

FORM-1 A

CHECK LIST OF ENVIRONMENTAL IMPACTS

(Project proponents are required to provide full information and wherever necessary attach explanatory notes with the Form and submit along with proposed environmental management plan & monitoring Programme)

1. LAND ENVIRONMENT

(Attach panoramic view of the project site and the vicinity)

- 1.1 Will the existing landuse get significantly altered from the project that is not consistent with the surroundings? (Proposed landuse must conform to the approved Master Plan / Development Plan of the area. Change of landuse if any and the statutory approval from the competent authority be submitted). Attach Maps of (i) site location, (ii) surrounding features of the proposed site (within 500 meters) and (iii) the site (indicating levels & contours) to appropriate scales. If not available attach only conceptual plans.

M/s Kumar Buildcon (P) Ltd Proposed "Residential Building Project" are 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. Site location (SOI toposheet), Patna Master Plan, 500 m. radius surrounding Google map and site photographs are attached herewith as Fig. 1, Fig. 2, Fig. 3 & Fig. 4 respectively.

Kumar Buildcon (P) Ltd, proposed new Project comprises of Residential building project is located at Mauza- Khilchipur Digha, PS- Phulwari (Old), Digha (New), Dist.- Patna, State- Bihar.

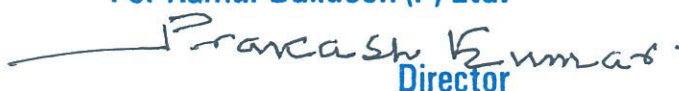
Existing land use is a vacant land for Residential building purpose. Due to this project, the site will accommodate multistoried buildings, with redesigned internal roads, service facilities, Parking and Green Area. However, as per Master Plan of Patna, the Land use of the project site, which is currently "Residential", will not change. Proposed project will be developed as per approved plan. Total 15291.61 Sq. M. land will be utilized for "Residential building project" of Kumar Buildcon (P) Ltd. The project is consistent with the surroundings of the project area. Surrounding area comprises of residential flats, schools, offices and health care facilities. Proposed Project is coming up on land under Development Agreement between land owners and Developer at Plot No. 3148, 3149, 3150, 3177, 3185, 3186, 3187, 3188, 3192, 3195, 3196, 3184, 3176 Khata No- 1123, 1133, 841, 856, 876, 888, 953, 1838, 971 Tauzi No – 5177, 5174, 5600, Thana No – 01, P.S – Phulwari (Old), Digha (New), Mauza – Khilchipur Digha, Dist.: Patna, State: Bihar.

Site Plan of proposed residential buildings is enclosed herewith as Annexure – I.

Development Agreement copy is enclosed herewith as Annexure – II.

Total cost of the project is approx. Rs. 62 Crores.

For Kumar Buildcon (P) Ltd.


Director

The Geo Co-ordinates of the project site are as under;

Corners	Latitude	Longitude
A	25°38'7.72"N	85° 5'51.52"E
B	25°38'11.46"N	85° 5'51.35"E
C	25°38'13.73"N	85° 5'52.08"E
D	25°38'13.79"N	85° 5'52.81"E
E	25°38'11.71"N	85° 5'52.84"E
F	25°38'11.82"N	85° 5'53.70"E
G	25°38'11.06"N	85° 5'53.72"E
H	25°38'11.01"N	85° 5'55.05"E
I	25°38'10.92"N	85° 5'55.06"E
J	25°38'10.85"N	85° 5'55.80"E
K	25°38'9.06"N	85° 5'55.53"E
L	25°38'8.95"N	85° 5'56.26"E
M	25°38'8.58"N	85° 5'56.17"E

The various features in the vicinity of the project area are as follows;

West	Rajeev Nagar, Ganaga Vihar Colony, Atal Path Road
East	Laxmi Nagar, Digha, Balapur
North	Shivaji Nagar, Balapur, Lalu Nagar, Digha, Mukhdumpur
South	Balupar Ln Road, Patliputra Colony

Topographical Map and Site & Surroundings location map of 500 m. radius area is shown hereunder;

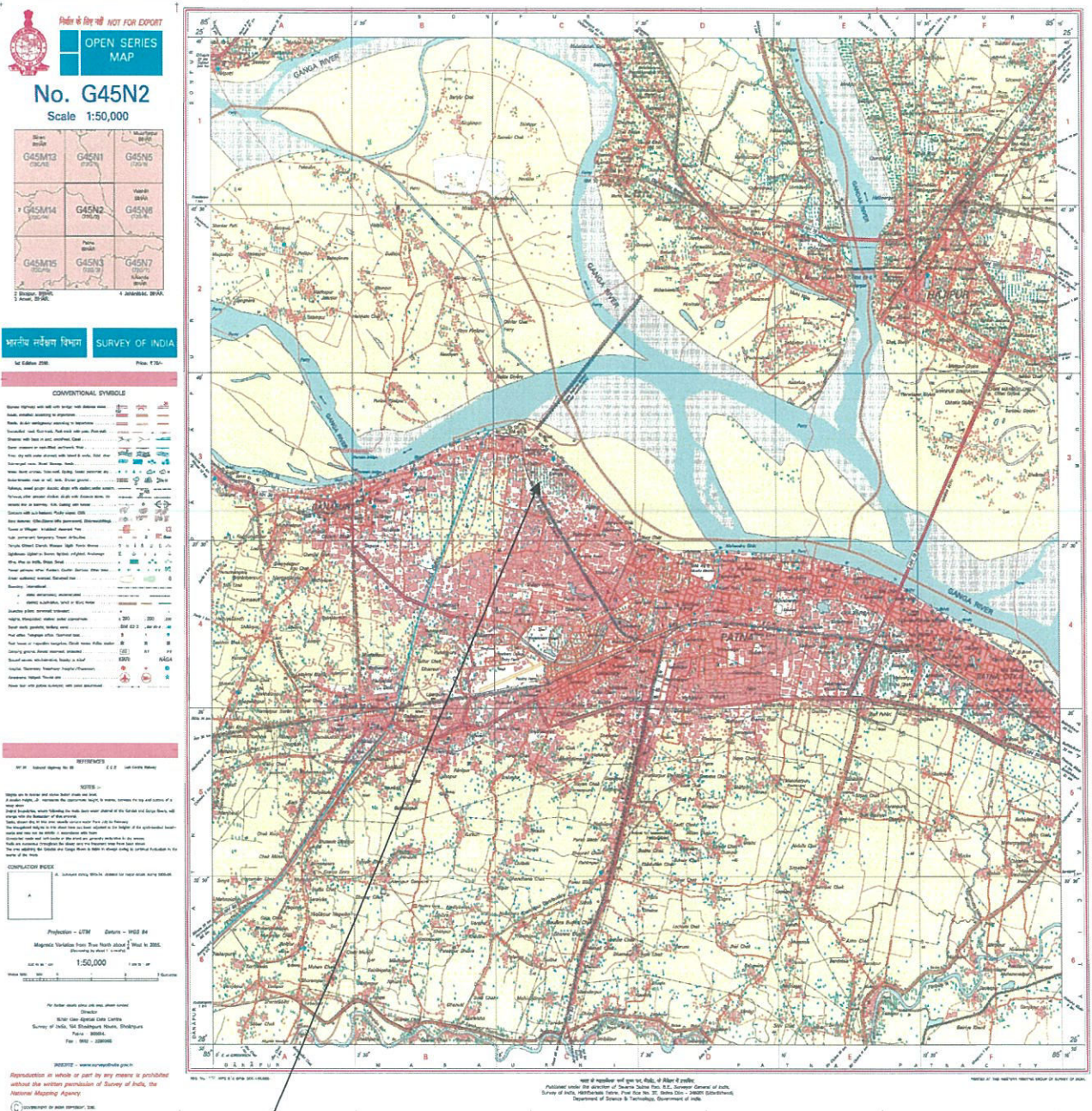
For Kumar Buildcon (P) Ltd.

Pankaj Kumar
Director

For Kumar Buildcon (P) Ltd.

