FORM 1

Group Housing "Red Apple Homes"

At

Khasra No. 1108m, 1109m, 1110m, Village: Morta, Ghaziabad (U.P.)

For

M/s Manju J Homes India Ltd.

Prepared By

GRASS ROOTS RESEARCH & CREATION INDIA (P) LTD.
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GRC INDIA TRAINING & ANALYTICAL LABORATORY
(Recognized by NABL & MoEF, GoI)
A unit of GRC India

FORM- I

(I) Basic Information

S. No.	Item	Details
1.	Name of the project/s	Group Housing "Red Apple Homes" Located at Khasra No. 1108m, 1109m, 1110m,Village Morta, Ghaziabad (U.P.)
2.	S. No. in the schedule	8 (b)
3.	Proposed capacity/area/length/tonnage to be handled/command area/lease area/number of wells to be drilled	Plot Area = 38,663 m^2 Built Up Area =**1,87,844.51** m^2
4.	New/Expansion/Modernization	New
5.	Existing Capacity/Area etc.	Nil
6.	Category of Project i.e. 'A' or 'B'	Category B
7.	Does it attract the general condition? If yes, please specify.	No
8.	Does it attract the specific condition? If yes, please specify.	No
9.	Location Plot/Survey/Khasra No. Village Tehsil District State	 1108m, 1109m, 1110m, Morta Ghaziabad U.P.
10.	Nearest railway station/airport along with distance in kms.	**Nearest Railway Station:** The nearest railway station is Ghaziabad Railway Station at a distance of 4.84 km in SSW. **Nearest Airport:** The nearest airport is IGI, approximately at a distance of 38.6 km in WSW direction. **(Source of information:- Google Image)**
11.	Nearest Town, city, District Headquarters along with distance in	Nearest Town: Ghaziabad 5 Km Nearest City: Noida 10 Km

	kms.	Nearest Headquarters : Ghaziabad
12.	Village Panchayats, Zilla Parishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given)	Ghaziabad Development Authority, Vikas path, Near Old Bus Stand. Ghaziabad. Pin-201001 0120-6450580 E-Mail: helplinegda@gmail.com
13.	Name of applicant	M/s Manju J Homes India Ltd.
14.	Registered Address	C-10, Ramprastha, Ghaziabad
15.	Address for correspondence : Name Designation (Owner/Partner/CEO) Address Pin Code Telephone No. E-mail	 Mr. Vijayant Jain Director C-10, Ramprastha, Ghaziabad 9810085719 vijayantjain@gmail.com
16.	Details of Alternative Sites examined, if any. Location of these sites should be shown on a toposheet.	Not applicable,
17.	Interlinked Projects	No
18.	Whether separate application of interlinked project has been submitted?	NA
19.	If yes, date of submission	Not Applicable
20.	If no, reason	Not Applicable
21.	Whether the proposal involves approval/ clearance under: if yes, details of the same and their status to be given. (a)The forest (Conservation) act, 1980? (b) The wildlife (Protection) act, 1972? (C) The C.R.Z Notification, 1991?	No
22.	Whether there is any Government Order/Policy relevant/relating to the site?	1. NBC Guidelines - 2005 2. Ghaziabad Bye laws

23.	Forest land involved (hectares)	No
24.	Whether there is any litigation pending against the project and /or land in which the project is propose to be set up? (a) Name of the Court (b) Case No. (c) Orders/directions of the Court, if any and its relevance with the project.	No

(II) Activity

1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

S. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	**No**	Proposed development is as per local development plan of Ghaziabad Master Plan. Development will be done according to sanctioned plan.
1.2	Clearance of existing land, vegetation and buildings?	**No**	Since the project land is vacant, no clearance of existing land and vegetation & buildings is required as the land is free from any vegetation & structure.
1.3	Creation of new land uses?	**No**	No new land use is proposed. The project site is allotted for residential development by local planning authority.
1.4	Pre-construction investigations e.g. bore houses, soil testing?	**Yes**	Soil testing will be done during the detailed EIA study.
1.5	Construction works?	**Yes**	All construction activities will be confined within the project premises; there will be no physical changes outside the project boundary.

1.6	Demolition works?	**No**	Project site is vacant land. Demolition is not required.
1.7	Temporary sites used for construction works or housing of construction workers?	**Yes**	All the construction activity including stocking of raw materials will be confined within the project site only. Temporary labour hutments are proposed. Local labours from nearby area will be hired. Sanitation facilities will be developed at site.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	**Yes**	Excavation will be carried out for foundation of buildings. The excavated soil will be used in backfilling and other area development activities.
1.9	Underground works including mining or tunneling?	**No**	No underground works including mining/ tunneling is required except excavation of earth.
1.10	Reclamation works?	**No**	No reclamation work required.
1.11	Dredging?	**No**	No dredging required.
1.12	Offshore structures?	**No**	No offshore structures required.
1.13	Production and manufacturing processes?	**No**	No production/manufacturing process is involved as the project is a residential project.
1.14	Facilities for storage of goods or materials?	**Yes**	Raw material will be stored at site in a covered area. Cement will be separately stored under cover in bales. Sand will be stacked neatly under tarpaulin cover. Bricks and steel will be laid in open.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	**Yes**	**Solid Waste:** The solid waste generated from the project will be in the form of: **Construction Waste:** Left over cement and mortars, cement concrete blocks, aggregate,

			sand and other inorganic material will be recycled and reused as granular subbase (GSB) layer of pavement. **Operational Phase:** Total solid wastes generated including landscape wastes will be 3960 kg/day. Solid wastes generated will be segregated into biodegradable (waste vegetables and foods etc.) and non-biodegradable (papers, cartons, thermocol, plastics, glass etc.) components and collected in separate bins. The biodegradable organic wastes will be treated inside the premises by organic waste converter. Recyclable and non-recyclable wastes will be disposed through Govt. approved agency. **Liquid effluents:** During construction phase, sewage will be treated and disposed through septic tanks with soak pits. The waste water in operation phase will be treated up to tertiary level in a STP of 684 KLD capacity and the treated sewage will be reused for toilet flushing and horticulture. The surplus treated water (226 KLD during dry season) will be discharged to the nearest Sewer line. Dewatered/dried sludge generated from the STP plant will be used as manure for green belt development.
1.16	Facilities for long term housing of operational workers?	**No**	Local labourers will be hired from nearby areas during construction phase. So, there will be no need to create permanent facilities for long-term housing of operational workers.

1.17	New road, rail or sea traffic during construction or operation?	**No**	The project site is in close proximity to NH 58. Only internal roads and paths will be developed for vehicular movements for transportation of construction material during construction phase whereas internal tracks and paths will be developed for traffic circulation (to avoid any congestion) during operational phase.
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	**No**	The site is in well connected through the road network. The nearest highway is NH-58 which is approximately 800 m away from the project site.
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	**No**	Since the site is adjacent to sector which has low traffic density, there will be no need for diversion or closure of exiting traffic routes.
1.20	New or diverted transmission lines or pipelines?	**No**	There will not be any new/diverted transmission lines or pipelines around the project.
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	**No**	No impoundment, damming, culverting, realignment or other changes to the hydrology of surface watercourses is proposed.
1.22	Stream crossings?	**No**	There are no streams running across the site.
1.23	Abstraction or transfers of water form ground or surface waters?	**Yes**	The source of water will be GDA. About 683 KLD of fresh water will be required during operation phase of the project.
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	**No**	Runoff will increase due to increased paved surface. However, increased runoff will be managed by well-designed rainwater harvesting system and storm water management plan.
1.25	Transport of personnel or materials for	**Yes**	During the construction phase, about

	construction, operation or decommissioning?		15-20 trucks are estimated per week. Adequate parking space within the project site for loading and unloading of materials will be provided. Adequate parking space will be provided for operational phase to the residents and commercial occupants of the premises.
1.26	Long-term dismantling or decommissioning or restoration works?	**No**	No Long term dismantling or decommissioning or restoration works will be involved.
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	**No**	None
1.28	Influx of people to an area in either temporarily or permanently?	**No**	Local laborers from nearby area will be employed during the construction phase. In the operation phase, most of the expected occupants will be from the surrounding areas. Hence, the project will lead to a redistribution of occupants within the city. Thus, no significant influx of people is envisaged.
1.29	Introduction of alien species?	No	The landscaping will be carried out with mainly local species of flora that are well suited to the local conditions like *Acacia auriculiforms, Alestonia scholaris, Anthocephalus chinensis, Araucaria cookie, Bauhinia blakeana, Cassia fistula,Cassia siames, Chorosia speciosa.*
1.30	Loss of native species or genetic diversity?	No	There will be no significant impact on the native species or genetic diversity.
1.31	Any other actions?	No	Not Applicable.

2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):

S. No.	Information/checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural land (ha)	**No**	The proposed project plot and its surrounding areas have been designated for residential development.
2.2	Water (expected source & competing users) unit: KLD	**Yes**	During operation phase, water will be provided through GDA water supply. About 683 KLD of fresh water will be required during operation phase of the project.
2.3	Minerals (MT)	**Yes**	Minerals such as sand and aggregates will be required during the construction phase.
2.4	Construction material – stone, aggregates, and / soil (expected source – MT)	**Yes**	All materials for construction will be arranged through select suppliers.
2.5	Forests and timber (source – MT)	**Yes**	All material forests and timber will be provided by selected suppliers. However steel frames etc shall be used to minimize the use of timber.
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	**Yes**	The connected load for the Group Housing project will be approx. 1,011.79 kVA which shall be supplied by transformer of 1,250 kVA. There is provision of 2 no. of DG set of 4000 kVA capacity (2*2000KVA) for power back up in the Group Housing Project.
2.7	Any other natural resources (use appropriate standard units)	**No**	Not Applicable

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

S. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which	**Yes**	Diesel for DG sets will be stored in

	are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)		drums in earmarked locations. It shall also be handled as per The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 and Material Safety Data Sheet. Used oil of DG sets will be given to authorized dealers approved by CPCB/MoEF for Hazardous Waste Handling.
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	**No**	Suitable drainage and waste management measures (with frequent spray of insecticides etc.) will be adopted in both the construction and operational phase such that there will be no stagnation of water or accumulation of waste. This will effectively restrict the reproduction and growth of disease vectors.
3.3	Affect the welfare of people e.g. by changing living conditions?	**Yes**	Socio-economic standard of people will improve due to increased employment opportunities provided by this project. This will lead to better quality of life and will also set a standard for future developments in the area.
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.	**No**	Impacts of this type are not expected.
3.5	Any other causes	**No**	Not Applicable

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

S. No.	**Information/Checklist confirmation**	**Yes/No**	**Details thereof (with approximate quantities/rates, wherever possible) with source of information data**
4.1	Spoil, overburden or mine wastes	**No**	No such spoil, overburden or mine wastes will be generated.

<table>
<tr><td>4.2</td><td>Municipal waste (domestic and or commercial wastes)</td><td>Yes</td><td>The total municipal (domestic) solid waste to be generated is approx. 3,960 kg/day.<table><tr><td>Biodegradable waste</td><td>2,376 kg/day (Waste vegetables and foods etc.)</td></tr><tr><td>Non-biodegradable waste</td><td>1,188 kg/day (Papers, cartons, thermocol, plastics, glass etc.)</td></tr><tr><td>Inert waste</td><td>396 kg/day</td></tr><tr><td>Total</td><td>3,960 kg/day</td></tr></table></td></tr>
<tr><td>4.3</td><td>Hazardous wastes (as per Hazardous Waste Management Rules)</td><td>Yes</td><td>The hazardous wastes along with other wastes in the project will be used oil from DG sets, which is classified as per The Hazardous Waste Category 5.1 as per The Hazardous Wastes (Management & Handling) Rules, 1989.
Used oil from DG sets will be stored in HDPE drums in isolated covered facility. This used oil will be sold to authorized recyclers. Suitable care will be taken so that spills/leaks of used oil from storage is avoided.</td></tr>
<tr><td>4.4</td><td>Other industrial process wastes</td><td>No</td><td>Not applicable</td></tr>
<tr><td>4.5</td><td>Surplus product</td><td>No</td><td>Not applicable</td></tr>
<tr><td>4.6</td><td>Sewage sludge or other sludge from effluent treatment</td><td>Yes</td><td>15.96 kg/day of Sludge generated from the STP plant will be dried and later will be used as manure for green belt development.</td></tr>
<tr><td>4.7</td><td>Construction or demolition wastes</td><td>Yes</td><td>The construction waste will consist of excess earth and construction debris along with cement bags, steel in bits and pieces, insulating and packaging materials etc.
Recyclable waste construction materials will be sold to recyclers. Unusable and excess construction debris will be disposed at designated places in tune with the local norms.</td></tr>
<tr><td>4.8</td><td>Redundant machinery or equipment</td><td>No</td><td>Redundant machinery will not be generated.</td></tr>
<tr><td>4.9</td><td>Contaminated soils or other materials</td><td>No</td><td>Contaminated soils or other materials will</td></tr>
</table>

			not be generated.
4.10	Agricultural wastes	**Yes**	Landscape wastes of 0.150 kg/day will be generated.
4.11	Other solid wastes	**No**	Not Applicable

5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr).

S. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	**Yes**	The project does not envisage any major air pollution sources except operation of DG sets during power failure and vehicular traffic.
5.2	Emissions from production processes	**No**	No production processes involved. Hence, there will be no such emissions.
5.3	Emissions from materials handling including storage or transport	**Yes**	Small quantities of fugitive emissions are envisaged during transport and handling of construction materials. Such emissions will be temporary and controlled by the use of sprinkling and other viable techniques like covering of loose material.
5.4	Emissions from construction activities including plant and equipment	**Yes**	This will be restricted to the construction phase and the construction site only.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste	**Yes**	Dust is anticipated during loading and unloading of construction material and excavation of upper earth surface. These will however be temporary in nature, which will be controlled by providing water sprinklers. Tarpaulin cover will be provided on stored loose materials to reduce the dust emission. There is no source of odors in the proposed project.
5.6	Emissions from incineration of waste	**No**	No incineration of wastes is proposed.
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	**No**	Open burning of biomass/other material will be prohibited on site.
5.8	Emissions from any other sources	**No**	Not Applicable

6. Generation of Noise and Vibration, and Emissions of Light and Heat:

S. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	**Yes**	Noise Source in the operational phase will be from DG sets (which will be in operation only during power failure) and pumps & motors. All the machinery will be of highest standard of reputed make and will comply with standard i.e. the DG set room will be provided with acoustic enclosure to have minimum 25 dB (A) insertion loss or for meeting the ambient noise standard whichever is on higher side as per E (P) Act, GSR 371 (E) and its amendments. Therefore, no significant impact due to operation of machinery is anticipated.
6.2	From industrial or similar processes	**No**	No industrial processes will be carried out in the project.
6.3	From construction or demolition	**Yes**	Due to various construction activities, there will be short-term noise impacts in the immediate vicinity of the project site. The construction activities will include the following noise generating activities: • Concreting, mixing & operation of DG sets. • Construction plant and heavy vehicle movement.
6.4	From blasting or piling	**No**	No blasting or mechanized piling will be done.
6.5	From construction or operational traffic	**Yes**	Some noise will be generated from vehicular movement in the construction and operational phase but that will be temporary and mitigated with green belt and PUC vehicle will be only operated.
6.6	From lighting or cooling systems	**No**	No significant noise impact will result from lighting or cooling systems.
6.7	From any other sources	**No**	Not Applicable

7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

			Details thereof (with approximate

S. No.	Information/Checklist confirmation	Yes/No	quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	**No**	The used oil from DG sets will be carefully stored in HDPE drums at isolated storage, and periodically sold to authorized recyclers. All precautions will be taken to avoid spillage from storage as per The Hazardous Wastes (Management & Handling) Rules, 1989.
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of Discharge)	**No**	There will be no discharge of untreated sewage on land or into water bodies. Adequate treatment of sewage will be carried out in a STP of capacity 684 KLD, proposed within the project premises. Treated sewage will be re-used for flushing & landscaping and the surplus treated water (226 KLD) will be discharged to the nearest external sewer External facility will be provided to discharge the excess treated water as per The Water (Prevention and Control of Pollution) Act, 1974.
7.3	By deposition of pollutants emitted to air into the land or into water	**No**	The DG Sets will be provided with stacks of adequate height. Hence dispersion will be achieved and avoid deposition of pollutants in significant concentrations at any single location.
7.4	From any other sources	**No**	Not Applicable
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	**No**	Not Applicable

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

S. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires, etc. from storage, handling, use or production of hazardous substances	**Yes**	To deal with any fire related accident, fire fighting facility of single handed hydrant valve, long hose reel, and portable fire extinguisher shall be

			provided.
8.2	From any other causes	**No**	Not Applicable
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)	**No**	The project falls under **seismic active Zone IV** indicating high damage risk zone. The buildings will be designed as earthquake resistant and comply with the required IS specifications.

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality

S. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of supporting. utilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.: • Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.)	**Yes**	Appropriate infrastructure like roads, power supply, waste management and waste water treatment will be developed within the project site. Development of the area will be as per the approved Ghaziabad Master Plan
	• Housing development	**Yes**	Housing development will take place.
	• Extractive industries	**No**	Not Applicable
	• Supply industries	**No**	Not Applicable
	• Other	**No**	Not Applicable
9.2	Lead to after-use of the site, which could have an impact on the environment	**No**	Not Anticipated
9.3	Set a precedent for later developments	**Yes**	The project will provide good infrastructure and better life style and will set an example for later developments in the areas.
9.4	Have cumulative effects due to proximity to other existing or planned projects with	**No**	Not Applicable

	similar effects		

(III) Environmental Sensitivity

S. No.	Areas	Name/ Identity	Aerial distance (within 15 km) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	**Nil**	No there is not any areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value is 15 km of periphery.
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	Hindon River	Hindon River is 4.71 km away from the project site towards WNW.
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	**Nil**	There is no ecologically sensitive species of flora or found in the study area
4	Inland, coastal, marine or underground waters	**Ground water**	The depth of groundwater in the nearby area ranges from 35 mbgl.
5	State, National boundaries	**Nil**	No state boundary within 15 km of the project site
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	NH-58	NH-58 is 800 m away from the Project site towards SE.
7	Defense installations	**Nil**	No defence installation within 15 km.
8	Densely populated or built-up area	Morta Village	Village Morta is approx. 1 Km away from the Project Site towards NE.
9	Areas occupied by sensitive man-made land uses *(hospitals, schools, places of worship, community facilities)*	**Gargi Hospital, Rajnagar, UP** **Springdales Public School, Block G.**	Approx. 3.43 Km in South from the project site. Approx. 2.53 Km in SSE from

		Rajnagar, UP **Shemrock Mother's Planet School**	the project site. Approx. 838 m in SE from the project site.
10	Areas containing important, high quality or scarce resources. *(ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)*	None	There are no such areas within 15 km containing important, high quality or scarce resources.
11	Areas already subjected to pollution or environmental damage. *(those where existing legal environmental standards are exceeded)*	**None**	There are no areas within 15 km which are subjected to pollution or environmental damage.
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (*earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions*)	**Earthquakes**	The site falls under the zone IV as per the Seismic Zone Map of India and is thus prone to high damage risk zone. Adequate measures will be taken during the construction of the project.

(IV) Terms of Reference for EIA studies Applicable

The scope of work for preparation of EIA report for the proposed project comprises various steps. The scope of study includes characterization of various components of the existing environmental parameters/variables area namely air, water, land, noise, biological and socio-economic etc. in a study area of 2 km radius in an angular distance from the proposed construction site. The various steps involved in the EIA Study are followings:

- Project description.
- Description of the Environment of the land, air, water, noise and socio-economic components of environment.
- Anticipated Environmental Impacts and Mitigation Measures.
- Preparation of Environmental Management and Monitoring Plan.
- Preparation of Emergency Preparedness Plan.
- Summary and Conclusion.

(I) Project Description

Project description will cover following aspects:

- Location and layout map of the project.
- A map of the study area 2 km from the boundary of the project site delineating the major topographic features such as landuse, drainage location of habitats, major roads, railways industries will be prepared. Approved master plan of the area will be provided.
- A map covering aerial distance of 15 km from the project site delineating environmental sensitive areas as specified in **Form-I** will be prepared.
- Details of project development, sewage treatment facilities, solid waste disposal facilities, recreational facilities, water supply, DG Set and project implementation schedule.
- Manpower requirement in skilled, semiskilled, unskilled workers, technician, engineers and managers during construction and operation phases.

(II) Description of Environment

Present status of environment covering land, air, water, noise, demography and socio-economic components shall be established through field monitoring and secondary data sources.

(1) Land environment

a) Study of existing land use pattern with respect to habitation, agriculture, forest/plantation cover, habitation, environmentally sensitive areas etc. based on satellite Imagery, ground truth verification and secondary data. These features will be depicted on a map.
b) Topography of the area including slope, landforms and terrain analysis.
c) Physico-chemical characteristics of soil including soil type, porosity, permeability, and primary/nutrients.

(2) Meteorological data

a) Collection of meteorological data from IMD for a year.
b) Micrometeorological data with respect to Wind speed, wind direction, temperature, relative humidity, atmospheric pressure and rainfall will be measured and recorded.
c) Preparation of monthly wind roses for one season.

(3) Air environment

a) Data for the air environment for one season (except monsoon) shall be collected with the help of appropriate field studies in an area of 2 km from the project site.

b) Data for ambient air quality shall be collected at four locations. The locations will be selected based on the CPCB norms and local geographical settings. These locations will be shown on a map.

c) Monitoring of ambient air quality shall be carried out for 2.5 µm and 10 µm particulates, SO_2, NO_2, and CO as per Gazette Notification on AAQ.

(4) Noise environment

a) Assessment of noise level at the project site and around the proposed site during daytime and nighttime.

(5) Water environment

a) Assessment of quality of ground water, surface water and municipal water in the study area and comparison with drinking water standard and state PWD specification for construction water.

b) Study of water resources with respect to quantity and preparation of ground water budget including rainwater harvesting.

c) Quantification of water requirement and identification of source for the project.

d) Quantity of Wastewater generated, wastewater treatment requirements as well as reuse and recycling of treated wastewater.

(6) Biological environment

a) Collection of data on existing flora and fauna of the study area.

b) Location of National park and Wildlife sanctuary within 10 km radius from project boundary, if any.

c) Identification of rare and endangered species in the study.

(7) Socioeconomic and health aspects

a) Study of sociological and cultural environment of study area with respect to demographic structure, literacy, average household size, sex ratio and social structure.
b) Study of infrastructure facilities in the study area.
c) Study of economic status of population and assessment of economic contribution by the proposed construction.

(III) Anticipated Environmental Impacts and Mitigation Measures:-

Anticipated Environmental Impacts and Mitigation Measures impact of proposed activities on various components of the environment shall be assessed.

a) Land Environment: Impact will be assessed with respect to natural drainage, soil erosion, loss of productive soil etc. Mitigation measures will include soil erosion control plan, details related to preservation of top soil.

b) Air Environment: Impact on ambient air quality during construction and operation of the project will be predicted using suitable model. Mitigation measures for air pollution control including fugitive dust control, DG set stack height, greenbelt development will be described.

c) Water Environment: Impact of construction and operation on surface and ground water will be assessed. Details of waste water treatment facilities, reuse of waste water, water conservation and rainwater harvesting to recharge ground water will be included.

d) Noise Environment:

- Assessment of Impact of noise generated from construction equipments during construction phase and due to increased traffic during operation phase of the project will be done.
- Necessary mitigation measures will be suggested.

e) Biological Environment:

- Assessment of impact of construction activities on biological environment will be done.
- Details of landscaping and plantation will be given.

(IV) Environment Management Plan

Environment management plan (EMP) shall be drawn after identification and prediction of the significant impacts and their evaluation. The proposed Environmental Management Plan will describe safeguards and monitoring on following aspects:

- Measures to control air and surface water pollution due to proposed activity. Details of sewage treatment plan, DG set.
- Measures to minimize generation of noise as well as personal protective equipments.
- Solid waste management plan
- Integration of energy conservation measures.
- Environmental monitoring, implementation, organization of setup and feedback mechanism to affect mid-course corrections

Emergency preparedness plan

The emergency preparedness plan shall be incorporated in the report, which will include analysis of risk probability, zone of influence etc. The plan will cover on-site emergency response, establishment setup of emergency control and manpower requirements in emergency operations, details of fire detection, alarm and control system.

EIA Report Format

The EIA Report will be prepared as per prescribed format described in the Ministry of Environment and Forests Notification, 2006 and its amendments.

