

CONCEPTUAL PLAN

1. INTRODUCTION

M/S Surya Nestbuild Limited has proposed for **Expansion of Residential Cum Commercial Building Project** at Mauza- Mustafapur, Tehsil- Danapur, Dist.- Patna, State- Bihar. There will be permanent change in Land use in view of upcoming Expansion project having Plot area of 5690.65 Sqm. and built-up area 31653.98 sqm and it is in consonance with the surroundings, the total Plot area after expansion will become 25365.79 Sqm. (19675.14 Sqm. + 5690.65 Sqm.) and Built-up area 135545.89 Sqm. (103891.91 Sqm. + 31653.98 Sqm.). The land use of the proposed Expansion project is barren and now it will be converted to “Residential cum Commercial Building”. The land use of the proposed project site is marked under residential zone as per approved master plan of Patna 2031. The Summary of Land along with land documents is enclosed as **Annexure-I**.

M/s Surya Nestbuild Limited has obtained Environment Clearance (EC) vide **EC Letter File no. – SIA/8(a)/987/2020 dated 24/11/2020** for Plot area 19675.14 Sqm. and total Built-up area 103,891.91 Sqm., EC Letter is enclosed as **Annexure II**. The project obtained the consent to establish (CTE) from BSPCB vide **CTE Memo No. 1064 on dated 21-06-2023** enclosed as **Annexure-III** and NOC for Ground water abstraction from CGWA vide **NOC No. CGWA/NOC/INF/ORIG/2023/18785** valid upto **02/07/2028** is enclosed as **Annexure-IV**.

Site visit by MOEF&CC RO official was conducted for certified EC compliance on dated 26/02/2024.

The Project built up area is greater than 20,000 sqm and less than 1,50,000 sqm therefore designated under Category “B” and falls under Item 8(a) (Building & Construction Project) of the Environmental Impact Assessment (EIA) Notification of September 14, 2006 and its subsequent amendments.

2. SITE SURROUNDING & CONNECTIVITY

The Residential and commercial building is well connected to different villages and towns. It is

Proposed Expansion of Residential cum commercial building at Mustafapur, Dist.- Patna, Bihar by M/S Surya Nestbuild Limited

surrounded by villages such as Rampur, Babakkarpur and Mustafapur habitation. Site surroundings and Connectivity details of the project are given in **Table-1**.

Table-1: Site Surroundings and Connectivity Details

S. No.	Connectivity & Site Surroundings “Surya Nestbuild” at Patna		
	Description		Distance and Direction
1.	Nearest Railway Station	Danapur Railway Station Phulwari Sharif Station Patliputra Station	Approx. 1.45 Km towards South Approx. 3.75 Km towards ESE Approx. 3.65 Km towards NE
2.	Nearest Airport	Jayprakash Narayan International Airport, Patna	Approx. 4.60 km towards East
3.	Nearest Village	Rampur Babakkarpur Mustafapur	Approx. 0.42 Km towards SSE Approx. 0.60 Km towards ENE Approx. 0.25 Km towards NNW
4.	Nearest Highway/Roads	Danapur Khagaul Road Maurya Path	Adjacent to the site Adjacent to the site
5.	Nearest School & College	Rajkiya Madhya Vidyalaya Primary School Rukanpura Mushari Garbhuchak Govt. Primary School	Approx. 1.60 Km towards ENE Approx. 2.25 Km towards ENE Approx. 2.90 Km towards East
6.	Nearest Hospital	Paras Hospital AIIMS, Patna IGMS	Approx 3.85 Km towards ENE Approx 3.60 Km towards South Approx 4.75 Km towards ENE
7.	Places of worship	Devi Asthan Mustafapur Tiruvanteswar Maa Temple Hanuman Temple	Adjacent to the site Approx. 0.35 Km towards WNW Approx. 0.80 Km towards WSW
8.	Water Bodies	Ganga River	Approx. 4.63 Km towards North
9.	Defense Installation	Danapur Cantonment	Approx. 4.20 Km towards North
10.	Town	Patna City	Approx. 9.25 Km towards East
11.	Reserve Forest/ Zoo	Sanjay Gandhi Biological Park, Patna	Approx. 5.50 Km towards East

Source: Google Earth & Site visit

The Site Location map is shown in **Figure-1**.

Surrounding features of the proposed site (within 500 meters) is shown in **Figure 2**.

Topographical map (*Survey of India Topo sheet no- G45N6_72G6 and G45N7_72G7*) of 10 km radius is shown in **Figure 3**.

**Proposed Expansion of Residential cum commercial building at Mustafapur, Dist.- Patna, Bihar by
M/S Surya Nestbuild Limited**