Director

Fig. – 1 PROPOSED PROJECT SITE ON TOPOSHEET MAP



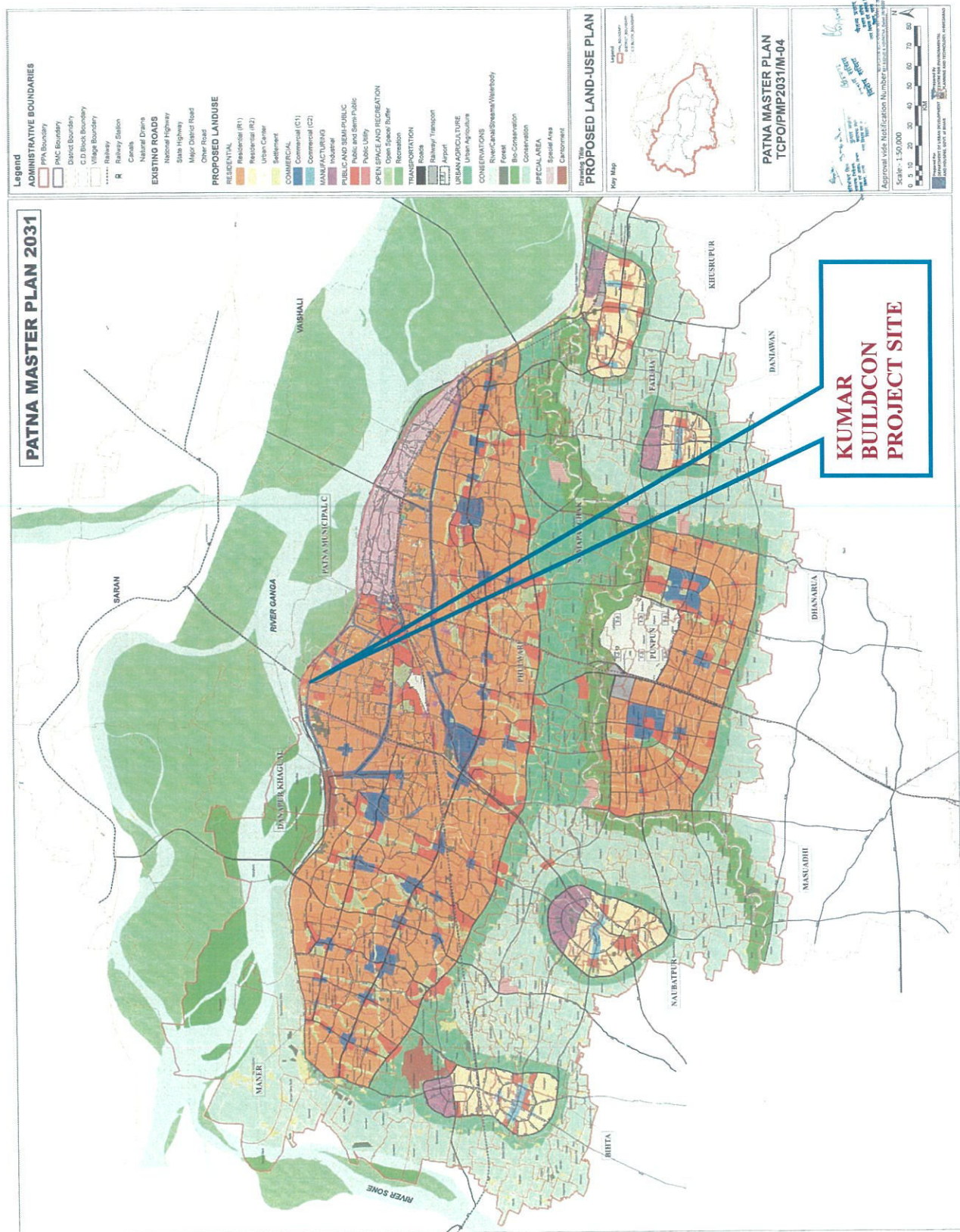
M/s Kumar Buildcon
At: Mauza- Khilchipur Digha,
PS- Digha, Dist- Patna,
State- Bihar

Source: Survey of India Toposheet No. G45N2 Scale 1:50,000

For Kumar Buildcon (P) Ltd.

Prakash Kumar
Director

FIG-2. PATNA MASTER PLAN SHOWING PROJECT LOCATION



For Kumar Buildcon (P) Ltd.

For Kumar Buildcon (P) Ltd.

Director

For Kumar Buildcon (P) Ltd.
Director

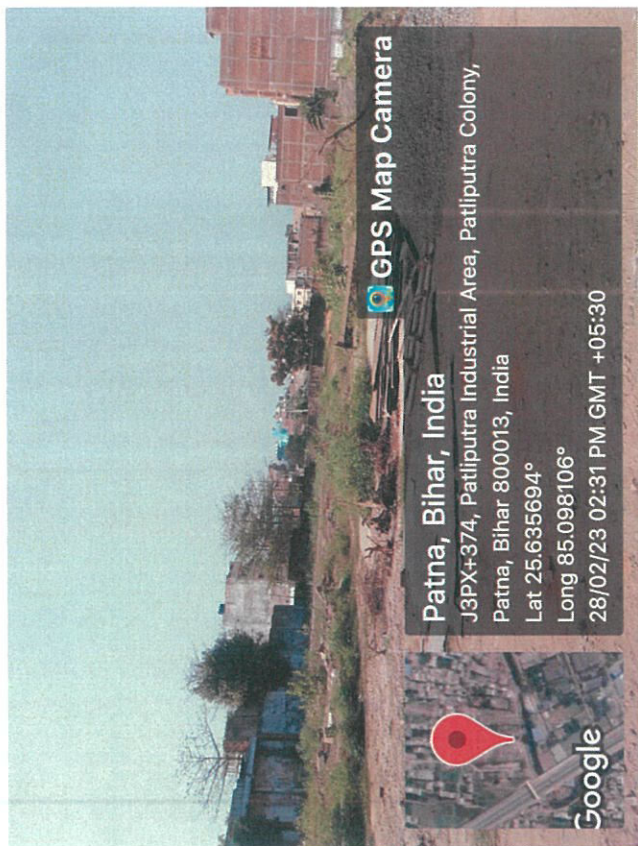
FIG. – 3 SURROUNDINGS LOCATION MAP OF 500 M. RADIUS AREA



For Kumar Buildcon (P) Ltd.

Poonkash Kumar
Director

FIG. -4 SITE PHOTOGRAPHS



For Kumar Buildcon (P) Ltd.

Prakash Kumar

Director

1.2

List out all the major project requirements in terms of the land area, built up area, water consumption, power requirement, connectivity, community facilities, parking needs etc.

Land & Area Details of “Residential Building Project” of Kumar Buildcon (P) Ltd. are as under ;

Total Built-up Area Details of Tower 01, 02, 03 & 04						
Floor	Tower 01 (B+G+19) (Residential) (Sq.mt.)	Tower 02 (B+G+19) (Residential) (Sq.mt.)	Tower 03 (B+G+19) (Residential) (Sq.mt.)	Tower 04 (B+G+17) (Residential) (Sq.mt.)		
				LIG	EWS	Total
Basement	7801.16					7801.16
Ground Floor	254.8	234.14	14.53	14.5	0.0	517.97
1 st Floor	812.2	606.49	606.49	164.61	181.09	2370.88
2 nd Floor	812.2	606.49	606.49	164.61	181.09	2370.88
3rd. Floor	812.2	606.49	606.49	164.61	181.09	2370.88
4th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
5th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
6 th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
7 th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
8 th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
9 th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
10 th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
11 th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
12 th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
13 th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
14 th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
15 th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
16 th Floor	812.2	606.49	606.49	164.61	181.09	2370.88
17 th Floor	812.2	606.49	606.49	175.4	--	2200.58
18 th Floor	626.3	548.81	548.81	--	--	1723.92
19 th Floor	509.3	363.48	363.48	--	--	1236.26
Total	15197.8	11456.76	11237.15	2823.66	2897.44	51413.97
Built up area of Club			299.13 Sq. m.			
Total Built-up Area of All Building			51713.1 Sq. m			
Total Parking Area Provision			12405.22 Sq. m			
Total No. of Residential Flats			Tower 01: 72 Nos- 4 BHK; Tower 02: 72 Nos – 3 BHK; Tower 03: 72 Nos – 3 BHK; Tower 04 (LIG & EWS): 99 Nos – 1 BHK Total: 315 Nos.			
Green Belt & Green Area			6987.72 Sq. m			
Total Plot Area			15291.61 Sq. m.			
Maximum Height of Buildings			65 m			

- **Water Consumption:** 237 KLD (117 KLD Fresh Water through Municipal water supply /Borewells & 120 KLD STP treated water)
- **Power requirement:** 2560 kW through BSEB Grid
- **Connectivity:** The project site is located at Mauza- Khilchipur Digha, PS- Phulwari (Old), Digha (New), Dist.- Patna, State- Bihar connecting Atal Path Road (0.13 Km.) and Bakipur-

For Kumar Buildcon (P) Ltd.

Pooresh Kumar
Director

Danapur Road (0.90 Km.) in West and North-East direction respectively. The Digha Bridge Halt Railway station in the NW (2.12 Km.) from the project site. The nearest airport is Patna Airport, at 4.79 km SW 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 12405.22 Sq. M will be provided for Parking Facility. Out of which 12067.72 Sq. M area has been provided for Covered Parking in Building floor area and Ground Floor area & rest of 337.50 Sq. M area has been provided parking in open area. Parking provisions will be provided as per guidelines of Bihar Building Bylaws.

