

CONCEPTUAL PLAN

1. INTRODUCTION

M/s Buildsquare Construction Pvt. Ltd. has proposed Residential Cum Commercial Building “Expression One” on the total land area measuring **8280.65 Sqm.** at Mauza- Mustafapur, Dist.- Patna, State- Bihar. The proposed built up area is **33739.11 Sqm.**

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. The Summary of Land along with land documents is attached as **Annexure-II.**

2. SITE SURROUNDING & CONNECTIVITY

The proposed project is well connected to different villages and towns. It is surrounded by Mainpura, Kalikat Nagar and Lekha Nagar habitation & the project is also close proximity to the Patna town within 10 km of the area of proposed project. Site surroundings and Connectivity details of the proposed project are given in **Table-1.**

Table-1: Site Surroundings and Connectivity Details

S. No.	Connectivity & Site Surroundings “Expression One” at Patna		
	Description		Distance and Direction
1.	Nearest Railway Station	Patliputra Station Danapur Railway Station	Approx. 3.02 Km towards ENE Approx. 2.60 Km towards South
2.	Nearest Airport	Jayprakash Narayan International Airport, Patna	Approx. 4.90 km towards ESE
3.	Nearest Village	Mainpura Kalikat Nagar Lekha Nagar	Approx. 0.17 Km towards East Approx. 0.50 Km towards NE Approx. 0.50 Km towards West
4.	Nearest Highway/Roads	Maurya Path Danapur-Khagaul Road Kali Mandir Road	Adjacent to Project Site Approx. 0.5 Km towards West Approx. 0.10 Km towards East

5.	Nearest School & College	Rajkiya Madhya Vidyalaya Rupaspur R.N Sinha B.D Public School M.G. Play School DAV Public School	Approx. 1.75 Km towards ESE Approx. 0.28 Km towards West Approx. 0.30 Km towards East Approx. 0.45 Km towards SSW
6.	Nearest Hospital	AIIMS Patna IGMS Patna Paras Hospital	Approx 4.75 Km towards South Approx 4.55 Km towards East Approx 3.92 Km towards East
7.	Places of worship	Devi Lok Mandir Devi Mandir Shiv Mandir	Approx. 0.30 Km towards ESE Approx. 0.36 Km towards SE Approx. 1.30 Km towards West
8.	Water Bodies	Ganga River	Approx. 3.60 Km towards North
9.	Defense Installation	Danapur Cantonment	Approx. 3.12 Km towards North
10.	Town	Patna City	Approx. 9.50 Km towards East
11.	Reserve Forest/ Zoo	Sanjay Gandhi Biological Park, Patna	Approx. 5.60 Km towards East

Source: Google Earth & Site visit

The Site Location map is shown in **Figure-1**. A Google Map showing the site corner coordinates of the proposed project is shown in **Figure-2**. Topographical map (**Survey of India Top sheet no G45N2, G45N2, G45N6 and G45N7**) of 10 km radius is shown in **Figure 3**.

Proposed Residential Cum Commercial Building "Expression One" by Buildsquare Construction Pvt. Ltd. at Mauza- Mustafapur, dist.- Patna, State- Bihar