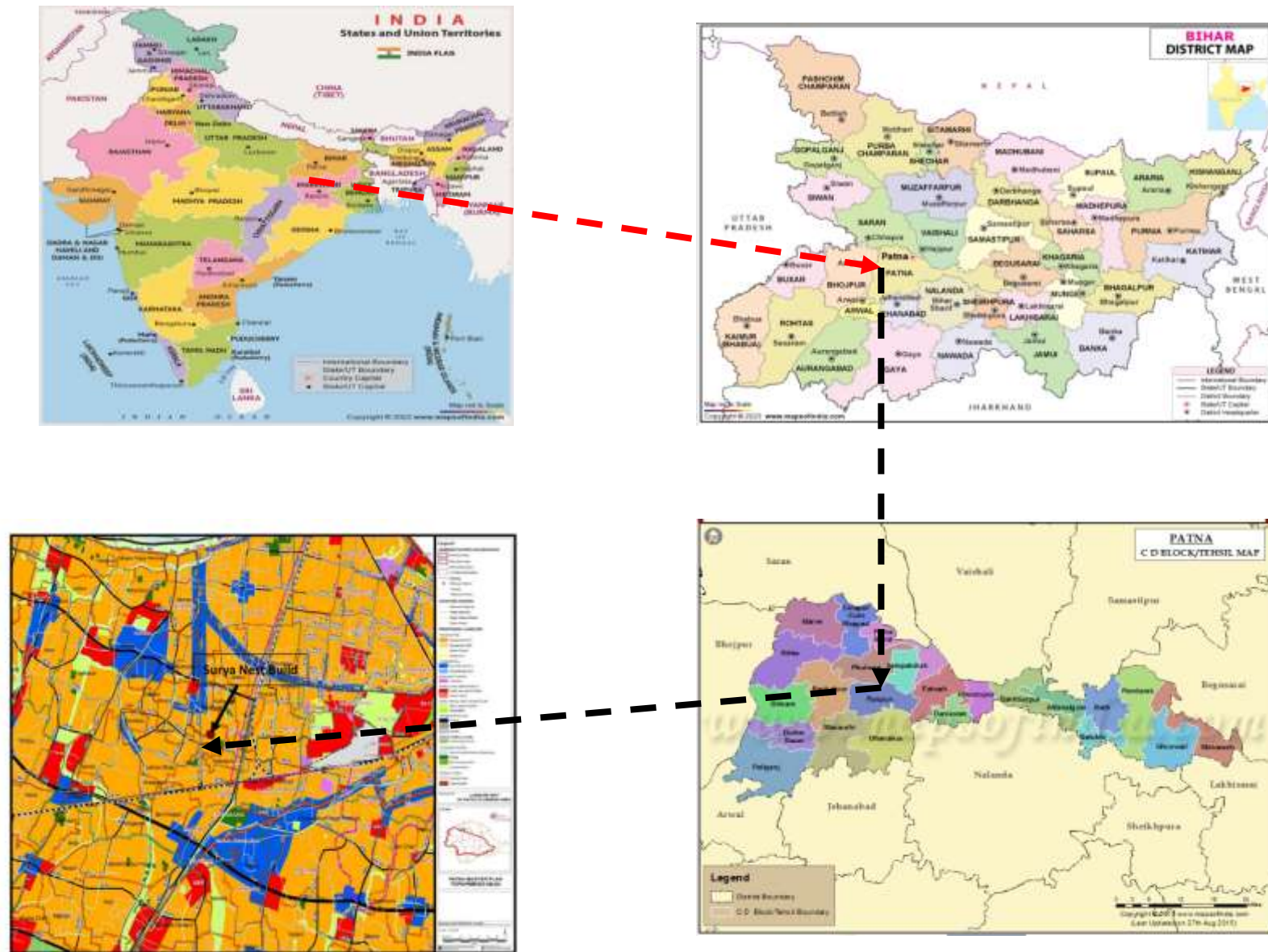


Figure-1: Site Location Map



Figure-2: Surrounding features of the proposed site (within 500 meter)

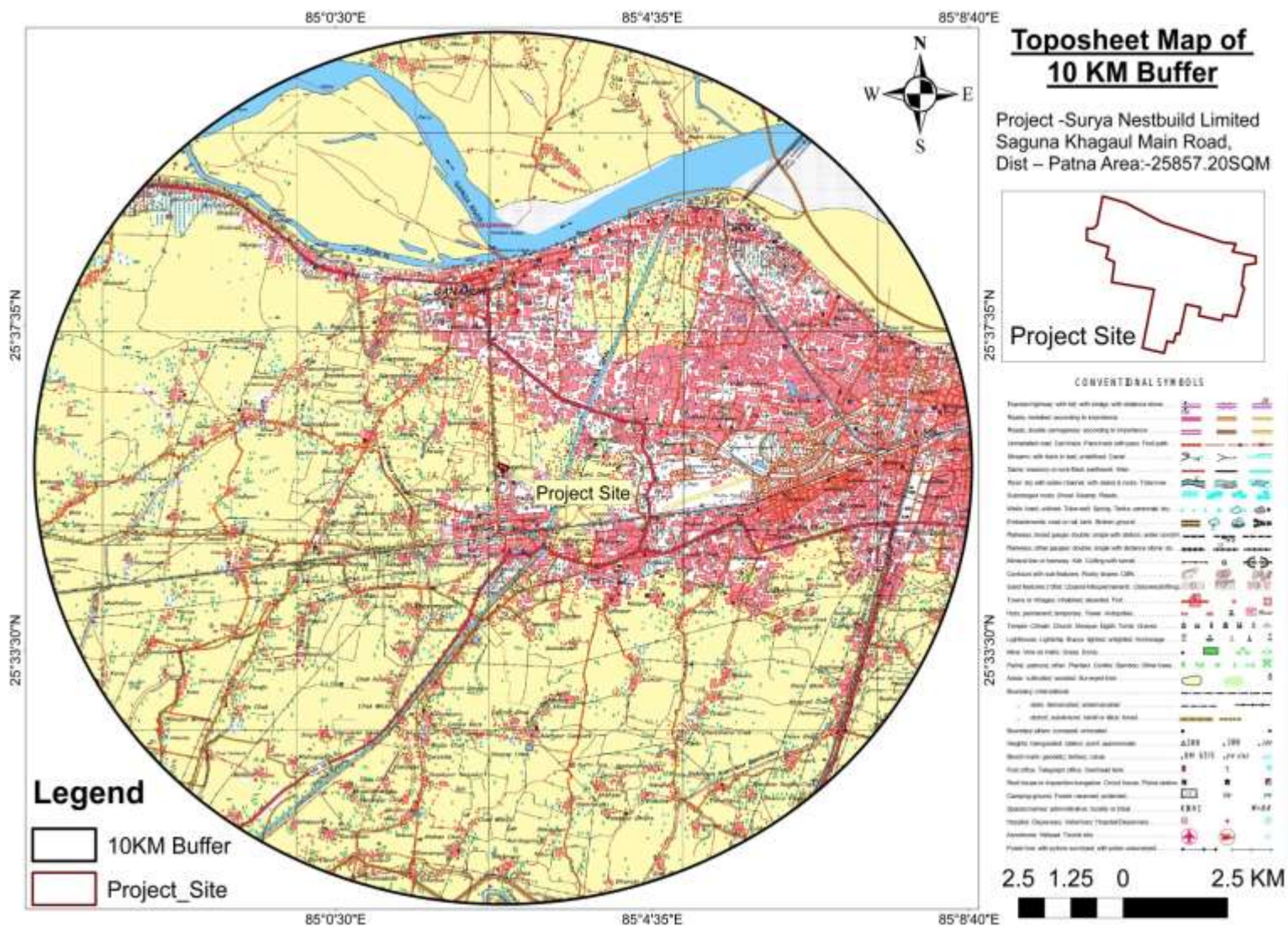


Figure-3: Topographical Map of 10 km radius

3. PROJECT LOCATION AND DESCRIPTION

The coordinates of the project boundary along with the center of the project site is given below in the **Table-2**.