Parking Requirement	Details of the Parking Area
Parking Requirement as per Bihar Building Byelaws (25 % of total built-up area of Residential Area excluding 15% service area)	10989.03 SQ. M. (43956.13* 25 %)
Parking Area Provision	COVERED PARKING: 12067.72 SQ:M. OPEN PARKING: 337.50 SQ. M.
TOTAL AREA FOR PARKING (Covered + Open)	12405.22 Sqm.
Parking Nos. of Cars	414 Cars

1.3 What are the likely impacts of the proposed activity on the existing facilities adjacent to the proposed site? (Such as open spaces, community facilities, details of the existing landuse, disturbance to the local ecology).

- Increased traffic volume & Water use are major impacts envisaged due to proposed “Residential Building Project” of Kumar Buildcon (P) Ltd. site is located at Mauza-Khilchipur Digha, PS- Phulwari (Old), Digha (New), Dist.- Patna, State- Bihar connecting Atal Path Road (0.13 Km.) and Bakipur-Danapur Road (0.90 Km.) in West and North-East direction respectively. The Digha Bridge Halt Railway station in the NW (2.12 Km.) from the project site. The nearest airport is Patna Airport, at 4.79 km SW from the project site.

There will be no disturbance to local ecology of the area, as waste water generated from the “Residential Building Project” of M/s. Kumar Buildcon (P) Ltd. Residential Building Project will be treated in STP inside the premises & treated water will be reused within the premises for car washing, irrigation of green areas, fire water tanks and balance treated water will be discharge to govt. Drains.

1.4 Will there be any significant land disturbance resulting in erosion, subsidence & instability? (Details of soil type, slope analysis, vulnerability to subsidence, seismicity etc may be given).

For Kumar Buildcon (P) Ltd.


Director

The Soil of the study area has been developed under the dominant influence of river, vegetation and climatic factors. The site is clear and surface level is flat. Also, for execution of the proposed buildings piling activities will take place. Therefore, while executing the project, the existing ground level will be modified. But, adequate measure will be taken to minimize the land disturbance of the project site and surrounding areas.

The area under study falls in Zone-IV according to the Indian Standard Seismic Zoning Map. Suitable seismic coefficients in horizontal and vertical directions respectively, will be adopted while designing the structures.

1.5 Will the proposal involve alteration of natural drainage systems? (Give details on a contour map showing the natural drainage near the proposed project site)

No intersection or alteration in natural drainage system envisaged due to Proposed Residential Building Project by Kumar Buildcon (P) Ltd.. Well planned storm water drainage has been designed to take care of internal storm water drainage. There is also plan of govt. drains in the surrounding areas, therefore, problem of water logging will not arise due to building project.

1.6 What are the quantities of earthwork involved in the construction activity-cutting, filling, reclamation etc. (Give details of the quantities of earthwork involved, transport of fill materials from outside the site etc.)

For the construction of proposed Residential Building Project cutting works are involved for basement floor. Approx. 7801.16 m³ of soil will be excavated for basement. All the excavated soil will be used for filling of the site and for land leveling purposes and future green belt development activity.

1.7 Give details regarding water supply, waste handling etc during the construction period.

Water requirement during construction phase is expected to be about 15 m³/day, which will be met by water tankers.

There are no demolition works, however, whatever waste will be generated during construction period will be used for filling purposes.

1.8 Will the low lying areas & wetlands get altered? (Provide details of how low lying and wetlands are getting modified from the proposed activity)

Not Applicable. As there are no low lying & wetlands areas at the proposed Residential Building Project area.

1.9 Whether construction debris & waste during construction cause health hazard? (Give quantities of various types of wastes generated during construction including the construction labour and the means of disposal)

There is no such construction activity which can cause health hazard. However, generated waste will be sold to authorized vendors.

For Kumar Buildcon (P) Ltd.

Director

For Kumar Buildcon (P) Ltd.

Pankaj Kumar
Director

2.0 WATER ENVIRONMENT

2.1 Give the total quantity of water requirement for the proposed project with the breakup of requirements for various uses. How will the water requirement met? State the sources & quantities and furnish a water balance statement.

The total water requirement for the proposed "Residential Building Project" of M/s Kumar Buildcon (P) Ltd. will be 237 KLD (117 KLD Fresh Water through Municipal water supply /Borewells, 120 KLD STP treated water.) Total Fresh Water requirement during 01st run will be 237 m³/day and thereafter 117 KLD fresh Municipal water/ground water required for domestic. Toilet flushing, Car/Street Washing, Green belt & landscape irrigation and Fire fighting water requirement will be met by Treated Water from STP. The fresh water will be sourced through Borewells. Water Budget & Water Balance for the Building Project are shown here as under;

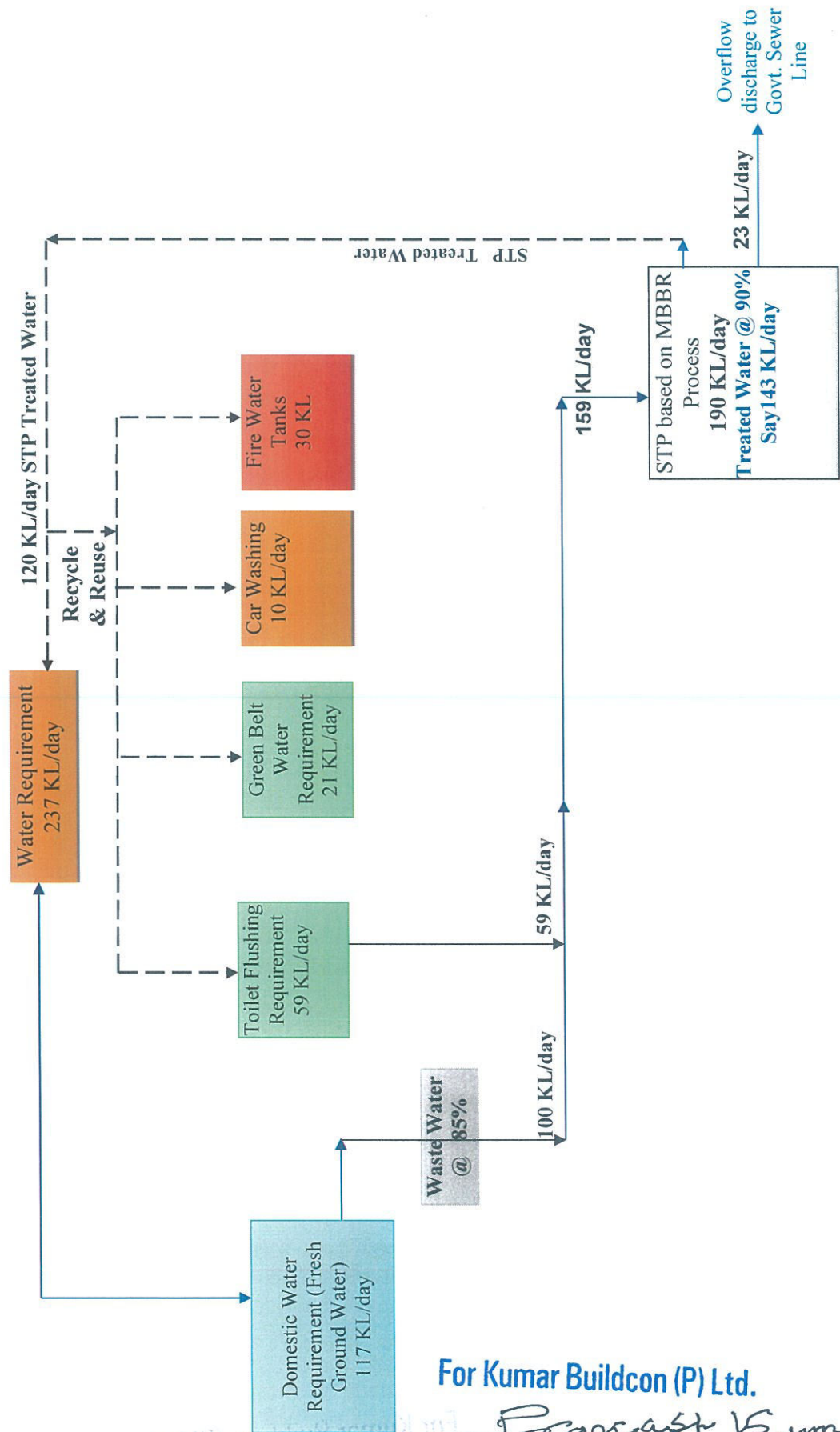
WATER BUDGET :-

Components	Occupancy / Area	Requirements as per MoEF / NBC Guidelines			Actual Requirement in KLD
		Domestic (Fresh Water) Requirement	Flushing (Treated Water) Requirement	Total Requirement	
Residential Flat Occupancy	1276 Nos.	90 Ltr./day/head	45 Ltr./day/head	135 Ltr./day/head	172.2 (Domestic 114.8 & Flushing 57.4)
Visitors @15% of the Residential Occupancy	191 Nos.	10 Ltr./day/head	5 Ltr./day/head	15 Ltr./day/head	3.0 (Domestic 2.0 & Flushing 1.0)
Security & Maintenance Staff	10 Nos.	20 Ltr./day/head	25 Ltr./day/head	45 Ltr./day/head	0.5 (Domestic 0.2 & Flushing 0.3)
Total Fresh Ground Water Requirement for Domestic Use					117.0
Toilet Flushing Water Requirement (STP Treated Water)					58.7 ~ 59
Horticulture, Landscaping & Miscellaneous; 6987.72 Sq. m @ 3 lit/Sqm/day (STP Treated Water)					21
Street /Car Washing (STP Treated Water)					10
Fire Fighting Tanks (STP Treated Water)					30
TOTAL WATER REQUIREMENT				237 KLD max^m.	

