CONCEPTUAL PLAN

FOR

"RKM Enclave Sahyog"

RESIDENTIAL GROUP HOUSING & COMMERCIAL BUILDING PROJECT

AT

Mauza – SIKANDARPUR, DIGHA PHULWARI ROAD, DANAPUR
DIST.: PATNA, STATE: BIHAR

Developer :

SHIVAM CONSTRUCTIONS

302, 3rd Floor, Patna Super Market Building,
Frazer Road,
Patna – 800 001 (BIHAR)

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1.0 INTRODUCTION ;

Benighted Bihar – till a few years ago, of course – was hardly the place to think in terms of investment in real estate. People had given up hope of a turnaround in its fortune and like migratory birds had been flocking to other parts of the country. But post 2005, Patna, the state capital of hitherto condemned Bihar, has become a favorite destination for those wanting to invest in immovable property.

The real estate sector has witnessed an unprecedented growth in Bihar's capital with flat prices zooming northwards, thanks to an improved law and order situation along with civic amenities. Rates of flats which varied between Rs 700 per square feet to Rs 1400 per sq ft about four years ago have touched Rs 2000 to 4500 per sq ft in the state capital. "The increase in real estate prices in Patna during the last three years has been almost 150 per cent," claims Bihar chapter of builders' association of India (BAI).

Builders point out that Patna has become a favorite place also because there were no satellite or "B" class cities as in the case of neighboring Jharkhand which has Jamshedpur, Dhanbad and Bokaro apart from Ranchi, the state capital. "In Bihar, Patna is the lone destination". People were disposing off land in villages to buy their dream home in Patna. This in turn has led to a rise in land prices in the countryside too.

During the last four years, builders point out, there has been a steady stream of customers wanting to buy property. "Patna is a changed place now. People of all hues including businessmen and the service class are coming in hordes and this has led to a gap between demand and supply.

"Bihar is based in different parts of the country and even abroad have been making inquiries about property in Patna which was not the case earlier." Then there are the neo-rich class comprising contractors and agents who found work during the present regime and are investing in cars, land and apartments.

Even rentals for residential house, offices and shops have hit the roof since law and order is no longer an issue now. The scenario was different five years back with none of the major companies was willing to open offices in Bihar. "Now many of them — like banks, insurance firms, mobile service providers, construction firms etc. — have their offices in Patna.

Patna has a population of 1.7 million according to the 2011 census and stands as the biggest city in the east of India, after Kolkata. With a population growth rate of 22.34% between 2001 and *2011,* and a current population density of 1,823 inhabitants per square *kilometer*, the city statistically *clamours* for accommodation. It is therefore pertinent from the perspective of residents, realtors, developers and investors to examine tier-two city *of Patna.*

It is one of the most prestigious Residential Group Housing Projects by Shivam Constructions and is aimed towards offering the citizens of Patna a fabulous opportunity to live at a place that is nestled amidst greenery and offers a calm and serene environment. No wonder it enjoys a great fan following. Secured and packed with a range of amenities that can make anyone's stay here comfortable and hassle-free, the project will be innovatively designed and present a wonderful opportunity to people who will get to live at a quality place at economical rates. There are numerous other advantages that the project offers. Take for instance the fact that the area in and around the project has well developed social amenities like schools, hospitals, market, malls, ATMs, bus stand, railway station etc. that will ensure that those living here do not feel slightest of inconvenience and enjoy their stay without any inconvenience.

The accommodation here will be available in 1/2/3 BHK spacious apartments that will make any ones stay here enjoyable and hassle-free. Innovative ventilation here will ensure that fresh air and natural light reach every flat while broad balconies will not only add beauty to the structure but will also allow the residents an opportunity to enjoy the panoramic view outside. The balconies will also provide a wonderful opportunity for the residents to unwind after a hard day's work at the office as well as enjoy a memorable time with friends and family. If one takes into account the popularity that the project enjoys then it can easily be assumed that the coming days will see its popularity grow in leaps and bounds.

2.0 PROJECT BACKGROUND ;

M/s Shivam Construction is developing "Residential Group Housing and Commercial Building Project" RBM Enclave Sahyog. The project area falls under Residential Area (R1) in approved Master Plan 2031 of Urban Development & Housing Department, Govt. of Bihar, issued vide Memo No. 11/N.Vi.Ma.Plan (Samiti)-17/2014/832/UD&HD/Patna Dt: 28.10.2016. Proposed Project is coming up on land under Development Agreement between land owners at Plot No. Plot

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No. 569, 569, 570, 569, 570, 570, 570, 570, 573, 573 ; Khata No- 198, 198, 167, 168, 167, 167, 167, 167, 188, 188, Mauza – Sikandarpur, Digha Phulwari Road, Danapur, Dist.: Patna, State: Bihar

The main purpose and benefit of the project are as under:

- To provide quality & comfortable residences at competitive prices.
- To create an environment that could support good standard of living related essential facilities required for day to day living.
- To enhance the surroundings with greenery, landscaping and recommended aesthetics.
- To emphasize the policy of rain water harvesting to create a better micro climate in the area
- To create a healthy planned environment.