Table-2: Coordinates of the Project Boundary

S. No.	Latitude	Longitude
1	25°35'43.77"N	85° 2'38.11"E
2	25°35'43.54"N	85° 2'39.18"E
3	25°35'44.11"N	85° 2'39.34"E
4	25°35'44.04"N	85° 2'39.64"E
5	25°35'44.47"N	85° 2'39.76"E
6	25°35'44.45"N	85° 2'39.92"E
7	25°35'45.88"N	85° 2'40.25"E
8	25°35'45.69"N	85° 2'40.96"E
9	25°35'45.05"N	85° 2'40.82"E
10	25°35'44.91"N	85° 2'41.95"E
11	25°35'45.38"N	85° 2'42.09"E
12	25°35'45.27"N	85° 2'42.72"E

The detailed area statement is given below in **Table-3**.

Table-3: Detailed area Statement (After Expansion)

S. No.	Details	Area (Sqm.)
1	Total Plot area	25365.79
2	Permissible FAR	3.5
3	Total FAR Achieved @ 3.49	88238.21
4	Residential Built-up Area excluding EWS & Commercial Building	80809.18
5	Commercial Built-up	7429.03
6	EWS Built-up Area required @ 15 % of Residential FAR	12121.377
7	EWS / LIG Built up area provided	13455.97

S. No.	Details	Area (Sqm.)
9	Total Residential and Commercial Built-up Area including EWS	101694.18
10	Total Parking area Required for Commercial @ 35% of BUA	2600.16
11	Total Parking area Required for Residential Block @ 25 % of BUA	20202.30
12	Total Parking Area requirement	22802.46
13	Total Parking Provided	33851.71
14	Total Built-up Area	135545.89
15	Greenbelt area Provided	9235
16	Total Ground Coverage	7898.85
17	Open and Paved area	8231.94

Approved Building plan is enclosed as **Annexure-V**.

4. DETAIL OF BUILDING BLOCK

Details of Building Blocks are given in **Table 4**.

Table 4: Details of Building Blocks

Block	4 BHK	3 BHK	2 BHK	1 BHK	Pent House	Total No. of units	No. of Floors	Height of the Building
Block A (Commercial part)	84 no's of Shops (GF, 1st to 4th) & Banquet Hall 1 no 720.86 sqm .					..	G+5	Max. Approx. 18 m
Block A (Residential part)	40		..	..	4 (4 BHK)	44	2nd +14	Max. Approx. 44.25 m
Block B	..	234		..	18(3BHK)	252	LB+UB +G+14	Max. Approx. 44.25 m
Block -C	40	182	..		18 (14-3 BHK & 4-4 BHK)	240	LB+UB +G+14	Max. Approx. 44.25 m
Block -D	26				4 (4 BHK)	30	LB+UB +G+14	Max. Approx. 44.25 m
EWS			84	140		224	S+15	Max. Approx. 44.25 m
Total						790	84 No of Shops, 2 club, 1 Banquet hall	

5. POPULATION DETAIL

Total population of the project will be **5992** which include the population of dwelling units and visitors population of commercial unit. Breakup of the population is given in **Table-5**.

Table-5: Calculation of Population

Block	Flat	No. of Units population	Population
Residential Block	790	4/5/6/7	4494

Visitors	10% of Residential Population	449
Banquet Hall	10 sqm per Floor Area (2323 sqm)	232
Commercial Block	(10 sqm of the commercial shop B.U Area)	743
Visitors (10% of the commercial population likely to use building facilities)		74
Total		5992

6. ROAD & PARKING DETAILS

Internal Road – Project has driveway of 6 to 27 m. inside the premises. The details of the Parking requirement are provided in the **Table-6**

Table-6: Parking Details

Total Parking area Required for Commercial @ 35% of Commercial BUA	2600.16 Sqm
Total Parking area Required for Residential Block @ 25 % of Residential BUA	20202.30 Sqm
Total Parking area requirement	22802.46 Sqm
Parking Provided at Lower Basement Floor	13387.49 Sqm.
Parking provided at Upper basement Floor	20464.22 Sqm
Total Parking Area Provided	33851.71 Sqm

7. GREENBELT DEVELOPMENT

Increasing vegetation in the form of greenbelt is one of the preferred methods to mitigate air pollution. Plants serve as a sink for pollutants, reduce the flow of dust and reduce noise pollution. The site for the buildings is vacant so, no tree cutting is required. Calculation of green area for the project is given in **Table-7**.

Table-7: Calculation of Green Area

Total Plot Area	25365.79 Sqm.
Landscape area provided	9235 Sqm.
Total No. of Trees required to be Planted @ 1 tree per 80 Sqm of Plot Area	317 Nos.
Total no. of trees proposed	318 Nos.

8. WATER REQUIREMENT, SUPPLY AND DISTRIBUTION

Water Requirement for the proposed project is mentioned below.

8.1 Water requirement during Construction phase

Approx. 21 KLD water will be required for domestic as well as for construction purpose. Source of fresh water will be packaged drinking water. Source of construction water is treated water & tanker water supply.

No use of ground water or surface water used during the construction activity

- Cement mixing – 05 KLD
- Curing -02 KLD
- Sprinkling -05 KLD
- Domestic purposes – 9 KLD

8.2 Water requirement during operation phase

Water requirement during the operational phase of the proposed expansion project will be met through Ground water. The total water requirement for the proposed expansion project has been estimated to be 522 KLD. This includes domestic water requirement, flushing, DG Cooling and landscaping. The total fresh water requirement is 292 KLD which includes Domestic water requirement. The water requirement for Flushing, landscaping, DG Cooling and other construction activities will be met through treated water from STP.

Details of break-up of water requirement are given in **Table-8**.

Table-8: Details of Water Requirement

S. No.	Description	No. of units / Area in Sqm	Unit Population/Per flat Population	Total Population	Per unit water consumption (lpcd)	Total water required (kld)	Fresh water required (kld)	Flushing (kld)	Total Wastewater (kld) (80% of domestic +100% Total flushing)
1	Main Dwelling Units (Residential)	790	4 BHK: 7 Person 3 BHK: 6 Person 2 BHK: 5 Person 1 BHK: 4 Person	4494	100 (60+40)	449	269.64	179.76	395
2	Visitors (10% of the residential population)	...	...	449	15 (10+5)	6.74	4.49	2.25	5.84
3	Banquet Hall	2323	1 person per 10 Sqm. of built-up area	232	15 (10+5)	3.48	2.32	1.16	3.02
4	Commercial block	7429.03	1 person per 10 Sqm. of built-up area	743	45(25+20)	33.44	14.86	18.58	30.46
5	Visitors (10% of the commercial population likely to use building facilities)	...	74	74	15 (10+5)	1.11	0.74	0.37	0.962
	Subtotal -I					494	292	202.11	436
	Horticulture	9235	3 liter/sqm of Landscape area	...		28			
	Subtotal II					28			
	Grand Total I+II					522			
	STP requirement 20% extra than waste water generated					525			
	Treated water generation @80% of waste water					349			

Water balance diagram for given in **Figure-7**.