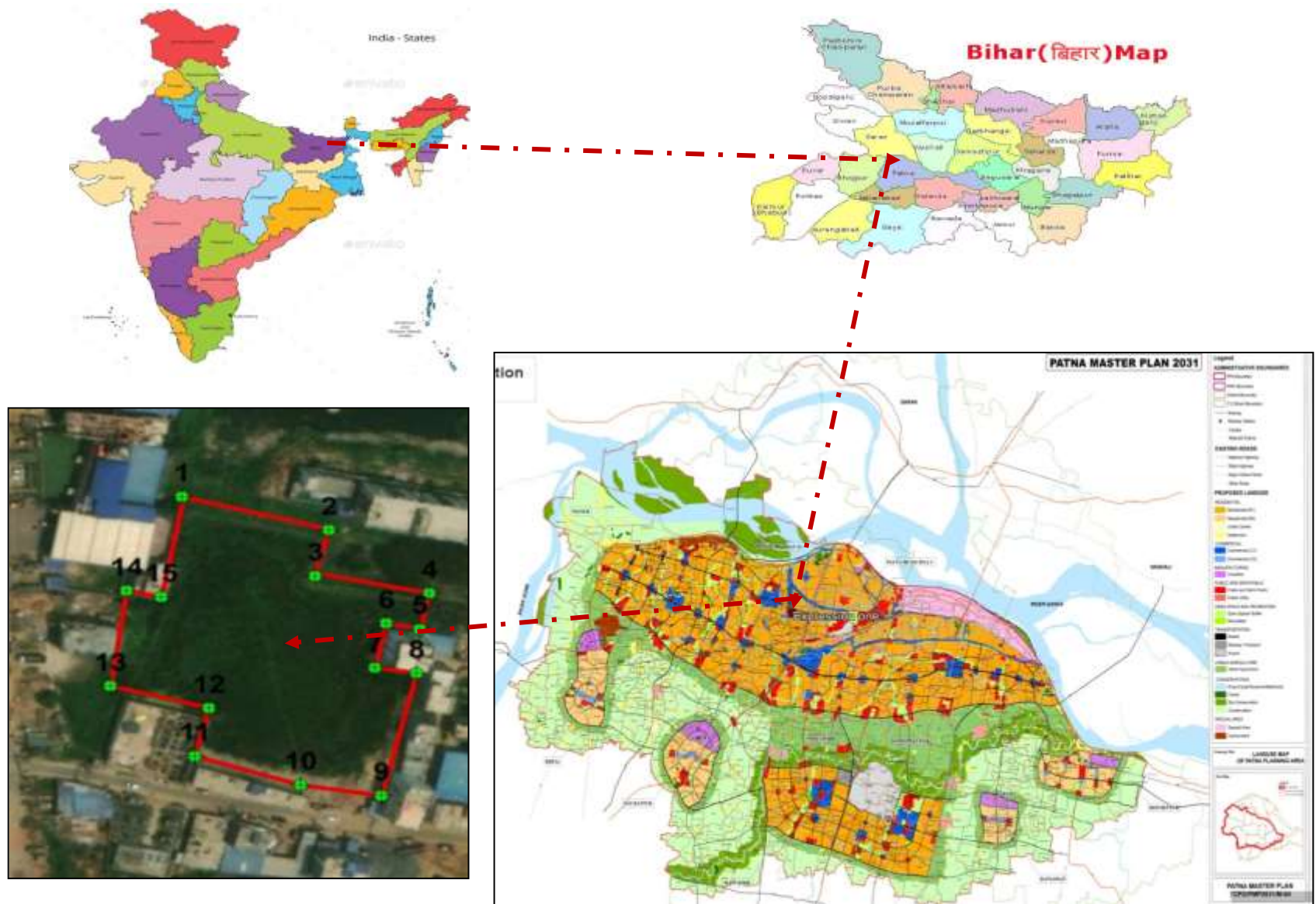
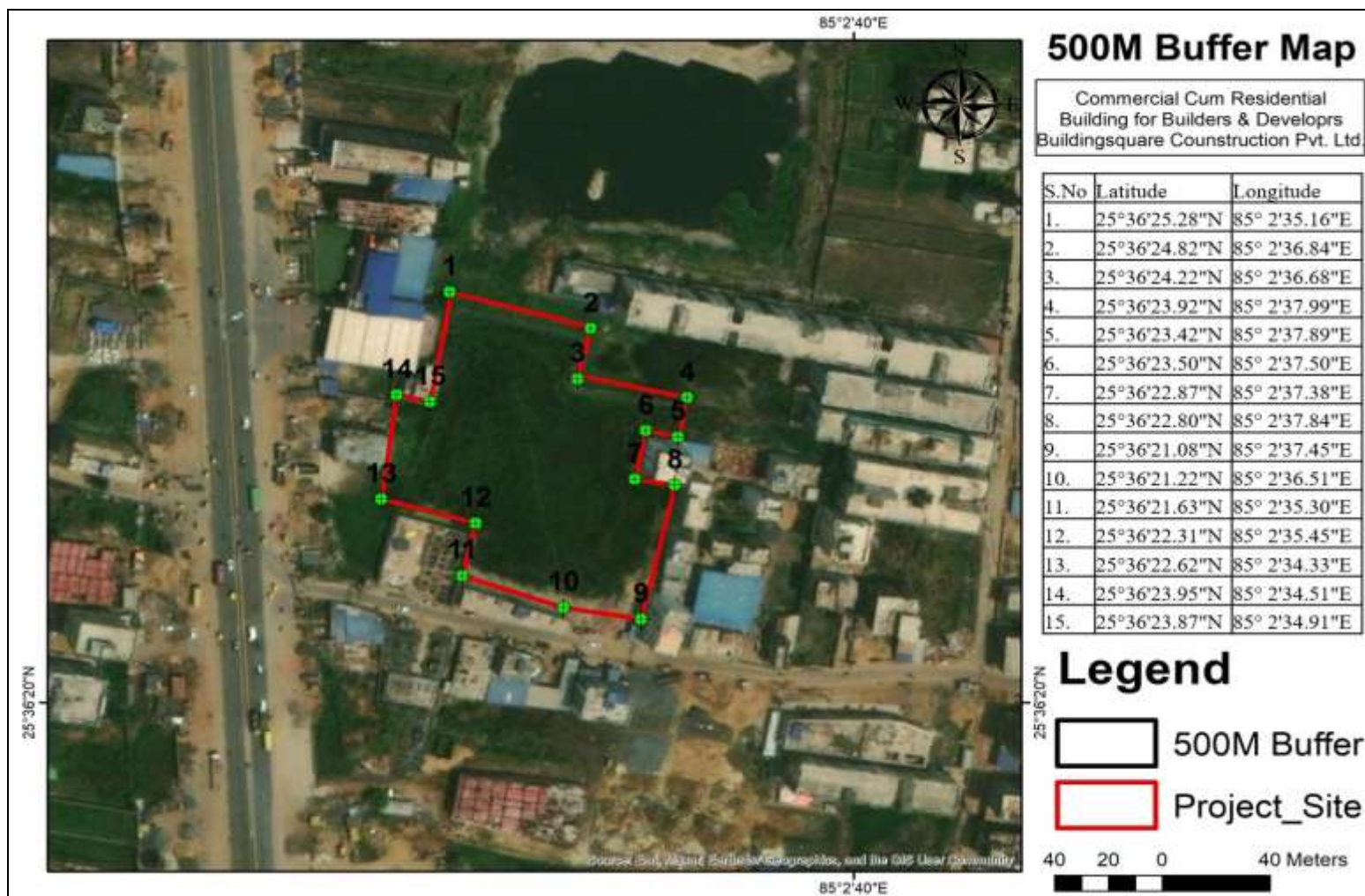