For Kumar Buildcon (P) Ltd.

Pooja sh
Director

WATER BALANCE FOR PROPOSED "RESIDENTIAL BUILDING PROJECT" OF KUMAR BUILDCON (P) LTD.



For Kumar Buildcon (P) Ltd.

Forcast Kumar
Director

2.2 What is the capacity (dependable flow or yield) of the proposed source of water?

Fresh water will be sourced through water tankers to meet the overall water requirement of the proposed construction activity. During operation phase water requirement will be met through Municipal Water supply/borewell.

2.3 What is the quality of water required, in case, the supply is not from a municipal source? (Provide physical, chemical, biological characteristics with class of water quality)

Fresh water will be sourced through Municipal Water Supply/Bore wells within premises. Ground Water Characteristics of the project area is enclosed herewith.

S.N.	Parameters	Unit	Method of Test	Limit as per IS 10500 : 2012		Results
				Limit (mg/l.) Acceptable	Permissible Limit in the absence of alternative source	
1	Colour	Hazen	IS 3025 (Part-4)	5	15	< 5.00
2	Odour	----	IS 3025 (Part-5)	Agreeable	Agreeable	Agreeable
3	Taste	----	IS 3025 (Part-7))	Agreeable	Agreeable	Agreeable
4	pH	----	IS 3025 (Part-11)	6.5 to 8.5	No relaxation	7.47
5	Turbidity on NTU	NTU	IS 3025 (Part-10)	1.0	5.0	0.8
6	Total Dissolved Solids (TDS)	mg/l.	IS 3025 (Part-16)	500.00	2000.00	308.0
7	Total Hardness as CaCO ₃	mg/l.	IS 3025 (Part-21)	200.00	600.00	208.0
8	Calcium as Ca	mg/l.	IS 3025 (Part-40)	75.00	200.00	50.5
9	Magnesium as Mg	mg/l.	IS 3025 (Part-46)	30.00	100.0	19.9
10	Iron as Fe	mg/l.	IS 3025 (Part-53)	1.0	No relaxation	0.34
11	Residual Free Chlorine	mg/l.	IS 3025 (Part-26)	0.2	1	<0.1
12	Total Alkalinity as CaCO ₃	mg/l.	IS 3025 (Part-23)	200.00	600.00	250.0
13	Chloride as Cl	mg/l.	IS 3025 (Part-32)	250.00	1000.00	22.0
14	Sulphate as SO ₄	mg/l.	IS 3025 (Part-24)	200.00	400.00	23.7
15	Nitrate as NO ₃	mg/l.	IS 3025 (Part-34)	45.00	No relaxation	2.05
16	Fluoride as F	mg/l.	APHA 4500 (F D)	1.0	1.5	0.30

Analysis Report Enclosed as Annexure – III

2.4 How much of the water requirement can be met from the recycling of treated wastewater? (Give the details of quantities, sources and usage)

Approximately 120 KLD treated sewage will be reused for toilet flushing, car/street washing, irrigation of landscape & green belt within premises & Fire water tanks. Balance treated water will be discharged to govt. drains.

2.5 Will there be diversion of water from other users? (Please assess the impacts of the project on other existing uses and quantities of consumption)

No, there will not be any diversion of water from other users because water will be extracted through Municipal water supply/borewells.

2.6 What is the incremental pollution load from wastewater generated from the proposed activity? (Give details of the quantities and composition of wastewater generated from the proposed activity)

For Kumar Buildcon (P) Ltd.

Director

For Kumar Buildcon (P) Ltd.

Pooja Kishor
Director

Approx. 159 KLD waste water will be generated from the proposed Residential Building Project. All waste water generated will be treated in STP and reused for toilet flushing, car/street washing, landscape irrigation & Fire water storage tanks. Characteristics of effluent from proposed building project will be as under;

Parameters	Expected Conc ⁿ . of Generated Effluent from proposed Project
pH	6.5 - 7.5
Suspended Solids mg/l.,	100 – 200 mg/l.
BOD (3 days at 27°C), mg/l.	50-150 mg/l.
COD, mg/l.	150-500 mg/l.
Oil & Grease, mg/l.	5-10 mg/l.

At present there is no sewage line, so we will discharge our treated effluent to soak pit within premises.

2.7 Give details of the water requirements met from water harvesting? Furnish details of the facilities created.

No water requirement will be met from rain water harvesting in the proposed building Project. Rather, rain water from the roof of the proposed buildings will be collected and discharged into ground water aquifer through recharge pits.

RAIN WATER HARVESTING POTENTIAL OF PROPOSED BUILDING PROJECT :-

Type of Area	Area is M²	Run-Off Coefficient	Annual Avg. Rainfall in m.	RWH Potential (m³)
Roof Area	4513.37	0.80	0.90	3,249.6
TOTAL				3,249.6 M³
Annual Rainwater Harvesting Potential				

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.

2.8 What would be the impact of the land use changes occurring due to the proposed project on the runoff characteristics (quantitative as well as qualitative) of the area in the post construction phase on a long term basis? Would it aggravate the problems of flooding or water logging in any way?

The proposed project will not cause any adverse impact on runoff characteristics. All the drains within the proposed Residential Building Project will be connected with main govt. drain outside the premises. Further, Rainwater harvesting scheme is proposed to collect the rainwater falling within the project premises which will be used for groundwater recharge. Proposed building Project will not aggravate the problems of flooding or water logging in any way as there will be proper drainage network within the premises for storm water management which will be finally connected to govt. drain.

For Kumar Buildcon (P) Ltd.

Poonam K. V.
Director

2.9 What are the impacts of the proposal on the ground water? (Will there be tapping of ground water; give the details of ground water table, recharging capacity, and approvals obtained from competent authority, if any)

- Ground water will be abstracted through borewells.
- Ground Water depth of the area is approx. 3.2-7.5 m. bgl during pre monsoon & 6.57-7.5 m. bgl during Post monsoon. (Source: CGWB Data)
- Annual Rain Water Harvesting Potential: 3,249.6 M³

2.10 What precautions/measures are taken to prevent the run-off from construction activities polluting land & aquifers? (Give details of quantities and the measures taken to avoid the adverse impacts)

The following control measures will be adopted in order to minimize the construction impacts on water quality :

- o Appropriate sanitation facilities will be provided for the labours to reduce impact on water quality.
- o No construction wastewater will be discharged directly on land or into the river as there is no river within 500 m. where drainage slope of the project is leading. 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 may be reused for wetting of building materials & structures.

2.11 How is the storm water from within the site managed? (State the provisions made to avoid flooding of the area, details of the drainage facilities provided along with a site layout indication contour levels)

Storm water from the proposed Residential Building Project will be discharge to govt. drains. There will be properly designed drain network within the proposed project. Premises which will be finally connected to govt. drain.

2.12 Will the deployment of construction labourers particularly in the peak period lead to unsanitary conditions around the project site (Justify with proper explanation)

No, as most of the construction labours are from local areas. However, following measures will be adopted to avoid unsanitary conditions around the project site ;

- Proper on-site sanitation facilities will be provided for the construction labourers so as to avoid defecation in and around project site.
- Temporary Toilets comprising lavatory, bath, hand-wash facilities will be constructed inside the project site.
- Moreover, adequate water supply for drinking and other domestic uses will also be provided during the construction stage of the project.

2.13 What on-site facilities are provided for the collection, treatment & safe disposal of sewage? (Give details of the quantities of wastewater generation, treatment capacities with technology & facilities for recycling and disposal)

For Kumar Buildcon (P) Ltd.


Director

Approx. 159 KLD domestic effluent will be generated from the proposed “Residential Building Project” of M/s. Kumar Buildcon (P) Ltd. All these effluents will be sent to 190 KLD capacity STP inside premises for treatment. The process of treatment is as under ;

A 190 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;

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

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

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

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

- o Filter feed pumps
- o Pressure Sand Filter (PSF)
- o Activated Carbon Filter (ACF)
- o 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.