8.3 Wastewater Generation

The total estimated quantity of wastewater to be generated from proposed project is ~**436 KLD**.

Calculation of wastewater generation is shown below in **Table-9**.

Table-9: Calculation of Wastewater Generation

Details	Water (KLD)
Water requirement for domestic purpose	292
Wastewater to be generated from domestic use (@ 80% of domestic water requirement)	234
Water requirement for Flushing Purpose	202
Wastewater to be generated from Flushing & (@ 100% of flushing requirement)	202
Total Wastewater generated	436
STP capacity 20% higher than total waste water	525

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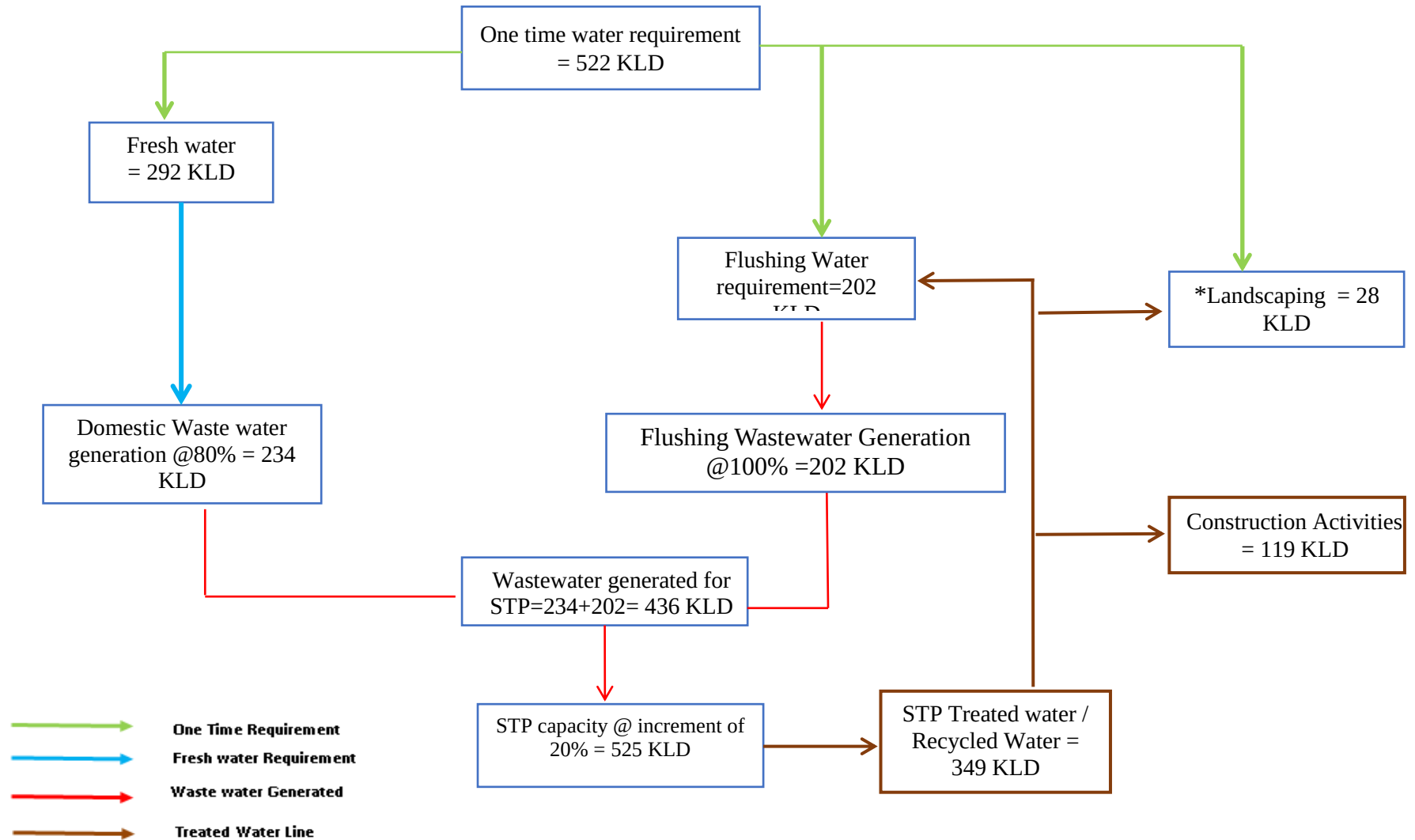


Figure 5: Water Balance Chart

Reuse of Treated Water:

Waste water generated will be 436 KLD, which will be treated in the onsite STP of capacity 20% more than the waste water generated i.e., 525 KLD. The treated water available will be 349 KLD (@ of 80%) and it will be recycled and re-used for flushing, DG cooling and irrigation of landscape area.

During the non-monsoon season, treated water will be used in Flushing & landscaping management and during the monsoon season, as there will be no requirement of water for landscaping, and the excess treated water depending upon requirement either will be used in nearby construction site or discharged into the sewer line.

Wastewater Treatment Scheme

The waste water generated will be treated in the Sewage Treatment Plant, and the capacity of Sewage Treatment Plant (STP) will be higher of waste water generated i.e., 525 KLD. The proposed STP is based on **Moving Bed Bio Reactor (MBBR)**.

Moving Bed Bio Reactor (MBBR)

It is proposed to use activated sludge process working on the principle of extended aeration based on a Fine Bubble Diffused Aeration System. Raw Sewage will flow through a bar screen chamber to an Equalization Tank. The bar screen shall be so designed that it can be cleaned manually from outside the Tank. Two submersible solid handling pumps shall be provided in the Equalization Tank to pump the collected Raw Sewage to the Aeration Tank. An automatic level controller shall be provided in the Equalization Tank to turn the pump off at the low water level in the Tank and to start the pump automatically when water level is high.