FORM 1A

Group Housing "Red Apple Homes"

At

Khasra No. 1108m, 1109m, 1110m, Village: Morta, Ghaziabad (U.P.)

For

M/s Manju J Homes India Ltd.

Prepared By

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FORM IA

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 environmental management plan & monitoring program)

SECTION 1- LAND ENVIRONMENT

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

1.1 Will the existing land use get significantly altered from the project that is consistent with the surroundings? (Proposed land use must conform to the approved Master Plan/Development Plan of the area. Change of land use, if any and the statutory approval from the competent authority are 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.

- **No**

The project site is vacant land. It is anticipated that the construction activities of the project will not have an adverse effect on the land use activities in the project area. Freehold land of the project is owned and assembled by M/s. Manju J Homes India Ltd. of the same is earmarked for residential development as per the Ghaziabad Master Plan.

The project site is well connected through Delhi Meerut Road which is NH-58 which is approx. 800 m away from project site towards SE direction The nearest railway station is New Ghaziabad Railway Station, which is approx. 4.84 km away from the project site towards (SSW). The nearest airport is IGI Airport, at 38.8 km (WSW) from the project site. Google Earth image and Toposheet showing site & surroundings within 500 m and 10 & 15 km is enclosed as **Annexure I (a) & I (b).**

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 REQUIREMENT**

Table 1: Area Statement

SI. No.	PARTICULARS	AREA (Sq.m.)	Percentage (%)
1.	Plot Area	38,663	
2.	Less road widening area	1,621.65	
3.	Area left for zonal plan green	6,577.50	
4.	Net Plot Area	30,463.85	100
5.	Permissible ground coverage (@ 40% of plot area)	12,185.54	
6.	Proposed ground coverage (@ 28.76% of plot area)	8,763.35	28.76
7.	Total Permissible FAR	1,25,318.88	
	a. Permissible FAR (@ 3.75 of plot area) b. Incentive FAR against EWS & L.I.G	1,14,239.43 11,079.45	
8.	Proposed FAR	1,25,103.52	
	a. Residential FAR* b. Nursery School Area c. Convenient shopping d. 5% Excess Non F.A.R area count in F.A.R	1,21,641.24 2,000.00 997.20 465.08	
9.	Total fire staircase area	2220.42	
10.	Area for garbage collection chamber	105	
11.	Electric sub-station & guard room area	49.50	
12.	Basement Area	42,964.28	
	• Upper Basement • Lower Basement	21,834.09 21,130.19	
13.	EWS/LIG area	11,079.45	
14.	Non- FAR (Mumty and Machine Room)	6322.34	
15.	Built Up Area	**1,87,844.51**	
16.	Open Area	21,700.5	71.24
17.	Landscape area (@ 10% of net plot area)	3,046.38	10
18.	Remaining open area	18,654.12	61.24

*FAR = Floor Area Ratio

Table 2: Built-up Area Details

S. No.	Particulars	Area (in m^2)
1.	Proposed FAR	1,25,103.52
2.	a. Residential FAR* b. Nursery School Area c. Convenient shopping d. 5% Excess Non F.A.R area count in F.A.R	1,21,641.24 2,000.00 997.20 465.08
3.	Total fire staircase area	2220.42
4.	Area for garbage collection chamber	105
5.	Electric sub-station & guard room area	49.50
6.	Basement Area	42,964.28
7.	• Upper Basement • Lower Basement	21,834.09 21,130.19
8.	EWS/LIG area	11,079.45
9.	Non- FAR (Mumty and Machine Room, etc.)	6322.34
	Built Up Area	**1,87,844.51**

- **WATER REQUIREMENT**

The total water requirement will be approx. 683 KLD, out of which total domestic water requirement will be 663 KLD. The fresh water requirement will be approx. 464 KLD (which is 70% of the domestic water demand).

- **POWER REQUIREMENT**

The power shall be supplied by Uttar Pradesh Power Corporation Limited (UPPCL). The connected load for the Group Housing project will be approx. 1,011.79 kVA which shall be supplied by transformer of 1,250 kVA.

Details of D.G Set

There is a provision of 2 no. of DG sets of total 2000 kVA capacity (2 x 1000 kVA) for power back up in the project in the group housing Project. The DG sets will be equipped with acoustic enclosure to minimize noise generation and adequate stack height for proper dispersion.

- **CONNECTIVITY**

The project site is well connected through Delhi Meerut Road which is NH-58 which is approx. 500 m away from project site towards SE direction The nearest railway station is New Ghaziabad Railway Station, which is approx. 4.84 km away from the project site towards (SSW). The nearest airport is IGI Airport, at 38.8 km (SW) from the project site.

- **PARKING FACILITIES**

Adequate parking (2,666 ECS) provision will be kept for vehicles parking in the project. Besides this, internal road of adequate width within the project will facilitate smooth traffic movement.

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 land use and disturbance to the local ecology).

The project being a well planned activity will result in organized open spaces and green areas. About 3,046.38 m^2 of the area is earmarked for landscaping. The project will have an overall positive impact on the existing land use and will not cause any disturbance to the local ecology. Proposed activity shall have no impact on surroundings.

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

There shall be no land disturbance resulting in erosion, subsidence and instability as it is a flat land. The site falls under the zone IV as per the seismic zone map of India and indicating high damage risk zone. The project will be earthquake resistant taking into account the latest provisions of Indian Standards Codes.

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

The project does not intersect any natural drainage route. No perennial or non-perennial drainage system is found to exist in the project area or being obstructed by the project. The surroundings comprise an urbanized stretch. Well planned storm water drainage has been designed to take care of internal storm water drainage. Thus, no impact on the natural drainage system is anticipated.

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?)

The earthwork shall include soil excavation and cutting 1, 28,892.84 m^3 of the earth will be moved. The cut and fill material in the project site is nearly at par and hence the need for movement of soil to and from the site is not anticipated.

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

Water requirement during construction phase treated water will be provided through Private water tankers .Wastewater generated during the construction will be disposed off through soak pits. Waste handling during the construction phase shall be done by the site contractor whose responsibility lies with collection and storage of construction and demolition waste generated on the site. All construction wastes generated during construction will be used within the site itself

for filling the floors, roads, aggregate for mortar etc. to the extent feasible. Remaining will be sent to the agency for proper disposal.

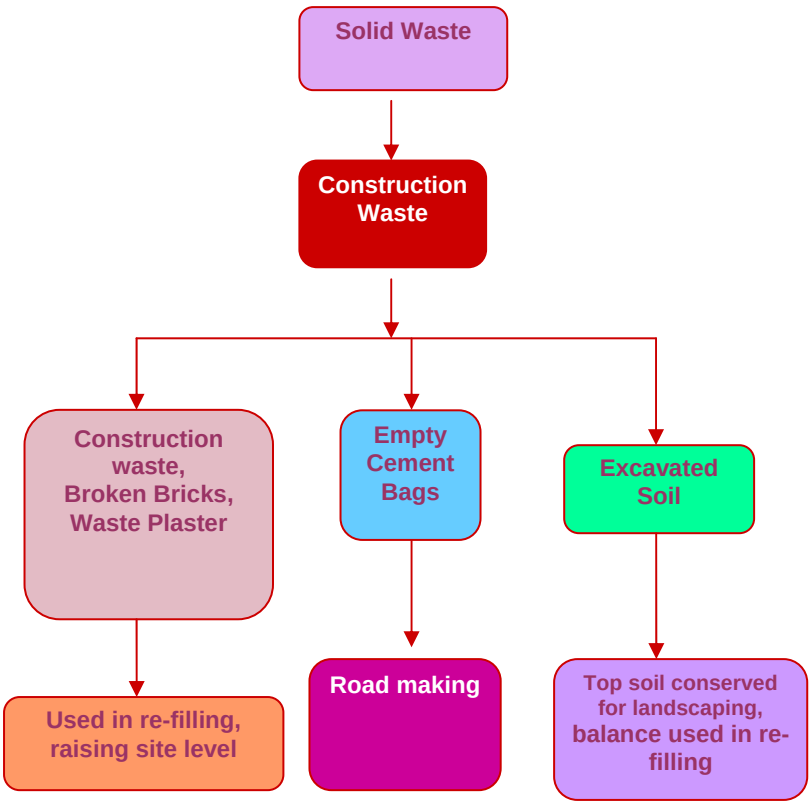

Figure 1: Waste Management Plan for the Construction Phase

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).

No. The site area is a flat land and the surroundings are characterized by an urbanized stretch. No low lying areas or wetlands are found in the region.

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

No health hazards are expected during the construction phase. The laborers will be provided with face masks to minimize dust inhalation.

A significant portion of the construction waste and wood scrap generated will be used on the site. The quantity of domestic waste generated will be very little, as mostly local laborers will be employed. However, the wastes generated will be collected and disposed by an authorized agency.

SECTION 2- WATER ENVIRONMENT

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

The total water requirement is approx. 683 KLD, out of which total domestic water requirement is 663 KLD. The fresh water requirement is approx. 464 KLD (which is 70% of the domestic water demand). The daily water requirement calculation is given below in **Table 3.**

Table 3: Calculations for Daily Water Demand

S. No.	Description	Area (in m^2)	Total Occupancy	Rate of water demand (lpcd)	Total Water Requirement (KLD)
A.	**Domestic Water**				
	I) Residential		7,443	86	6,40,098
	II) Staff		372	30	11,160
	III) Visitors		744	15	11,160
Total Domestic water (A=I+II+III)					**662.42 say 663 KLD**

B.	**Horticulture and Landscape development**	3,046.38 m^2		3 lt./sqm/day	9
C.	**DG Set Cooling (2 × 2,000 kVA)***	2,000 KVA		0.9 lt./KVA/hr	11
Grand Total (A+B+C) = 683 KLD					

**Considering 6 hours running for DG set*

Table 4: Wastewater Calculations

Domestic Water Requirement	663 KLD
• Total Fresh water (70% of domestic)	464 KLD
• Flushing (@ 30% of domestic)	199 KLD
Wastewater Generated (@ 80% fresh + 100% flushing)	371 + 199 = **570 KLD**
STP Capacity	684 KLD

The water balance diagram during rainy season & non-rainy seasons are shown below in **Figure 2 & 3** respectively:

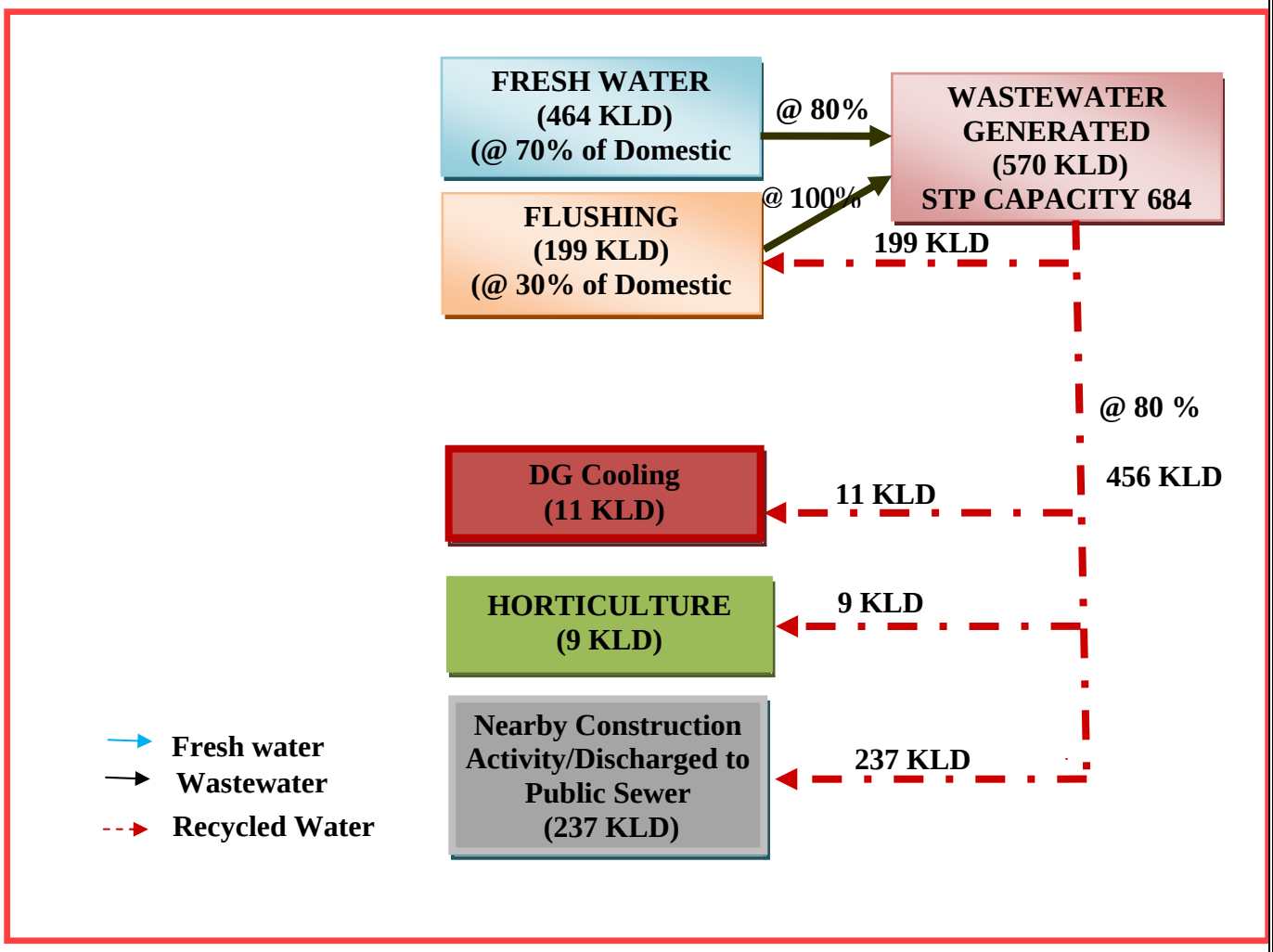

Figure 2: Water Balance Diagram during Non-Rainy Season

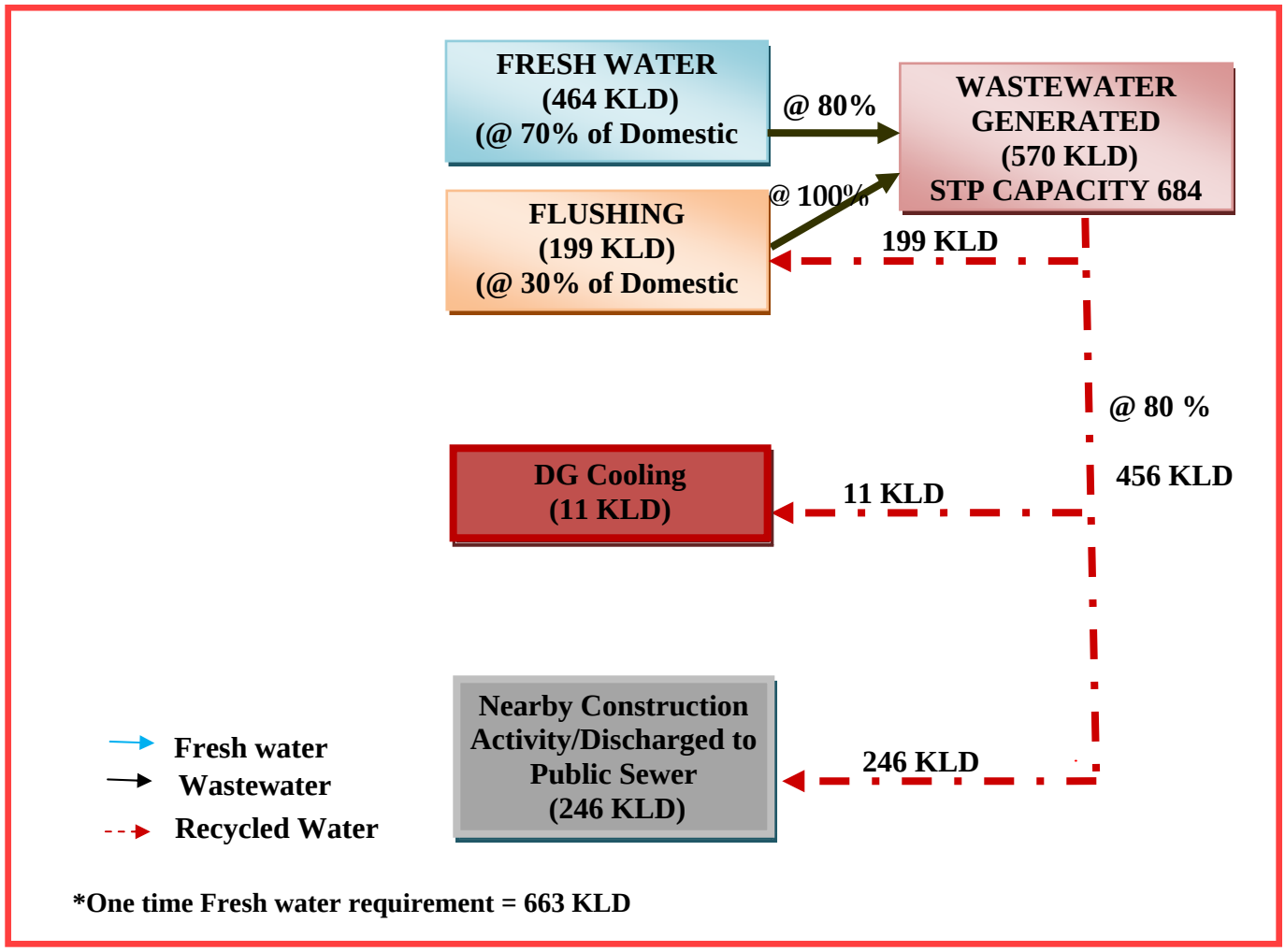

Figure 3: Water Balance Diagram during Rainy Season

2.2 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).

As the source of water supply to the project is from municipal supply.

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

The project will generate approx. 570 KLD of wastewater which will be treated in the STP of 684 KLD capacity provided within the project premises. The treated effluent generated from STP will be approx.219 KLD which will be recycled & reused within the project premises. Surplus treated effluent will be discharged into external sewer.

2.2.1 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. Rise in water demand is a local phenomenon but the project would only involve spatial shifting of water demand within a region.

2.5 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)

Approximately, 570 KLD (@ 80% fresh + 100% flushing) of wastewater will be generated during the operational phase from domestic use and other commercial uses. This wastewater generated will be treated in well designed sewage treatment plant based on fine bubble aeration system technology.

The following are the input characteristics of the waste water:

Wastewater Details

(a)	Daily load	:	570 KLD
(b)	Duration of flow to STP	:	24 hours
(c)	Temperature	:	Maximum $32^{o}C$
(d)	pH	:	7 to 9.5
(e)	Colour	:	Mild
(f)	T.S.S. (mg/l)	:	100-400 mg/l

(g)	BOD_5 (mg/l)	:	200-300 mg/l
(h)	COD (mg/l)	:	500-700 mg/l

b. <u>Final discharge characteristics</u>

(a)	pH	:	6.5 to 7.5
(b)	Oil & Grease	:	<10 mg/l
(c)	B.O.D.	:	<10 mg/l
(d)	C.O.D.	:	<30 mg/l
(e)	Total Suspended Solids	:	<10 mg/l

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

The storm water disposal system for the premises shall be self-sufficient to avoid any collection/stagnation and flooding of water. The amount of storm water run-off depends upon many factors such as intensity and duration of precipitation, characteristics of the tributary area and the time required for such flow to reach the drains. The drains shall be located near the carriage way along either side of the roads. Taking the advantage of road camber, the rainfall run off from roads shall flow towards the drains. Storm water shall be connected to adjacent drain by a pipe through catch basins. Therefore, it has been calculated to provide 1rainwater harvesting pit & 1 rainwater harvesting tank at selected locations, which will catch the maximum run-off from the area.

1) Since the existing topography is congenial to surface disposal, a network of storm water pipe drains is planned adjacent to roads. All building roof water will be brought down through rain water pipes.
2) Storm water system consists of pipe drain, catch basins and seepage pits at regular intervals for rain water harvesting and ground water recharging.

3) For basement parking, the rainwater from ramps will be collected in the basement storm water storage tank. This water will be pumped out to the nearest external storm water drain.
4) Peak Hourly Rainfall of 50 mm/hr shall be considered for designing the storm water drainage system.

Rain water harvesting has been catered to and designed as per the guideline of CGWA. Peak hourly rainfall has been considered as 50 mm/hr. The effective length, breadth and depth, of a Recharge pit is 4.0 m, 1.3 m and 3.5 m respectively and effective length, breadth and depth of a desilting chamber 2.0 m, 1.3 m and 1.25 m respectively is constructed for recharging the water, also the rainwater harvesting tank of 2 m, 3 m and 2 m have been proposed. The bottom of the recharge structure will be kept 5 m above ground water level. At the bottom of the recharge well, a filter media is provided to avoid choking of the recharge bore. Design specifications of the rain water harvesting plan are as follows:

- Catchments/roofs would be accessible for regular cleaning.
- The roof will have smooth, hard and dense surface which is less likely to be damaged allowing release of material into the water. Roof painting has been avoided since most paints contain toxic substances and may peel off.
- All gutter ends will be fitted with a wire mesh screen and a first flush device would be installed. Most of the debris carried by the water from the rooftop like leaves, plastic bags and paper pieces will get arrested by the mesh at the terrace outlet and to prevent contamination by ensuring that the runoff from the first 10-20 minutes of rainfall is flushed off.
- No sewage or wastewater would be admitted into the system.
- No wastewater from areas likely to have oil, grease, or other pollutants has been connected to the system.

Calculations for storm water load

Roof-top area = Ground Coverage = 8,763.35 m2

Green Area = 3,046.38 m^2

Paved Area = Total Plot Area – (Roof-top Area + Green Area)

= 30,463.85 – (8,763.35 + 3,046.38)

= 18,654.12 m^2

Runoff Load

Roof-top Area = 8,763.35 × 0.05 × 0.8

= 350.534 m^3/hr

Taking 15 minutes Retention Time, Total volume of storm water = 350.534/4

= 87.6335 say 88 m^3

The effective length, breadth and depth of a Recharge pit is 4.0 m, 1.3 and 3.5 m respectively.

Volume of a single Recharge pit (a) = L X B X H = 4.0 x 1.3 x 3.5

= 18.2 m^3

Volume of single desilting chamber (b) = L X B X H = 2.0 x 1.3 x 1.25

= 3.25 m^3

Total Combine Capacity (a) + (b) = 18.2 + 3.25 = 21.45 say 22 m^3

Hence No. of pit required = 88/22 = 4 pits.

Total of 4 Rain Water Harvesting pits are being proposed for artificial rain water recharge from roof runoff within the project premises.

Runoff from green area and paved area will be collected in rain-water harvesting tank.

Rain water harvesting potential from Green Area = Green area × Max^m monthly rainfall (m) × runoff coefficient for landscape area/garden/park

= 3,046.38 × 0.10 × 0.10

= 30.46 m^3

Rain water harvesting potential from Paved Area = 18,654.12 × 0.10 × 0.75

= 1,399.06 m^3

Total Runoff Load for 30 days = 30.46 + 1,399.06 m3

$= 1429.52\ m^3$

Total runoff project site for 3 days $= 1429.52/10\ m^3$

$= 142.95\ m^3$

Taking length, breadth and depth of harvesting tank to be 2 m, 3 m and 2 m; Volume of tank will be 2 m × 3 m × 2 m = 12 m^3.

Number of tanks required = 142.95/12

= 11.9 say 12 tanks required.

Total of 12 tanks are being proposed for harvesting rainwater from run off from green and paved area.