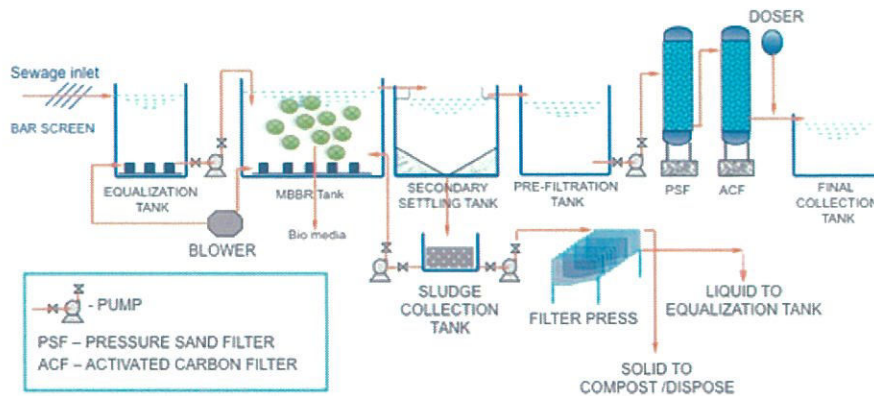
The treated effluent will be of suitable quality for use as flushing, car washing landscape irrigation & fire water tanks. Treated water Characteristics will be as under;

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

For Kumar Buildcon (P) Ltd.


Director

STP SCHEMATIC FLOW DIAGRAM



- 2.14 Give details of dual plumbing system if treated waste used is used for flushing of toilets or any other use.**

120 KLD of treated water from STP will be recycle and reused for toilet flushing by dual plumbing system.

3.0 VEGETATION

- 3.1 Is there any threat of the project to the biodiversity? (Give a description of the local ecosystem with it's unique features, if any)**

There will not be any kind of threat due to the proposed project on the biodiversity of the area, as the area is identified as residential area as per Master Plan of Govt. of Bihar. The area is predominantly residential in nature. No sanctuary / forest is situated within 10 km. radius. Neither any rare or endangered species have been recorded in the project influence area (500 m. radius). So, considering the type and nature of project and commonly found flora and fauna within the project influenced area, no adverse effects are envisaged on the ecology of the region. List of Flora in the project influence area is enclosed as **Annexure – IV**.

- 3.2 Will the construction involve extensive clearing or modification of vegetation? (Provide a detailed account of the trees & vegetation affected by the project)**

No, the establishment of Proposed Residential Building Project will not involve clearing or modification of vegetation as there is no vegetation present at the project site and the land use around the project site is residential in nature.

- 3.3 What are the measures proposed to be taken to minimize the likely impacts on important site features (Give details of proposal for tree plantation, landscaping, creation of water bodies etc along with a layout plan to an appropriate scale)**

In the proposed Building Project trees will be grown to the maximum extent possible in the

strip of open land surrounding the buildings. 6987.72 Sq. M. area on ground as well as on Terrace will be developed and maintained for green belt within the project premises. Mostly native species will be planted. Decorative trees and hedges will be provided along pedestrian pathways.

4.0 FAUNA

4.1 Is there likely to be any displacement of fauna- both terrestrial and aquatic or creation of barriers for their movement? Provide the details.

No, Proposed project is coming up in an area which is already populated and identified as Residential area is Master Plan of Govt. Therefore, there is a very less probability for the displacement or any other effect on the local fauna. List of Fauna in the project influence area is enclosed as **Annexure – V**.

4.2 Any direct or indirect impacts on the avifauna of the area? Provide details.

In the proposed Building Project, Green belt & landscaping will be developed and various species are planted to create a clean, healthy and aesthetic environment within the premises. Common native variety of trees and ornamental flowering species will be planted in the green belt. Landscaping can have direct positive impact on the local avifauna, as this will provide shelter to local birds. List of common Avifauna found in the project influence area is enclosed as **Annexure – V**.

4.3 Prescribe measures such as corridors, fish ladders etc to mitigate adverse impacts on fauna

Not Applicable for this Project

1.0 AIR ENVIRONMENT

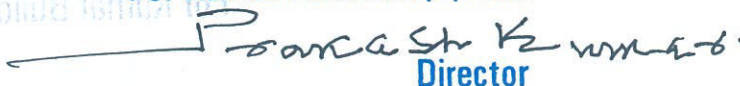
5.1 Will the project increase atmospheric concentration of gases & result in heat islands? (Give details of background air quality levels with predicted values based on dispersion models taking into account the increased traffic generation as a result of the proposed constructions)

In the “Proposed Residential Building Project of “M/s Kumar Buildcon (P) Ltd.” DG Sets & vehicular traffic movement are the major sources of air pollution. DG sets will be equipped with exhaust muffler with adequate stack height of 3.5 m. above the roof of buildings where DG Set will be installed as per CPCB norms.

Background Ambient Air Quality of the project site area was monitored at three locations within project area on 28.02.2023. The average values are as under ; (Test Report enclosed as Annexure - VI) ;

Parameters	24 Hrs. Average Concn. in $\mu\text{g} / \text{m}^3$	Limit as per NAAQS Nov.'2009
1. Particulate Matter (PM_{10})	102.1	100 $\mu\text{g} / \text{m}^3$

For Kumar Buildcon (P) Ltd.


Director

2. Particulate Matter (PM _{2.5})	57.7	60 µg / m ³
3. Sulphur Dioxide as SO ₂	9.6	80 µg / m ³
4. Nitrogen Dioxide as NO ₂	34.0	80 µg / m ³

Current traffic survey data (on 28.02.2023) at Atal Path Road (near project site) is as under;

Time (Hrs.)	TYPE OF VEHICLE			
	2 Wheelers	3 Wheelers	4 Wheelers & LCV's	HCV's
06-07	78	11	47	28
07-08	110	16	52	26
08-09	123	18	60	19
09-10	160	11	80	14
10-11	171	16	84	12
11-12	222	17	92	7
12-13	219	13	85	16
13-14	187	12	96	21
14-15	255	14	100	17
15-16	259	18	112	19
16-17	300	20	115	20
17-18	282	10	95	14
18-19	244	9	81	12
19-20	183	11	90	21
20-21	122	8	72	14
21-22	58	6	33	23
22-23	4	4	13	16
23-24	5	7	9	20
00-01	3	3	5	21
01-02	1	1	3	30
02-03	0	0	1	25
03-04	0	2	0	22
04-05	2	7	7	21
05-06	12	12	20	25
TOTAL	3000	246	1352	463

Due to proposed Residential Building Project there will be increment in traffic density in the project area. Incremental Traffic Scenario will be as under;

Type of Vehicle	Present Scenario	Increment in Traffic Load due to Proposed Building Project
HTV (Trucks, Tractors etc.)	463	5
MTV (Car & Jeeps)	1352	216
LTV (Two & Three Wheelers)	3246	314

Existing Pollution Load (based on CPCB Document CUPS/10/1982-83) due to traffic density of project area is as under;

Type of vehicle	Total No. of vehicles / Day	Pollution Load (Kg. /Day)				
		CO	HC	NO ₂	SO ₂	SPM
HTV (Trucks, Tractors etc.)	463	7.06	1.17	11.67	0.83	0.42

MTV (Diesel based 4 Wheelers)	540	0.71	0.18	0.65	0.25	0.29
MTV (Petrol based 4 Wheelers)	812	38.98	5.85	3.12	0.08	0.32
LTV (2 & 3 Wheelers)	3246	66.22	38.95	0.27	0.08	0.78
TOTAL		112.97	46.15	15.71	1.24	1.81

Incremental Pollution Load (based on CPCB Document CUPS/10/1982-83) due to movement of vehicles during Operation Stage of proposed Residential Building Project will be as under;

Type of vehicle	Total No. of vehicles / Day	Pollution Load (Kg. /Day)				
		CO	HC	NO ₂	SO ₂	SPM
HTV (Trucks, Tractors etc.)	468	7.13	1.18	11.80	0.84	0.42
MTV (Diesel based 4 Wheelers)	627	0.83	0.21	0.75	0.29	0.34
MTV (Petrol based 4 Wheelers)	941	45.17	6.78	3.62	0.09	0.37
LTV (2 & 3 Wheelers)	3560	72.63	42.72	0.30	0.09	0.86
TOTAL		125.76	50.89	16.46	1.31	1.98

Percentage Increment due to proposed project

Type of vehicle	No. of Vehicles	% Increment in Pollution Load				
		CO	HC	NO ₂	SO ₂	SPM
HTV (Trucks, Tractors etc.)	1.08	1.08	1.08	1.08	1.08	1.08
MTV (Diesel based 4 Wheelers)	16.11	16.11	16.11	16.11	16.11	16.11
MTV (Petrol based 4 Wheelers)	15.89	15.89	15.89	15.89	15.89	15.89
LTV (2 & 3 Wheelers)	9.67	9.67	9.67	9.67	9.67	9.67
TOTAL % Incremental Pollution Load		11.32	10.27	4.79	5.59	9.82

5.2 What are the impacts on generation of dust, smoke, odorous fumes or other hazardous gases? Give details in relation to all the meteorological parameters.

