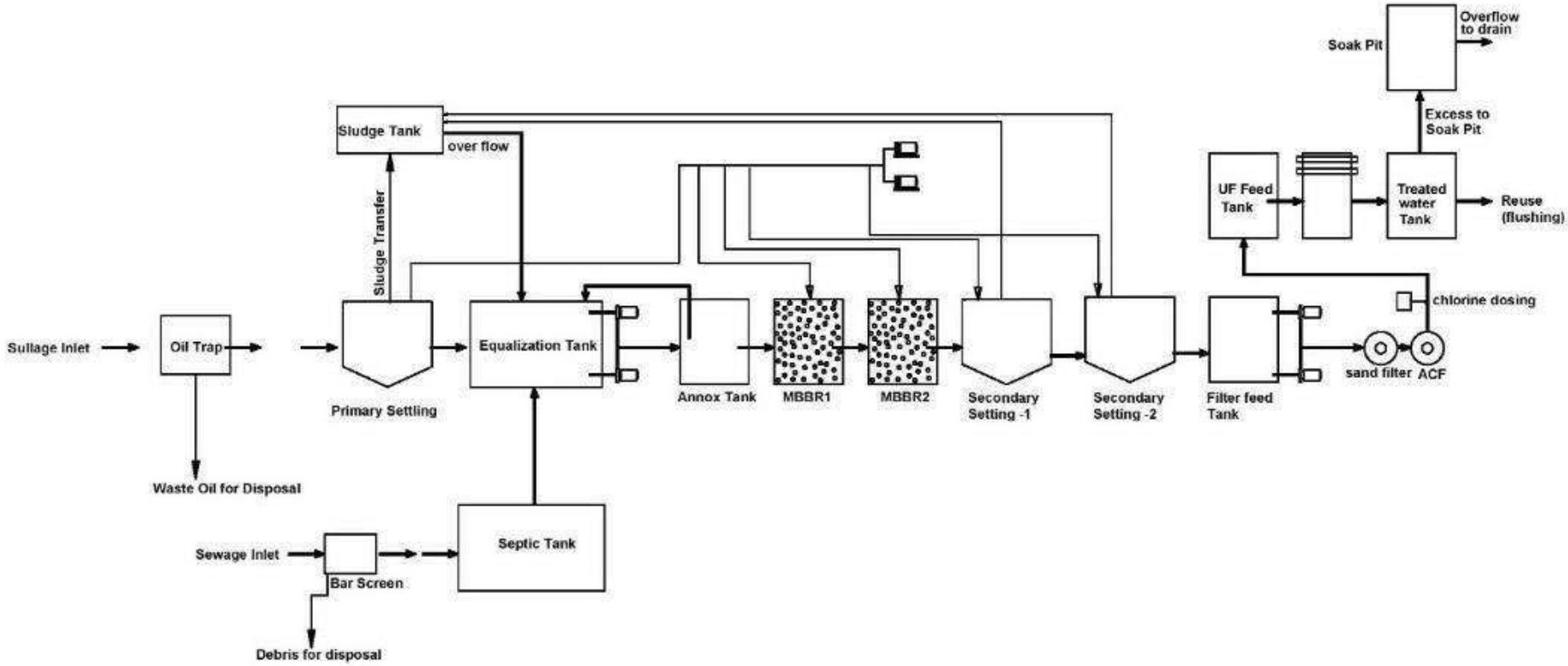
The treated water will meet the discharge standards suggested by KSPCB. The expected levels are given below.

BOD	**10 mg/l**
COD	**50 mg/l**
pH	**6.5 to 9**
Suspended solids	**10 mg/l**
Amonia Nitrogen	**5 mg/l**
N- Total	**10 mg/l**
Fecal Coliform	**<230 MPN/100 ml**

Sl. No.	ITEM	SPECIFICATION	UNIT	QTY
1	**Lift pump**	1 on duty	nos.	2
	Make/ Brand	Kirloskar		
	Type/ Model	Self- priming sewage pump		
	Material of Construction	CI		
	HP/KW ratings	2 HP		
	Pipe size	2"		
	Capacity	5 m2/hour at 12 m		
2	**Filter feed Pump**	1 on duty	nos.	2
	Make/ Brand	Kirloskar/ Johnson/ Wilo		
	Type/ Model	Cetrifugal		
	Material of Construction	CI		
	HP/KW ratings	2 HP, 2 Ph		
	Pipe size	1.5"		
	Capacity	5 m2/hour at 25 m		
3	**Blowers**	1 on duty	nos.	2
	Make/ Brand	A1/Akash		
	Type/ Model	Twin lobe blowers		
	Material of Construction	CI		
	Motor Make	Siemens/ Kirloskar		
	HP/KW ratings	5HP		
	Pipe size	1.5"		
	Capacity	200 m2/hour at 3 m water		