3.0 PROJECT LOCATION & SURROUNDINGS ;

The project site is located near Digha Phulwari Road, which is connected to district headquarter and other places of country through Bailey Road on South side and Ashok Rajpath on North Side. Patliputra Railway Station is nearest railway station which is at 0.5 km. in E direction. The nearest airport is LNJPNI Patna Airport, at 7 km E from the project sitee. Geo Coordinates of project site is as under ;

Corners	Latitude	Longitude
A	25°37'19.71"N	85° 4'4.85"E
B	25°37'17.90"N	85° 4'4.04"E
C	25°37'18.09"N	85° 4'3.14"E
D	25°37'18.26"N	85° 4'3.15"E
E	25°37'18.60"N	85° 4'1.50"E
F	25°37'19.92"N	85° 4'1.61"E
G	25°37'20.15"N	85° 3'58.86"E
H	25°37'21.00"N	85° 3'58.72"E
I	25°37'20.89"N	85° 4'1.99"E
J	25°37'21.10"N	85° 4'2.05"E
K	25°37'21.06"N	85° 4'3.10"E
L	25°37'21.25"N	85° 4'3.10"E
M	25°37'21.06"N	85° 4'4.18"E
N	25°37'20.53"N	85° 4'4.02"E
O	25°37'20.78"N	85° 4'3.12"E
P	25°37'20.48"N	85° 4'3.11"E
Q	25°37'20.33"N	85° 4'3.60"E
R	25°37'20.03"N	85° 4'3.54"E

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4.0 PROJECT DETAILS & FACILITIES ;

Land & Area Details of "Residential Group Housing Project" of Kumar Buildcon (P) Ltd. are as under ;

Land Area: 8560.15 Sq. m. (0.8560 Ha. / 2.115 Acres)					
	Tower 1 (B+G+10)	Tower 2 (B+G+11)	Tower 3 (LIG & EWS) (B+G+11)	Tower 4 (LIG & EWS) (B+G+11)	Club (G+1)
Basement/ Upper basement	27.05	20.5	12.75	14.78	-
Lower basement	-	20.5	12.75	14.78	-
Ground floor	805.83	81.84	67.21	312.97	116.85
1st Floor	803.65	1183.65	360.72	312.97	210.36
2nd Floor	803.65	1183.65	360.72	312.97	-
3rd Floor	803.65	1183.65	360.72	312.97	-
4th Floor	803.65	1183.65	360.72	312.97	-
5th Floor	803.65	1183.65	360.72	312.97	-
6th Floor	803.65	1183.65	360.72	312.97	-
7th Floor	803.65	1183.65	360.72	312.97	-
8th Floor	803.65	1183.65	360.72	312.97	-
9th Floor	803.65	1183.65	360.72	312.97	-
10th Floor	803.65	1183.65	-	312.97	-
11th Floor	-	1183.65	-	312.97	-
TOTAL	**8869.38**	**13142.99**	**3339.19**	**3785.2**	**327.21**

Total Built-up Area of All Building	29463.97 Sq. m
Covered Parking Area	7406.27 Sq. m
TOTAL BUILT-UP AREA OF PROJECT	**36870.24 Sq. m.**
Permissible FAR	**3.0%**
Proposed FAR	**2.99%**
Permissible FAR (EWS/LIG)	**15 %**
Proposed FAR (EWS/LIG)	**14.51 %**
Total No. of Residential Flats	Tower 01, 02 & 3 : 214 Nos. Tower 04 (LIG & EWS): 60 Nos.
Green Belt & Green Area	1192.08 Sq. m (21 %)
Maximum Height of Buildings	60 m. (Upto Water Tank roof level)
Proposed Ground Coverage (23%)	1961.47 Sqm.

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- **Water Consumption:** The total water requirement for the proposed "Residential Group Housing and commercial building Project" will be will be 477 KLD (121 KLD Domestic Water, 225 KLD Water for swimming pool, 131 KLD STP treated water.) Total Fresh Water requirement during 01st run will be 477 KLD and thereafter 121 KLD fresh ground water required for domestic & 225 KLD for swimming pool. Toilet flushing, Car/Street Washing, Green belt & landscape irrigation and Firefighting water requirement will be met by Treated Water from STP. The fresh water will be sourced through Borewells.
- **Power requirement**: 2560 kW through SBPDCL Grid
- **Connectivity:** The project site is located near Digha Phulwari Road, which is connected to district headquarter and other places of country through Bailey Road on South side and Ashok Rajpath on North Side. Patliputra Railway Station is nearest railway station which is at 0.5 km. in E direction. The nearest airport is LNJPNI Patna Airport, at 7 km E from the project site..
- **Community facilities:** All community facilities like schools, market, educational institutions, banks, hospital etc. are located within 0.5 – 5 km. radius of Project area.
- **Parking Needs:** Total 7756.27 Sq. M will be provided for Parking Facility. Out of which 7406.27 Sq. M area has been provided for Covered Parking in Basement and 350 Sqm. in open area. An area of 200 Sqm. has been provisioned for EWS/LIG Parking. Parking provisions will be provided as per guidelines of Bihar Building Bylaws.