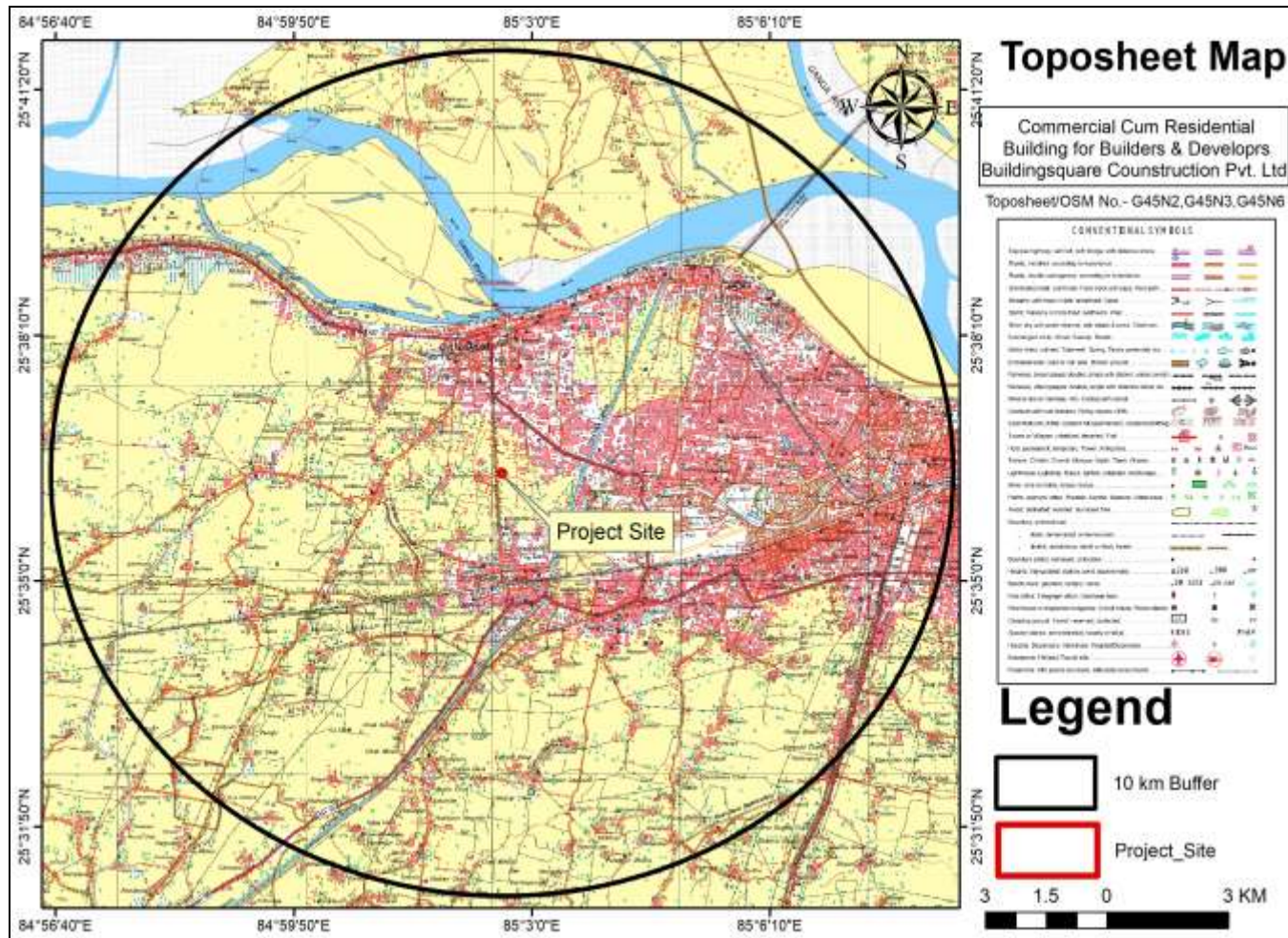
Figure-1: Site Location Map



Source: Google Map

Figure-2: Pillar Coordinate Map

Proposed Residential Cum Commercial Building "Expression One" by Buildsquare Construction Pvt. Ltd. at Mauza- Mustafapur, dist.- Patna, State- Bihar



Source: Survey of India

Figure 3: Topographical Map of 10 km radius

3. PROJECT LOCATION AND DESCRIPTION

The Proposed Residential Cum Commercial Building “Expression One” at Mauza- Mustafapur, Dist.- Patna, State- Bihar. The coordinates of the project boundary are mentioned below in the **Table-2**.

Table-2: Coordinates of the Project Boundary

S. No.	Latitude	Longitude
1	25°34'14.242"N	85°14'0.597"E
2	25°34'13.345"N	85°14'4.342"E
3	25°34'14.541"N	85°14'4.673"E
4	25°34'13.943"N	85°14'7.489"E
5	25°34'11.693"N	85°14'6.970"E
6	25°34'12.291"N	85°14'4.106"E
7	25°34'13.078"N	85°14'4.311"E
8	25°34'14.022"N	85°14'0.534"E

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

Table-3: Brief description of the Project

Sr. No.	Particulars	
1.	Total Plot area	8280.65 Sqm.
2.	Permissible FAR	2.5
3.	Commercial Built-up area (FAR)	7083.96 Sqm
4.	Residential Built-up area (FAR) excluding LIG & EWS	13313.17 Sqm
5.	Residential cum Commercial built-up Area (FAR) excluding LIG & EWS	20397.13 Sqm
6.	EWS Built-up Area required @ 15 % of Residential cum commercial FAR	3059.5695 Sqm
7.	EWS/LIG Built-up area provided (FAR)	3083.44 Sqm
8.	Total FAR Achieved (Non LIG, EWS + LIG, EWS)	23480.57 Sqm
9.	Total Parking Area requirement	4936.40 Sqm
10.	Total Parking Area Provided (Basement 1 + Basement 2)	10258.54 Sqm
11.	Total Built-up Area	33739.11 Sqm

