

ENVIRONMENT CLEARANCE APPLICATION CONCEPTUAL PLAN

For

**Proposed Tribhuvan Resort of Shri Nand Kishore
Singh S/o Late Tribhuwan Prasad Singh**

At

Khata no. - 456, 390, 381, 396, 380, 404, 378, 396, 448, 446, 445, 454, 443,
218, 37, 445, 388, 398, 385, 402 Thana no.- 09, Khasra No. 1486, 1408, 1409,
1407, 1852, 1401, 1402, 1406, 1407, 1400, 1384, 1481, 1398, 1397, 1395,
1850, 1399, 1391, 1396, 1403, 1404 Sheikhpura, Mauza-Sheikhpura, District-
Patna, Bihar

Developed By
SHRI NAND KISHORE SINGH

PROJECT CATEGORY	- 8 (a)
PLOT AREA	- 13,916.56 m ² (3.438 Acres)
NET PLOT AREA	- 13,051.72 m ² (3.225 Acres)
BUILT-UP AREA	- 40,365.86 m ²
PROJECT COST	- 164 Cr.

ENVIRONMENT CONSULTANT

AGS ENVIRONMENTAL SERVICES PVT. LTD.

Certificate No.- NABET/EIA/2326/IA 0122

Address- Star infinity tower, Suite no. 412, Kaushambhi Ghazaibad, UP- 212214

Email id- info@agsconsultant.in

Contact No. - +91-9717345740

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1 Introduction

1.1 General

The Ministry of Environment, Forest and Climate Change has notified the Environmental Impact Assessment (EIA) Notification, 2006 under the provisions of the Environment (Protection) Act, 1986, which regulates development and their expansion/modernization of 39 sectors/activities listed in the Schedule to the EIA Notification, 2006. As per notification, all building construction and area development projects comes under schedule 8.

All the Building construction projects which have built up area $\geq 20000 \text{ m}^2$ and $< 1, 50,000 \text{ m}^2$ they come under schedule 8 (a) and Township/Area Development projects which have covering an area $\geq 50 \text{ ha}$ and or built-up area $\geq 1, 50,000 \text{ m}^2$ they come under schedule 8(b). Projects comes under above schedules are required to obtain prior environmental clearance from State Environmental Impact Assessment Authority (SEIAA)/Expert Appraisal Committee (MoEF&CC).

For the scheduled category 8(a), application seeking prior environmental clearance shall be made in the prescribed Form 1, supplementary Form 1A and Conceptual Plan. The application shall be submitted in SEIAA. The project shall be screened and scrutinized by respective SEAC. Following the appraisal of the project to the satisfaction of the SEAC, Environmental Clearance shall be granted.

Since, Net plot area of the proposed project is $13,051.72 \text{ m}^2$ (3.225 Acres) **with built-up area of $40,365.86 \text{ m}^2$** . thus, it is required for the project proponent to obtain environmental clearance from SEIAA, Bihar under EIA Notification, 2006 and its amendments from SEIAA/MoEF&CC.

Other mandatory approvals required for the project will be under Water Act, 1974 and Air Act, 1981. As per the Water Act, 1974 and Air Act, 1981, project proponent should obtain consent prior establishment and prior operation from respective state pollution control board.

1.2 Brief about Project Proponent

Shri Nand Kishore Singh, a visionary entrepreneur with a passion for hospitality, is embarking on an ambitious project to construct a resort in the picturesque city of Patna, Bihar and to carry out all the activities related to the environment clearance from SEIAA, Bihar Shri Nand Kishore Singh entrusted himself as authorized person, and his details are as follows.

Authorized Person: Shri Nand Kishore Singh

Designation : Owner

Address : C/O TP Singh ,18 First floor, Paschimi Marg, Opposite Little Pearls School,Vasant Vihar, Vasant Vihar-1,South West Delhi, Delhi,110057

2 Project Background

The proposed project, epitomizes comfort and environmental sustainability. Its design seamlessly blends luxury with eco-conscious practices, ensuring a serene escape for guests while minimizing its ecological footprint. From plush accommodations to thoughtfully curated landscapes, every aspect of the resort harmonizes comfort with responsible stewardship of the environment, offering guests a guilt-free indulgence in nature's beauty.

The proposed project will have

One Residential block having G+2 floors and other commercial Building block with 2 Basement floor + Ground floor +10 floors. The basement level-01 will have essential services such as STP, Grabage Collection, HVAC Plant Room, and ESS. These services are crucial for the smooth functioning of the building and ensuring the comfort and safety of its occupants.

3 Project Location and Connectivity

Site is located at Khasra No. 1486,1408,1409, 1407, 1852, 1401, 1402, 1406, 1407, 1400, 1384, 1481, 1398, 1397, 1395, 1850, 1399, 1391, 1396, 1403, 1404-Khata no. - 456, 390, 381, 396, 380, 404, 378, 396, 448, 446,445, 454, 443, 218, 37, 445, 388, 398, 385, 402 Thana no.- 09, sheikhpura, Mauza-Sheikhpura, District- Patna, Bihar. Site co-ordinates of the project site are as follow.

Table 1 Geographical co-ordinates of the site

Description	Details (Coordinates)
P-1	25°36'16.52"N 85°05'34.98"E
P-2	25°36'16.56"N 85°05'37.03"E
P-3	25°36'17.08"N 85°05'39.43"E
P-4	25°36'18.75"N 85°05'40.21"E
P-5	25°36'19.37"N 85°05'38.67"E
P-6	25°36'23.25"N 85°05'40.43"E
P-7	25°36'23.47"N 85°05'39.73"E
P-8	25°36'22.53"N 85°05'39.28"E
P-9(Centre)	25°36'18.17"N 85°05'37.46"E

CONCEPTUAL PLAN OF Proposed Tribhuvan Resort of Shri Nand Kishore Singh S/o Late Tribhuvan Prasad Singh at Khasra No. 1486,1408,1409, 1407, 1852, 1401, 1402, 1406, 1407, 1400, 1384, 1481, 1398, 1397, 1395, 1850, 1399, 1391, 1396, 1403, 1404-Khata no. - 456, 390, 381, 396, 380, 404, 378, 396, 448, 446,445, 454, 443, 218, 37, 445, 388, 398, 385, 402 Thana no.- 09, sheikhpura, Mauza-Sheikhpura, District- Patna, Bihar