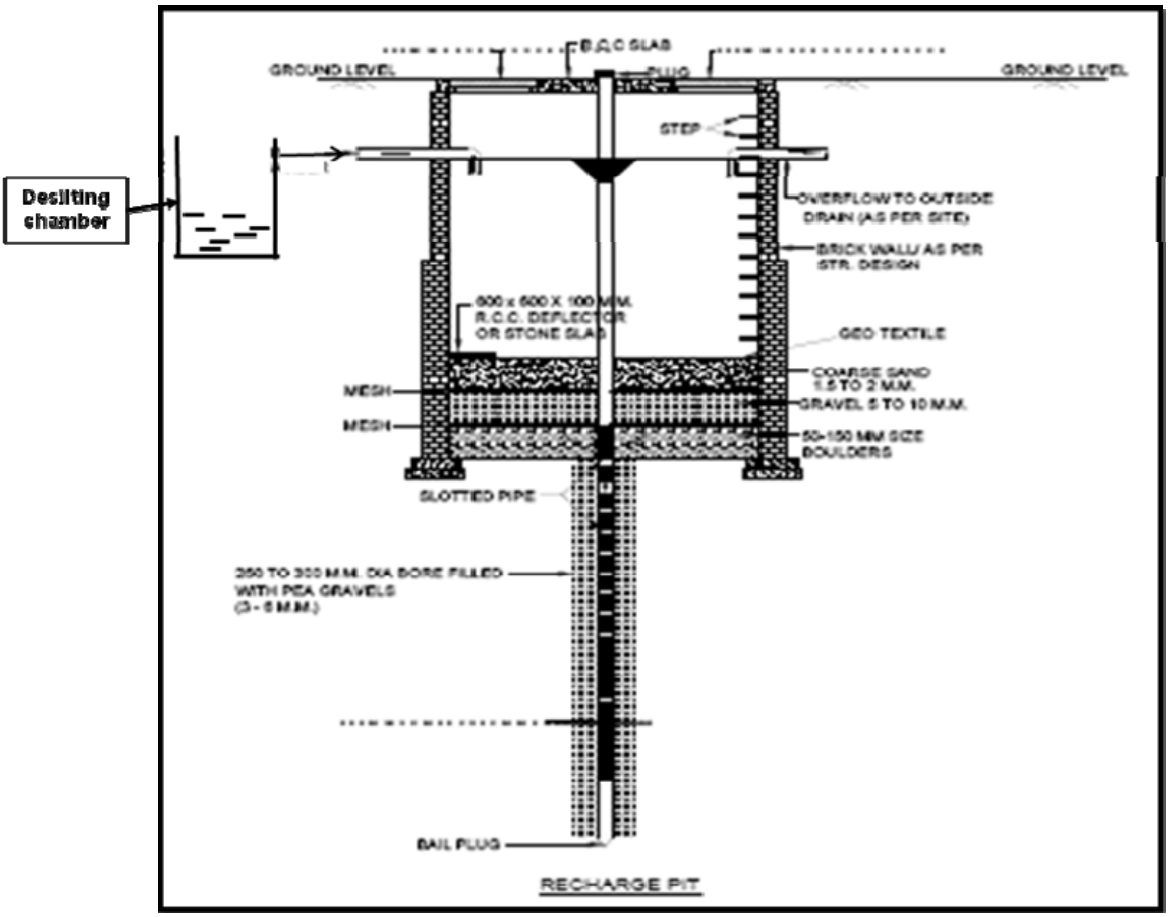

Figure 4: Typical Rain Water Harvesting Pit Design

2.7 What would be the impact of the land use changes occurring due to the 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 project will include paved areas and thus the runoff from the plot is expected to increase due to reduced infiltration. However, the increased runoff will not cause flooding or water logging as a well designed storm water drainage will be provided. The runoff will finally be collected into rainwater harvesting pit for groundwater recharge and RWH tank for storage. The quality of the runoff is expected to improve due to paved areas.

2.8 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)

Water demand will be fulfilled from Private tankers. To reduce the freshwater demand, treated water will be used for landscaping, flushing and D.G. cooling and surplus treated water 226 KLD (non-rainy season) and 235 KLD (rainy season) will be discharged to External sewer.

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2.9 What precautions/ measures have been proposed to check the surface run-off, as well as uncontrolled flow of water into any water body?

The following management measures are suggested to protect the water quality are:

- Avoid excavation during monsoon season.
- Community toilets shall be constructed on the site during construction phase and the wastewater will be channelized to the septic tank in order to prevent wastewater from entering the water bodies.

- To prevent surface and ground water contamination by oil/grease, leak proof containers would be used for storage and transportation of oil/grease. The floors of oil/grease handling area would be kept effectively impervious.
- Collection and settling in the storm water, prohibition of equipment wash downs, and prevention of soil loss and toxic release from the construction site will be adhered to minimize water pollution.

2.10 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).

Most of the storm water produced on site will be harvested for ground water recharge. Thus proper management of this resource is a must to ensure that it is free of contamination. A detailed Storm Water Management Plan will be developed which will consider the sources of storm water. The plan will incorporate best management practices which will include the following:

- Regular inspection and cleaning of storm drains.
- Installation of clarifiers or Oil/Water separators/traps system of adequate capacity around parking areas and garages as per requirement.
- Avoid application of pesticides and herbicides before wet season.
- Conducting routine inspections to ensure cleanliness.
- Preparation of spill response plans, particularly for fuel and oil storage areas.
- Provision of silt traps in storm water drains.
- Good housekeeping in the above areas.

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

No, mostly local laborers will be employed during the construction phase and thus negligible quantities of wastes will be generated. Mobile toilets will be provided and the wastewater generated will be collected in septic tanks. Different color bins will be provided to manage different kind of waste to maintain the sanitary conditions of the project site.

2.12 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).

It is expected that the project will generate approx.570 KLD of wastewater which will be treated in STP of capacity 684 KLD. Treated water will be recycled for Landscaping, Flushing, and DG cooling in non-rainy season and for flushing and DG Cooling in rainy season. Surplus water will be discharged to External Sewer.

2.13 Give details of dual plumbing system if treated waste used for flushing of toilets or any other use.

Dual plumbing system that utilizes separate piping systems for freshwater and recycled wastewater will be adopted for the project. Treated water from the on-site STP is estimated at 456 KLD. The recycled water system shall utilize this treated waste water and serve for non-contact uses such as flushing, horticulture; DG etc and rest will be discharged to External Sewer.

3. VEGETATION

3.1 Is there any threat of the project to the biodiversity? (Give a description of the local ecosystem with its unique features, if any).

No ecologically sensitive area falls within the project site. Hence, no ecological/ biological threat has been anticipated.

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

The project does not support any significant vegetation. It is proposed to develop a peripheral greenbelt of native plant species to enhance the aesthetic value of the region and also provide an excellent habitat for various faunal groups. Evergreen tall and ornamental trees like *Polyalthia longifolia* , *Ficus benjamina* , *Pulmeria alba* etc. have been proposed to be planted inside the premises.

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?)

Green belt will be developed along the periphery of the project premises along with the internal parks and lawns 3,046.38 m^2 will be developed as green belt and organized green spaces.

4. 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. The existing land use around the site is urban and does not provide a habitat for wild species. The peripheral greenbelt will provide an excellent habitat for the native fauna.

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

The project will not have any direct or indirect impacts on the avifauna of the area. However, planting of fruit bearing trees in the greenbelt will be an attraction to the local bird population.

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

Not applicable

5. 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 construction).

Ambient air monitoring will be carried out at during detailed EIA/EMP studies.

From vehicular emissions, PM, NO_x and CO are pollutants of primary concern. The dispersion of vehicular emissions would be confined within 100 m from the road and concentration will decrease with the increase in distance from road. It is anticipated that the contribution of vehicular emissions in ambient air quality will be marginal but well within the stipulated National Ambient. At higher wind speed dispersion will be faster.

Mitigation Measures: The Expansion Group housing project will develop a green belt inside the premises of the project site and along the internal road, which will work as barrier for the movement of pollutants and help in pollution control.

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.

Source of pollution:-

- DG set running
- Vehicular movement

Impacts on Air Quality due to DG Sets and vehicular emissions:

- Impacts on ambient air during operation phase would be due to emissions from the stacks attached to backup DG sets only during grid power failure.
- Increase of CO level in the basement.

Mitigation Measures for Impacts of DG Sets and other vehicular emissions on Ambient Air Quality:

- Back up DG sets will comply with the applicable emission norms.
- Adequate stack height for DG sets will be provided as per norms.
- Back up DG sets will be used only during power failure.
- Monitoring of emissions from DG sets and ambient air quality will be carried out as per norms.

Being a small construction project, it comes under 8(a) schedule of EIA notification 2006, so emissions will be negligible and under prescribed limits.

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 and exit to the project site.

Adequate provision will be made for car/vehicle parking at the project site. There shall also be adequate parking provisions for visitors so as not to disturb the traffic and allow smooth movement at the site.

Parking Required:

As per MoEF Norms:

For residential facilities = 1 ECS/100 m^2 FAR

= 1,21,641.24/100 = **1216.4 ECS say 1216 ECS**

For Commercial & Community Facilities = 1 ECS/50 m^2 FAR

= 2997.20/50 = **59.9 say 60 ECS**

Total Parking required as per MoEF Norms = 1216 + 60 ECS = 282 ECS

As per Ghaziabad Bye Laws:

For residential facilities = 1.5 ECS/100 m^2 FAR

= 1,21,641.24 X 1.5/100 = **1824.6 say 1825 ECS**

For Convenient Shops = 2 ECS/100 m^2 FAR

= 997.20 X 2/100 = **19.9 say 20 ECS**

For Community area = 1.25 ECS/100 m^2 FAR

= 2,000 X 1.25/100 = **25 ECS**

Total parking required = 1825 + 20 + 25 = 1870 ECS

Parking Proposed:

Area proposed for upper basement parking = 21,834.09 m^2
Area required for 1 ECS of basement parking = 32 m^2
Parking proposed in upper basement = 21866.09 say 21,866 ECS

Area proposed for lower basement parking = 21,130.19 m^2
Area required for 1 ECS of basement parking = 32 m^2
Parking proposed in lower basement = 660.3 say 660 ECS

Area proposed for stilt parking = 37,083.86 m^2
Area required for 1 ECS of stilt parking = 28 m^2
Parking proposed in stilt parking = 1324.4 say 1,324 ECS

Total Parking proposed = 21,866 + 660 + 1,324 = 23,850 ECS

Out of which, 5% of the parking will be proposed for physically handicapped persons near staircases.

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

Internal roads of adequate width, footpaths/pedestrian pathways have been well planned for the project.

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.

No significant impact of noise has been anticipated within and outside of the project site due to provision of wide roads for smooth flow of traffic and greenbelt along the roads. Noise, due to the traffic, within site, will result in a marginal increase in the noise levels because noise control measures shall be provided in vehicles & DG sets as mentioned below, which will cause slight increase in noise level.

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

During operation, vehicular movement and operation of DG set are the major sources of noise pollution. But both these activities- DG set and vehicular movement will not have any significant impact on the people residing in the area. Since DG set will not be operational continuously and moreover it will be placed away from residential settlements and will be enclosed with suitable enclosures, hence no or minimal impact will be anticipated. It is envisaged that the movement of the motor vehicles will be restricted to designated carriageways only.

Impacts on Air Quality due to DG Set:

- Impacts on ambient air during operation phase would be due to emissions from the stacks attached to backup DG set only during grid power failure.

Mitigation Measures for Impacts of DG Set on Ambient Air Quality:

- Back up DG set will comply with the applicable emission norms.
- Adequate stack height for DG set will be provided as per norms.
- Back up DG set will be used only during power failure.
- Monitoring of emissions from DG set and ambient air quality will be carried out as per norms.

Noise Control Measures for DG set:

- DG room will be provided with acoustic lining / treatment to insure 25 dB (A) insertion loss as per the regulations.
- Adequate exhaust mufflers will be provided as per norms to limit the noise.

6. AESTHETICS

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

The site lies in an urbanized settlement and is well planned. Thus, no obstruction of view or scenic beauty or landscape is anticipated. Furthermore, the construction will be planned in such a way that the organized open spaces and landscaped areas will render the plot aesthetically appealing.

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

No impacts anticipated.

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

The project will strictly follow the Area Building Regulation of NBC. All norms on Ground Coverage, FAR, Height, Setbacks, Fire Safety Requirements, Structural Design and other parameters will be strictly adhered to.

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

No anthropological or archaeological sites or artifacts are found near the site area.

7. SOCIO-ECONOMIC ASPECTS

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

No such changes anticipated.

Construction phase: Since local labourers will be engaged during construction phase, alteration to the existing demographic profile of the area is not anticipated.

Operation phase: The changing demography in the area is another impact that needs attention. The project will mainly lead to spatial redistribution of local population and hence no considerable influx of population is envisaged owing to the project.

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

The project site is well connected through Delhi Meerut Road which is NH-58 which is approx. 800 m away from project site towards SE direction The nearest railway station is New Ghaziabad Railway Station, which is approx. 4.84 km away from the project site towards (SSW). The nearest airport is IGI Airport, at 38.8 km (SW) from the project site.