Parking Requirement	**Details of the Parking Area**
Residential Parking Requirement as per Bihar Building Byelaws (25 % of total built-up area of Residential Area excluding 15% service area)	6261.094 SQ. M. (25044.37* 25 %)
Commercial Parking Requirement as per Bihar Building Byelaws (30 % of total built-up area	241.75 SQ. M. (805.83* 30 %)
TOTAL REQUIRED PARKING AREA	6261.094 + 241.75 = 6502.84 SQM.
Parking Area Provision	Covered Parking: 7406.27 Sqm. Open Parking : 350 Sqm.
PROVISION OF TOTAL PARKING AREA (Covered + Open)	**7756.27 Sqm.**
Parking Nos. of Cars	**225 Cars**
Required LIG & EWS Parking (@2 Sqm. each unit)	120 Sqm. (60 Units * 2 Sqm.)
Provision for EWS/LIG Parking	**200 Sqm.**

5.0 PROJECT COMPONENTS ;

The infrastructure facilities planned for the proposed Building Project are highlighted under this part. All the plans for the proposed project have been prepared according to the Building Bye Laws of Bihar. Proposed project will have residential area. The maximum height of the proposed building will be not more than 61.6 meters.

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The proposed project is designed in such a way that natural light and air circulation would enhance the micro-environment of the project area. Adequate natural light and air ventilation will be available in the premises during daytime. It will be helpful in energy conservation significantly. The proposed project will provide space in accordance with the planning parameters of the Modified Building Bye-laws, Bihar. Modern lifestyle amenities, which include adequate power backup, 24X7 security with intercom facility, drinking water & waste water treatment also being proposed in the Project.

5.1 *Community Facility*

The proposed development will include all basic essential facilities as per the prevailing norms in the area. It would also include construction of internal developments like roads, water supply, drains, sewers, electrification, rain water harvesting structure, parking, other utilities and landscape areas.

5.2 *Power Requirement & Availability*

Power requirement: 2650 kW through SBPDCL Grid
Source of Supply: SBPDCL
Back-up Source: 4 Nos. of DG Set of 500 KVA
Energy Consumption per Sq. Ft. Built-up Area: 8.32 Watt/Sq. Ft.

5.3 *Water Requirement & Availability*

The total water requirement for the proposed "Residential Group Housing and commercial building Project" will be will be 477 KLD (121 KLD Domestic Water, 225 KLD Water for swimming pool, 131 KLD STP treated water.) Total Fresh Water requirement during 01st run will be 477 KLD and thereafter 121 KLD fresh ground water required for domestic & 225 KLD for swimming pool. Toilet flushing, Car/Street Washing, Green belt & landscape irrigation and Firefighting water requirement will be met by Treated Water from STP. The fresh water will be sourced through Borewells.

5.4 *Parking Requirement & Availability*

Total 7756.27 Sq. M will be provided for Parking Facility. Out of which 7406.27 Sq. M area has been provided for Covered Parking in Basement and 350 Sqm. in open area. An area of 200 Sqm. has been provisioned for EWS/LIG Parking. Parking provisions will be provided as per guidelines of Bihar Building Bylaws.

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Commercial Parking Requirement as per Bihar Building Byelaws (30 % of total built-up area	241.75 SQ. M. (805.83* 30 %)
TOTAL REQUIRED PARKING AREA	6261.094 + 241.75 = 6502.84 SQM.
Parking Area Provision	Covered Parking: 7406.27 Sqm. Open Parking : 350 Sqm.
PROVISION OF TOTAL PARKING AREA (Covered + Open)	**7756.27 Sqm.**
Parking Nos. of Cars	**225 Cars**
Required LIG & EWS Parking (@2 Sqm. each unit)	120 Sqm. (60 Units * 2 Sqm.)
Provision for EWS/LIG Parking	**200 Sqm.**

5.5 *Manpower Requirement & Availability*

Approx. 100 skilled, unskilled and professional work forces as on temporary basis will be required during the construction period. Temporary proper sanitary facilities will be provided to Construction laborers in form of mobile toilets. Wash areas will be constructed and good hygienic conditions will be maintained. Hence, no adverse impacts on human health are envisaged due to construction activities of proposed Residential Group Housing Project.

50 Nos. of staffs in the form of security & maintenance will be deployed during operation stage of Proposed Residential Group Housing Project.