Air will be introduced in the Equalization Tank through submerged air diffusers, to prevent the sewage from becoming septic during long retention or low load conditions. The Raw Sewage that comes into the Aeration Tank shall be aerated by using Fine Bubble Diffusers mounted in a grid at the bottom of the tank. Facility will be made to pull up the diffusers for cleaning if necessary. Air will be supplied to the diffusers by twin lobe rotary air blowers located in the plant room. The aeration system shall be designed in a way so as to achieve complete mixing of the sludge organisms with raw sewage in order to achieve a MLSS of between 3000 – 4000 in the Aeration Tank. From the aeration tank this mixed liquor passes into a Clarifier. The liquid in

the clarifier tank is maintained in quiescent condition allowing the solids to settle to the bottom of the Clarifier for collection.

The accumulated solids (Activated Sludge) shall be constantly pumped back into the aeration tank by sludge recycle pumps. This return sludge undergoes further digestion in the aeration tank and also provides the active organism needed to digest the incoming raw sewage.

The Clarifier shall be provided with an overflow weir to collect the treated effluent and a scum baffle shall keep any floating matter from passing out in the final treated water. Treated water from clarifier shall overflow into a Chlorine Contact Tank where hypo chlorite solution shall be added to disinfect the treated water.

Excess sludge from the bottom of the Clarifier shall be wasted into an adjoining aerobic digester cum thickener tank. In this tank sludge shall be aerated. The air shall be shut off periodically and supernatant water will be led back into the Equalization Tank. This way the sludge shall be thickened and its volume shall be reduced. The thickened sludge will be further solidified using a centrifuge or a filter press and the solid cakes will be used as manure in horticulture.

The treated and disinfected water from the Chlorine Contact Tank will be passed through a multigrade Filter, an Activated Carbon Filter and a Softener and then stored in a Treated Sewage Water Tank.

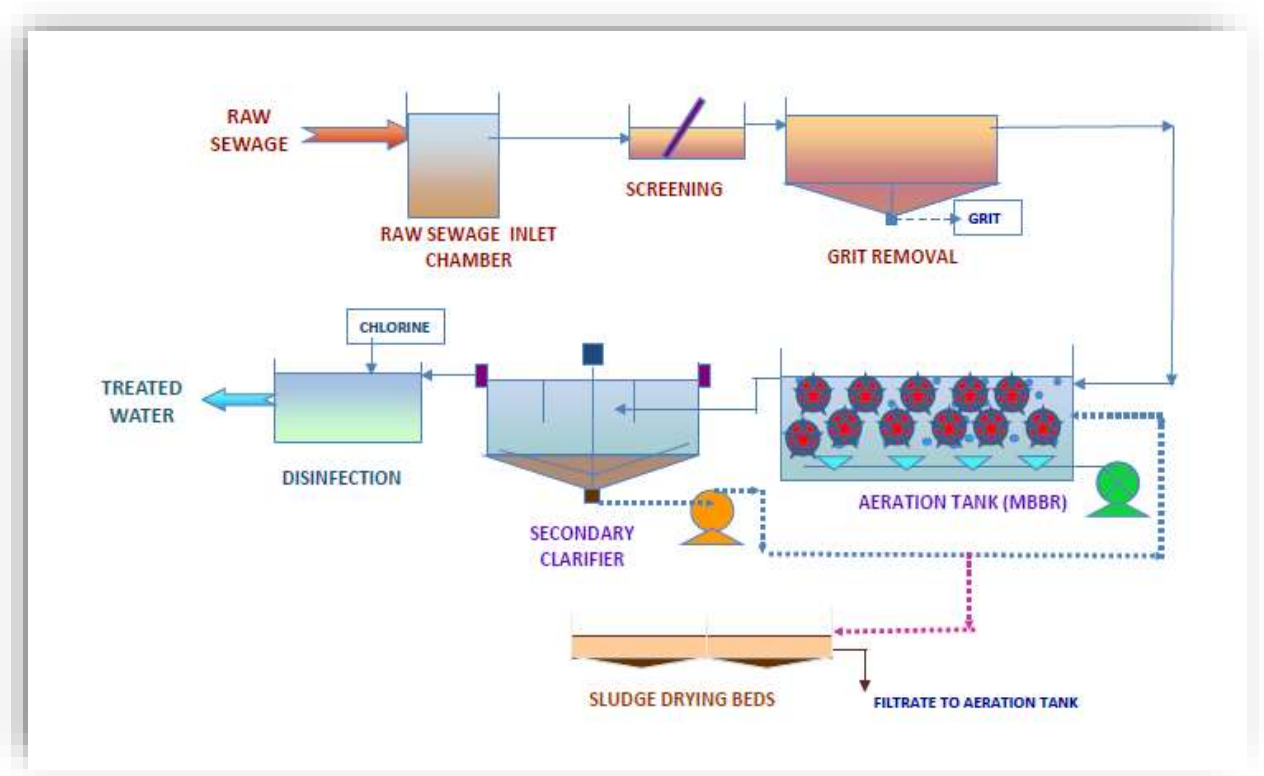


Figure-6: Schematic Diagram of MBBR STP

9. STORM WATER MANAGEMENT

The storm water disposal system for the premises shall be self-sufficient to avoid any collection/ stagnation and flooding of water. Maximum harvesting will be done within the site. Therefore, it has been decided to provide sufficient rainwater harvesting at selected locations, which are liable to catch the maximum run-off from the area. Following are some measures for Storm water disposal:

- 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 annual rainfall intensity of 45 mm/hr shall be considered for designing the storm water drainage system.

The entire site is provided with extensive planned drainage system to low lying areas. The arrangement provides appropriate protection to the site against flooding.

10. RAINWATER HARVESTING

Rainwater harvesting is the activity of direct collection of rainwater. Collected Rainwater will be stored for direct use or for recharging the groundwater. Rain Water Harvesting is the technique through which rain water is captured from the roof and paved surfaces and stored in sub-surface ground water reservoir by adopting artificial recharge techniques.

Advantages:

- ✓ To meet the ever increasing demand for water.
- ✓ To avoid flooding of roads.
- ✓ To augment the ground water storage and control the decline of water table levels.
- ✓ To reduce ground water pollution.
- ✓ To improve the quality of ground water.
- ✓ To reduce the soil erosion.
- ✓ To supplement domestic water requirement during summer, drought etc.
- ✓ Improves the quality of ground water through dilution when recharged to ground water.