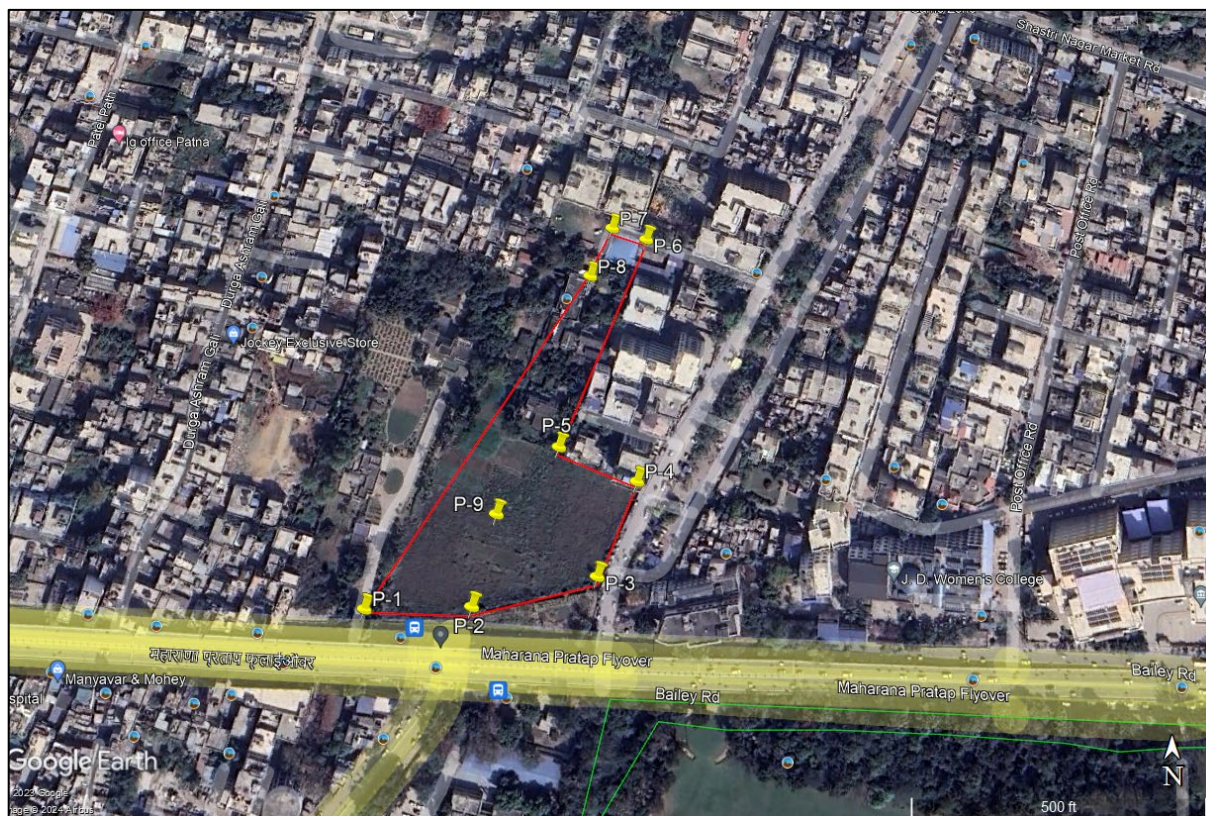


Figure 1 Geographical co-ordinates of the site on Google Map

Site is well connected to transport facilities as well as surrounded by densely populated areas. Project site is adjacent to the Maharana Pratap Flyover (in direction South). Patna Junction railway station is present at the distance of 4.40 km (in direction South). Jay Prakash International Airport, is located at 1.18 km from the site (in direction West direction).

Site surroundings and Connectivity details of the project within 15km are given in Table 2.

Table 2 Site surroundings and its connectivity within 15 km

S. No.	Particulars	Name	Aerial Distance & Direction from the Project site
1.	Nearest Railway Station (RS)	- Patliputra railway station - Patna Junction railway station	3.08 km, North 4.40 km, South
2.	Nearest Airport	Jayprakash Naryan international Airport	1.18 km, West
3.	Nearest Populated Area	- Sheikhpura - Nand Gaon - Shashtrinagar	0.28km, North 0.51km, SE 0.86km, E 2.84 km, NW

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		• Jalapur	
4.	Nearest Road	• Bailey Road • Digha-AIIMS Elevated Road • NH-922 • NH-139	Adjacent, North 3.07 km, North 2.99 km, SW 4.24 km, W
5.	Nearest School/Institute	• Icon public School • West point School • Government Middle school • St. Xavier's Public school	0.48 km, NW 1.22 km, N 1.16 km, SE 1.56 km, E
6.	Nearest Hospital	• Paras HMRI Hospital • Holy Prime Rose Hospital • Ruban Memorial Hospital • Sai Raj Hospital	1.12 km, N 1.60 km, E 3.09 km, E 4.07 km, S
7.	Place of Worship	• Khajpura Shiv Mandir • Mahima Mandir • Hindustani masjid • Gurunank bhawan	1.56 km, N 2.14 km, N 1.59 km, SW 3.07 km, ESE
8.	Water Bodies	• Ganga river	4.65 km, East
9.	Ecological Sensitive Area	• Sanjay Gandhi Biological Park (Patna Zoo)	0.87 km, South

(Source: Google Earth Pro)

Google map and topographical map showing site and surroundings within 2km, 5 km, 10 km and 15 km are attached as Annexures.

Annexure 1, Annexure2 and Annexure 3

4 Salient Features of the Site

Table 3 Salient Features of the site

S. No.	Description	Proposed
1	Plot Area	13,916.56 (3.438 Acres)
2	Proposed Built Up Area	40,365.86 m²
3	Maximum No. of Floors and height	2 Basements + Ground +10 Floors 27.15 mtrs
4	Cost of Project	164 Cr
5	Expected Population	7324
6	Total Water Requirement Daily Fresh water demand Recycled water	343 KLD 226 KLD 117 KLD

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7	Wastewater Generation STP Capacity and Technology	270 KLD 330 KLD, MBBR
8	No. of RWH Pits Proposed	5
9	Parking area Proposed Proposed E-Vehicle charging facility	13,176.78 m ² 30 Nos. of Charging Points
10	Solid Waste Generation Biodegradable waste	1248 kg/day 624 kg/day
11	Electrical Load	1554kVA
12	DG Set Capacity	1 x 1500 KVA, 1 x 600 kVA

5 Building Components

The building components of proposed project area are as follows.

Table 4 Building component

Floor Name	Floor Use
Basement Second Floor	Parking + Domestic Pump room
Basement First Floor	Parking + Fire Pump Room+ Electrical Substation+ HVAC Plant room+ STP + Garbage Room
Ground Floor	Residential block + Gym +Spa+ Banquets Halls (03) + Dining +Bar +Club
1 st and 2 nd Floor	Residential block + Gym +Spa+ Banquets Halls (03) + Dining +Bar +Club
3 rd Floor	Service Floor
Typical Floor 4-10 th Floor (Except- 7 th floor)	Guest Rooms (217 Nos.)
7 th Floor	Refuge area
Terrace	Terrace

6 Area Details

The Proposed commercial project has net plot area is of **13,051.72 m² (3.225 Acres)** with built-up area of **40,365.86 m²**. Detailed area statement is given in table below.

Table 5 area statement

S. No.	Description	Area (m ²)
1.	Plot Area	13,916.56 (3.438 Acres)
2.	Land Left For road widening	864.84
3.	Net plot area	13,051.72 (3.225 Acres)
4.	Permissible Ground Coverage (40% of net plot area)	5,220.68
5.	Proposed Ground Coverage (@ 39.13 % of net plot area)	5,107.24

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6.	Proposed FAR Area (@2.08)	27,155.08
7.	Total Basement Area	13,210.78
	Basement Area-1	7,469.14
	Basement Area-2	5,714.64
8.	BUILT UP AREA	40,365.86
9.	Proposed Green Area (@10 % of the net plot area)	1,305.17
10.	Road/Paved area/open area	6,639.31
11.	Maximum height of the building	27.15 meters

7 Building Wise Built Up Area Details

The proposed site area is 3.43 Acres. The Proposed FSI is 2.08. Tower/block/ Floor wise details are as follow.