Sr. No.	Particulars		
12.	Greenbelt area Provided (15.00%)		1242.097 Sqm
13.	Total Ground Coverage (23.52%)		1948.39 Sqm
14.	Road Area		1781.55 Sqm
15.	Open Area		3308.6 Sqm
16.	Rain Water Harvesting Pits (with size)		7 (RWH Pit size= 9.42 m³)
17.	STP Capacity		86 KLD
18.	Maximum Height of the Building (m)		Approx. 44.75 m.
19.	Power Requirement		~1800 KW
20.	Power Backup		1500 KVA (3 x 500 KVA)
21.	Total Water Requirement		~86 KLD Fresh water: 49 KLD Treated water: 37 KLD Source: Ground water
22.	Waste water Generated		~72 KLD
23.	Solid Waste Generated		~377 Kg/day
24.	Biodegradable Waste		~151 Kg/day
25.	Non-Biodegradable Waste		~226 Kg/day
27.	Number of Tower		02
28.	Basement		02
29.	Max. Stories		B1+B2+G+11
30.	Project Cost		45 Crores
31.	EMP Budget		During Construction Capital Cost: 26 Lakhs Recurring Cost: 11 Lakhs
			During Operation Capital Cost: 188 Lakhs Recurring Cost: 35 Lakhs
32.	Connectivity	Patliputra Station Danapur Railway Station	Approx. 3.02 Km towards ENE Approx. 2.60 Km towards South
		Jayprakash Narayan International Airport, Patna	Approx. 4.90 km towards ESE
		Maurya Path Danapur-Khagaul Road Kali Mandir Road	Adjacent to Project Site Approx. 0.5 Km towards West Approx. 0.10 Km towards East

Table-4: Detailed Area Statement

S. No.	Details	Area (Sqm.)
1	Total Plot area	8280.65 Sqm.
2	Permissible FAR	2.5
3	Commercial Built-up Area (FAR)	7083.96 Sqm
4	Residential Built-up Area (FAR)excluding LIG & EWS	13313.17 Sqm
5	Residential cum Commercial built-up Area (FAR) excluding LIG & EWS	20397.13 Sqm
6	EWS Built-up Area required @ 15 % of Residential cum commercial FAR	3059.5695 Sqm
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8	Total FAR Achieved (Non LIG, EWS + LIG , EWS)	23480.57 Sqm
9	Total Parking Area requirement	4936.40 Sqm
10	Total Parking Area Provided (Basement 1 +Basement 2)	10258.54 Sqm
11	Total Built-up Area	33739.11 Sqm
12	Greenbelt area Provided (15.00%)	1242.097 Sqm
13	Total Ground Coverage (23.52%)	1948.39 Sqm
14	Road Area	1781.55 Sqm
15	Open Area	3308.6 Sqm

4. DETAIL OF BUILDING BLOCK

The Project envisages construction of two blocks. Details of Building Blocks are given in Table 5.

Table 5: Details of Building Blocks

Block	4 BHK	3 BHK	2 BHK	1 BHK	Total No. of units	Population	No. of Floors	Height of the Building
Block A (Residential Building)	17	42	17	..	76	456	B1+B2+G +11	Max. Appr.44.7 5 m
Block -B (LIG& EWS)	..		24	24	48	216	B1+B2+G +8	Max. Appr.31.9 5m
Block A Commercial)	10 No.Shops,2 No Anchor Shop ,2 No Food Court,1 No Canteen,1 No Cloub House,3							

	No Offices.			
Total		124	672	

5. POPULATION DETAIL

Total population of the proposed project will be **1418** which include the population of dwelling units and visitors. Breakup of the population is given in **Table-5**.

Table-6: Calculation of Population

Block	Flat	No. of Units population	Population
Residential Block	124	4/5/6/7	672
Visitors	10% of Residential Population		67
Commercial Block (Staff)	10 *5 Shops & 2 *10 Anchor Shop Food Court 2*5,Canteen 1*5 Club House 1*5,Office 3*5		105
Visitors Commercial (10 sqm of the commercial shop Floor Area)	10 sqm of the commercial shop Floor Area (5745.09 sqm)		574
Total			1418

6. PARKING DETAIL

The details of parking required and provided is mentioned in following **Table 7**.

Table 7: Parking Details

Details	Area
Parking area Required for Commercial Block @ 35 % of BUA, (Excluding 15% of Service Area)	2107.353 sqm
Parking area Required for Residential Block @ 25 % of BUA, (Excluding 15% of Service Area)	2829.05 sqm
Total Parking Area requirement	4936.4
Parking Provided at Basement -1	5129.27 Sqm.
Parking provided at Basement-2	5129.27 Sqm
Total Parking Area Provided	10258.54 Sqm

7. LANDSCAPE 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 proposed buildings is vacant so, no tree cutting is required. Calculation of green area for proposed project is given in **Table-8**.

Table-8: Calculation of Green Area

Total Plot Area	8280.65 Sqm.
Landscape area provided @ 15.00%	1242.097 Sqm.
Total No. of Trees will be Planted @ 1 tree per 80 Sqm. of Plot Area	104 Nos.

8.0 WATER REQUIREMENT, SUPPLY AND DISTRIBUTION

Water Requirement for the proposed project is discussed 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 will be used during the construction activity

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

7.2 Water requirement during operation phase

Water requirement during the operational phase will be met through ground water. The total water requirement for the proposed project has been estimated **~86 KLD**. This includes domestic water requirement, flushing and landscaping. The total fresh water requirement is **~49 KLD** which includes domestic water requirement. The water requirement for flushing and landscaping will be met through treated water from STP. Details of break-up of water requirement are given in **Table-9**.

Table-9: 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)	124	4 BHK: 7 Person 3 BHK: 6 Person 2 BHK: 5 Person 1 BHK: 4 Person	672	100 (60+40)	67	40.32	26.88	59
2	Visitors (10% of the residential population)	...	...	67	15 (10+5)	1.01	0.67	0.34	0.87
3	Commercial-staff	...		105	45(25+20)	4.73	2.63	2.10	4.20
4	Visitors (10 sqm. of the commercial shop Floor Area)	5745.09	...	574	15 (10+5)	8.61	5.74	2.87	7.46
	Subtotal -I					82	49	32.19	72
	Horticulture	1242.097	3 liter/sqm of Landscape area	...		4			
		Subtotal II				4			
		Grand Total I+II				86			
	STP requirement 20% extra than waste water generated					86			
	Treated water generation @80% of waste water					57			

8.3 Wastewater Generation

The total estimated quantity of wastewater to be generated from proposed project is **~72 KLD**.