5.6 *Electrical Vehicle Charging Points Facility:*

Electrical Vehicle Charging Points Facility will be provided in Parking Area.

Type of Vehicle	No. of EV Charging Pointes to be Proposed	Capacity
Two-Wheeler	50 Nos.	3 KW
Four Whelers	25 Nos.	35 KW

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6.0 ENVIRONMENTAL MANAGEMENT PLAN ;

6.1 WATER POLLUTION MANAGEMENT ;

6.1.1 *Construction Phase ;*

- Water requirement during construction phase is expected to be about 15 m^3/day, which will be primarily sourced through Water Tankers. The following control measures will be adopted in order to minimize the construction impacts on water quality of the area:
- Monsoon season would be avoided for construction activity.
- Appropriate sanitation facilities will be provided for the labours to reduce impact on water quality.
- No construction wastewater will be discharged directly on land or into the river. A couple of Sediment traps with retention period of half an hour will be constructed during the construction stage, where all construction wastewater will be collected. After the sedimentation of the construction wastewater, the comparatively cleaner water will be reused for wetting of building materials & structures.

6.1.2 *Operation Phase ;*

The total water requirement for the proposed "Residential Group Housing and commercial building Project" will be will be 477 KLD (121 KLD Domestic Water, 225 KLD Water for swimming pool, 131 KLD STP treated water.) Total Fresh Water requirement during 01st run will be 477 KLD and thereafter 121 KLD fresh ground water required for domestic & 225 KLD for swimming pool. Toilet flushing, Car/Street Washing, Green belt & landscape irrigation and Firefighting water requirement will be met by Treated Water from STP. The fresh water will be sourced through Borewells..

Approx. 164 KLD domestic effluent will be generated from the proposed Residential Group Housing and Commercial Building Project of Shivam Constructions. All these effluents will be sent to 180 KLD capacity STP inside premises for treatment. Characteristics of effluent from proposed building project will be as under;

Parameters	Expected Conc$^{n.}$ of Generated Effluent from proposed Project
1. pH	6.5 - 7.5
2. Suspended Solids mg/l.,	100 – 200 mg/l.

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3. BOD (3 days at 27^0C), mg/l.	50-150 mg/l.
4. COD, mg/l.	150-500 mg/l.
5. Oil & Grease, mg/l.	5-10 mg/l.

A 180 KLD Sewage Treatment Plant (STP) based on MBBR (Moving Bed Bio Reactor) Technology will be installed. Operation details of proposed MBBR technology STP are as under;

Preliminary Treatment: The treatment will include the following unit / equipment;

- Screen Chamber
- Oil & Grease Trap
- Raw Sewage Collection Tank
- Raw Sewage Transfer pumps

Biological Treatment (Secondary Treatment): This will include the following;

- MBBR Bioreactor
- Secondary Clarifier
- Sludge Dewatering System-(Filter press)

Tertiary Treatment: The treatment will include the following unit / equipment;

- Filter feed pumps
- Pressure Sand Filter (PSF)
- Activated Carbon Filter (ACF)
- UV system

The clear supernatant from the Secondary clarifier will be collected in a Filter feed tank this tank will be provided with level switch for unmanned operations. The treated sewage will be pumped to MGF followed by ACF. After ACF treated sewage will be passed through UV filtration for disinfection. After UV filtration treated sewage will be collected in Treated Water Tank.

The treated effluent will be of suitable quality for use as flushing, car washing landscape irrigation & fire water tanks. Treated water Characteristics will be as under;

Expected characteristics of Treated water is as under;

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Parameters	General Standards as per Schedule VI of E(P) Rules for Irrigation of Land	Expected Conc$^{n.}$ (mg/l.)
1. pH	5.5 – 9.0	6.5 – 7.5
2. Suspended Solids mg/l.,	200.0 mg/l.	< 20.0
3. BOD (3 days at 27^{0}C), mg/l.	100.0 mg/l.	< 10.0
4. COD, mg/l.	Not Specified	< 30.0
5. Oil & Grease, mg/l.	10.0 mg/l.	< 2.0

6.1.3 ***Rainwater Harvesting;***

Rain water harvesting with filtration system & recharge wells will be provided for the purpose of recharging ground water.

It is proposed to collect all the Rain Water falling on the Roof surface will be channelize into the Rain Water Catch Basins with in-built recharge pits around the periphery of the proposed Residential Group Housing Project.

RAIN WATER HARVESTING POTENTIAL OF PROPOSED BUILDING PROJECT :-

Type of Area	Area is M^2	Run-Off Coefficient	Annual Avg. Rainfall in m.	RWH Potential (m^3)
Roof Area	1961.47	0.80	0.90	1412

4 Nos. of Recharge Pits (Size :3.0 Ø X 10.0 m deep) will be provided within this building project to recharge ground water aquifer.