Table 6 Built up area Details

Floor Name	FAR Area (Sq.mt.)	Non-FAR Area (Sq.mt.)	Built Up Area (Sq.mt.)
Basement First Floor	7,469.14		7,469.14
Basement Second Floor	5,714.64		5,714.64
Ground Floor	5107.24		5107.24
1 st Floor	5234.14		5234.14
2 nd Floor	5241.32		5241.32
3 rd Floor	Service Floor		
4 th Floor	1648.30		1648.30
5 th Floor	1648.30		1648.30
6 th Floor	1648.30		1648.30
7 th Floor	1648.30		1648.30
8 th Floor	1648.30		1648.30
9 th Floor	1648.30		1648.30
10 th Floor	1648.30		1648.30
Total	27155.08	13,210.78	40,365.86

8 Population Density

8.1 Construction Stage

The total manpower requirement during construction phase of the site will be an approximate 100-150 person which includes workmen, labourers, supervisors, engineers, architect and Manager.

8.2 Operational Stage

The total population of the project will be, **7324 persons** that include residential, office staff as well as visitor population. The detailed population breakup including all the components is given in table below.

Table 7 Population breaks up

S. No.	Unit Name	Area (m ²)/units	Occupant Load, Floor Area m ² /Person	Total Population
1	Guest Rooms	217	2	434
2	Staff			380
3	Visitor			6500
4	Residents	2	5	10
TOTAL POPULATION				7,324

9 Water Requirement

9.1 Construction Stage

The water requirement during the construction phase comprises mainly of two parts i.e., potable water for labourers and water for building constructions. About 202 ML¹ (~7.46 kl/ Sqm) of water will be required for construction purpose of the buildings. The construction water requirement for non-portable purposes would be met by from the private water tanker.

It is estimated that approx. 6.75 KLD (@45lpcd*150=6,750lpcd) of fresh water would be required for drinking purpose and domestic purpose. It is proposed that there will be no labour camps inside the project site; however, drinking water would be supplied through bottled cans from the local freshwater supplier during construction period.

9.2 Operational Stage

Total water requirement during the operational stage of the project is 343 KLD. Total daily Fresh water requirement shall be approx. 201 KLD. The source of water supply during operational phase will be municipal water supply.

Efficient dual flushing fixtures will be provided for conservation of fresh water. There will be a dual plumbing system for use of water for different applications thus saving on the high-quality water. Installation of dual plumbing for using recycled water will

¹ Studies on Virtual Water Content of Urban Buildings in India -Indian Journal of Science and Technology

save the potable water from authorized water agency. There will be two pipe lines, one supplying freshwater for drinking, cooking etc. And other for supply of recycled water for flushing, landscape cooling, etc. this will result in saving of fresh water demand and life of existing sewerage will be improved. Other water conservation measure shall also be adopted to conserve water.

Table 8Water conservation measure

Measures	Type
Water Conservation Fixtures	Dual plumbing cisterns, Dual flushing system, low flow taps, low flow urinals, sensor-based taps in facility areas, low faucet taps, low flow showers, tap aerators, auto control valves and pressure reducing devices
Monetary Measures	Metering (flow water)
Leakage Prevention	Timely detection of leakages in pipeline & tanks
Wastage Prevention	Alarms for filling of tank
Storm water harvesting	Storm water collection and recharging system. Recharge pits to be provided to recharge ground water

Detailed water consumption at the site is given in table below

Table 9 Total water demand during operational phase²

S. No.	Description	Total Population/ Occupancy/ Area (m ²)	Unit Water Cons. (LPCD)	Domestic/ Fresh water (LPD)	Flushing /Treated Water (LPD)	Total Water Requirement (LPD)	Wastewater generation/ day (LPD)
	Main Uses						
A	RESIDENTIAL						
1.1	Residential	10	135	900	450	1350	1170
1.2	Guest rooms	434	320	112840	26040	138880	116312
1.3	Staff	380	45	9500	7600	17100	15200
1.4	Visitor	6500	15	32500	65000	97500	91000
1.5	Misc. Uses (Maintenance Staff, Filter back wash, visitors)	10% of above		15574	9909	25483	22368
1.6	Kitchen			30000		30000	24000
	Sub-total (A)			201314	108999	310313	270050

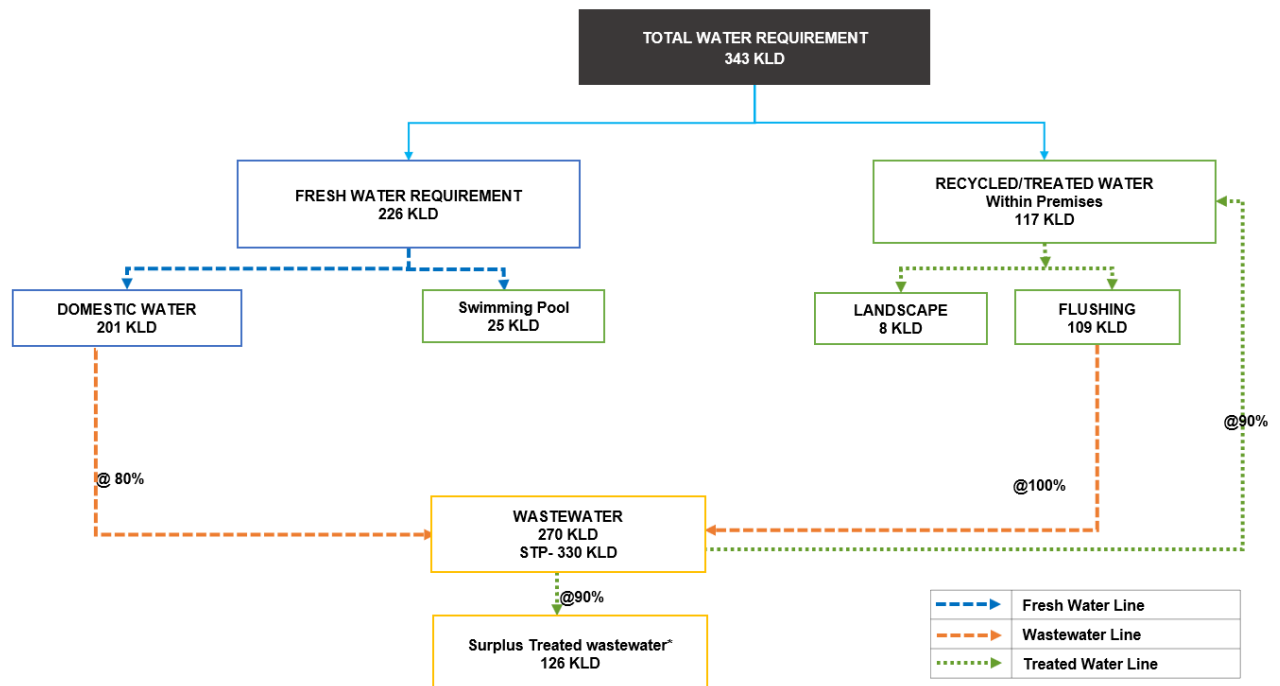
² Manual on norms and standards for environment clearance of large construction projects, Ministry of Environment and Forests, Government of India (ii) National Building Code of India 2016, iii) DBR