4	**MBBR media** Material of Construction Type/ Model Make:	 Imported Bio-wheels on PP K3 type Vasuenviro products	m3	8
5	**Diffusers**		nos.	16
	Type/ Model Make Dimensions	fine bubble tubular Anjeneya International 65x 650 mm		
6	**Dosing pump**	for Chlorine dosing	nos.	3
	Make/ Brand	Pentair/edose		
	Type/ Model	Diaphram pumps		
	Material of Construction Capacity	Liquid contact is with PP 0-5 LPH		
7	**Pressure Sand Filter**		nos.	1
	Dimensions Material of Construction	dia 760 &Ht>1600 mm FRP		
	Make:	Pentair/ Aventura		
	Media	Graded Quartz sand		
8	**Activated carbon Filter**		nos.	1
	Dimensions Material of Construction	dia 760 &Ht>1600 mm FRP		
	Make:	Pentair/ Aventura		
	Media	Activated carbon IV-1000		
9	**Control Panel and electrical works**		nos.	1

	Make/ Brand	L&T Fittings		
	Fittings	Starter, timer controlled operation changeover switch for pumps and TOD type energy meter		
	Material of Construction	MS powder coated CRCA 16 guage sheet		
10	**Water meter 1.5 " inlet/outlet**		nos.	1
11	**Pipe and fittings**	Lot (includes all plumping and electrical material)	Lot	1
	Make/Brand Type/Model	Supreme/ Fenolex uPVC pipes		
12	**Instllation and commissioning**		Lot	1
13	**Ultra filtration** Capacity:	 4 m3/hour	Set	1
	No. of membranes No of skid No of streams Feed pump	2 1 (fabricated on MS) 1 1 (SS - Centrifugal) 1 .5 HP		
	Backwash Pump	1 (Centrifugal) 2 HP		
	Membrane:	Hitec		
	Control panel	PLC based automatic control		


Soak Pit
Overflow to drain
Excess to Soak Pit
Sludge Tank
over flow
Sludge Transfer
UF Feed Tank
Treated water Tank
Reuse (flushing)
chlorine dosing
Sullage Inlet
Oil Trap
Primary Settling
Equalization Tank
Annox Tank
MBBR1
MBBR2
Secondary Setting -1
Secondary Setting -2
Filter feed Tank
sand filter
ACF
Waste Oil for Disposal
Sewage Inlet
Bar Screen
Septic Tank
Debris for disposal

CHAPTER 3: SOLID WASTE MANAGEMENT

3.11: Construction Phase:

The total man power = 100

Considering solid waste generation @ 0.20 kg/capita/day Total

solid waste generation = 100 x 0.20 = 20 kg/day

The domestic waste will be disposed through corporation authorities.

3.22: Occupancy Phase:

The wastes that are generated from day to day activities which are in solid form are categorized as solid wastes. Solid waste includes dry refuse of offices, street sweepings, and also electronic wastes. The quantity of solid waste generated from the proposed project is calculated as follows:

Details of solid waste generation:

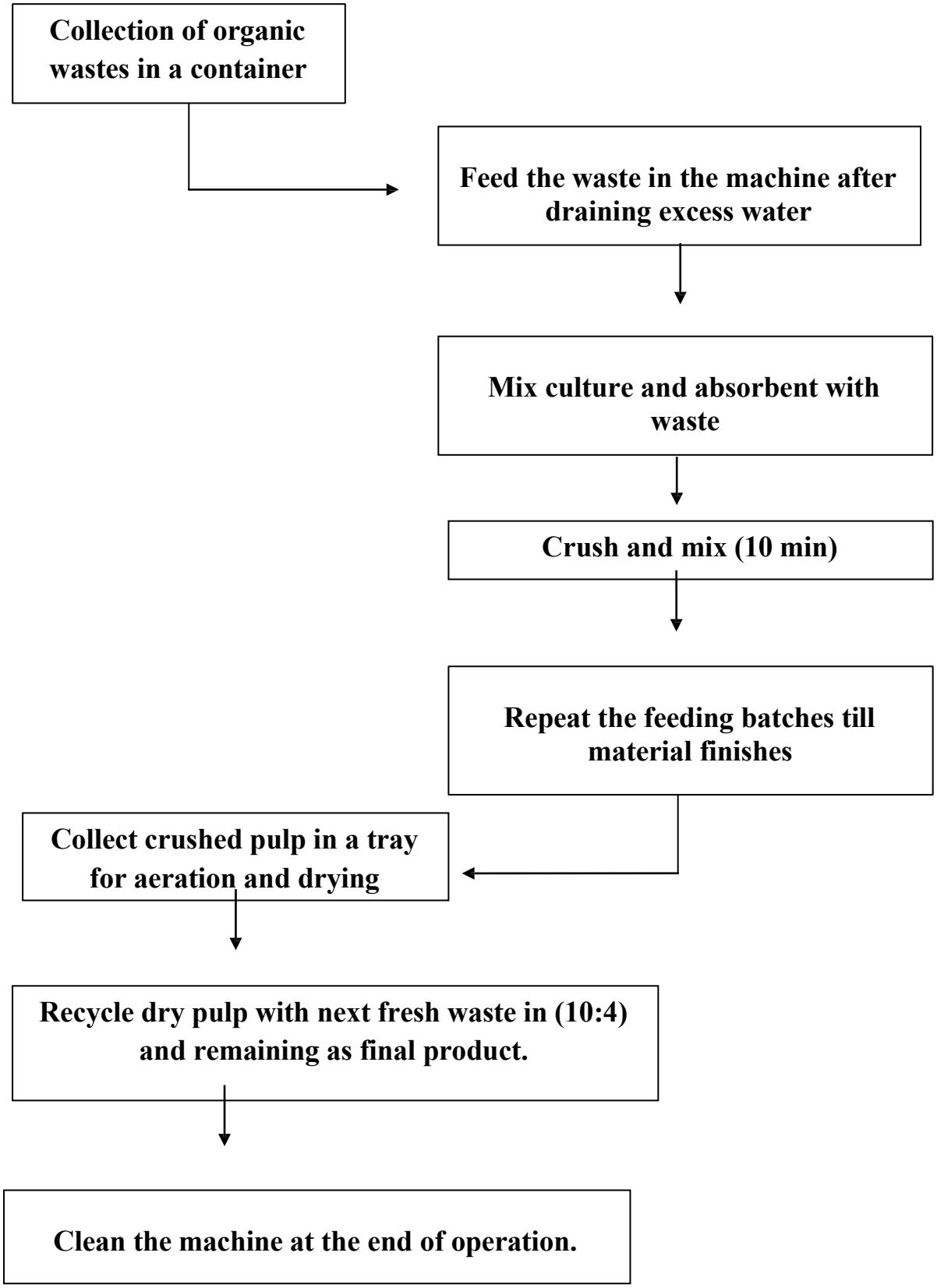
Sl.No.	Description	Population	Solid waste generated kg/day		
			Total	Organic (40%)	Inorganic (60%)
1	Building	500	500 x 0.20 =100	40	60
			Total	100 kg/day	

Considering solid waste generated in office as 0.20 kg/day and 40% of the solid waste generated is organic waste.