Calculation of wastewater generation is shown below in **Table-10**.

Table-10: Calculation of Wastewater Generation

Details	Water (KLD)
Water requirement for domestic purpose	49
Wastewater to be generated from domestic use (@ 80% of domestic water requirement)	39
Water requirement for Flushing Purpose	33
Wastewater to be generated from Flushing (@ 100% of flushing requirement)	33
Total Wastewater generated	72
STP capacity 20% higher than total waste water	~86

Water balance diagram for given in **Figure-5**.

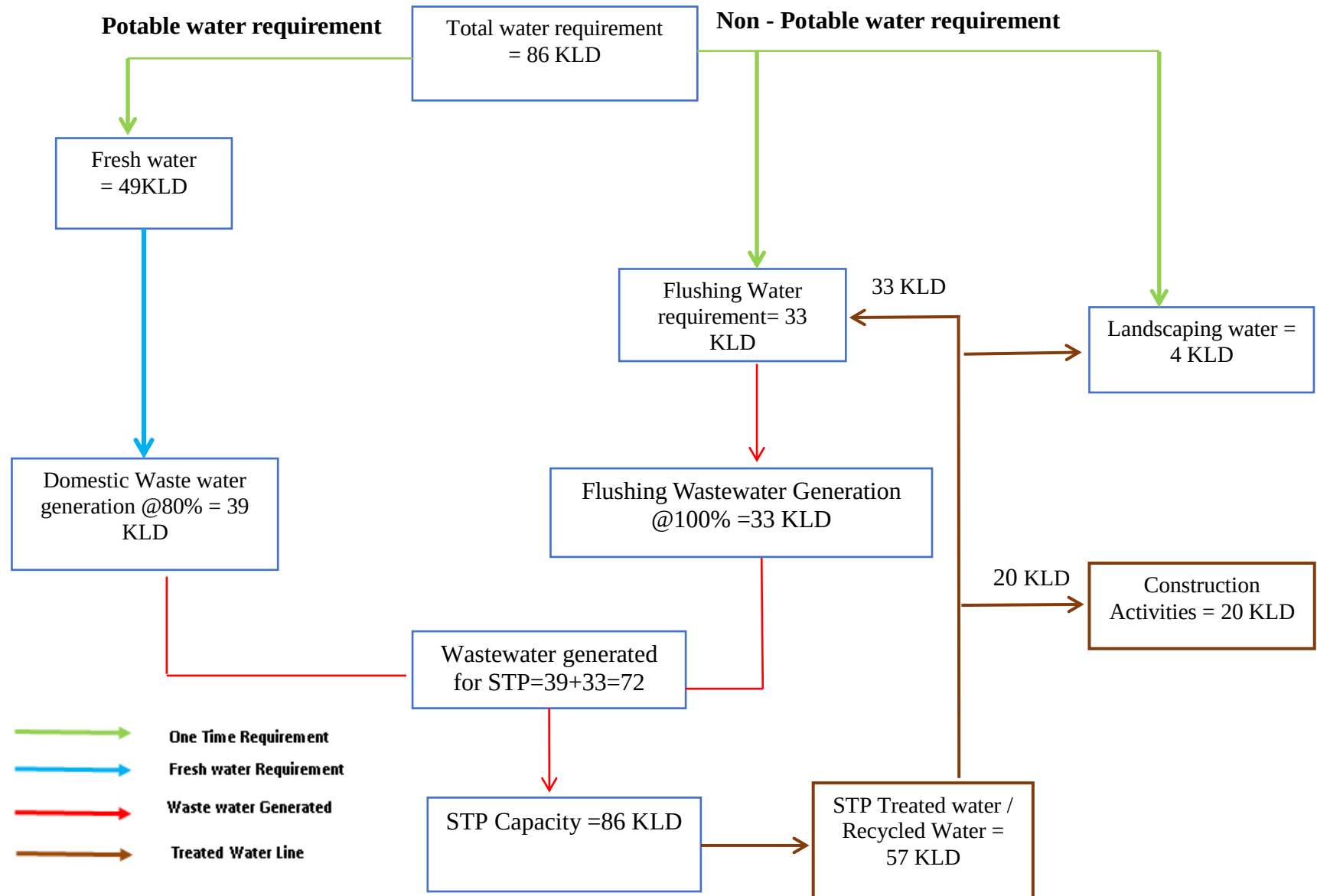


Figure-5: Water Balance Chart

Reuse of Treated Water:

Waste water generated is 72 KLD, which will be treated in the onsite STP of capacity 20% more than the waste water generated i.e. 86 KLD. The treated water available is 36 KLD (@ of 80%) and it will be recycled and re-used for flushing and landscaping purpose.

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 up on requirement either will be used in nearby construction site or discharged into the sewer line.

Pre-treatment:

To reduce the chances of membrane damage, wastewater should undergo a high level of debris removal using screens prior to the MBR. Primary treatment is often provided in larger installations. In addition, all MBR systems require 1- to 3-mm-cutoff fine screens immediately before the membranes, depending on the MBR manufacturer. These screens require frequent cleaning.

Membrane Configuration:

MBR manufacturers employ membranes in two basic configurations: hollow fiber bundles and plate membranes. A number of **bundles** are connected by manifolds into units that can be readily changed for maintenance or replacement.

The other configuration, employ **membranes** in a flatplate configuration, again with manifolds to allow a number of membranes to be connected in readily changed units.

System Operation:

All MBR systems require some degree of pumping to force the water flowing through the membrane. While other membrane systems use a pressurized system to push the water through the membranes, the major systems used in MBRs draw a vacuum through the membranes so that the water outside is at ambient pressure. The advantage of the vacuum is that it is gentler to the membranes; the advantage of the pressure is that throughput can be controlled. All systems also include techniques for continually cleaning the system to maintain membrane life and keep the

system operational for as long as possible. All the principal membrane systems used in MBRs use an air scour technique to reduce buildup of material on the membranes. This is done by blowing air around the membranes out of the manifolds.