During construction period major sources of dust & smoke are 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.

During Operation stage of proposed Residential Buildings, Dust & smoke will be emitted due to operation of DG Sets & vehicular traffic movement which will be minimized and controlled through in-built exhaust muffler & acoustic enclosures in DG Sets & regular water spraying all around the premises.

6987.72 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.

Meteorological Condition (Source IMD Data) of Project area is as under ;

The temperature variations in the study area are as under :

Period	Min ^m . Temperature	Max ^m . Temperature
Mar. – June	14 °C – 20 °C	35 °C – 40 °C
Jul. – Oct.	16 °C – 23 °C	33 °C – 35 °C

For Kumar Buildcon (P) Ltd.

Parakash Kumar
Director

Nov.- Feb.	6 °C – 10 °C	24 °C – 30 °C
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Rainfall in Study Area :

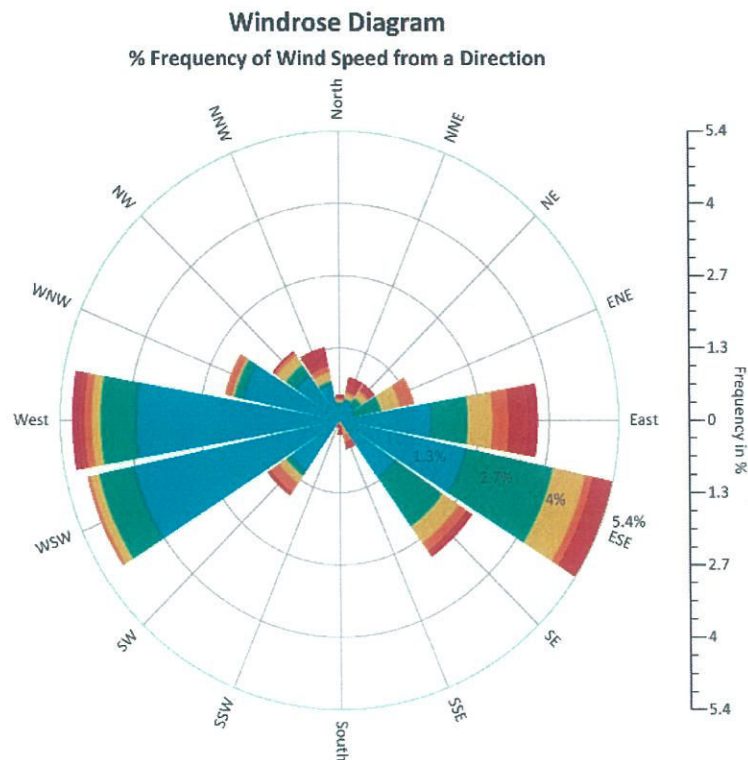
Year	Rainfall in mm.
2017	730.5
2018	651.5
2019	906.9
2020	1287.1
2021	1099.5
Average Rainfall	935.1 mm.

Source: imd.gov.in

Wind Direction and Velocity :

Season	Direction	Maximum Velocity
Mar. – June	SE to SW	5 – 30 km/hr
Jul. – Oct.	NE to SW	2 – 25 km/hr
Nov.- Feb.	NW to SE	1 – 22 km/hr

Wind rose is as under;



For Kumar Buildcon (P) Ltd.

Praveen Kumar
Director

5.3 Will the proposal create shortage of parking space for vehicles? Furnish details of the present level of transport infrastructure and measures proposed for improvement including the traffic management at the entry & exit to the project site.

- M/s Kumar Buildcon (P) Ltd., Proposed Residential Building Project 12405.22 Sq. M area has been provided For Covered Parking in Basement and Ground Floor area. Parking provisions will be provided as per guidelines of Bihar Building Bylaws (25 % of total built-up area of Residential Area excluding 15% service area).

5.4 Provide details of the movement patterns with internal roads, bicycle tracks, pedestrian pathways, footpaths etc., with areas under each category.

Keeping a long-term perspective and movement of traffic (cars and two-wheelers predominantly), internal roads has been planned in the proposed Residential Building Project. Arrangement for Streetlights will be provided all along the roads and junctions.

5.5 Will there be significant increase in traffic noise & vibrations? Give details of the sources and the measures proposed for mitigation of the above.

There will be marginal increase in traffic noise & vibrations due to proposed residential building project as the project site is located in well developed area with heavy traffic density. Present Background Ambient Noise Level Data is enclosed as **Annexure VII**.

Noise level will be minimized through development of green belt all around the project premises.

5.6 What will be the impact of DG sets & other equipment on noise levels & vibration in & ambient air quality around the project site? Provide details.

Noise will be generated by DG sets when they are operating, operation of compressors and water pumps.

It shall be ensured that the DG sets to be installed shall comply Notification No. G.S.R. 371(E), dt: 17th May'2002 for emission limits for new diesel engines (> 1000 KVA) for genset applications, issued by Ministry of Environment & Forests, Govt. of India. As per this notification, the acoustic enclosure for new DG Sets with rated capacity more than 1000 KVA, manufactured on or after the 01st Jul.'2003 shall have an insertion loss of 25 dB(A).

The DG Set will have an acoustic enclosure and an exhaust muffler, which will ensure a minimum of 25 dB(A) insertion loss. The design is in such a manner that within the proposed premises the noise level will be limited to 45-50 dB(A). This criterion is also essential from occupants & visitors comfort point of view.

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

For Kumar Buildcon (P) Ltd.

21

Pranav Kumar
Director

Overall design of facilities, equipment, layout and landscaping is done with a view to maintain noise level within Ambient Noise Level standards for Residential Areas.

(Ambient Noise Level Monitoring Data attached herewith as **Annexure – VII**)

6. AESTHETICS

6.1 Will the proposed constructions in any way result in the obstruction of a view, scenic amenity or landscapes? Are these considerations taken into account by the proponents?

No, The maximum height of the Residential Building Project will be 65.0 m. only upto roof top water tank from G.L. Open spaces according to the municipal building rules are being provided.

6.2 Will there be any adverse impacts from new constructions on the existing structures? What are the considerations taken into account?

There will be not any adverse impact of this project on existing structures as all other existing structures are similar in nature.

6.3 Whether there are any local considerations of urban form & urban design influencing the design criteria? They may be explicitly spelt out.

There are no local urban design criteria which require to be considered.

6.4 Are there any anthropological or archaeological sites or artefacts nearby? State if any other significant features in the vicinity of the proposed site have been considered.

No there are no such structures within 5 km. radius of the project area.

7. SOCIO-ECONOMIC ASPECTS

7.1 Will the proposal result in any changes to the demographic structure of local population? Provide the details.

Yes, the proposed Residential Building Project will definitely change the demographic structure of the area as 1286 nos. of people will be added due to proposed building project. Demographic Pattern of Area is enclosed as **Annexure – VIII**.

7.2 Give details of the existing social infrastructure around the proposed project.

The proposed project is located in a developing Residential area. The area is well connected with roads to all the important places of city. However, all the basic needs & amenities are available within the 1 – 5 Km. radius of the project site.

West	Rajeev Nagar, Ganaga Vihar Colony, Atal Path Road
East	Laxmi Nagar, Digha, Balapur
North	Shivaji Nagar, Balapur, Lalu Nagar, Digha, Mukhdumpur
South	Balupar Ln Road, Patliputra Colony

All social infrastructure facilities i.e. Hospitals, Clinics, Banks, Post Offices etc. exists within 1 – 5 Km. of proposed project area.

For Kumar Buildcon (P) Ltd.

Director

7.3 Will the project cause adverse effects on local communities, disturbance to sacred sites or other cultural values? What are the safeguards proposed?

No, the proposed project will not cause any adverse effects on local communities, disturbance to sacred sites or other cultural values. Rather, it will provide economic development / business opportunities. Proposed Residential Building Project will also generate indirect employment opportunities in the form of retail shops, security guards, servants, helpers, cleaners, washer men, electrician etc.

8. BUILDING MATERIALS

8.1 May involve the use of building materials with high-embodied energy. Are the construction materials produced with energy efficient processes? (Give details of energy conservation measures in the selection of building materials and their energy efficiency)

All building materials to be used in the construction of proposed Building project are of high embodied energy content. (Aluminium 200-250 Gj/tonne, Steel 30-60 Gj/Tonne, Glass 12-25 Gj/Tonne, Cement 5-8 Gj/Tonne, Lime 3-5 Gj/Tonne).

As energy conservation measures sun dried pavers will be used for making paved path, instead of baked pavers as they are manufactured from energy efficient processes. Non toxic Paints and Fly ash products may be used as per availability in the region.

8.2 Transport and handling of materials during construction may result in pollution, noise & public nuisance. What measures are taken to minimize the impacts?