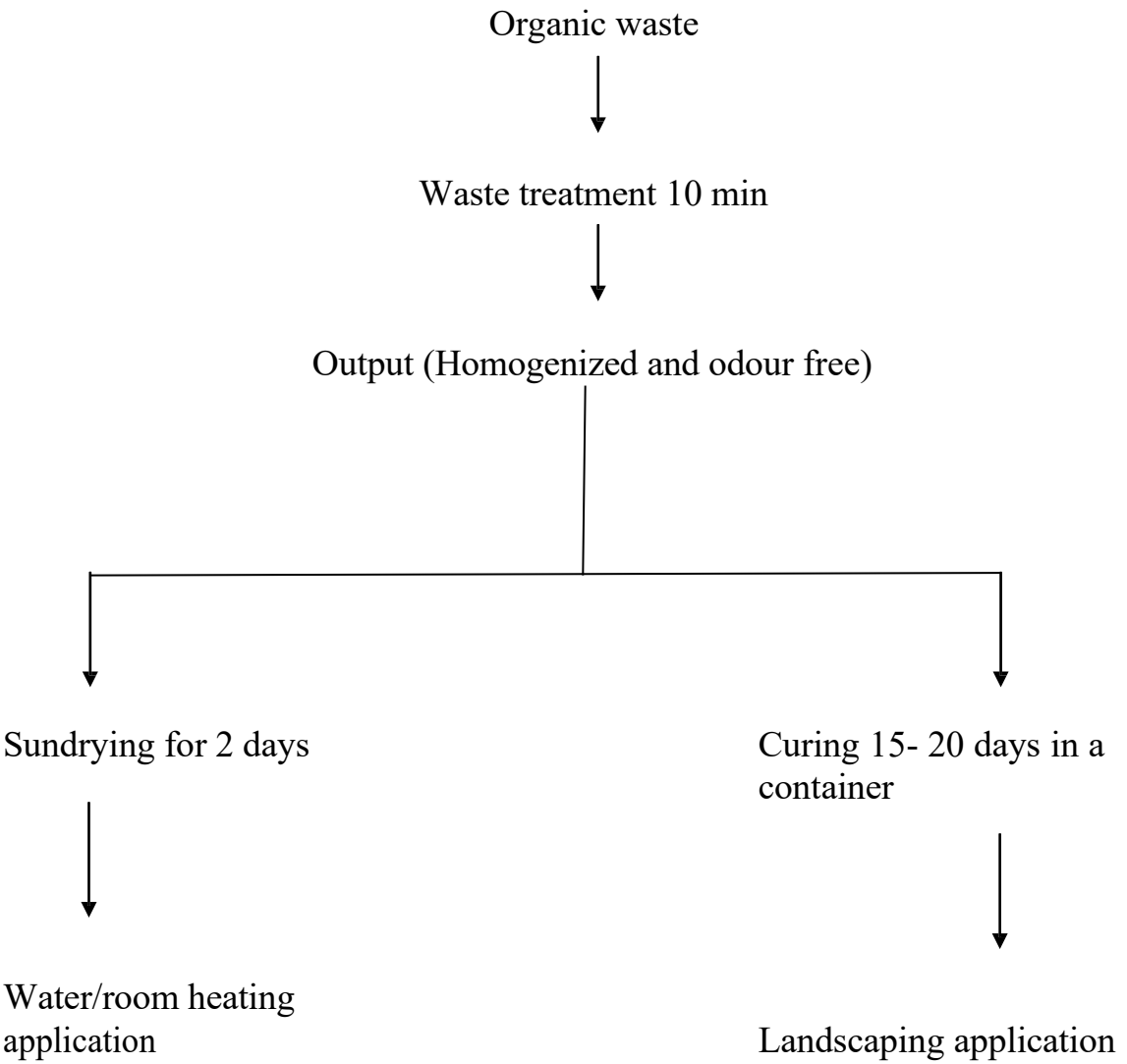
The solid wastes generated will be segregated at its point generation and collected separately in different colour coded synthetic Bins depending upon the basis of its Biodegradability at a common designated point. The collection and disposal of the solid wastes from the project is done in such a way that it is scientifically disposed without causing eyesore or any adverse effects to the surrounding environment. Organic sold waste from the site will be treated in an

organic waste converter and is used as manure for landscape or used as fuel. The inorganic solid waste is proposed to be recycled.

Operational Procedure:



Process Flow Chart for Organic Waste Converter:



3.2.1 Secondary Sludge from STP:

The solid waste generated from the STP of secondary settling is in the form of stabilized secondary sludge. Then it is passed through the plate and frame fitter press. The solids obtained as semi solid cakes which can be used as organic manure for the development of landscaping.

Rate: 80M3/day and sludge: 12 kgs/day (considering 15% of sewage volume as sludge generation)

3.2.2Hazardous Waste:

The hazardous Waste generated from the project is waste oil from DG sets which will be stored in HDPE barrels and disposed.

3.2.3 Bio Medical Waste:

No bio medical waste is generated on site, incase of bio medical waste generated from the project will be collected and segregated at source based on their categorization as per the Bio medical waste rule in containers and will be disposed as per guidelines. Common designated place will be earmarked for the storage of biomedical waste and will be disposed scientifically.

3.2.4: e-Waste:

The electronic waste such as CD's pen drives, computer and its components, used batteries etc. from the project will be segregated collected and stored at a designated place and will be handed over to authorized recyclers.