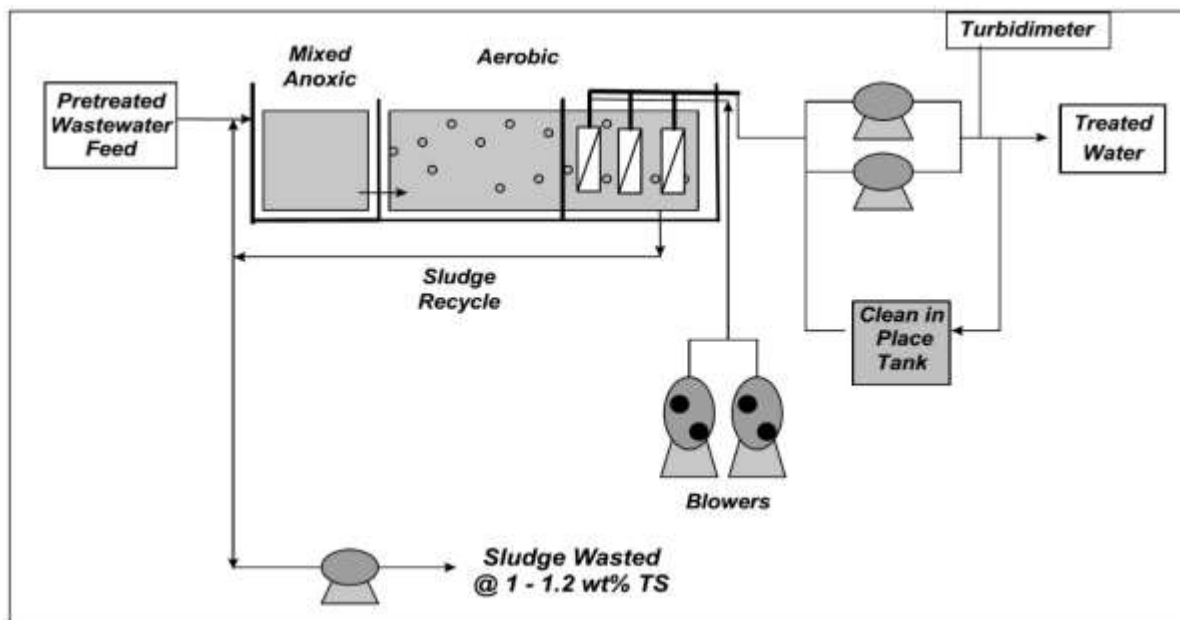


Figure 10: Schematic Diagram of MBR STP

8. 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 rain water 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. RAIN WATER 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			Unit	Reference
Catchment Area		Value		
1	Rooftop Area of Building/shed	1948.39	sq-mtr	
2	Green Belt Area	1242.097	sq-mtr	
3	Open & Paved Area	5090.163	sq-mtr	
	Total	8280.65		
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				$Q = A * c * I$
	Rooftop Area of Building/shed	1782.00	cu-m/year	
	Green Belt Area	200.47	cu-m/year	
	Paved Area	4107.76	cu-m/year	
Runoff Calculation for the Peak Rainfall, Q				
	Rooftop Area of Building/shed	18.63	cu-mtr/hour	RWH in India, MoEF&CC, e-book 2016
	Green Belt Area	2.30	cu-mtr/hour	
	Paved Area	42.95	cu-mtr/hour	
	Total	63.68	cu-mtr/hour	
Annual Recharge Potential				IMD
	Recharge Potential	6090.23	cu-m/year	
	Rainy Season	June-Sep		
Design of Recharge Structure for Peak Flow				
Calculation for One Pit				
	Diameter of Pit	2	mtr	
	Depth of the Pit	3	mtr	
	Volume of the Pit	9.42	cu-mtr	
Number of Pits Required to store the peak discharge		6.8		
Rain water harvesting Pits provided		7		

Number of RWH Pits Proposed = ~7

11. POWER REQUIREMENT

The total electrical load demand has been estimated to be ~1800 KW. The source of power will be supplied by State Electricity Board.

In case of power failure, 3 DG sets of each of capacity of 3 x 500 KVA will be provided as power back-up. The DG sets are located in the basement and will be air 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 500 KVA

$$H = h + 0.2 \sqrt{500}$$

$$H = h + 0.2 \times 22.36$$

$$H = h + 4$$

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. Following solid waste generation rate has been considered as given in **Table-12.**

Table 12: Solid waste Generation details

S. N.	Category of Solid Waste	Waste Generation Rate	Formula	Total Pop.	Waste Generated	Bio-degradable	Non-biodegradable
1	Residential Refuse	0.3 to 0.6 kg/cap/day	Total Population *0.45	672	302.4	120.96	181.44

2	Visitor (10% of the residential Population)	0.1 to 0.2 kg/cap/day	Total Population *0.1	67	6.7	2.68	4.02
3	Commercial - staff	0.1 to 0.2 kg/cap/day	Total Population *0.1	105	10.5	4.2	6.3
4	Visitors (10 sqm. of the commercial shop Floor Area)	0.1 to 0.2 kg/cap/day	Total Population *0.1	574	57.4	22.96	34.44
	Total			1418	377	151	226