Noise during the construction phase is expected due to operation of construction equipment, material and vehicular movement. The expected noise levels will be in the range of about 60 – 70 dB(A), though close to the construction site. Construction equipment and vehicles will be provided with mufflers and silencers thereby reducing the noise levels. Also, no major noise generating activity will be carried out during night to maintain the ambient noise standards.

All building materials carrying vehicles will be covered with tarpaulin or polythene sheets to avoid spreading of dust and dirt. Separate raw material handling yard will be made. Cement will be separately stored under cover bales. Sand will be stacked neatly under tarpaulin cover. All material transportation will be done during the off peak hours only. Raw material handling yard will be located within the project site and separated by enclosures.

In order to minimize impact on traffic congestion due to construction activities of the projects, all construction vehicles will be instructed to ply during off-peak hours. It shall also be ensured that vehicles being allowed within the construction site and for the construction activity shall meet the vehicular pollution regulation (PUC).

8.3 Are recycled materials used in roads and structures? State the extent of savings achieved?

Recycled materials from outside may be used in roads and land development activities. These materials will be used as fillers in base and sub-base of the carriageway, footpaths pavements or

For Kumar Buildcon (P) Ltd.

Prakash Kumar
Director

pedestrian way.

Depending upon the situation 5 to 10% savings may be achieved by using recycled materials.

8.4 Give details of the methods of collection, segregation & disposal of the garbage generated during the operation phases of the project.

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

Construction Phase: Municipal solid waste – 50 kg/day.

Operation Phase: Municipal solid wastes – 657 kg/day. The solid waste includes paper, card board, plastic cans etc. and kitchen wastes from houses. Recyclable wastes like card boards and plastic cans will be sold to vendors. (@ 0.25 to 0.45 Kg per capita).

These generated solid wastes will be first segregated as plastic, glass, paper and other waste separately and disposed off as per MSW Rule, 2016. The plastic, glass and paper waste may be collected by private vendors for recycling. Sludge generated from STP (after drying) will be filled in HDPE bags and used as manure for gardening purpose.

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- 2m. 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.

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 Municipal Corporation 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.

For Kumar Buildcon (P) Ltd.


Director

Biodegradable wastes viz. kitchen waste, waste leaves etc. will be composted within project premises through Biocomposting pits.

9. ENERGY CONSERVATION

9.1 Give details of the power requirements, source of supply, backup source etc. What is the energy consumption assumed per square foot of built-up area? How have you tried to minimize energy consumption?

Power requirement: 2560 kW through BSEB Grid

Source of Supply: BSEB

Back-up Source: 4 Nos. of DG Set of 750 KVA & 1 Nos. of DG Set of 180 KVA will be installed.

Energy Consumption per Sq. Ft. Built-up Area: 4.70 Watt/Sq. Ft.

Measures for minimizing energy consumption ;

- Outer walls will be properly insulated to reduce heat load
- Provisions for using Solar power for landscape, corridors & pathways lighting.
- Capacitors system to improve the load power factor
- LED lamp fitting will be used.
- Roof Top Thermal Insulation will be provided
- Buildings will be designed to more daylight integration.
- 3 % power of total power requirement i.e. 77 kW of power for common lighting purpose will be sourced through solar panels on the roof.

The electrical installations are designed to comply with the regulations and practices and under stipulation of Pollution Control Authorities. They are based on the recommendation of the Indian National electrical code & Electrical Installation Standards.

9.2 What type of, and capacity of, power back-up to you plan to provide?

4 Nos. of DG Set of 750 KVA & 1 Nos. of DG Set of 180 KVA will be installed to meet emergency power load. Solar panels will also be provided to meet the emergency lighting purposes.

9.3 What are the characteristics of the glass you plan to use? Provide specifications of its characteristics related to both short wave and long wave radiation?

In the proposed Building project clear & tinted glass will be used having U-Value of 2.9 W/m²K.

9.4 What passive solar architectural features are being used in the building? Illustrate the applications made in the proposed project.

Passive solar design refers to use of the sun's energy for the heating and cooling purposes. Pergolas, projections, façade elements, metal louvers will be provided for sun shading to reduce the heat influx into the building and thus reduce the air conditioning loads.

Moreover, Solar energy will be used for meeting the requirement of hot water & landscape and street lighting purposes within the proposed building premises.

For Kumar Buildcon (P) Ltd.

Pran Kumar
Director

9.5 Does the layout of streets & buildings maximize the potential for solar energy devices? Have you considered the use of street lighting, emergency lighting and solar hot water systems for use in the building complex? Substantiate with details.

Proposed Buildings are designed in a way so that direct radiations can be received during day hours which are specific to the orientation. Solar energy will be utilized to meet various energy requirements.

Street lights, Green Belt & Landscape lights will be solar powered. The on/off control of external lighting will be through automatic time based timers.

Provisions have been made for Solar street lights, Solar blinkers, Solar power packs/inverters, Roof top SPV (Solar Photo voltaic) systems.

9.6 Is shading effectively used to reduce cooling/heating loads? What principles have been used to maximize the shading of Walls on the East and the West and the Roof? How much energy saving has been effected?

Shadings provided to reduce cooling loads. Green area and open areas will be spaced in a way to achieve reduction in temperature.

9.7 Do the structures use energy-efficient space conditioning, lighting and mechanical systems? Provide technical details. Provide details of the transformers and motor efficiencies, lighting intensity and air-conditioning load assumptions? Are you using CFC and HCFC free chillers? Provide specifications.

The space heating load will be minimized by using passive solar structures and suitable building envelope material. LED will be used in all common areas. The façade lighting and external lighting shall be controlled by timer clock. There will be on/off control of external lighting through automated timer based systems.

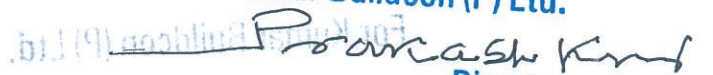
- The glass area to be covered with curtain / Venetian blinds / sun film
- The roof has been considered as insulated with 50 mm thick insulation, also under deck insulation of the roof is suggested.
- The main entrances shall have air Curtains.

The system design for all material equipments shall in general comply with the standards, codes and statutory regulations issued by the relevant authorities.

Integrated building management system (IBMS) will enable automation and effective operation of building and facilities. The IBMS can integrate energy management system, Electrical distribution system, lifts, CCTV system, fire alarm system and others.

The system design for all material equipments shall in general comply with the standards, codes and statutory regulations issued by the relevant authorities.

For Kumar Buildcon (P) Ltd.


Director

9.8 What are the likely effects of the building activity in altering the micro-climates? Provide a self assessment on the likely impacts of the proposed construction on creation of heat island & inversion effects?

The proposed project is Residential Building Project due to which there will be insignificant emission of air pollutants by vehicular movements and occasional use of DG sets, therefore no heat island effect is envisaged, as the area is similar to proposed structures. Increased traffic generation and occasional use of DG sets used due to project is not going to cause significant increase in atmospheric concentration of gases and will not result in heat island formation and inversion effects. Grass pavers may be provided to avoid heat island effects.

9.9 What are the thermal characteristics of the building envelope? (a) roof; (b) external walls; and (c) fenestration? Give details of the material used and the U-values or the R values of the individual components.

The structural design of proposed Residential Building Project will reduce heating loads as major part is of brick wall with plaster and paint finish. The U-factors & R values of the individual components are as under;

- Roof Assembly – R Value: 2.1 sqm. °C/W; U-factor: 0.409 W/sqm. °C
- Opaque Walls Assembly – R Value: 2.35 sqm. °C/W; U-factor: 0.352 W/sqm. °C
- Vertical Fenestration: U-factor: 3.177 W/sqm. °C; SHGC: 0.25

9.10 What precautions & safety measures are proposed against fire hazards? Furnish details of emergency plans.

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

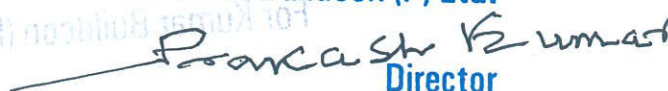
- i. Hydrant & Sprinkler system will be common
- ii. Sprinkler system will fed from the Hydrant riser and being the residential complex, sprinkler system will be restricted only in the basement and parking areas.
- iii. Single Jockey pump will be used to maintain the pressure on hydrant system.
- iv. 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 CO₂ Fire Extinguishers.
- g. Fire Hose Reel

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

For Kumar Buildcon (P) Ltd.


Director

9.11 If you are using glass as wall material provides details and specifications including emissivity and thermal characteristics.

The proposed project is a Residential Building Complex and no glass will be used as wall materials within the proposed building premises.

9.12 What is the rate of air infiltration into the building? Provide details of how you are mitigating the effects of infiltration.

In the proposed Residential Building Project premises prime importance is given to the natural wind circulation and illumination aspect. Keeping that in mind open terraces, cutouts, larger open able windows and the inter-block spaces have been proposed so that air infiltration through all the spaces is maximum. However, due to close proximity to River Ganga favorable wind will be received all around the year.