3.33: Disposal of Excavated Earth and Construction Debris:

3.3.1 Excavated Earth Disposal:

The proposed building in the project has basement floor and earth excavation is necessary. Quantity of earth excavated and its disposal is as given below.

Sl. No.	Description	Basement Area (M^2)	Basement height (M)	earth excavated (M^3)
1	Building	1900	4.2	7980

The excavated earth will be reused for back filling, paved area formation activity and landscape development. The excess excavated earth will be disposed off at pre-identified site.

For back filling: Considering 35% of the total excavated earth to be used
= 7980x 35%
= 3990 cu.m

For landscaping: Considering 50cm filling
= 200 sq.m x 0.50
= 100cu.m

For paved area development: Considering 50 cm filling:

= 1000.00 Sq.m x 0.50

=500M^3

Total quantity of excavated earth to be reused = 4600 Cu.m

3.3.2: Construction Debris:

Construction debris generated will be used as preparatory for formation activities within the project site. Necessary measures and modern construction practices such as proportioning and weigh batchers for concreting etc. will be implemented to reduce construction debris.

CHAPTER 4: AIR AND NOISE POLLUTION MANAGEMENT

4.11: Air Pollution Source and its Management:

The anticipated power required for the project (About 1000 KW) will be supplied from KSEB. The primary sources of air pollution from the establishment are from the operation of diesel generator set. The project will be provided with DG set of 2 nos of 500KVAcapacity and it is installed to serve as an alternative back up source of power supply in the event of breakdown of power supply from KSEB. The details of capacities and fuel consumption for the DG sets are given below.

Sl. No.	Stack details	Stack attached to
	Physical details	D.G. set.
1	Capacity	2 x 500 KVA
2	Fuel quantity	108 Liters/hr
3	Fuel used	High speed diesel
4	Stack height	Chimney above roof level
5	Stack diameter	60 cm

Emission Details:

1	Sulpher Dioxide	0.097g/s
2	Suspended particulate matter (SPM)	0.03 g/s
3	Oxides of nitrogen	0.57g/s

4.22: Noise Generation Sources:

Major noise producing sources of the commercial project is expected to be from DG sets and vehicular movements from and to the site. The DG sets are provided with acoustic enclosures to control the noise levels in such a way that the noise levels are within the permissible limits specified for ambient noise levels. Moreover DG sets are operated only during emergencies when there is power failure.

CHAPTER 5: RAIN WATER HARVESTING AND STORM WATER MANAGEMENT

5.11: Rain Water Harvesting and Storm Water Management:

The water collected from the terrace of the building shall be collected in the rain water collection sump and reused for domestic purpose after necessary treatment.

5.22: Volume of Rain Water Harvested:

The total quantity of water i.e., received in the form of rail fall over an area is called the rain water endowment of that area out of which the amount of water than can be effectively harvested is called the rainwater harvesting potential.

Rain water harvesting potential = Intensity of rain fall (m) x
Roof area x Impermeability factor.

The collection efficiency accounts for the fact that all the rainwater falling over an area cannot be effectively harvested due to losses on account of evaporation, spillage or run off etc.

According to data available from the Indian Meteorological Department, the average annual rainfall is 1423.90 as per IMD. Assuming that about 90% rain fall can be effectively harvested.

Number of raining days = 69
Therefore the IR = 1423.90/60 = 20.64 mm/day or 0.021 m/day Rain water Q = 0.021 x 75% roof area x 0.90

Sl. No.	Description	Roof Area/sq.m	75% of Roof area (Sq.m)	Quantity of rainwater harvested M3
1	Building	578	433.5	8.19
Total quantity of rainwater harvested = say 8.19 cu.m				

5.33: Storm Management:

Storm water disposal is divided into 2 Groups:

a) **Terrace storm water disposal**: The entire rainwater from the terrace would be disposed through suitable rainwater pipes and collecting in the dedicated rain water collection sump. This water will be utilized for domestic purpose.

b) **Site storm water disposal**: The entire storm water from the site would be disposed off through suitable RCC box drainage system to the rainwater recharge pits and the excess is diverted to external storm water drainage.

   The amount of storm water that the paved area will produce can be determined by considering the impermeability factor to be 0.90. The paved area of the proposed project is 1275.00 M^2

   Q = 0.021 x 1275.00 x 0.9 = 24 cum/day

   The proponent shall also provide recharge pits along the boundary with recharge pits of size 1.20 m dia x 2.00 m deep spaced at 20m centre to centre. The pits are filled with graded media comprising of boulder at bottom and coarse aggregate.