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	In KLD			201 KLD	109 KLD	310 KLD	270 KLD
B	OTHER USES						
2.1	Swimming Pool	As per DBR		25000	-	25000	-
2.2	Landscape Area	1,305.17	6l/m ² /day	-	8000	8000	-
	Sub- total (B)			25000	8000	33000	
	In KLD			25 KLD	8KLD	33 KLD	
	TOTAL (A+B)			226 KLD	117 KLD	343 KLD	270 KLD

Table 10 Summary of Water available for Reuse and Recycle

S. No.	Description	Quantity (KLD)
	Total waste water generated	270 KLD
	STP Proposed	330 KLD
A)	Recycled Water Available (@90% of Waste Generated)	243 KLD
B)	Recycled Water Required	117 KLD
01	For Flushing Purposes	109 KLD
02	For Landscape Area	8 KLD
04	Surplus water available	126 KLD



* Surplus treated water will be either discharge to the Sewer line or will be reused in nearby construction site

*Considering Landscape water demand @3 l/m²/day

Figure 2 Water balance diagram-Non rainy season

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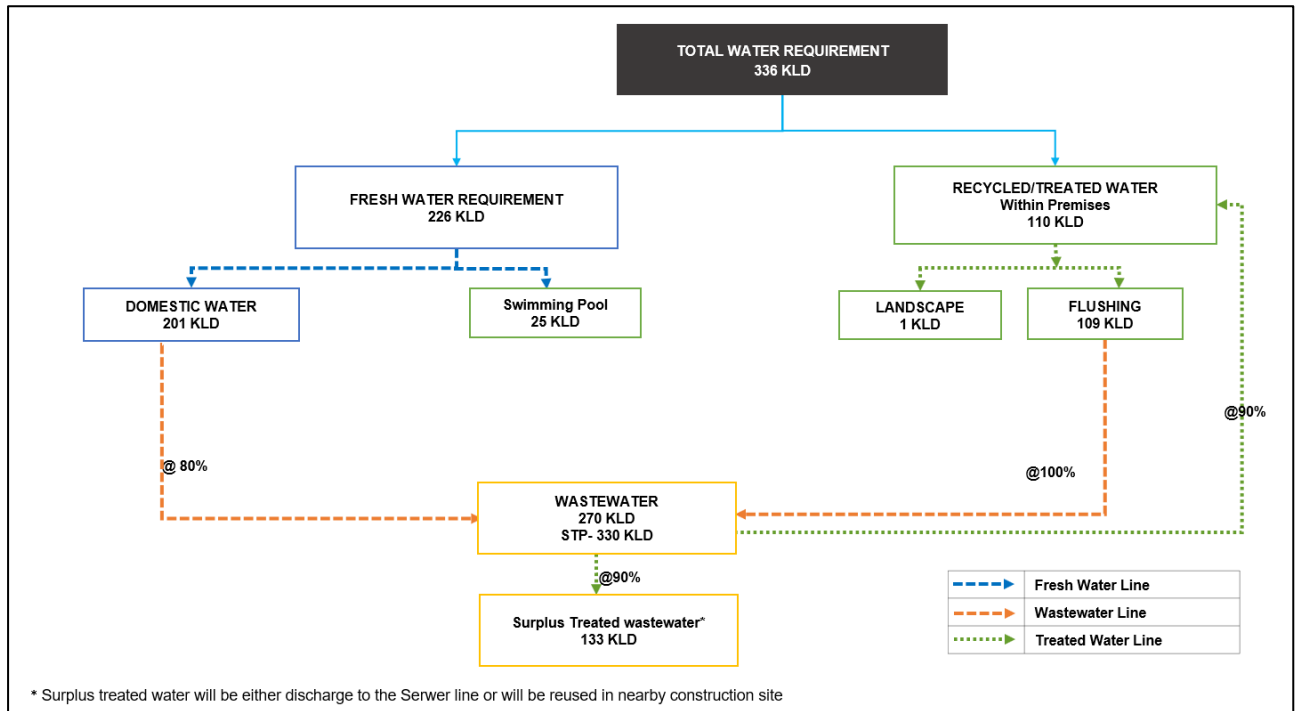


Figure 3 Water balance diagram rainy season

*Considering Landscape water demand @1 l/m²/day

9.3 Wastewater Generation and Treatment

Construction Phase

The quantity of sewage generation during the construction phase will be approx. 6 KLD (for 150 workers). Thus, the sewage will be treated by providing small septic tanks, soak trenches.

Operational Phase

Quantity of sewage generated during operational phase shall be approx. 270 KLD. The domestic sewage will be treated through in-house sewage treatment plant of capacity 330 KLD, the treated domestic wastewater shall be recycled and re use within premises. The treated waste water will be reused for flushing (109KLD), and landscape development (8 KLD). During non-rainy seasons surplus treated water available will be 126 KLD and during Rainy season it would be 133 KLD. the surplus tread wastewater will be reused to the nearby parks or sites.

SEWAGE TREATMENT TECHNOLOGY

The design of sewage network shall be done in accordance with the CPHEEO guideline, NBC guidelines and reverent Indian Standards. Sewage generation is assumed to be 100% of flushing water and 80% of domestic water.

The following parameters/ site conditions shall be kept in mind when designing the sewage, Sludge and storm water drainage system.

- Natural slope of the area.

- Layout of different facility in the complex;
- Possibility of using complete or part of the existing sewage network;
- Sub-soil water table;
- Provision of Sewage lifting station; (if required)
- Provision of venting arrangement for manholes;
- Construction of manholes & laying of pipes considering ground condition;
- Termination of vent cowl at terrace level;
- Provision of adequate slope for horizontal header in the under slung pipes especially for public toilets
- Sewage flow starts with fractional capacity and builds up to full capacity in due course. An operational plan to meet this demand from a low flow to full flow will be part of the design.

An external sewage network shall collect the sewage from all units, and flow by gravity to the proposed sewage treatment plant.

Following are the benefits of providing the Sewage Treatment Plant in the present circumstances:

- Reduced dependence on the public utilities for water supply and sewerage systems.
- Sludge generated from the Sewage Treatment Plant shall be rich in organic content and an excellent fertilizer for horticultural purposes.

Desired treated waste water characteristics for BOD and suspended solids levels shall be as per CPCB norms. The characteristics of treated water shall depend on the quality of raw water of the system. Wastewater details are given in below

Table 11 Wastewater details

Particulars	Quantity	
Daily load	270 KLD	
Duration of flow to STP	24 Hours	
Temperature	5 Deg. C to 43.3 Deg. C	
	Inlet	Outlet (Treated Wastewater)
pH	6.5 – 8.0	6.5 - 8.5
S.S. (mg/l)	200 - 450	Less than 10mg/l
BOD ₅ 27° C (mg/l)	250 - 300	Less than 10mg/l
COD (mg/l)	600 - 800	Less than 30 mg/l
Oil & grease ABS (mg/l)	Up to 20 mg/l	Less than 5 mg/l
E. coli	>10 ⁶ MPN	< 10 ³ MPN

Operation

Moving bed biofilm reactor technology is based on the principle of attached growth process. Raw sewage will be collected under gravity into the equalization tank after allowing to pass through the bar screen. Screens will be provided in screen chambers and it will be manually cleaned by going down to a platform. The bar

screen, by removing coarse solids from the sewage help in protecting the raw sewage pump. Fully submersible centrifugal non clog sewage handling pump will be provided in the collection cum equalization tank to pump the collected Sullage to the next MBBR tanks. Automatic level controller will be provided in the tank to turn the pump off at the low water level in the tank and to start the pump when water level is high automatically. Air will be introduced in this tank to prevent any potential foul smell problem & to provide the mixing of wastewater to avoid the sedimentation of solids in this tank. Air Grid used for aeration purpose will be non-clog. The sewage collected in equalization tank is pumped the moving bed bioreactor. There will be two nos. of bioreactors in series for the efficient working and removal of BODs for the required retention time. The process inside the moving bed bioreactors consists of adding small cylindrical-shaped polyethylene/polypropylene carrier elements in aerated basins to support biofilm growth. The small cylinders are provided with a cross inside the cylinder and longitudinal fins on the outside.