9.13 To what extent the non-conventional energy technologies are utilized in the overall energy consumption? Provide details of the renewable energy technologies used.

In order to conserve electrical energy, it is proposed to utilize solar energy for staircase lightings. The landing and mid-landing of all the staircases shall be provided with 12 hours back-up solar power lighting. All light fittings shall be provided with electronic ballast. Solar Power will be utilized for ;

- Street lights
- Solar power packs/inverters
- Green Belt & landscape lighting

10.0 ENVIRONMENT MANAGEMENT PLAN :-

The Environment Management Plan would consist of all mitigation measures for each item wise activity to be undertaken during the construction, operation and the entire life cycle to minimize adverse environmental impacts as a result of the activities of the project. It would also delineate the environmental monitoring plan for compliance of various environmental regulations. It will state the steps to be taken in case of emergency such as accidents at the site including fire.

10.1 Introduction ;

The Environment Management Plan (EMP) is a site-specific plan developed to ensure that the project is implemented in an environmentally sustainable manner where all contractors and subcontractors, including all stake holders, understand the potential environmental risks arising from the project and take appropriate actions to properly manage that risk. EMP also ensures that the project implementation is carried out in accordance with the design by taking appropriate mitigation actions to reduce adverse environmental impacts during its life cycle. The plan outlines existing and potential problems that may adversely impact the environment and recommends corrective measures where required.

Proposed "Residential Building Project" by M/s. Kumar Buildcon (P) Ltd. at Mauza- Khilchipur Digha, PS- Phulwari (Old), Digha (New), Dist.- Patna, State- Bihar, will adopt all measures for better environmental management. Proper Green belt & landscaping will be developed for better

For Kumar Buildcon (P) Ltd.
Ranash Kumar
Director

air environment, because man needs inhalation every moment, so also is Flora and Fauna dependent on it. All waste water generated from proposed project will be treated in STP inside the project premises.

10.2 OBJECTIVE

Present Environmental Management Plan (EMP) is designed to minimize the potential adverse environmental impacts, if any, due to proposed residential Building Project. The EMP reflects the commitment, of the Developers, to safeguards for environment as well as the surrounding population. The potential impacts on the environment from the proposed Building Project are identified based on the nature of the various activities associated with the location, and operation of the proposed project and also on the current status of the environmental quality around the project area.

10.3 WATER POLLUTION MANAGEMENT ;

10.3.1 Construction Phase ;

Water requirement during construction phase is expected to be about 15 m³/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.

10.3.2 Operation Phase ;

The total water requirement for the proposed Residential Building Project of "M/s Kumar Buildcon (P) Ltd." will be 237 KLD (117 KLD Fresh Water through Municipal Water Supply/Borewells, 120 KLD STP treated water.) Total Fresh Water requirement during 01st run will be 237 m³/day and thereafter 117 KLD fresh Municipal water/ground water required for domestic. Toilet flushing, Car/Street Washing, Green belt & landscape irrigation and Fire fighting water requirement will be met by Treated Water from STP. The fresh water will be sourced through Borewells.

Approx. 159 KLD waste water will be generated from the proposed Residential Building project. The proposed project will adopt recycling of treated waste water. All waste water generated will be treated in STP and reused for toilet flushing, street/car washing, landscape irrigation & Fire water storage tanks. Balance treated water from above will be discharged to govt. drains outside project area. Characteristics of effluent from proposed building project will be as under;

For Kumar Buildcon (P) Ltd.

Director

Parameters	Expected Conc ⁿ . of Generated Effluent from proposed Project
pH	6.5 - 7.5
Suspended Solids mg/l.,	100 – 200 mg/l.
BOD (3 days at 27°C), mg/l.	50-150 mg/l.
COD, mg/l.	150-500 mg/l.
Oil & Grease, mg/l.	5-10 mg/l.

Approx. 159 KLD domestic effluent will be generated from the proposed Residential Building premises of “M/s Kumar Buildcon (P) Ltd.”. All these effluents will be sent to 190 KLD capacity STP inside premises for treatment. The process of treatment is as under;

A 190 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;

For Kumar Buildcon (P) Ltd.

 Director

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

10.3.3 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 Building Project.

RAIN WATER HARVESTING POTENTIAL:-

RAIN WATER HARVESTING POTENTIAL OF PROPOSED BUILDING PROJECT :-

Type of Area	Area is M²	Run-Off Coefficient	Annual Avg. Rainfall in m.	RWH Potential (m³)
Roof Area	4513.37	0.80	0.90	3,249.6
TOTAL				3,249.6 M³
Annual Rainwater Harvesting Potential				

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.

10.4 AIR QUALITY MANAGEMENT;

10.4.1 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.

10.4.2 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.

For Kumar Buildcon (P) Ltd.

Prakash Kumar
Director

The impact of Air Emissions can be minimized in following ways ;

- 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), July 11, 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, 6987.72 Sq. M. area on ground as well as on Terrace 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.

10.5 AMBIENT NOISE MANAGEMENT ;

10.5.1 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.

10.5.2 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.
- The noise levels outside these rooms will be maintained within the stipulated norms both during the day and night time.

For Kumar Buildcon (P) Ltd.

Director

- It shall be ensured that the new DG sets to be installed for the proposed hotel 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, 6987.72 Sq. M area on ground as well as on Terrace 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 trees will be planted which will also act as barrier for outside noise.

10.6 SOLID & HAZARDOUS WASTE MANAGEMENT ;

10.6.1 Construction Phase ;

No flammable / hazardous materials will be handled, stored or used beyond the Threshold Limit of MSIHCRules 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.
- 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.

For Kumar Buildcon (P) Ltd.

Prakash Kumar
Director

10.6.2 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. 657 Kg/day solid waste will be generated from proposed Residential building 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	1276 Nos.	0.45 kg/person	574.2	0.36 kg/person	459.4	114.8
2	Visitors	191 Nos	0.36 kg/person	68.8	0.25 kg/person	47.8	21.0
3	Security Staff and maintenance staff	10 Nos	0.45 kg/person	4.5	0.36 kg/person	3.6	0.9
4	Green Area, Landscaping & Others	6987.72 SQ.M.	5 kg/acres	8.7	5 kg/acres	8.7	0.0
Total Municipal waste generation				656.2 say 657 Kg/day		519.5 Say 520 Kg/day	136.7 Say 137 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 colored bins for different categories of wastes will be provided.

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 ;

- Waste from biodegradable bins will be reutilized in bio-composting to prepare organic manure.
- The dried STP Sludge will be used as manure for gardening

For Kumar Buildcon (P) Ltd.

Director

- 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 authorized 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.

10.7 GREEN BELT DEVELOPMENT AND LANDSCAPING :-

An area of 6987.72 Sq. M area on ground as well as on Terrace will be developed and maintained for green belt within the project premises.

After construction of the Residential buildings, trees will be grown to the maximum extent all around the premises boundary.

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. 191 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.

For Kumar Buildcon (P) Ltd.

Pankaj Kumar
Director

- 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 “Building Project” by M/s Kumar Buildcon (P) Ltd.

- | |
|---------------------------------------|
| • Crotons |
| • Coleus |
| • Colocasia |
| • English Laurel |
| • Song of India |
| • Roses |
| • Jasmine |
| • Chrysanthemum |
| • Gerbera |
| • Marigold |
| • Geranium |
| • Dahlia |
| • Daffodils |
| • Tulips |
| • Bird’s Nest Fern |
| • Bougainvillea |
| • Arabian Jasmine |
| • Orchid Tree |
| • Bottle Brush |
| • Jungle Flame or West Indian Jasmine |

10.8 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.

For Kumar Buildcon (P) Ltd.

 Director

- 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 Building 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.

10.9 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:

- 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

For Kumar Buildcon (P) Ltd.


Director

10.10 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 8 Lakhs
2.	Installation of SPV and Solar Lighting System	Rs. 31 lakhs	Rs. 6 Lakhs
3.	Installation of Fire Fighting & Management System	Rs. 30 Lakhs	Rs. 2 Lakhs
4.	Environmental Monitoring as per requirement of EC	---	Rs. 10 Lakhs
5.	Green Belt Development & Maintenance	Rs. 15 Lakhs	Rs. 3 Lakhs
6.	Rain Water Recharging (4 Nos.)	Rs. 6 Lakhs	Rs. 0.2 Lakhs
7.	Municipal Solid waste (Bio composting pits – 2 Nos. 300 kg/day)	Rs. 3 Lakhs	Rs. 0.3 Lakhs
TOTAL AMOUNT		Rs. 105 Lakhs	Rs. 29.5 Lakhs ~ 30.0 Lakhs

After the completion of Construction work of proposed residential project of M/s Kumar Buildcon (P) Ltd., Residential Building flats will be handed over to respective buyers. Owner Society of the proposed building project 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 Building 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 of “M/s Kumar Buildcon (P) Ltd.”.

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For Kumar Buildcon (P) Ltd.


Director