CHAPTER 6: ENVIRONMENTAL MANAGEMENT PLAN

6.11: Environmental Management Plan:

The environmental management plan (EMP) is aimed at mitigating the possible adverse impact of a project and ensure the existing environmental quality. The EMP converse all aspects of planning, construction and operation of the project relevant to Environment. It is essential to implement the EMP right from the planning stage continuing throughout the construction and operation stage. Therefore the main purpose of the environmental management plan is to identify the project specific activities that would have to be considered for the significant adverse impacts and the mitigation measures required. The construction phase impacts are mostly short term restricted to the plot area and not envisaged on the large scale. In the operational phase the environmental impacts are due to continuous operation of the project. Hence the emphasis in the environment management plan is to minimize such impacts. The following mitigation measures are recommended in order to synchronize the economic development of the project area with the environmental protection of the region. The emphasis on the EMP development is on the following

* Mitigation measures for each of the activities causing the environment impact

* Monitoring plans for checking activities and environmental parameters

* Role responsibilities and resource allocation for monitoring

* Implementation of the scheduled plan.

6.22: EMP During Construction Phase:

During construction phase activities to be monitored are given below.

Environmental Impact	Mitigation Proposed	Remarks
Noise generation caused due to demolition of machineries, excavators and Bulldozers.	*Most optimum no. of operation by the heavy equipment. *Selection of equipment with less noise generation. *The earth moving equipment shall be periodically checked.	To reduce noise level equipment provided with noise control devises is only used.

	*The workers will be provided with PPE	

Environmental Impacts	Mitigation Proposed	Remarks
Dust generation: leveling and demolition activities results in the emission of dust.	The site cleared will be periodically watered to reduce dust emissions. Bar codes like metal sheets will be provided all around the premises to avoid fugitive dust emission during demolition to the neighboring area apart from water sprinkling Workers will be provided with PPE such as nose masks and goggles to reduce impact.	Treated water to be used.

Transportation of construction materials:

Environmental Impacts	Mitigation Proposed
Noise generation	*Quality fuel will be used *Periodic maintenance of vehicle is required.
Dust generation	*Quality packaging of the construction materials *Construction materials will be covered with tarpaulin sheet to prevent from being airborne. *The vehicle speed shall be regulated. *The workers, transporting materials will be provided with PPE kits such as nose masks.
Vehicular emission	*Periodic emission check for vehicles will be done. *Clean fuel will be used for vehicles.

Construction Activities:

Environmental Impacts	Mitigation Proposed	Remarks
Noise generation	*Less noise generation equipment *PPE such as ear plugs and helmets will be provided for workers *Working hours to be imposed on the construction workers.	Implementation responsibility: Contractor – Civil Works
Dust generation	*PPE in the form of noise masks will be provided for construction workers. *Use of water sprays to prevent dust from being air borne *Barricade like metal sheets will be provided all around the premises to avoid fugitive dust emission into the neighboring area.	Implementation responsibility – Contractor
Dust generation	*PPE in the form of noise masks will be provided for construction workers. *Use of water sprays to prevent dust from being air borne *Barricade like metal sheets will be provided all around the premises to avoid fugitive dust emission into the neighbouring area.	
Dust generation	*PPE in the form of noise	Implementation

	masks will be provided for construction workers. *Use of water sprays to prevent dust from being air borne *Barricade like metal sheets will be provided all around the premises to avoid fugitive dust emission into the neighboring area.	responsibility – Contractor

Water discharge (Construction works)	*Sewage generated will be treated in STP	Implementation responsibility - Contractor
Air emission from construction Machinery	*Periodic check and regular maintenance of construction machinery for emissions. *Clean fuel are used in equipments.	Implementation responsibility – Contractor.

6.2.1<u>Personnel Safety System</u>:

It is planned to adapt the safe working practices which shall govern all construction works undertaken throughout the project. The following safety aids to all laborers will be provided.

*Safety helmets, safety Belts, Safety shoes, hand gloves.

* Gumboots while concreting

*Safety goggles while welding/stone dressing etc.

*Face mask and full body kit while pest control.