6.4 **AIR QUALITY MANAGEMENT;**

6.4.1 ***Construction Phase*** ;

During construction period major sources of dust & smoke are DG Sets, Vehicular movement & construction activities. To mitigate these effects regular water sprinkling will be done all around the construction area and building materials will be stored in covered area by way of covering them with tarpaulin or keeping them in temporary makeshift sheds.

6.4.2 ***Operational Phase*** ;

The sources of air emissions from the proposed project are the stacks attached to DG set Exhaust. The DG sets will run only in case of power failure and hence air emissions from the DG sets are restricted to only such occasions.

The impact of Air Emissions can be minimized in following ways

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- Stack height, of 3.5 m. above the roof of the building where DG Sets will be installed, as per regulatory norms will be provided for the DG sets to ensure satisfactory dispersion of the gaseous pollutants.
- It will be ensured that the stack emissions from DG sets meet prescribed standards for diesel engines as per GSR 489 (E), July11, 2002.
- The DG Sets will be maintained regularly as per preventive maintenance schedules and engine tuning of DG Sets carried out as per recommendations by the manufacturers to ensure stack emission quality within desired limits.
- The secondary source of air emissions is from vehicles movement of the residents & outside guests. It shall be ensured that all such vehicles are maintained on regular basis and meet PUC norms.
- Moreover, 1192.08 Sq. M. area on ground will be developed and maintained for green belt within the project premises. Regular Water Spraying will be done all around the project premises to minimize dust emissions.

6.5 **AMBIENT NOISE MANAGEMENT** ;

6.5.1 ***Construction Phase*** ;

- Equipment generating minimum noise and vibration will be selected for construction phase.
- Vehicles and construction equipment with internal combustion engines will be provided with proper silencers and mufflers in order to reduce noise levels.
- Requisite compliance requirements from contractors for their equipment will be communicated to them before commencing construction.
- To prevent the hearing damage to construction workers, they will be provided with ear plugs and muffs and job rotation will also be practiced.
- Emphasis on carrying out the construction work during day time only.

6.5.2 ***Operational Phase*** ;

- During the operational phase, noise will be generated from the DG sets, compressors, pump rooms & vehicles movement.
- The DG set room, compressors and pump room will be isolated from the outside environment and proper acoustic arrangements will be made to control the noise generated.

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- The noise levels outside these rooms will be maintained within the stipulated norms both during the day and night time.

- It shall be ensured that the new DG sets to be installed for the proposed building project shall comply with all applicable environmental regulations for noise. The DG set shall have an acoustic enclosure and an exhaust muffler that will ensure minimum of 25 dB(A) insertion loss.

- Plantation and landscaping will be designed to ensure that there is a green belt all around the project area so that further noise attenuation is achieved.

- Overall design of facilities, equipment, layout and landscaping is done with a view to maintain pre-project noise level in the post project stage also.

- All efforts will be made to maintain the noise level within the proposed premises around 55 dB(A) in day time & 45 dB(A) during night time.

- Moreover, 1192.08 Sq. M. area on ground will be developed and maintained for green belt within the project premises. Regular Water Spraying will be done all around the project premises to minimize dust emissions.

- Alongside boundary of the proposed building premises tress will be planted which will also act as barrier for outside noise.

6.6 SOLID & HAZARDOUS WASTE MANAGEMENT ;

6.6.1 *Construction Phase* ;

No flammable / hazardous materials will be handled, stored or used beyond the Threshold Limit of MSIHC Rules at Construction site of proposed Project.

- Wherever possible, hazardous raw materials will be substituted by non-hazardous materials e.g. cleaning solvents can be replaced with biodegradable cleaners, usage of non-chlorinated strippers instead of strippers containing methylene chloride and substitution of water based paints for oil based ones.

- On-site composting of bio-degradable wastes and off-site recycling of paint, thinner, solvent wastes and waste oil will be carried out. Segregation and storage of waste paints and thinners, contaminated rags and brushes will be carried out to facilitate recycling and reuse.

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- Vehicle maintenance area shall be designed to prevent contamination of ground water by accidental spillage of oil.
- Appropriate inventory control of all hazardous materials will be maintained.
- It will be ensured that concerned contractors follow prescribed directions regarding the above.

6.6.2 ***Operational Phase*** ;

The collection, transportation and disposal of the solid waste generated during the operation phase of the proposed Building project will be done as per the Municipal Solid Wastes (Management & Handling) Rules, 2016 (MSW Rules).

During operational phase approx. 662 Kg/day solid waste will be generated from proposed Residential Group Housing Project in the form of domestic waste. (@ 0.25 to 0.45 Kg per capita).