As stated above, due to high ground water table, it is not feasible to provide the rain water recharge pits for aquifer recharging but there will be provision of the water sump for the collection of roof top rain water and it will be further used for miscellaneous purposes. The rainwater runoff from the roofs shall be transported through underground pipes to water sumps structures & surface rainwater shall naturally percolate in the underground aquifer through natural filtration.

Table-11: Rainwater Harvesting Calculation

Input Data				Reference
Catchment Area		Value		
1	Rooftop Area of Building/shed	7898.85	sq-mtr	
2	Green Belt Area	9235	sq-mtr	
3	Open & Paved Area	8231.94	sq-mtr	
	Total	25365.79		
Run off Coefficient, c				
	Rooftop Area of Building/shed	0.85		RWH in India, MoEF&CC, e-book 2016
	Green Belt Area	0.15		
	Paved Area	0.75		
	Open Area	0.15		
				CGWB Patna
Rainfall				
	Average Annual Rainfall	1076	mm/year	
	Hourly Peak Rainfall Intensity, I	45	mm/hour	
	Peak Time taken	15	minutes	
Total Volume of Water to be Captured on Annual Basis				
	Rooftop Area of Building/shed	7224.29	cu-m/year	
	Green Belt Area	1490.53	cu-m/year	
	Paved Area	6643.18	cu-m/year	
Runoff Calculation for the Peak Rainfall, Q				
	Rooftop Area of Building/shed	75.53	cu-mtr/hour	RWH in India, MoEF&CC, e-book 2016
	Green Belt Area	15.58	cu-mtr/hour	
	Paved Area	69.46	cu-mtr/hour	
	Total	160.57	cu-mtr/hour	
Annual Recharge Potential				IMD
	Recharge Potential	15357.99	cu-m/year	
	Rainy Season	June-Sep		
Design of Recharge Structure for Peak Flow				

Calculation for One Pit				
	Diameter of Pit	3.5	mtr	
	Depth of the Pit	3.2	mtr	
	Volume of the Pit	30.79	cu-mtr	
Number of Pits Required to store the peak discharge		5.2		
Rain water harvesting Pits provided		5		

11. POWER REQUIREMENT

The total electrical load demand has been estimated to be 3200 KW. The source of power will be supplied by Bihar Power distribution company Limited.

In case of power failure, 4 DG sets of total capacity of 2800 KVA (2 x 1000 KVA+ 2 x 400 KVA) will be provided as power back-up. The DG sets are located in the basement and will be of water cooled.

The DG sets will be provided with acoustic enclosure. Adequate stack heights of D.G. Sets will be provided as per the stipulated guidelines of Central Pollution Control Board (CPCB) to facilitate natural dispersion of exhaust gases as the calculation for the stack height is given below considering height of the building.

Calculation of DG Stack Height:

$$H = h + 0.2 \sqrt{(\text{capacity of DG in KVA})}$$

Where:

H = Total height of stack in meter.

h = Height of the building in meters where the generator set is installed.

KVA = Total generator capacity in the set of KVA.

For DG set of 1000 KVA

- Stack Height = $h + 0.2\sqrt{\text{KVA}}$
- Stack Height = $42 + 0.2\sqrt{1000} = 48 \text{ m}$

We suggest 5 meter above the max. Height of the building

12. SOLID WASTE GENERATION AND MANAGEMENT

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 Solid Waste Management Rules, 2016.

It is estimated that maximum solid waste generation would be about **2180 kg/day**. Following solid waste generation rate has been considered as given in **Table-12**.

Table-12: Proposed Solid Waste Generation Rate

S. No.	Category of Solid Waste	Waste Generation Rate	Formula	Total Population	Waste Generated	Bio-degradable	Non-biodegradable
1	Residential Refuse	0.3 to 0.6 kg/cap/day	Total Population*0.45	4494	2022.3	808.92	1213.38
2	Visitor (10% of the residential Population)	0.1 to 0.2 kg/cap/day	Total Population*0.1	449	44.9	17.96	26.94
3	Commercial population refuse	0.1 to 0.2 kg/cap/day	Total Population*0.15	743	111.45	44.58	66.87
4	Visitors (10% of the commercial population likely to use building facilities)	0.1 to 0.2 kg/cap/day	Total Population*0.1	74	1.3	0.52	0.78
	Total			5760	2180	872	1308

Source: Manual on Municipal Solid Waste Management, published by Central Public Health and Environmental Engineering Organization (CPHEEO), Ministry of Urban Development, Government of India.