The bio film carriers are maintained in the reactor by the use of a perforated plate with appropriate slot at the tank outlet. Air agitation or mixers are applied in a manner to continuously circulate the packing. The packing may fill 25 to 50 percent of the tank volume. Specific surface area of the packing is about 450-500 m²/m³ of bulk packing volume.

The Sullage from first bioreactor flows by gravity through the perforated plate/mesh to the next bioreactor kept in series. Inside the bioreactors, aerobic bacteria grow in an attached growth from around the moving plastic media inside the reactors. The bacteria have to reduce BOD & COD of Sullage in the presence of oxygen provided through the air grids located at the bottom of the reactors. The Process does not require any return activated sludge flow or backwashing.

From the bio-reactors, the effluent passes by gravity into the clarifier (Tube Settling Tank). Clarifier will be a hopper bottom sedimentation tank provided with appropriate size PVC tube deck media. The suspended solids will settle at the bottom of the tank & clear supernatant will overflow to filter feed tank through outlet launder.

The collected sludge at bottom will be transferred through pumps to sludge holding tank. The clear supernatant after clarifier will be collected in to filter feed tank. This tank will act as housing tank for filter feed pumps. The clarified & dis-infected water will be then fed to filtration unit. Filtration unit consisting of Dual Media sand filter, activated carbon filter and ultra-filtration system (optional) will remove the residual impurities such as odor/color, suspended solids, BOD/COD.

The treated water after the filtration unit will be collected in Irrigation cum Flushing water storage tank from where it is transferred to flushing water tank at terrace & Irrigation System. Excess sludge from the bottom of the settling tank will be removed and transferred to sludge holding tank. Air grid will be provided in this tank to avoid conversion into anaerobic conditions, thickening of sludge and keep sludge in homogenous condition.

CONCEPTUAL PLAN OF Proposed Tribhuvan Resort of Shri Nand Kishore Singh S/o Late Tribhuvan Prasad Singh at Khasra No. 1486,1408,1409, 1407, 1852, 1401, 1402, 1406, 1407, 1400, 1384, 1481, 1398, 1397, 1395, 1850, 1399, 1391, 1396, 1403, 1404-Khata no. - 456, 390, 381, 396, 380, 404, 378, 396, 448, 446,445, 454, 443, 218, 37, 445, 388, 398, 385, 402 Thana no.- 09, sheikhpura, Mauza-Sheikhpura, District- Patna, Bihar

The digested & thickened sludge will be further thickened through Sludge Dewatering System (Filter press with screw pump) and disposed-off periodically through closed tanker or can be reused as manure. An external sewage network shall collect the sewage from all units, and flow by gravity to the proposed sewage treatment plant.

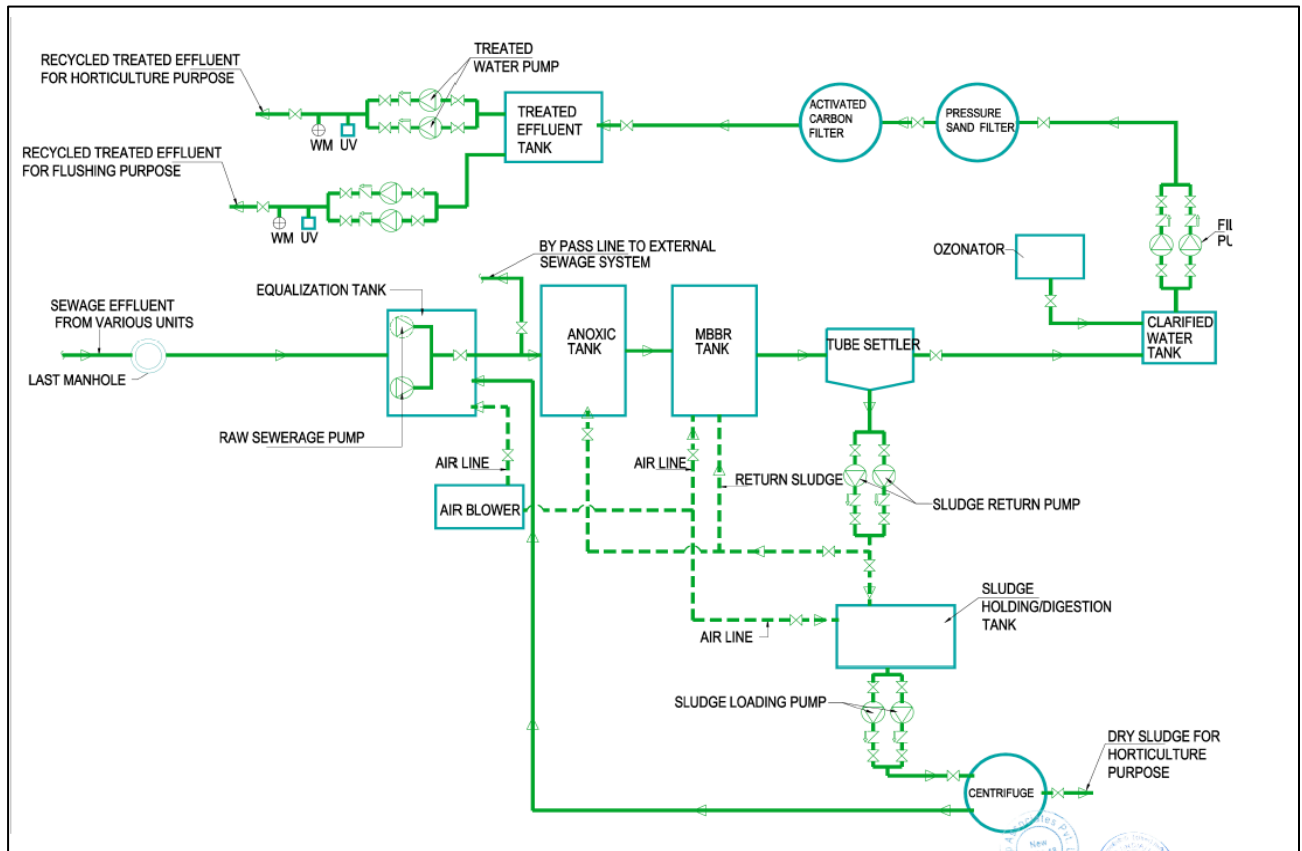


Figure 4 Process Flow Diagram

10 Parking Details

Adequate provision shall provide for vehicle parking at the project site not to disturb the traffic and allow smooth movement at the site.