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

Construction phase: There are no religious sites or archeological monuments of historical significance in or near the project site. Hence, no adverse impact in this regard is anticipated. Rather, this phase will generate jobs that relate to unskilled, semi skilled as well as skilled labour category. Few supervisory positions will also open up, for which local candidates will be considered based on merit.

Operation phase: The project will provide state-of-the-art housing facility in the area, thereby improving the quality of life. The Group housing project of such scale will also boost the local economy.

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)

For the purpose of paved path, sun dried pavers will be used instead of baked pavers as they are manufactured through energy efficient processes.

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

Mitigation Measures for Air Pollution during Construction Stage:

- Construction materials will be suitably covered with tarpaulin cover etc during transportation.
- Water sprinkling shall be done on haul roads where dust generation is anticipated.
- Raw material storage and handling yard will be enclosed from all sides.
- To minimize the occupational health hazard, proper personal protective gears i.e. mask shall be provided to the workers working in the dust prone areas.

Mitigation Measures for Noise Pollution during Construction Stage:

- Administrative as well as engineering control of noise will be implemented.
- Isolation of noise generation sources and temporal differentiation of noise generating activities will ensure minimum noise at receiver's end.
- To prevent any occupational hazard, earmuff / earplug shall be given to the workers working around construction plant & machinery emitting high noise levels.
- Use of such plant or machinery shall not be allowed during night time. Careful planning of machinery operation and scheduling of operations shall be done to minimise such impact.

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

Yes, for road construction fly-ash will be utilized. Recycled materials will be bought from outside sources and will be used as fillers in base and sub-base of the carriageway, footpaths pavements or pedestrian way, as needed.

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

The solid waste of the project will be segregated into biodegradable and recyclable waste. Biodegradable waste and recyclable waste will be collected in separate bins. Biodegradable waste will be treated in the project premises by organic waste converter. The recyclable wastes will be sent off to recyclabers. Proper guidelines for segregation, collection and storage will be prepared as per Municipal Solid Wastes (Management and Handling) Rules, 2000.

❖ **Collection and Segregation of waste**

1. A door to door collection system will be provided for collection of domestic waste in plastic bags from household units.
2. The local vendors will be hired to provide separate colored bins for dry recyclables and Bio-Degradable waste.
3. For domestic waste collection, adequate number of colored bins (Green, Blue, and Dark Grey bins separate for Bio-degradable and Non Bio-degradable) are proposed to be provided at the strategic locations of the housing area.
4. Litter bin will also be provided in open areas like parks etc.

❖ **Treatment of waste**

- **Bio-Degradable wastes**

1. Bio-degradable waste will be subjected to Organic Waste Converter and the compost/resultant will be used as manure.
2. STP sludge is proposed to be used for horticultural purposes as manure.

3. Horticultural Waste is proposed to be composted and will be used for gardening purposes.

- **Recyclable wastes**

1. *Grass Recycling* – The cropped grass will be spread on the green area. It will act as manure after decomposition.
2. Recyclable wastes like paper, plastic, metals etc. will be sold off to recyclables.

- **Non-Recyclable wastes**

Non-Recyclable wastes will be disposed through Govt. approved agency. Hence, the Municipal Solid Waste Management will be conducted as per the guidelines of Municipal Solid Wastes (Management and Handling) Rules, 2000. E-waste will be managed as per E-waste (Management & Handling Rules, 2011). It will be handed over to Govt. approved vendors.

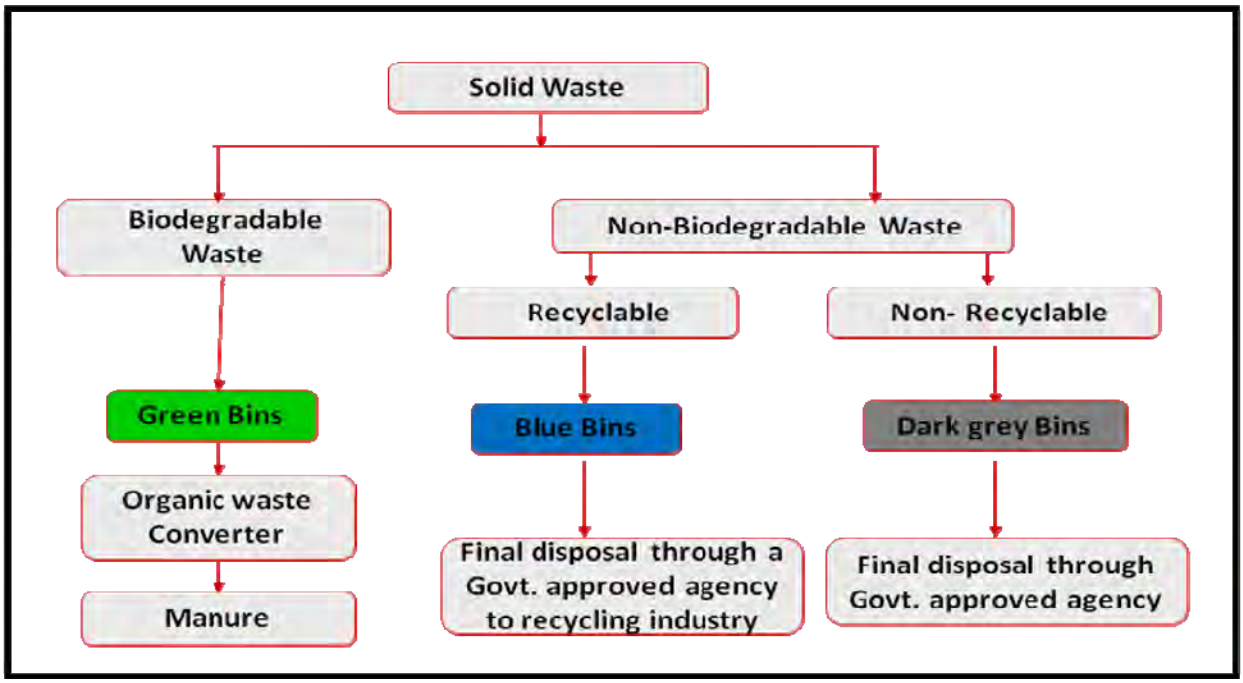

Figure 5: Solid Waste Management Scheme (Operation Phase)

9. ENERGY CONSERVATION

9.1 Give details of the power requirements, source and 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?

The power supply shall be supplied by Uttar Pradesh Power Corporation Limited (UPPCL). The connected load for the Group Housing project will be approx. 1,011.79 kVA which shall be supplied by transformer of 1,250 kVA. There is provision of 2 nos. of DG set of 4000 kVA capacity for power back up in the Group Housing Project. The DG set will be equipped with acoustic enclosure to minimize noise generation and adequate stack height for proper dispersion.

Effective measures have been incorporated to minimize the energy consumption in following manners:

- Solar street lights. .
- All internal lighting shall be BEE star rated and solar lit, at least to an extent of 25%.
- Solar street light controllers will be used for automatic dusk to dawn operation of street lights.
- A minimum of 50% hot water requirement shall be met by solar water heating systems.

Integration of automated system to operate electrical equipment as per load requirement to save energy

9.2 What type and capacity of power backup do you plan to provide?

There is provision of 2 nos. of DG set of 4,000 kVA capacity for power back up in the Group Housing Project. The DG set will be equipped with acoustic enclosure to minimize noise generation and adequate stack height for proper dispersion.

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?

The project being a Group housing Project, will involve uses of clear & tinted glass having SHGC of less than 3.11 w/m^2-^oC.

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

Passive solar design refers to use of the sun's energy for the heating and cooling of living spaces. 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.

9.5 Does the layout of street & building 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.

Layout of buildings has been done as per the sun path analysis so that the design cuts off direct radiations of critical hours which are specific to the orientation. Solar energy will be harnessed to meet various energy requirements of the project such as:

- Solar street lights.
- Solar blinkers.

9.6 Is the shading effectively used to reduce cooling/heating lands? 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?

Pergolas, projection, façade elements, metal louvers will be provided to reduce cooling loads. Green area and open areas will be so spaced that a reduction in temperature is achieved.

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

Yes. Well designed building structures will allow natural light to enter. Measures prescribed in Energy Conservation Building Code 2007 will be adopted to reduce the heat influx by walls, roofs and openings. Only prescribed quality of glasses will be used.

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

Heat emissions from the construction may be from the following sources:

- Heat absorbed from the paved and concrete structures
- Heat generated from equipment/appliances
- Heat increase due to population increase in the Expansion of group housing project

However, the heat generated will not be significant and will be dissipated in the greens and open areas provided within the project area.

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 value or the R values of the individual components.

The roof tops of the buildings will be planned with puffing/bricks bat coba for water proofing and reflective tiles.

External wall-external opening will have regular door windows with slightly tinted glass. Regular walls have some cladding/fixture paints.

S. No.	Component	U-value (W/m^2-°C)	R-value (m^2-^{0}C/W
(a)	Roof	< 0.409	R-2.1
(b)	External wall	< 0.352	R-2.35

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

Firefighting measures shall be adopted as per the guidelines of NBC. External yard hydrants installed around all buildings in the complex and galvanized steel fire hose boxes/cabinet (weather proof). All external yard hydrants shall be at one meter height from finished ground level as per NBC at a distance of 45 m along the road. External fire hydrants shall be located such that no portion of any building is more than 45 m from a hydrant and the external hydrants are not vulnerable to mechanical or vehicular damage.

Fire hydrant system will be provided within the buildings, fire escape staircases and refuge areas will be provided and the building structures will be planned as per NBC. In addition, 10 kg fire extinguishers will be provided for class A, B, and C fires. CO_2 extinguishers will also be provided.

Disaster Management Plan

PRECAUTION & MITIGATORY METHODS TO PREVENT DISASTERS:

- Complex is planned to reduce the impact of disasters and to encourage recovery.
- A disaster management cell would be established which will take care of post disaster scenario.
- It would be a volunteer kind of set-up and professionals can also be hired in case of eventuality.
- Complex management and maintenance agency will prepare an integrated, comprehensive management plan.

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PRECAUTION & MITIGATORY METHODS TO PREVENT DISASTERS:

(Earthquake Management)

- At the time of designing and constructing the building due care would be taken to have earthquake resistant structures which will conform to IS 1983.
- New systems and devices using non-conventional civil engineering materials would be developed to reduce the earthquake forces acting on structure.

PRECAUTION & MITIGATORY METHODS TO PREVENT DISASTERS:

(Fire Hazard)

- Fire safety would be taken into account and would follow all the safety norms and regulations as per the NBC and other related Indian Standards.
- All electrical cables would be underground and sophisticated modern electrical distribution system to reduce risk of fire.
- Special fire fighting equipments like Automatic Fire Detection and alarm system, automatic Sprinkler System etc. would be installed as per the NBC standards.
- Risk assessment with on site disaster management plan will be specified to fire, smoke and other emergency conditions.

9.11 If you are using glass as wall materials, provide details and specifications including emissivity and thermal characteristics.

The project being Group housing will not involve use of glass as wall material. All fenestration with U-factors, SHGC, or visible light transmittance determined, certified and labeled in accordance ISO 15099 shall be adopted.

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

The project will not be centrally air conditioned and hence there will be provision for ample natural ventilation.

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.

Solar energy will be variedly used as:

- Solar street lights.
- CFLs will be used in buildings to minimize the energy consumption.
- Green area is provided along with tree plantation which will result in natural air cooling and will reduce the load on conventional energy sources.

10. ENVIRONMENT MANAGEMENT PLAN

The Environment Management Plan (EMP) would consist of all mitigation measures for each component of the environment due to the activities increased during the construction, operation and the entire life cycle to minimize adverse environmental impacts resulting from 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 sites including fire. The detailed EMP for the project is given below.

10.1 Environmental Management Plan

The Environment Management Plan (EMP) is a site specific plan developed to ensure that the project is implemented in an environmental sustainable manner where all contractors and subcontractors, including consultants, 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. Also, the plan outlines roles and responsibility of the key personnel and contractors who will be in-charge of the responsibilities to manage the project site.

10.1.1 The EMP is generally

- Prepared in accordance with rules and requirements of the MoEF & CC and CPCB/ SPCB
- To ensure that the component of facility are operated in accordance with the design
- A process that confirms proper operation through supervision and monitoring
- A system that addresses public complaints during construction and operation of the facilities and
- A plan that ensures remedial measures is implemented immediately.