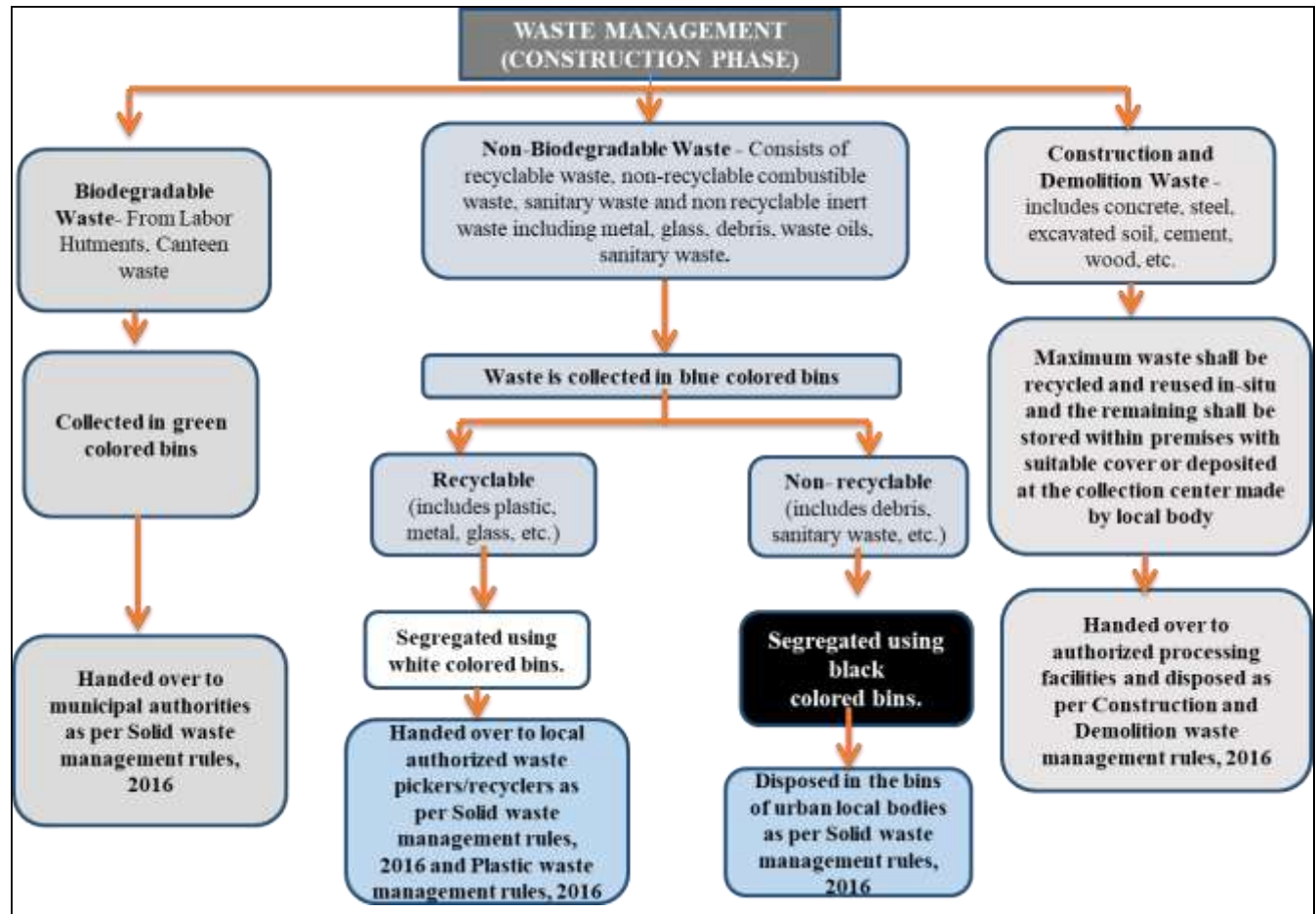


Figure-7: Solid Waste Management during Construction Phase

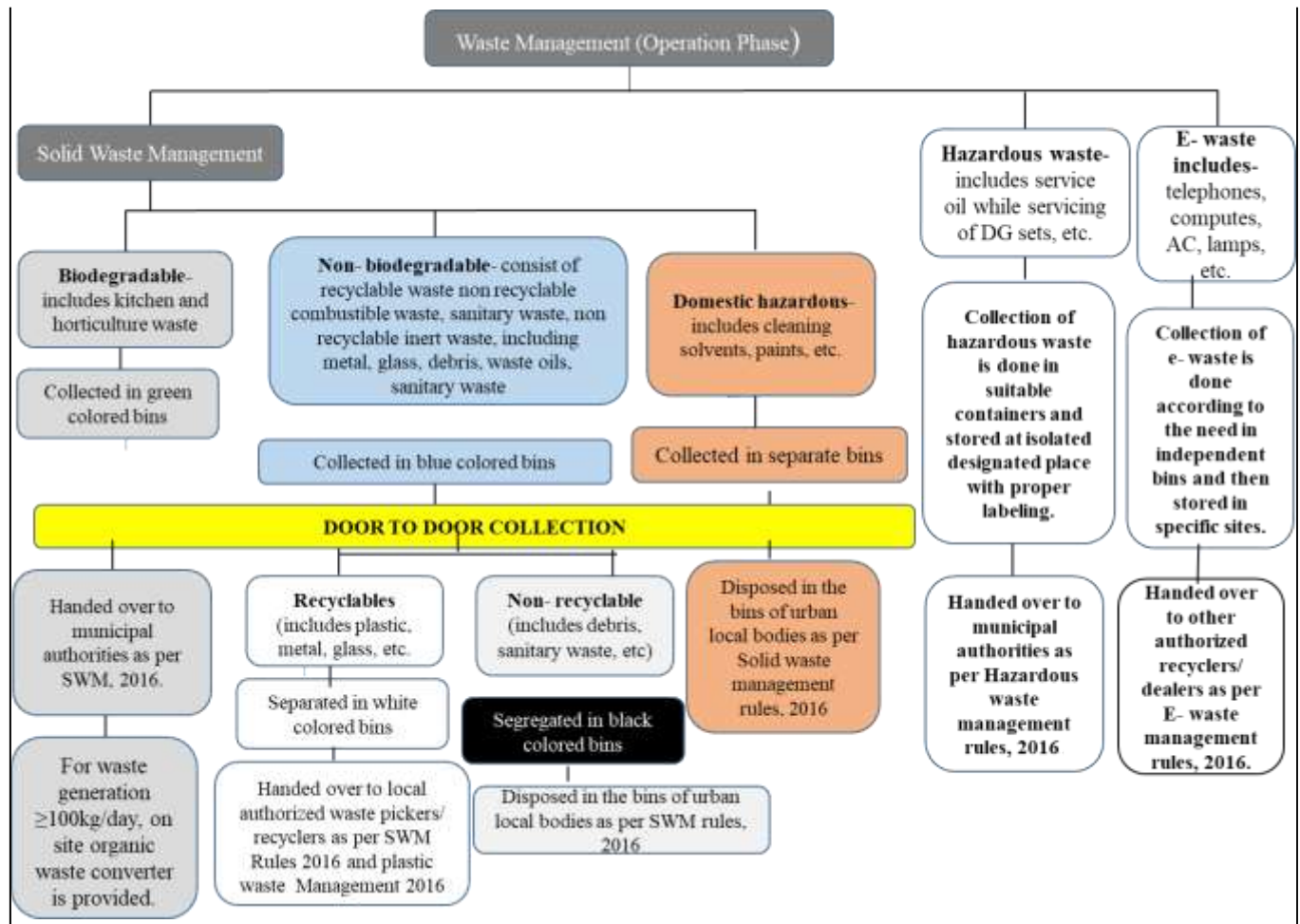


Figure-8: Solid Waste Management during Operation Phase

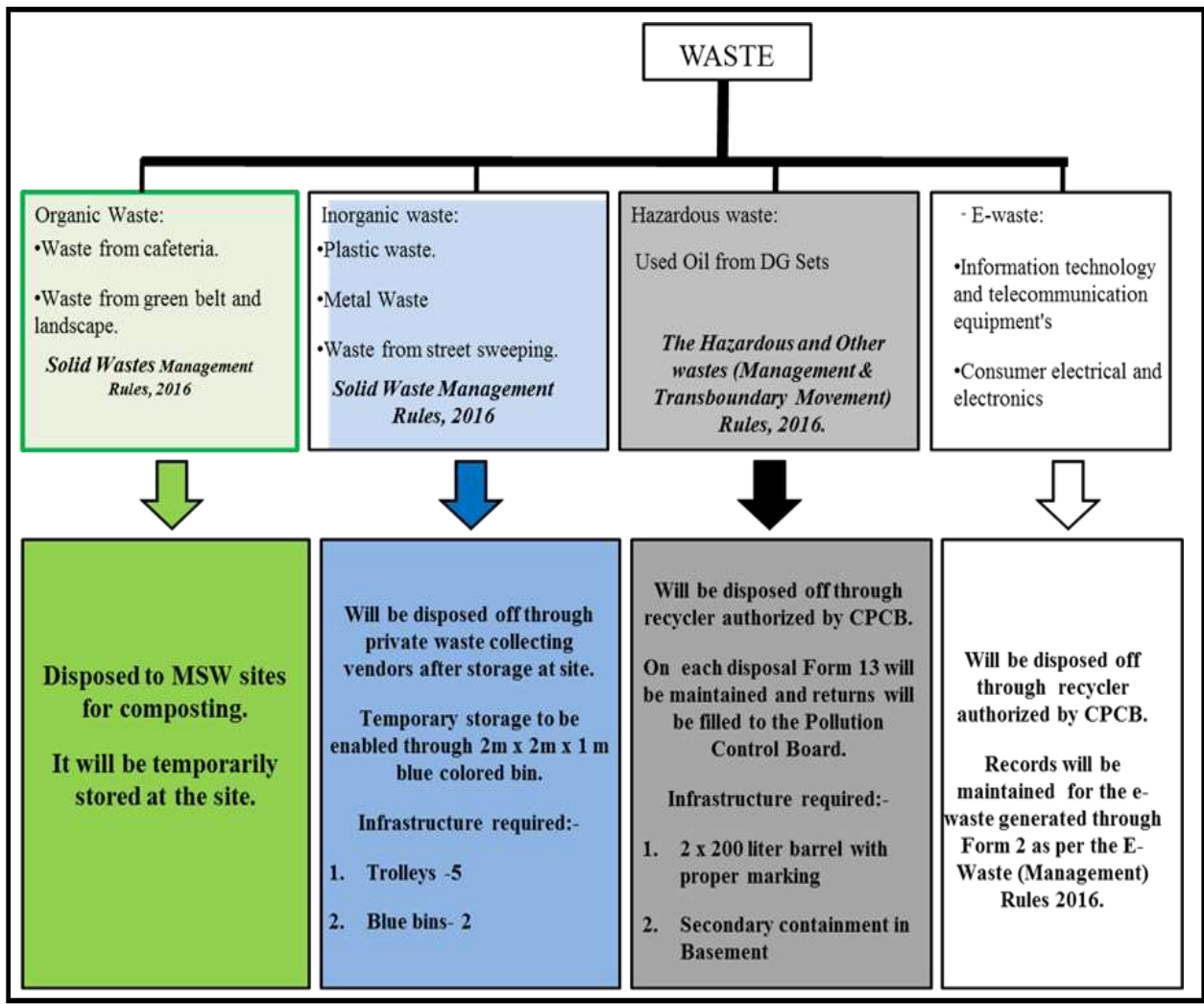


Figure-9: Hazardous Waste Management Plan

13. FIRE FIGHTING SYSTEM

The Fire Fighting will be designed as per the recommendations of the National Building Code of India: Part 4 Fire and Life safety: 1997. The building has been classified under Group-C: Institutional Building, Sub Division (C-1) in the National Building Code 2005.

The fire- fighting system has been designed considering the following codes, manual and guidelines;

- National Building Code of India (NBC);
- As per requirement of fire officer/local fire approving authorities; and
- As per Indian Standard Code for Fire Protection (IS Codes)

14. DETAIL OF CONSTRUCTION MATERIAL

Locally available building materials are majorly used for project development. Low embodied energy material like fly ash mixed cement is also used for construction of the project.

15. Occupational Health and Safety (during construction)

The Management of the project has committed for the health and safety of workers as under;

- The management declares its intention and commitment with all relevant statutory requirements in regard to environment, health and safety of workers.
- The management has assigned the responsibility at different levels as:

Project Manager	:	For all the workers/employees.
Supervisor	:	For casual and daily/unskilled workers.

The management will ensure the occupational health and safety, at the site during construction, by adopting following practices;

- a) Every responsible effort will be made to provide and maintain safe and healthy working conditions, environment, and system of work for all employees.
- b) It will also endeavor of the project proponent to ensure that surrounding environment is not adversely affected by the work activity.