SOLID WASTE CALCULATION

Sr. No.	Category	Capacity (Nos.)/Area	Waste Generation (Kg/day/capita)	Waste generated (kg/day)	Bio-Degradable Waste (Kg/day/capita)	Bio-Degradable Waste (Kg/day)	Non-Bio-Degradable Waste (Kg/day)
1	Residential Occupancy	**1310 Nos.**	0.45 kg/person	568	0.36 kg/person	445	96
2	*Visitors*	**196 Nos**	0.36 kg/person	71	0.25 kg/person	49	25
3	*Security Staff and maintenance staff*	**50 Nos**	0.45 kg/person	23	0.36 kg/person	18	22
4	Green Area, Landscaping & Others	1192.08 SQ.M. (0.29 Acres)	5 kg/acres	1	5 kg/acres	1	0
Total Municipal waste generation				**662 Kg/day**		**514 Kg/day**	**148 Kg/day**

All biodegradable and non-biodegradable waste will be handled as per Municipal Solid Waste (Management and Handling) Rule, 2016. Waste from biodegradable bins will be reutilized in bio-composting to prepare organic manure. Non-bio-degradable waste will be disposed off through govt. waste collection system.

2 Nos. bio composting pits of 300 Kg. capacity each (Dimension: L- 2 m. x W – 1 m., D – 1 m.) will be provided within premises for composting of biodegradable waste.

Three-bin system will be adopted. Storage facilities will be created and established by taking into account quantities of waste generation in a given area and the population densities. Different coloured bins for different categories of wastes will be provided.

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Three colour of wheeled bins in each building: - Dark grey for non-recyclable waste, Green for kitchen food/ compostable garden waste and Blue for paper.

In addition, boxes will be provided for the collection of other recyclable materials; a green box is used for paper and a black box is used for cans and plastic collections.

Following measures will be adopted for safe disposal and management of solid wastes from the proposed project ;

a. Waste from biodegradable bins will be reutilized in bio-composting to prepare organic manure.
b. The dried STP Sludge will be used as manure for gardening
c. Waste oil generated from DG Set / Other machinery overhauling and waste transformer oil will be sold off to CPCB / BSPCB authorized vendors for waste oil.
d. Old newspapers & other paper waste and used empty bottles will be sold off to authorized scrap dealers.
e. All the non-bio-degradable waste disposal will be done through Patna Nagar Nigam waste collection system or other authorized vendors.

The used Spent Oil from DG sets would be carefully stored in HDPE drums in isolated covered facility and disposed off through CPCB/BSPCB authorized recyclers as per guidelines of Hazardous and Other Wastes (Management and Transboundary Movement) Rules '2016.

Following measures will be adopted for safe disposal and management of solid wastes from the proposed project ;

a. Waste oil generated from DG Set / Other machinery overhauling and waste transformer oil will be sold off to CPCB / BSPCB authorised vendors for waste oil.

b. Old newspapers & other paper waste and used empty bottles will be sold off to a scrap dealer.

The used Spent Oil from DG sets would be carefully stored in HDPE drums in isolated covered facility and disposed off through CPCB/BSPCB authorized recyclers as per guidelines of Hazardous and Other Wastes (Management and Transboundary Movement) Rules '2016.

6.7 GREEN BELT DEVELOPMENT AND LANDSCAPING :-

An area of 1192.08 Sq M (21 % of total plot area) area on ground will be developed and maintained for green belt within the project premises. After construction of the Residential Group Housing Projects, trees will be grown to the maximum extent all around the premises boundary.

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As per the requirement of EIA Notification 2006 amendment vide Gazette Notification No. S.O. 3999(E) dt: 09.12.2016, one tree / 80 sq. M. should be planted in case of building & construction projects, approx. 70 nos. of trees will be planted within and all around the proposed building premises.

While carrying out plantation within premises or outside the following considerations will be given for choice of types of trees:

- Species of trees and plants suitable for the local agro-climatic and soil conditions will be selected.
- Natural hedgerows will be preferred over fencing wherever possible.
- Trees with large canopies will be chosen which will serve as natural air filters, noise attenuators and umbrellas.
- Automatic irrigation systems will be installed. Irrigation will preferably be carried out at night so that less water is lost in evaporation and most of the water naturally percolates to groundwater through the soil.
- Location of trees and shrubs will be chosen such that they provide a natural shield to the buildings from natural ailments like excessive sunlight and rain.
- Organic manure made from garden waste (dry leaves etc.) & STP sludge will be used so that dependence on chemical fertilizer can be reduced.
- Following species will be planted within the premises of proposed Residential Group Housing Project

• Crotons
• Coleus
• Colocasia
• English Laurel
• Song of India
• Roses
• Jasmine
• Chrysanthemum
• Gerbera
• Marigold
• Geranium
• Dahlia
• Daffodils
• Tulips

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• Bird's Nest Fern
• Bougainvillea
• Arabian Jasmine
• Orchid Tree
• Bottle Brush
• Jungle Flame or West Indian Jasmine

6.8 ENVIRONMENT CONSERVATION CONSIDERATIONS ;

Following initiatives may be considered (if feasible within economic constraints) for energy conservation & preserving the environment ;