Implementation of safety procedures such as

*Using proper lifting techniques
*Using safe scaffolds
*Work permits for fabrications and welding

6.2.2 Financial Allocation And Budgetary Provision For EMP Aspects (Construction Aspects):

Sl. No.	Description	Financial provisions in Lakhs	
1	Environmental Management plan during construction phase using water for *Sprinkling to control dusts *Construction & curing purposes *Flushing	 1.0 1.0 0.50	 0.50 0.50 0.25
2	Sewage Treatment plant for operation phase	35.0	--
3	Potable water for workers	1.0	0.50
4	Maintenance of vehicles and equipments	--	1.0
5	Temporary storm water drains	2.0	1.0
6	Personal protection safety gadgets	2	0.50
7	First aid facilities for workers	1	0.50
8	Environmental monitoring plan (air, noise, water and soil)	--	1.00
Total	43.50	5.75	
Contingency at 10%	4.35	0.575	
Total	47.85	6.275	

6.33: EMP during Operation Phase:

Following are the identified operational phase activities in the impact assessment which may have impact on the environment.

1) Air quality
2) Water quality
3) Noise quality
4) Solid waste disposal
5) Green belt development
6) Storm water management

6.3.1Air Quality Management:

The pollutants envisaged from the proposed project are SPM, Nox, HC and CO mainly due to burning of liquid fuel (HSD) in DG sets. Exhaust from DG sets will be emitted from stack of adequate height for dispersion of gaseous pollutants. The following table presents the EMP for air quality management during operation phase.

Air quality management during operation phase:

Environmental Impacts	Mitigation Proposed
D.G. Set	*Equipment selected will ensure the exhaust emission standard as prescribed as per the latest amendments from MOEF *DG will be used as standby unit *Periodic check and maintenance
Ambient air quality	*Ambient air quality monitoring as per the prescribed norms at regular interval

6.3.2: Water Quality Management:

Water requirement of project will be augmented through KWA source Details of water requirement and water balance is presented in chapter 2.4.

The sewage generated from the project will be treated in the proposed STP of total capacity 30 KLD. The treatment scheme for domestic sewage

generated from project is discussed in chapter 2.8. Treated water will be reused for flushing, gardening etc. and the following table presents the EMP for water quality.

Water Quality Management during operation phase:

Environmental impacts	**Mitigation proposed**
Waste water	*Treated with proposed sewage Treatment plant to produce tertiary treated water which is used for secondary purposes such as flushing, and landscaping *Water conservation measures will be encouraged.

6.3.3: Noise Management:

High Noise generating units such as DG sets will be provided with acoustic enclosures. Green belt on the project boundary will further act as noise barrier. The table presents the EMP for noise level.

Noise management during operation phase:

Noise from DG set area	*Acoustic enclosures will be provided for DG set *DG set will be installed in an area where the access will be restricted. *The use of PPE (earplugs) will be mandatory in this area. *Selection of equipment to ensure that the residual noise level of ,<55dB(A) *Noise levels will be checked periodically using a noise pressure level meter.

6.3.4 Solid Waste Management:

The solid wastes generated during operation phase can be categorized as:

*Wet garbage : Food waste
*Dry garbage : Paper, plastic, bottles etc.
*Sludge from sewage treatment plant (STP)

The various mitigation measures to be adopted during collection and disposal of wastes are as follows:

*It is preferable that the container and bins used for collection of waste should be of closed type and waste is not exposed thus possibility spreading of disease through flies and mosquitoes is minimized.

*Collection system should be properly supervised so that quick and regular removal of waste from the dustbin is practiced.

6.44: Health Risk And Disaster Management:

6.4.1: Public and Health Safety:

Since all the construction related activities are confined to the project site, minimal health related impacts are envisaged within the project influenced area during the construction stage.

At the project site on an average of 300 No. of persons will be engaged, who face direct exposure to dust and noise generated from the construction activity. This may likely to cause health related problem such as asthma, bronchitis etc.

To minimize these anticipated impacts, suitable actions like

1. Use of water sprinklers to prevent dust from being airborne.
2. Providing suitable PPE kit like mask with filter, helmets etc.
3. Periodic health check-up camp for the laborers will be arranged
4. Provision of safety belts.
5. In case of injury on site medical treatment and transport will be organized.

6.4.2Risk and Disaster Management Plan:

Construction phase:

Sl. No.	Potential	Mitigation
1	Accidental fire	Fire safety gadgets
2	Fall of objects	Use of personnel protection devises-helmets
3	Working at great heights	Protection to prevent fall, with life safety belts and nets
4	Accident from Machinery	Personnel protection gadgets
5	Electrical mishap	Adopting safety measures to prevent any act of negligence and providing electrical safety measures like fire extinguishers.