The key benefits of the EMP are that it offers means of managing its environmental performance thereby allowing it to contribute to improved environmental quality. The other benefits include cost control and improved relations with the stakeholders.

EMP includes four major elements:

- Commitment & Policy: The management will strive to provide and implement the Environmental Management Plan that incorporates all issues related to air, water, land and noise.
- Planning: This includes identification of environmental impacts, legal requirements and setting environmental objectives.
- Implementation: This comprises of resources available to the developers, accountability of contractors, training of operational staff associated with environmental control facilities and documentation of measures to be taken.
- Measurement & Evaluation: This includes monitoring, counteractive actions and record keeping.

It is suggested that as part of the EMP, a monitoring committee would be formed by M/s. Manju J Homes India Ltd. comprising of the site in-charge/coordinator, environmental group representative and project implementation team representative. The committee's role would be to ensure proper operation and management of the EMP including the regulatory compliance.

The components of the environmental management plan, potential impacts arising, out of the project and remediation measures are summarized below in Table 5.

TABLE 5: SUMMARY OF POTENTIAL IMPACTS AND REMEDIAL MEASURES

S. No.	Environmental components	Potential Impacts	Potential Source of Impact	Controls Through EMP & Design	Impact Evaluation	Remedial Measures
1.	Ground Water Quality	Ground Water Contamination	Construction Phase • Waste water generated from temporary labor tents.	• No surface accumulation will be allowed. • Mobile toilets will be provided. • Wastewater will be collected in septic tanks.	No significant impact as majority of labors would be locally deployed	
			Operation Phase • Sewage Discharge from the project	• Proponent will provide the STP to treat the discharge of Expansion of Group Housing Project.	No negative impact on ground water quality envisaged. Not significant.	
2.	Ground Water	Ground Water	Construction Phase	• Not Applicable	No significant impact on	

	Quantity	Depletion	• Ground water will not use during construction phase		ground water quantity envisaged.	
			<u>Operation Phase</u> • The source of water during operation phase is taken from Municipal supply.	• Black and Grey water treatment and reuse. • Percolation well to be introduced in landscape plan. • Awareness Campaign to reduce the water consumption	No significant impact on surface/ground water quantity envisaged.	
3.	Surface Water Quality	Surface water contamination	<u>Construction Phase</u> • Surface runoff from site during	• Silt traps and other measures such as additional on site	No off-site impact envisaged as no surface water receiving body is	

			construction activity.	diversion ditches will be constructed to control surface run-off during site development	present in the core zone.	
			<u>Operation Phase</u> • Discharge of domestic wastewater to STP.	• Domestic water will be treated in STP	No off-site impact envisaged	Excess of treated water will be discharged to CSTP.
4.	Air Quality	Dust Emissions	<u>Construction Phase</u> • All heavy construction activities	• During construction phase the contractors are advised to facilitate masks for the labors. Water sprinklers are being used for suppression of dust	Not significant because dust generation will be temporary and will settle fast due to dust suppression techniques.	

				during construction phase.		
		Emissions of PM, SO_2, NO_2 and CO	Construction Phase • Operation of construction equipment and vehicles during site development. • Running D.G. set (back up)	• Rapid on-site construction and improved maintenance of equipment. • Use of Personal Protective Equipment (PPE) like earmuffs and earplugs during construction activities.	Not significant.	Regular monitoring of emissions and control measures will be taken to reduce the emission levels.
			Operation Phase • Power generation by DG Set during power failure • Emission from	• Use of low sulphur diesel if available • Stack height of DG set above the tallest building as per CPCB standards	Not significant. No significant increase in	

			vehicular traffic in use	• Providing Footpath and pedestrian ways within the site for the residents • Green belt will be developed with specific species to help to reduce pollution level • Proper maintenance of equipment	ambient air quality level is expected from the project's activities. There are no sensitive receptors located within the vicinity of site.	
5.	Noise Environment		Construction phase	• Provision of noise shields near the heavy construction operations and acoustic enclosures for DG set.	Noise Environment	

				• Construction activity is being carried out to day time only		
			Operation Phase • Noise from vehicular movement • Noise from DG set operation	• Green Belt Development • Development of silence zones to check the traffic movement • DG set room will be equipped with acoustic enclosures	No significant impact.	

6.	Land Environment	Soil contamination	Construction Phase • Disposal of construction debris	Construction debris will be collected and suitably used on site as per the solid waste management plan for construction phase.	No significant impact. Impact will be local, as waste generated will be reused for filling of low lying areas etc.	
			Operation Phase • Generation of municipal solid waste • Used oil generated from D.G. set	• It is proposed that the solid waste generated will be managed as per MSW Rules, 2000. • Collection, segregation, transportation and disposal will be done as per MSW	Since solid waste is handled by the authorized agency, waste dumping is not going to be allowed. Not significant. After proper handling of MSW as per MSW Notification 1989. Negligible impact.	

				Management Rules, 2000 by the authorized agency • Used oil generated will be sold to authorized recyclers		
7.	Biological Environment (Flora and Fauna)	Displacement of Flora and Fauna on site	<u>Construction Phase</u> • Site Development during construction	• Important species of trees, if any, will be identified and marked and will be merged with landscape plan.	The site has shrubs as vegetation	
			<u>Operation Phase</u> • Increase in green covered area	• Suitable green belts will be developed as per landscaping plan	Beneficial impact.	

				in and around the site using local flora		
8.	Socio-Economic Environment	Population displacement and loss of income	<u>Construction Phase</u> • Construction activities leading to relocation	• Residential zone as per Master Plan 2021 of Ghaziabad Development. Authority • Project is being provided employment opportunities to the local people in terms of labor.	No negative impact. Beneficial Impact	
			<u>Operation Phase</u> • Site operation	• Project Proponent will	Beneficial impact	

				provide employment opportunities to the local people in terms of labor during construction and service personnel (guards, securities, gardeners etc) during operations • Providing quality-Integrated infrastructure.		
9.	Traffic Pattern	Increase of vehicular traffic	<u>Construction Phase</u> • Heavy Vehicular movement	• Adequate parking facility is being provided. • The peak hours is being avoided for	No negative impact	

			during construction	transportation of materials.		
			<u>Operation Phase</u> • Traffic due to residents once the project is operational	• Vehicular movement will be regulated inside the project with adequate roads and parking lots in the project.	No major significant impact.	

10.2 ENVIRONMENT MANAGEMENT PLAN

An Environmental Management Plan (EMP) will be required to mitigate the predicted adverse environmental impacts during construction and operation phase of the project and these are discussed in later subsections.

10.2.1 EMP for Air Environment

Construction Phase

To mitigate the impacts of PM during the construction phase of the project, the following measures are recommended for implementation:

- A dust control plan
- Procedural changes to construction activities

Dust Control Plan

The most cost-effective dust suppressant is water because water is easily available on construction site. Water can be applied using water trucks, handled sprayers and automatic sprinkler systems. Furthermore, incoming loads could be covered to avoid loss of material in transport, especially if material is transported off-site.

Procedural Changes to Construction Activities

Idle time reduction: Construction equipment is commonly left idle while the operators are on break or waiting for the completion of another task. Emission from idle equipment tends to be high, since catalytic converters cools down, thus reducing the efficiency of hydrocarbon and carbon monoxide oxidation. Existing idle control technologies comprises of power saving mode, which automatically off the engine at preset time and reduces emissions, without intervention from the operators.

Improved Maintenance: Significant emission reductions can be achieved through regular equipment maintenance. Contractors will be asked to provide maintenance records for their fleet as part of the contract bid, and at regular intervals throughout the life of the contract. Incentive

provisions will be established to encourage contractors to comply with regular maintenance requirements.

Reduction of On-Site Construction Time: Rapid on-site construction would reduce the duration of traffic interference and therefore, will reduce emissions from traffic delay.

Operation Phase

To mitigate the impacts of pollutants from DG set and vehicular traffic during the operational phase of the Expansion of Group Housing Project., following measures are recommended for implementation:

- DG set emission control measures
- Vehicular emission controls and alternatives
- Greenbelt development

Diesel Generator Set Emission Control Measures

Adequate stack height will be maintained to disperse the air pollutants generated from the operation of DG set to dilute the pollutants concentration within the immediate vicinity. Hence no additional emission control measures have been suggested.

Vehicle Emission Controls and Alternatives

During construction, vehicles will be properly maintained to reduce emission. As it is a Expansion of Group Housing project, vehicles will be generally having "PUC" certificate.

Footpaths and Pedestrian ways: Adequate footpaths and pedestrian ways would be provided at the site to encourage non-polluting methods of transportation.

Greenbelt Development

Increased vegetation in the form of greenbelt is one of the preferred methods to mitigate air and noise pollution. Plants serve as a sink for pollutants, act as a barrier to break the wind speed as well as allow the dust and other particulates to settle on the leaves. It also helps to reduce the noise level to a large extent. The following table indicates various species of the greenbelt that can be used to act as a barrier.

Table 6: Trees to be planted in the premises of the Group Housing project

Evergreen Trees		Ornamental Trees
Botanical Name	**Common Name**	**Botanical Name**
Delonix regia	Gulmohar	*Areca palm*
Azadirachta indica	Neem	*Prunus armeniaca*
Callistemon lanceolatus	Bottle Brush	*Bougainvillea torch glow*
Cassia fistula	Amaltas	*Cleredendron inerme*
Gravellia robusta	Silver Oak	*Cycas circinalis*
Ficus bengalensis	Bargad	*Euphorbia carcasana*

10.2.2 EMP FOR NOISE ENVIRONMENT

Construction Phase

To mitigate the impacts of noise from construction equipment during the construction phase on the site, the following measures are recommended for implementation.

Time of Operation: Noisy construction equipment would not be allowed to use at night time.

Job Rotation and Hearing Protection: Workers employed in high noise areas will be employed on shift basis. Hearing protection such as earplugs/muffs will be provided to those working very close to the noise generating machinery.

Operation Phase: To mitigate the impacts of noise from diesel generator set during operational phase, the following measures are recommended:

- Adoption of Noise emission control technologies
- Greenbelt development

Noise Emission Control Technologies

DG set will be housed in a suitable acoustic enclosure so that noise level at a distance of 1 m does not exceed 25 dB(A) at as per CPCB standards or is meeting the local standard (whichever is higher).

It would be ensured that the manufacturer provides acoustic enclosure as an integral part along with the diesel generators set. Further, enclosure of the services area with 4 m high wall will

reduce noise levels and ensure that noise is at a permissible limit for resident of the site and surrounding receptors.

10.2.3 EMP FOR WATER ENVIRONMENT

Construction Phase

To prevent degradation and to maintain the quality of the water source, adequate control measures have been proposed. To check the surface run-off as well as uncontrolled flow of water into any water body check dams with silt basins are proposed. The following management measures are suggested to protect the water source being polluted during the construction phase:

- Avoid excavation during monsoon season
- Common toilets will be constructed on site during construction phase and the waste water would be channelized to the septic tanks in order to prevent waste water to enter into the water bodies
- To prevent surface and ground water contamination by oil and grease, leak-proof containers would be used for storage and transportation of oil and grease. The floors of oil and grease handling area would be kept effectively impervious. Any wash off from the oil and grease handling area or workshop shall be drained through imperious drains
- Collection and settling of storm water, prohibition of equipment wash downs and prevention of soil loss and toxic release from the construction site are necessary measure to be taken to minimize water pollution
- All stacking and loading area will be provided with proper garland drains, equipped with baffles, to prevent run off from the site, to enter into any water body.

Operation Phase

In the operation phase of the project, water conservation and development measures will be taken, including all possible potential for rain water harvesting. Following measures will be adopted:

- Water source development.
- Minimizing water consumption.

- Promoting reuse of water after treatment and development of closed loop systems for different water streams.

Water Source Development

Water source development shall be practiced by installation of scientifically designed Rain Water Harvesting system. Rainwater harvesting promotes self-sufficiency and fosters an appreciation for water as a resource.