- Switching to low-flow toilets or installing toilet tank fill diverters
- Installation of low-flow showerheads and sink aerators
- Switching to compact fluorescent light bulbs in lobbies and common areas and use of sensors and/or timers for areas that are infrequently used.
- Awareness program for residential owner of the proposed Residential Group Housing Projects to close drapes and turn off lights and turn off heating / air conditioning when rooms are unoccupied.
- Installation of window film to lower heating and cooling loads
- Provision of recycler baskets for newspaper, white paper glass, aluminum, cardboard and plastic.
- Provision of recycling bins to make recycling as easy as possible.
- Use of least toxic cleaners, sanitizers, paints, pesticides etc. throughout and ensuring all chemicals are stored safely in a well ventilated area.
- Monitoring and tracking rates of energy and water use. Making repairs or replace equipment when rate changes indicate problems.
- Creating an incentive program to encourage management staff to participate in and improve upon environmentally friendly practices.
- 5% power of total power requirement i.e., 132 kW of power for common lighting purpose will be sourced through solar panels on the roof.

6.9 ENVIRONMENTAL MONITORING PROGRAM ;

Monitoring / Sampling stations will be fixed as per recommendation of Environmental Clearance to assess the ambient levels in relevant areas of environment after the commissioning of the project. An environmental monitoring programme is important as it provides useful information on the following aspect:

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i) It helps to verify the predictions on environmental impacts presented in this study.

ii) It helps to indicate warnings of the development of any alarming environmental situations, and thus, provides opportunities for adopting appropriate control measures.

The monitoring programme in different areas of environment are outlined below;

POST PROJECT ENVIRONMENTAL MONITORING PROGRAM

Area of Monitoring	Frequency of sampling	Parameters to be Analyzed
Ambient Air Quality	Quarterly	PM_{10}, $PM_{2.5}$, SO_2, NO_2 & O_3
DG Set Stack Emission	Quarterly	PM, SO_2 & NO_2
Ground Water Quality	Monthly	As per IS 10500:2012
Effluent sample before & after STP	Monthly	In accordance with EPA, 1986 and requirement of Central Pollution Control Board (CPCB)
Noise	Quarterly i.e. once in three months	Ambient Equivalent continuous Sound Pressure Levels (Leq) at Day and Night Time

6.10 ENVIRONMENTAL BUDGET FOR STATUTORY COMPLIANCES;

Sr. No.	EHS Component	One Time Installation Cost	Recurring Cost / Annum
1.	Installation of STP & Water Treatment Plant	Rs. 20 Lakhs	Rs 10 Lakhs
2.	Installation of SPV and Solar Lighting System	Rs. 25 lakhs	Rs. 5 Lakhs
3.	Installation of Fire Fighting & Management System	Rs. 25 Lakhs	Rs. 2 Lakhs
4.	Environmental Monitoring as per requirement of EC	---	Rs. 10 Lakhs
5.	Green Belt Development & Maintenance	Rs. 15 Lakhs	Rs. 5 Lakhs
6.	Rain Water Recharging (4 Nos.)	Rs. 5 Lakhs	Rs. 0.25 Lakhs
7.	Municipal Solid waste (Bio composting pits – 2 Nos. 300 kg/day)	Rs. 3 Lakhs	Rs. 0.25 Lakhs
TOTAL AMOUNT		**Rs. 93 Lakhs**	**Rs. 325 Lakhs ~ 33 Lakhs**

After the completion of Construction work of proposed residential project of M/s Shivam Constructions, Residential Group Housing and Commercial Building Project will be handed over to

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respective buyers. Owner Society will carry out environmental monitoring & management work as per conditions imposed in Environmental Clearance issued by State Expert Appraisal Committee, Bihar. A fixed amount as per above budget will be allocated for Environmental Monitoring & Management work of proposed Residential Group Housing Project. All these work will be accomplish under the supervision of Secretary or his authorized representative of the Owner Society of the proposed building project.

7.0 DISASTER & EMERGENCY MANAGEMENT PLAN

Emergency prevention through good design, operation, maintenance and inspection are essential to reduce the probability of occurrence and consequential effect of such eventualities. However, it is not possible to totally eliminate such eventualities and random failures of equipment or human errors, omissions and unsafe acts cannot be ruled out. An essential part of major hazard control has therefore, to be concerned with mitigating the effects of such Emergency and restoration of normalcy at the earliest.

The overall objective of an Emergency Response Plan (ERP) is to make use of the combined resources at the site and outside services to achieve the following:

1. To localize the emergency and if possible, eliminate it;
2. To minimize the effects of the accident on people and property;
3. Effect the rescue and medical treatment of casualties;
4. Safeguard other people;
5. Evacuate people to safe areas;
6. Informing and collaborating with statutory authorities;
7. Initially contain and ultimately bring the incident under control;
8. Preserve relevant records and equipment for the subsequent enquiry into the cause and circumstances of the emergency;
9. Investigating and taking steps to prevent reoccurrence

The ERP has therefore to be related to the identification of sources from which hazards can arise and the maximum credible loss scenario that can take place in the concerned area. The plan takes into account the maximum credible loss scenario-actions that can successfully mitigate the effects of losses/emergency need to be well planned so as they would require less effort and resources to control and terminate emergencies, should the same occur.