Operation phase:

Disaster is an unexpected event due to sudden failure of the system, external threats, internal disturbances, fire and accidents.

An appropriate management plan shall be incorporated.

Precautions:

- Once the likelihood of the disaster is suspected, preventive actions should be undertaken by the project-in-charge.
- Conditional maintenance of equipments, materials and expertise for use during emergency.
- The electrical system shall be provided with automatic circuit breakers activated by over current.
- Proper escape routes are planned and displayed in the public domain.
- Selected representatives are given proper training to guide inhabitants during fire accidents.
- Periodic awareness program is conducted to the workers on their roles during emergency situations.
- Important telephone numbers like police, Fire Department and hospitals for use during emergency situations will be made available.

6.55: EMP Implementation Schedule:

Sl. No.	Recommendations	Requirements
1	Air pollution Control measures	Before commissioning of respective units.
2	Water pollution control measures	Before commissioning of the project
3	Noise control measures	Along with the commissioning of the project
4	Solid waste management	During commissioning of the project
5	Green belt development	Stage-wise implementation

Financial Allocation and Budgetary provision for EMP aspects (Occupancy phase)

Sl. No.	Description	Financial Provision In Lakhs	
		Capital cost	Recurring cost
1	Operation of sewage treatment plant	--	2.0
2	Rain water harvesting tanks and its facilities	10.0	2.0
3	Ground water recharging pits & its management	5.0	1.0
4	DG sets acoustic maintenance	5.00	1.0
5	Landscaping	4.0	1.0
6	Solid waste management	4.0	1.0
7	Environmental Monitoring Plan per annum	--	1.0
	Total	28.0	9.0
	Contingency at 10%	2.8	9.0
	Total	30.80	9.90

A comprehensive monitoring program is suggested below

6.66: Environmental Monitoring Routines:

A comprehensive monitoring program is suggested below

Sl. No.	Particulars	Monitoring Frequency	Duration Of Monitories	Important Parameters For Monitoring
1	Air Quality			
2	Ambient Air Monitories			
	Project premises	Once in a month	24 hourly sample	RSPM, SPM, SOZ, NOX
2	Stack monitoring	Once in a year if required	Grab	SPM, SOZ, NOX, HC, CO
II	Water and Waste water quality			
1	Water Quality			
a)	Ground Water at two locations of treated effluent discharge are	Ones in a month	Grab	As per PCB requirement
2	Waste water quality			

a)	Inlet into STP	N.A.	N.A.	
b)	Treated effluent prior to discharge	N.A.	N.A.	
III	Soil Quality			
1	Within project premises at 1 location on effluent discharging area	Ones in 6 months	Composite sample	As per PCB requirements
2	Ecological preservation and up-gradation	Seasonal	Visual observation	Survival rate
IV	Noise Monitoring			
1	Project premises	Ones in 6 months	Day and night	As per PCB requirements

6.77: Traffic Management Measures:

- Merging of vehicles will be performed only to leave vehicle from the gate, this ensues safety.
- To establish smooth entry and exit of vehicles, bell mouth shape geometry is provided at the gates.
- Yellow paint junction boxes are painted at the locations to create psychological barrier for through drivers to control the speed.
- Adequate sign & guide posts for traffic as per IRC:
- Road marking, stop lines, parking lines, slot numbers etc. must be clearly painted so as to guide the vehicles.

6.88: Energy Conservation Aspects Proposed In The Project:

- Energy efficient motors, whose efficiency is not lower than the limits specified in section 8.2.2 of the energy conservation building code will be installed.
- Dry type transformer with efficiency not lower than the limits specified in section 8.2.1 of the code shall be considered.
- Power monitoring, recording and check metering will be provided in main LT panels on the incoming feeders and individual outgoing feeders covering all parameters such as current, voltage, and energy as stipulated in section 8.2. 4 of the Code.
- Cable size and design of distribution system will ensure that the total distribution loss will not exceed 1% of the total energy consumed as stipulated in section 8.2.5.1 of the Code.

- Timer controls will be incorporated in the distribution board of external lighting to save energy.
- Solar lighting shall be provided at strategic locations in outdoor areas,
- Water cooled chillers are used instead of air-cooled chillers to save energy.
- VFD driver shall be provided for secondary pumps for water cooled chillers and lifts which will result in energy savings.