Proposed project will have basement parking. The parking space criteria and area requirement provided are summarized in the below tables. Parking details are as per Bihar building bye laws.

Table 12 Parking Required

Parking required (Banquet Hall and Marriage Hall)	35% of 85% of BUA
Parking Required	12,008 m ²

Table 13 Parking Proposed

Total Parking area Proposed in Basement	13,176.78 m ²
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11 Rainwater Harvesting and Storm Water Drain

The storm water collection system for the premises shall be self-sufficient to avoid any collection/stagnation and flooding of water. The amount of storm water run-off depends upon many factors such as intensity and duration of precipitation, characteristics of the tributary area and the time required for such flow to reach the drains. The drains shall be located near the carriage way along either side of the roads. Taking the advantage of road camber, the rainfall run off from roads shall flow towards the drains. Storm water from buildings shall be connected to adjacent drain by a pipe through catch basins. Therefore, it has been calculated to provide 5 rainwater harvesting pits at selected locations, which will catch the maximum run-off from the site.

- 1) Since the existing topography is congenial to surface disposal, a network of storm water pipe drains is planned adjacent to roads. All building roof water will be brought down through rain water pipes.
- 2) Proposed storm water system consists of pipe drain, catch basins and seepage pits at regular intervals for rain water harvesting and ground water recharging.
- 3) The average annual precipitation of 1130 mm shall be considered for designing the storm water drainage system.

Rain water harvesting has been catered to and designed as per the guideline of CGWA. The recharge pit of 60 cum. is constructed for recharging the water. The bottom of the recharge structure will be kept 5 m above this level. At the bottom of the recharge well, a filter media is provided to avoid choking of the recharge bore. Design specifications of the rain water harvesting plan are as follows:

- Catchments/roofs would be accessible for regular cleaning.
- The roof will have smooth, hard and dense surface which is less likely to be damaged allowing release of material into the water. Roof painting has been avoided since most paints contain toxic substances and may peel off.
- All gutter ends will be fitted with a wire mesh screen and a first flush device would be installed. Most of the debris carried by the water from the rooftop like leaves, plastic bags and paper pieces will get arrested by the mesh at the terrace outlet and to prevent contamination by ensuring that the runoff from the first 20 minutes of rainfall is flushed off.
- No sewage or wastewater would be admitted into the system.
- No wastewater from areas likely to have oil, grease, or other pollutants has been connected to the system.

The quantity of storm water load for the proposed construction project is given below

Table 14 Storm water calculation

S. No.	Type of Surface	Catchment's Area (sq.	Run off Coff.	Peak rainfall	Rain water harvesting potential (in m3/hr)
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		mtrs)		intensity (ln m)	
A	Building				
	Roof Area	5,107.24	0.9	0.011	50.56
	Green area	1,305.17	0.15	0.011	2.15
	Open and road areas	6,639.31	0.80	0.011	58.425
Total Storm water load calculated					111.135
Considering 15 mins retention period					27.78
Capacity of recharge pit					60
Rainwater harvesting pits required for total site area					0.46
However, total no. of rainwater harvesting Proposed					5

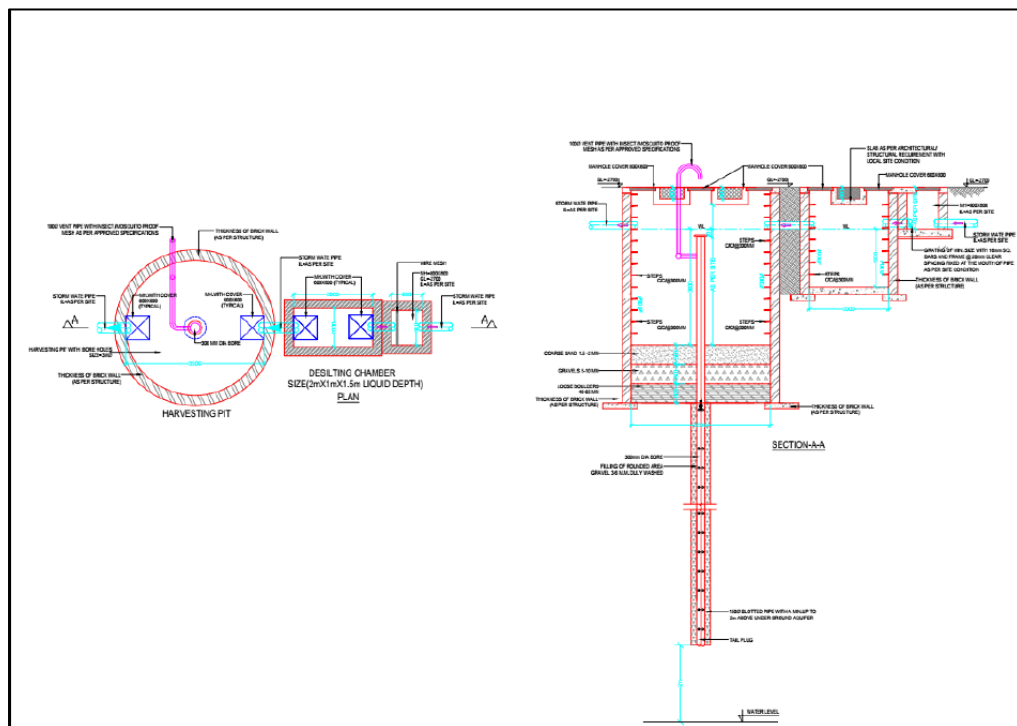


Figure 5 Typical rainwater harvesting pit design

12 Power Requirement

The electrical load requirement has been calculated on the basis of covered area of service building as per NBC 2016. Bihar State Power Transmission Company Limited, shall provide electric supply on 11 kV for meeting electrical load requirements of proposed project.

Table 15 Electrical Load Details

POWER REQUIREMENT	DETAILS
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CONCEPTUAL PLAN OF Proposed Tribhuvan Resort of Shri Nand Kishore Singh S/o Late Tribhuvan Prasad Singh at Khasra No. 1486,1408,1409, 1407, 1852, 1401, 1402, 1406, 1407, 1400, 1384, 1481, 1398, 1397, 1395, 1850, 1399, 1391, 1396, 1403, 1404-Khata no. - 456, 390, 381, 396, 380, 404, 378, 396, 448, 446,445, 454, 443, 218, 37, 445, 388, 398, 385, 402 Thana no.- 09, sheikhpura, Mauza-Sheikhpura, District- Patna, Bihar

Total Connected Electrical Load	Maximum demand Load 1554 kVA
Transformer Selection	2 x 2.0 MVA (N+1), 11/0.433 kV
Source of Power Supply	Bihar State Power Transmission Company Limited,
Proposed DG Set Capacity	1 x 1500 KVA, 1 x 600 kVA
Location of DG Sets	DG sets shall be placed in open at basement level
Stack Height	As per CPCB norms and Local Authority

13 Solid Waste Generation

Solid wastes from construction sector can be categorized into two phases **i.e., during construction & during operation**. During the construction stage, waste generation will comprise of excavated material & demolition building material while operational phase waste may comprise of biodegradable and non-biodegradable waste depending upon the generation of the waste.