- c) The working environment would be healthy and co-operative.
- d) The prevention of accidents or accident hazards leading to personal injury or damage of equipment/property is recognized as essential as an integral part of efficient operations.
- e) Every employee will follow safety rules/regulations, operating procedures/safe work method design to protect people and equipment from risk of injury of damage to property.
- f) The project will endeavor to adequately train all employees suitably equip them to perform their duties in a safe and effective way.
- g) Every employee will discharge his personal responsibility, and shall co-operate and actively participate in maintaining and improving safety standards.

- h)** A primary health care centre will be provided within the campus. Besides, there is a multi-specialty private hospital (on panel of the institute) just opposite to the institute entrance.
- i)** A doctor will be appointed for health checkup of workers at regular intervals and related records shall be maintained. A doctor and a hospital will be empanelled for attending off site health problems of the workers.
- j)** First Aid kits will be kept ready and available to the workers, in case of emergencies, company will provide fastest possible medical aid. Staff will be adequately trained for this.
- k)** Adequate supply of clean drinking water, neat and clean toilets and washing facilities will be provided at the site.
- l)** Proper ventilation, wherever required, shall be provided in the work areas.
- m)** Proper safety and protections, steps and guards shall be provided at all required places.
- n)** Suitable safety instructions will be displayed in writing (including that in vernacular language) for all critical areas and working conditions.
- o)** A vehicle/ambulance will be specifically positioned at the site for emergency evacuation of workers in case of any health problem/accident.