Reference: NBC 2016

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

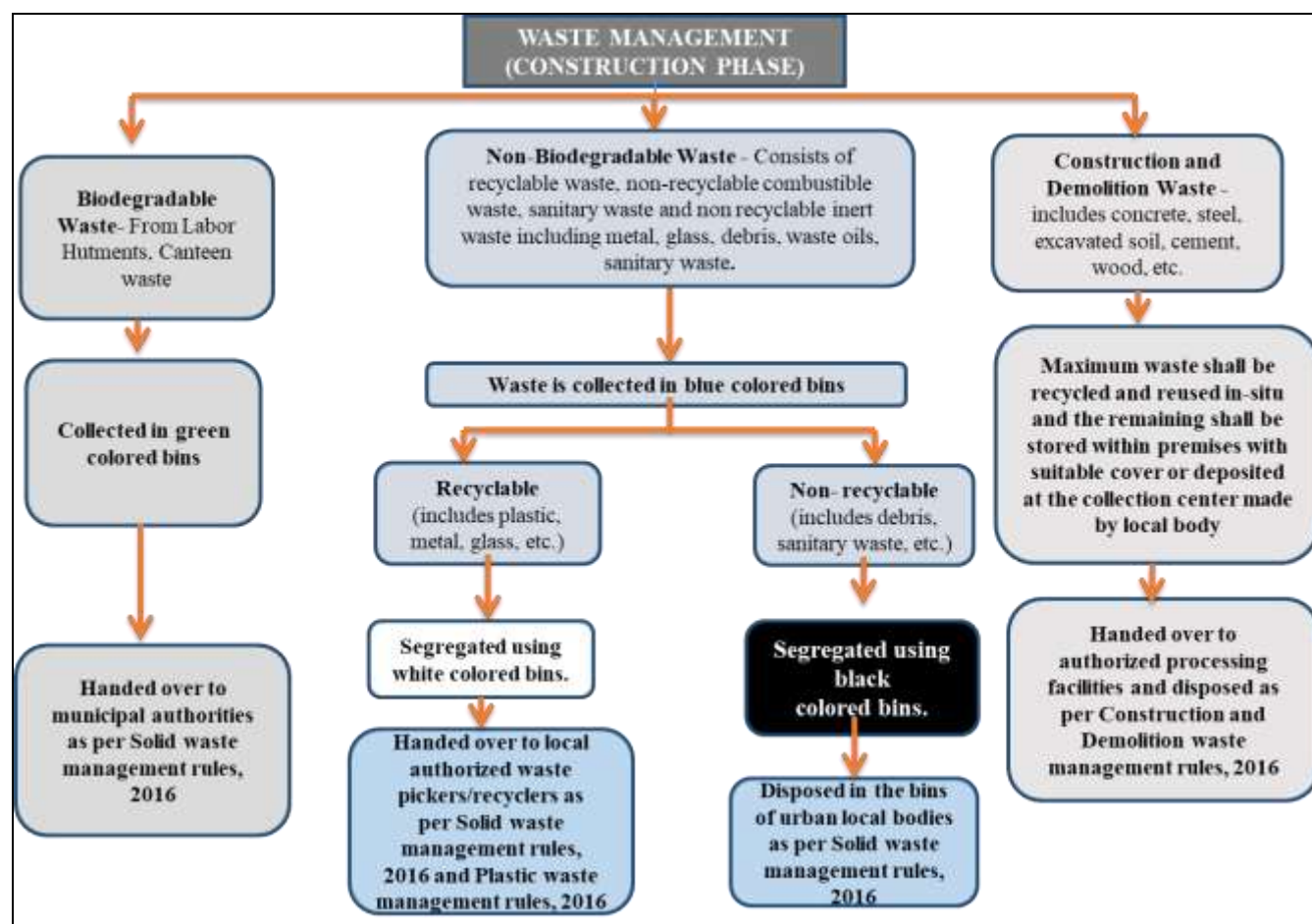


Figure-7: Solid Waste Management during Construction Phase

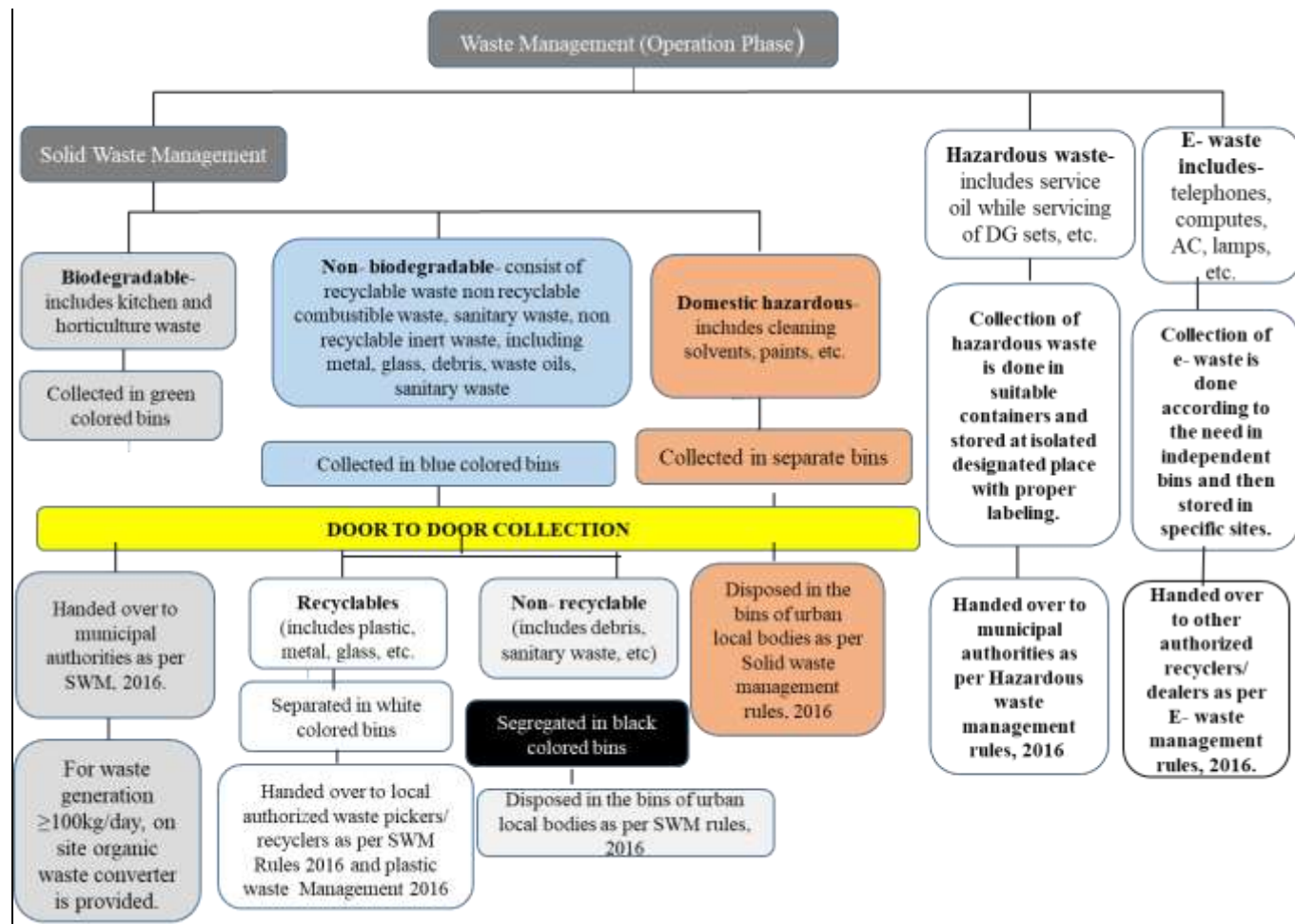


Figure-8: Solid Waste Management during Operation Phase

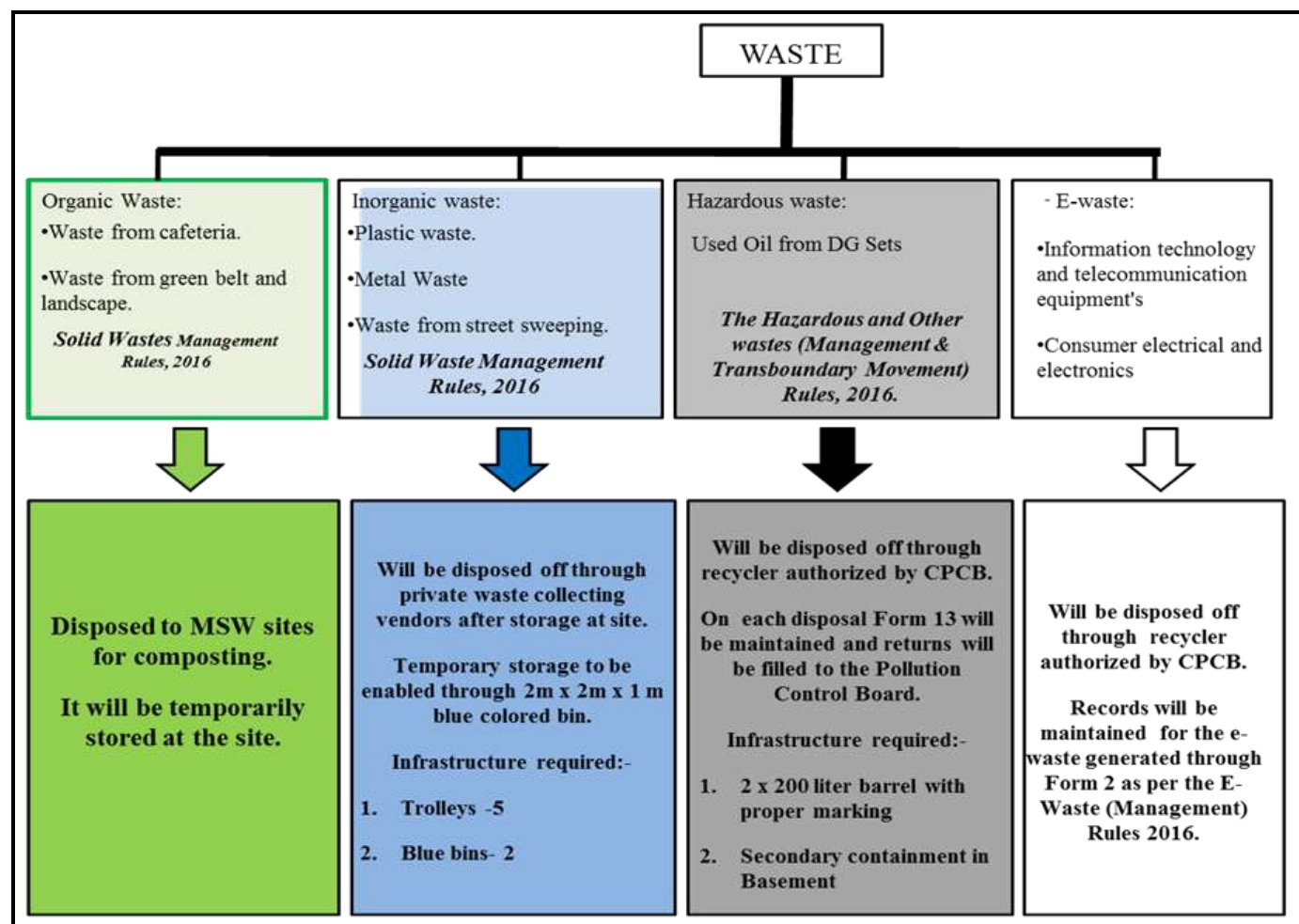


Figure-9: Hazardous Waste Management Plan

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 2016.

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

List of building materials will be used at site:

- Coarse sand – 690010.122 CFT
- Stone aggregate (10 MM)- 157976.0016 CFT
- Stone aggregate (20 MM)- 368610.6704 CFT
- Cement (50 Kg/BAG)- 145265.289 BAGs
- Bricks- 3086887.387
- Steel- 1501.1959 Tons
- Plywood- 47211.219 SFT

Finishing materials like tiles, sanitary fixtures, etc. shall be stored in closed rooms..

16. 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 or 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.