13.1 Construction Phase

Construction & Demolition Waste:

Construction and demolition (C&D) waste is generated from construction, renovation, repair, and demolition of houses, large building structures, roads, bridges, piers, and dams. C& D waste has two major components.

Major components include Cement concrete, Bricks, Cement plaster, Steel (From RCC, door/window frames, roofing support, railings of staircases etc., rubbles, stone (marble, granite, sand stone), Timber/wood (especially demolition of old buildings).

Minor components-Conduits (iron, plastics), Pipes (GI, iron, plastic), electrical fixtures (copper/ aluminum wiring, wooden baton, switches, wire insulation), panels (wooden, laminated), others (glazed tiles, glass panes).As the proposed site is vacant plot therefore construction and demolition waste during the construction phase will be of remainder material of building construction. Which will be utilized within the premises.

There would be generation of 15 kg/day (approx@100 g/day x 150) of Municipal Solid Waste from the work sites which would be treated as per SWM Rules, 2016.

The following steps will be followed for the management solid waste:

- Construction yards are proposed for storage of construction materials.
- The excavated material such as topsoil and stones will be stacked for reuse during later stages of construction.
- Excavated top soil will be stored in temporary constructed soil bank and will be reused for landscaping.
- Remaining soil shall be utilized for refilling / road work / rising of site level at locations/ selling to outside agency for construction of roads etc.
- C&D waste shall be stored and transported to Govt. approved recycling plant and disposal site for further treatment and disposal.

13.2 Operational Phase

The project will adopt a systematic approach for solid waste collection and disposal. Solid waste generated from the project will be collected properly and will be managed as per MSW Rules, 2016.

- Municipal waste shall be mainly categories in two classes. 1. Bio degradable Waste 2 Non- biodegradable Waste. The biodegradable portion dominates the bulk of MSW. This is mainly due to food and paper waste.
- These solid wastes will be collected separately by putting separate bins at the source of generation. The biodegradable waste shall be sent to onsite organic waste convertor which shall convert the bio degradable waste to manure, the manure will be used in horticulture purposes, however the recycle bale waste shall be given to recycling agency for further treatment. Schematic waste management plan during operational phase is shown below.

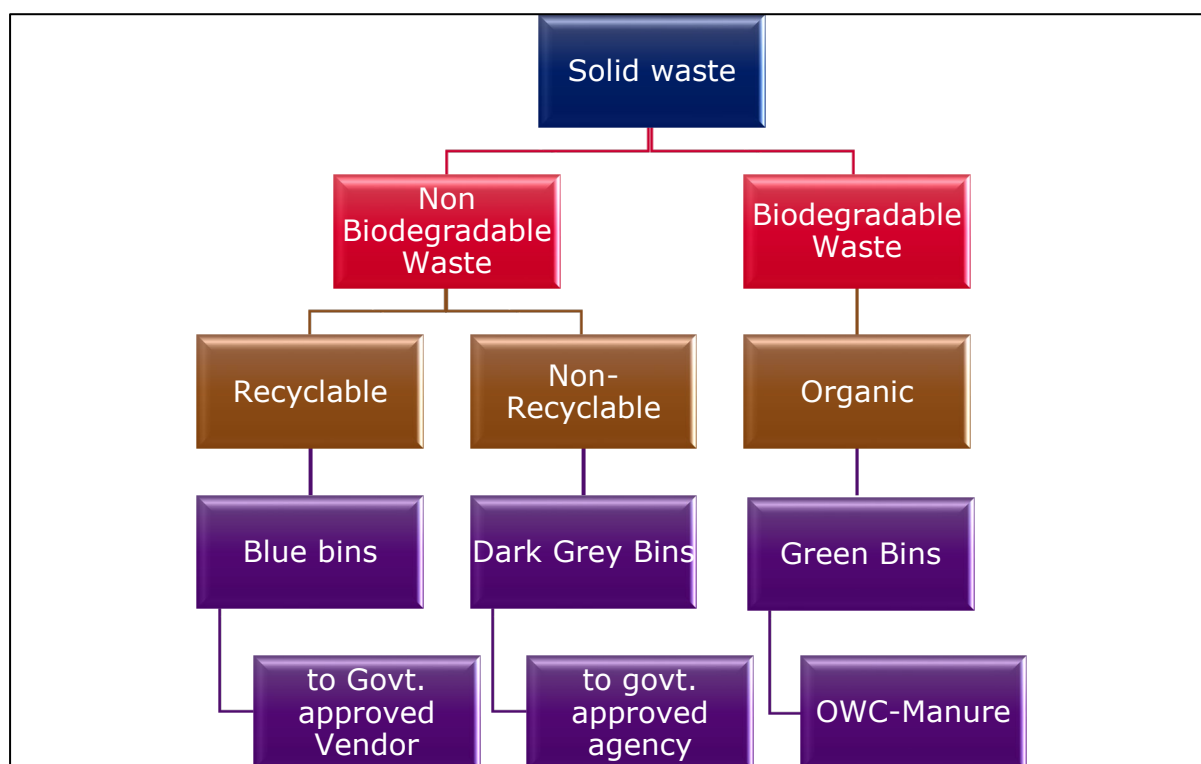


Figure 6 Solid Waste Management Scheme –Operational stage

It is estimated that maximum solid waste generation would be about **1,248 Kg/day**; Following are the solid waste generation rate has been considered as is given table.

Table 16 Calculation of Solid Waste Generation

Category	Counts (heads)	Waste Generated (kg/day)
Residential	444 @ 0.4 kg/day	177.6

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Staff	380 @0.25 kg/day	95
Visitors	6500 @0.15 kg/day	975
Landscape Waste (0.32 Acre)	@ 0.2 kg/Acre/day	0.06
Total Waste Generated		1,247.66 Kg/day say 1,248 kg/day

(Source:

http://cpheeo.nic.in/WriteReadData/Cpheeo_SolidWasteManagement/chap3.pdf)

Biodegradable waste (@50%)	approx. 624 kg/day
Non-Bio degradable waste (@40%)	approx. 499 kg/day
Inert waste (@10%)	approx. 125 kg/day

13.2.1 Collection, Segregation and Storage of Waste

Colored bins will be placed at designated locations of each unit for the waste collection and encourage the source segregation. Garbage area provided in basement is approx. 51.57 m². The local vendors will be hired to provide separate-colored bins for dry recyclables and Bio-Degradable waste. For waste collection, adequate numbers of colored bins (dark grey for non-recyclable waste, green for kitchen food/compostable garden waste and blue for paper) are proposed to be provided at the strategic locations of the area. Litter bin will also be provided in open areas like parks etc. Storage facilities shall be created and established by taking into account quantities of waste generation in a given area and the population densities.

13.2.2 Treatment of Waste

Bio-degradable waste will be subjected to the compost/resultant will be used as manure. STP sludge is proposed to be used for horticultural purposes as manure. Horticultural Waste is proposed to be composted and will be used for gardening purposes. Recyclable Waste-The cropped grass will be spread on the green area. It will act as manure after decomposition. Recyclable wastes like paper, plastic, metals etc. will be sold off to recyclables.