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7.1 RESPONSE IN CASE OF EARTHQUAKE

Response Procedures for Occupants

If indoor

1. Take shelter under heavy furniture or against an inside wall and hold on
2. Stay inside: the most dangerous thing to do during the shaking of an earthquake is to try to leave the building because objects can fall on you.

If outdoors

Move into open, away from building, streetlights and utility wires. Once in the open, stay there until the shaking stops.

After the quake

1. After the quake be prepared for aftershocks
2. Although smaller than the main shock, aftershocks cause additional damage and may bring weakened structures down. Aftershocks can occur in the first hours, days, weeks or even months after the quake. Help injured or trapped persons:

1. Give first aid where appropriate. Do not move seriously injured persons unless they are in immediate danger of further injury. Call for help.
2. Remember to help those who may require special assistance-infants, the elderly and people with disabilities.
3. Stay out of damaged buildings.
4. Use the telephone only for emergency calls.

Response Procedure for Emergency Team

1. Formulate an Emergency Response Team for earthquake response.
2. Using the public address system, inform residents of response procedures discussed above.
3. Inform the necessary authorities for aid.
4. Ensure no residents are stuck beneath any debris, in case of a structural failure.
5. Ensure that all residents standing outside near the buildings are taken to open areas.
6. Ensure that the first aid ambulance and fire tender vehicles are summoned if necessary.
7. Inform the nearby hospitals if there are any injuries.
8. Check the utilities and storage tanks for any damage.

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7.2 RESPONSE FOR LPG LEAKAGE

1. The affected area should be evacuated and cordoned off immediately.
2. Initiate an emergency response team for LPG leakage.
3. Ensure that only concerned personnel are present in the affected area and all other personal and visitors are moved to the nearest assembly points.
4. Rescue trapped personnel, also check if any personnel are unconscious in the area and immediately move them outside and provide first aid. Ambulance should be summoned to take injured personnel to the nearest hospital.
5. Personnel in the nearby buildings to close all doors and windows to prevent entry of the leaked gas.
6. Source of leakage to be traced and isolated from all the other areas. And if required use pedestal fans to bring down the gas concentration.
7. In case of a fire follow the instruction in case of fire.

7.3 RESPONSE IN CASE OF FIRE

1. Required response during in the event of a fire should be described in signs located in the lobby.
2. Inform the Fire department.
3. If the fire is small, engage in extinguishing the fire using the nearest fire extinguisher.
4. The emergency response team will provide immediate relief to the injured residents at the scene of incident. Any injured persons should be evacuated on priority to the dispensary or one of the nearest hospitals based on their conditions.

7.4 Instructions for the Occupants-

1. Get out of buildings as quickly and as safely as possible.
2. Use the stairs to escape. When evacuating, stay low to the ground.
3. If possible, cover mouth with a cloth to avoid inhaling smoke and gases.
4. Close doors in each room after escaping to delay the spread of the fire.
5. If smoke is pouring in around the bottom of the door or if it feels hot, keep the door closed.
6. Open a window to escape or for fresh air while awaiting rescue.
7. If there is no smoke at the bottom or top and the door is not hot, then open the door slowly.
8. If there is too much smoke or fire in the hall, slam the door shut.

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9. Stay out of damaged buildings.
10. Check that all wiring and utilities are safe.

8.0 FIRE FIGHTING FACILITIES ;

In the proposed Residential Group Housing Project following considerations have been taken for Fire Fighting arrangements;

i. Hydrant & Sprinkler system will be common
ii. Sprinkler system will fed from the Hydrant riser and being the residential complex, sprinkler system will be restricted only in the basement and parking areas.
iii. Single Jockey pump will be used to maintain the pressure on hydrant system.
iv. Electrically operated hydrant pump to be used under the DG Supply only and not under the grid supply.
v. Electrical load for jockey pump only to be considered under the grid supply.
vi. Another diesel operated pump of same capacity to be kept as stand by.

Recommendation by the State Fire Office will be followed during the operational phase of the project. The following provisions will be made for combating fire hazards ;

a. Underground Fire Water Tank & Pump Room
b. Hydrant System & Wet Riser Piping
c. Automatic Smoke Detectors
d. Automatic Sprinkler System
e. Fire Alarm System
f. Portable CO_2 Fire Extinguishers.
g. Fire Hose Reel

Moreover, Emergency Evacuation Plan will be displayed at all strategic locations within the proposed Residential Group Housing Project Premises.

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