13.2.3 Disposal of Waste

Recyclable wastes will be disposed through authorized recyclers. The total excavated earth material will be used for refilling in the low-lying area. Bio degradable waste will be treated by OWC and used as a manure for gardening area. The Mechanical Composter involves a biomechanical process which decomposes bacteria and produces odourless pre-organic compost in 15 minutes. The machine occupies small area and provides a cleaner and better environment.

WORKING PRINCIPLE

Mechanical Composter converts the organic waste into odourless, pre-compost manure in 15-20 minutes. The organic waste, free from foreign particles is fed into

MC. The shredder reduces the organic waste into the optimum particle size for composting. Then it is mixed with moisture absorbing materials and Useful microorganisms. This mixture is then blended for a homogeneous mixture and is converted into pre-compost manure in 20 minutes. The pre-compost manure is then fed into aerated compost blocks or 12 - 15 days. The compost blocks or piles are specially designed for the pre-compost manure to have proper aeration and suitable environment to mature. The final manure will be rich in nutrients and used for the development of green belt.

Salient Features of Organic Waste Converter (OWC)

- Quick, easy to operate, less space requirement and odour free manure compared to other waste conversion process
- Immediate and hygienic disposal of food waste
- Waste minimization strategy followed by 3R Technique (Reduce, Reuse, Recycle)
- Savings on Purchase of Manure for landscape
- Savings on Waste Disposal Expenses
- Elimination on the usage of chemical fertilizers
- Carbon credit revenue in the future



Figure 7 Organic Waste Converter

Benefits of organic waste converter:

- Large quantity of solid waste is converted to fertilizer in a very short period
- This fertilizer can be sold as compost to farmers, or used for gardening
- Machine requires less space and the efficiency is high
- Manpower and maintenance are very less
- This is one of the latest techniques of managing solid waste.

14 Landscape Details

Total green area proposed for project is **1,305.17 m² (@10 % of the net plot area)**. The landscape design integrates a harmonious blend of enduring foliage and decorative greenery, including palms, shrubs, and ground covers, strategically placed along the roadside and within the complex layout's open spaces and setback areas. This landscaping plays a crucial role in modifying the microclimate of the area. By strategically planting, it mitigates direct sunlight from reaching building surfaces, thereby curbing heat absorption. Moreover, it minimizes the transfer of heat from reflective surfaces, fosters diverse airflow patterns, and can even manipulate wind direction beneficially by inducing pressure differentials. The shade provided by trees and the cooling effects of grass and shrubbery collectively reduce the ambient air temperature adjacent to buildings while facilitating evaporative cooling.

Table 19-Landscape area details

Net Plot area	13,051.72 m²
Proposed Green Area	1,305.17 m² (@10 % of the net plot area)
As Per MoEF&CC Guidelines	One tree per 80 m ² of total area out of which minimum 50 % to be in the category of evergreen trees.
Trees Required	13,051.72 / 80 = 163
NOS. OF TREES PROPOSED AT SITE	186

Tree list is given in landscape plan.

15 List of Building Materials will be used at Site

- | | | |
|-------------------|--------------------|--------------------|
| • Coarse sand | • Pipe scaffolding | • MDS, MCBs |
| • Fine sand | (cup lock | • PVC overhead |
| • Stone aggregate | system) | water tanks |
| • Stone for | • Bricks | • 2 1/2" thick red |
| masonry work | • CLC fly ash | colour paver tiles |
| • Cement | blocks | • PPR (ISI |
| • Reinforcement | • Crazy (white | marked) |
| steel | marble) in grey | • PVC waste |
| | cement | water lines |
| | • P.V.C. conduit | |

- | | | |
|--|---|--------------------------------------|
| • S.W. sewer line
up to main
sewer | • PVC rain water
down take
• Stainless steel
sink in kitchen | • Joinery
hardware- ISI
marked |
|--|---|--------------------------------------|

16 List of Machinery Used During Construction

- | | |
|------------------------------|---------------------------|
| • Dumper | • RMC Plant |
| • Concrete mixer with hopper | • Tower Cranes |
| • Excavator | • Hoist |
| • Concrete Batching Plant | • Labor Lifts |
| • Cranes | • Pile Boring Machines |
| • Road roller | • Concrete pressure pumps |
| • Bulldozer | • Mobile transit mixer |

17 Environmental Management System and Monitoring Plan

For the effective and consistent functioning of the proposed complex, an Environmental Management system (EMS) would be established at the site. The EMS would include the following:

- 1) An Environmental management cell.
- 2) Environmental Monitoring.
- 3) Personnel Training.
- 4) Regular Environmental audits and Correction measures.
- 5) Documentation – standards operation procedures Environmental Management Plan and other records.

1) An Environmental management cell.

Apart from having an Environmental Management Plan, it is also proposed to have a permanent organizational set up charged with the task of ensuring its effective implementation of mitigation measures and to conduct environmental monitoring. The major duties and responsibilities of Environmental Management Cell shall be as given below:

- To implement the environmental management plan.
- To assure regulatory compliance with all relevant rules and regulations.
- To ensure regular operation and maintenance of pollution control devices.
- To minimize environmental impact of operations as by strict adherence to the EMP.
- To initiate environmental monitoring as per approved schedule.

- Review and interpretation of monitored results and corrective measures in case monitored results are above the specified limit.
- Maintain documentation of good environmental practices and applicable environmental laws for a ready reference.
- Maintain environmental related records.
- Coordination with regulatory agencies, external consultants, monitoring laboratories.
- Maintenance of log of public complaints and the action taken.

2) Environmental Monitoring

The purpose of environmental monitoring is to evaluate the effectiveness of implementation of Environmental Management Plan (EMP) by periodic monitoring. The important environmental parameters within the impact area are selected so that any adverse effects are detected and time action can be taken. The project proponent will monitor ambient air Quality, Ground Water Quality and Quantity, and Soil Quality in accordance with an approved monitoring schedule.

Table 17 Suggested Monitoring Programme

S. No.	Type	Locations	Parameters	Period /Frequency
1.	Ambient Air Quality	Project Site	Criteria Pollutants: SO ₂ , NO ₂ , PM _{2.5} , PM ₁₀ , CO	Once in a 6 months.
2.	Groundwater (Portability testing)	Project site	Drinking water parameters as per IS 10500.	Once in a 6 months.
3.	Ambient Noise	Project site	dB (A) levels	Once in a 6 months.
4.	Fresh water quality	Municipal Supply	As per IS 10500 potable water standards	Once in a 3 months.
5.	Soil quality	Project site	Organic matter, C.H., N, Alkalinity, Acidity, heavy metals and trace metal, Alkalinity, Acidity.	Once in a 6 months.
6.	Waste Characterization	Proposed	Physical and Chemical composition	Daily Basis.
7.	Treated water	Outlet of STP	BOD, MPN, coliform count, etc.	Daily Basis.

3) Awareness and Training and human resource development is an important link to achieve sustainable operation of the facility and environment management. For successful functioning of the project, relevant EMP would be communicated to Contractor.

Contractor must be made aware of the importance of waste segregation and disposal, water and energy conservation. The awareness can be provided by periodic Integrated Society meetings. They would be informed of their duties.

4) Environment Audit and Corrective Action Plan

To assess whether the implemented EMP is adequate, periodic environmental audits will be conducted by the project proponent's Environmental division. These audits will be followed by Correction Action Plan (CAP) to correct various issues identified during the audits.