Minimizing Water Consumption

Consumption of fresh water will be minimized by combination of water saving devices and other domestic water conservation measures. Further, to ensure ongoing water conservation, an awareness program will be introduced for the residents. The following section discusses the specific measures, which shall be implemented:

Domestic and Commercial Usage

- Use of water efficient plumbing fixtures (ultra low flow toilets, low flow sinks, water efficient dishwashers and washing machines). Water efficient plumbing fixtures uses less water with no marked reduction in quality and service
- Leak detection and repair techniques.
- Sweep with a broom and pan where possible, rather than hose down for external areas.
- Meter water usage: Implies measurement and verification methods.

Monitoring of water uses is a precursor for management.

Horticulture

- Drip irrigation system shall be used for the lawns and other green area. Drip irrigation can save 15-40% of the water, compared with other watering techniques.
- Plants with similar water requirements shall be grouped on common zones to match precipitation heads and emitters.
- Use of low-angle sprinklers for lawn areas.

- Select controllers with adjustable watering schedules and moisture sensors to account for seasonal variations and calibrate them during commissioning.
- Place 3 to 5 inches of mulch on planting beds to minimize evaporation.

Promoting Reuse of Water after Treatment and Development of Closed Loop Systems

To promote reuse of waste water and development of closed loop system for waste water segregation. Two water conservation schemes are suggested, namely:

1) Storm Water Harvest 2) Waste water recycling.

Storm water harvest as discussed in earlier, will be utilized for artificial recharge of ground water sources; and waste water will be reused on site after treatment.

Treated waste water will be used for landscaping, flushing, DG set cooling and rest will be discharged to Nearby Construction Activity/Discharged to Public Sewer. Following section discuss the scheme of waste water treatment.

Waste Water Treatment Scheme

Proponent will treat the wastewater of the Expansion of group housing in well-designed sewage treatment plant of capacity 684 KLD based on FAB technology.

Storm Water Management

Most of the storm water produced on site will be harvested for ground water recharge. Thus proper management of this resource is a must to ensure that it is free from contamination.

Contamination of Storm Water is possible from the following sources:

- Diesel and oil spills in the diesel power generator and fuel storage area
- Waste spills in the solid / hazardous waste storage area
- Oil spills and leaks in vehicle parking lots
- Silts from soil erosion in gardens
- Spillage of sludge from sludge drying area of sewage treatment plant

A detailed storm water management plan will be developed which will consider the possible impacts from above sources. The plan will incorporate best management practices which will include following:

- Regular inspection and cleaning of storm drains
- Clarifiers or oil/separators will be installed in all the parking areas. Oil / grease separators installed around parking areas and garages will be sized according to peak flow guidelines. Both clarifiers and oil/water separators will be periodically pumped in order to keep discharges within limits
- Covered waste storage areas
- Avoid application of pesticides and herbicides before wet season
- Secondary containment and dykes in fuel/oil storage facilities
- Conducting routine inspection to ensure cleanliness
- Provision of slit traps in storm water drains
- Good housekeeping in the above areas

10.2.4 EMP FOR LAND ENVIRONMENT

Construction Phase

The waste generated from construction activity includes construction debris, biomass from land clearing activities, waste from the temporary make shift tents for the labors and hazardous waste. Following section discuss the management of each type of waste. Besides waste generation, management of the topsoil is an important area for which management measures are required.

Construction Debris

Construction debris is bulky and heavy and re-utilization and recycling is an important strategy for management of such waste. As concrete and masonry constitute the majority of waste generated, recycling of this waste by conversion to aggregate can offer benefits of reduced landfill space and reduced extraction of raw material for new construction activity. This is particularly applicable to the project site as the construction is to be completed in a phased manner.

Mixed debris with high gypsum, plaster, shall not be used as fill, as they are highly susceptible to contamination, and will be send to designated solid waste landfill site.

Metal scrap from structural steel, piping, concrete reinforcement and sheet metal work shall be removed from the site by construction contractors. A significant portion of wood scrap will be reused on site. Recyclable wastes such as plastics, glass fiber insulation, roofing etc shall be sold to recyclers.

Hazardous waste

Construction sites are sources of many toxic substances such as paints, solvents wood preservatives, pesticides, adhesives and sealants. Hazardous waste generated during construction phase shall be stored in sealed containers and disposed off as per The Hazardous Wastes (Management & Handling) Rules, 1989.

Some management practices to be developed are:

- Herbicides and pesticide will not be over applied (small-scale applications) and not applied prior to rain
- Paintbrushes and equipment for water and oil based paints shall be cleaned within a contained area and will not be allowed to contaminate site soils, water courses or drainage systems
- Provision of adequate hazardous waste storage facilities. Hazardous waste collection containers will be located as per safety norms and designated hazardous waste storage areas will be away from storm drains or watercourses
- Segregation of potentially hazardous waste from non-hazardous construction site debris
- Well labeled all hazardous waste containers with the waste being stored and the date of generation
- Instruct employees and subcontractors in identification of hazardous and solid waste

Even with careful management, some of these substances are released into air, soil and water and many are hazardous to workers. With these reasons, the best choice is to avoid their use as much as possible by using low-toxicity substitutes and low VOC (Volatile Organic Compound) materials.

Waste from Temporary Makes Shift Tents for Labors

Wastes generated from temporary make shift labor tents will mainly comprise of household domestic waste, which will be managed by the contractor of the site. The wastewater generated will be channelized to the septic tank.

Top Soil Management

To minimize disruption of soil and for conservation of top soil, the contractor shall keep the top soil cover separately and stockpile it. After the construction activity is over, top soil will be utilized for landscaping activity. Other measures, which would be followed to prevent soil erosion and contamination include:

- Maximize use of organic fertilizer for landscaping and green belt development
- To prevent soil contamination by oil/grease, leaf proof containers would be used for storage and transportation of oil/grease and wash off from the oil/grease handling area shall be drained through impervious drains and treated appropriately before disposal
- Removal of as little vegetation as possible during the development and re-vegetation of bare areas after the project.
- Working in a small area at a point of time (phase wise construction)
- Construction of erosion prevention troughs/berms.

Operational Phase

The philosophy of solid waste management at the proposed complex will be to encouraging the four R's of waste i.e. **R**eduction, **R**euse, **R**ecycling and **R**ecovery (materials & energy). Regular public awareness meetings will be conducted to involve the residents in the proper segregation and storage techniques. The Environmental Management Plan for the solid waste focuses on three major components during the life cycle of the waste management system i.e., collection and

transportation, treatment or disposal and closure and post-closure care of treatment/disposal facility.

Collection and Transportation

- During the collection stage, the solid waste of the project will be segregated into biodegradable waste and non-biodegradable. Biodegradable waste and non biodegradable waste will be collected in separate bins. Biodegradable waste will be treated in the project premises by organic waste converter. The recyclable wastes will be sent off to recyclabers. Proper guidelines for segregation, collection and storage will be prepared as per MSW Rules, 2000 and amended Rules, 2008.
- To minimize littering and odour, waste will be stored in well-designed containers/ bins that will be located at strategic locations to minimize disturbance in traffic flow
- Care would be taken such that the collection vehicles are well maintained and generate minimum noise and emissions. During transportation of the waste, it will be covered to avoid littering.

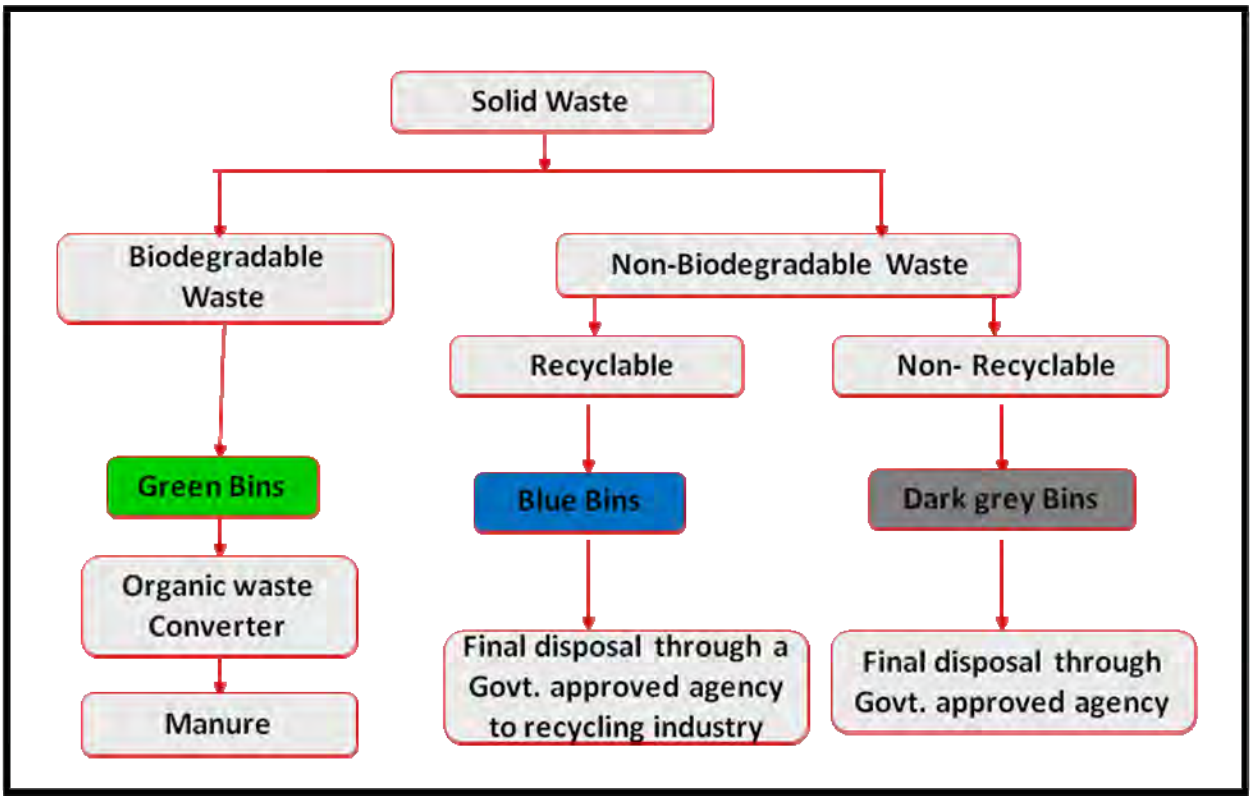


Figure 6: Waste Management Flow Diagram

Disposal

With regards to the disposal/treatment of waste, the management will take the services of the authorized agency for waste management and disposal of the same on the project site during its operational phase.

10.2.5 EMP FOR ECOLOGICAL ENVIRONMENT

Construction activity changes the natural environment. But Expansion of group Housing project also creates a built environment for its inhabitants. The project requires the implementation of following choices exclusively or in combination.

Construction Stage

- Restriction of construction activities to defined project areas, which are ecologically sensitive

- Restrictions on location of temporary labor tents and offices for project staff near the project area to avoid human induced secondary additional impacts on the flora and fauna species
- Cutting, uprooting, coppicing of trees or small trees if present in and around the project site for cooking, burning or heating purposes by the labors will be prohibited and suitable alternatives for this purpose will be made
- Along with the construction work, the peripheral green belt would be developed with suggested native plant species, as they will grow to a full-fledged covered at the time of completion.

Operation Stage

Improvement of the current ecology of the project site will entail the following measures:

- Plantation and Landscaping
- Green Belt Development
- Park and Avenue Plantation

The section below summarizes the techniques to be applied to achieve the above objectives:

Plantation and landscaping

Selection of the plant species would be done on the basis of their adaptability to the existing geographical conditions and the vegetation composition of the forest type of the region earlier found or currently observed.

Green Belt Development Plan

The plantation matrix adopted for the green belt development includes pit of 0.3 m × 0.3 m size with a spacing of 2 m x 2 m. In addition, earth filling and manure may also be required for the proper nutritional balance and nourishment of the sapling. It is also recommended that the plantation has to be taken up randomly and the landscaping aspects could be taken into consideration.

Plantation comprising of medium height trees (7 m to 10 m) and shrubs (5 m height) are proposed for the green belt. In addition creepers will be planted along the boundary wall to enhance its insulation capacity.

Selection of Plant Species for Green Belt Development

The selection of plant species for the development depends on various factors such as climate, elevation and soil. The plants would exhibit the following desirable characteristics in order to be selected for plantation

1. The species should be fast growing and providing optimum penetrability
2. The species should be wind-firm and deep rooted
3. The species should form a dense canopy
4. As far as possible, the species should be indigenous and locally available
5. Species tolerance to air pollutants like SO_2 and NO_x should be preferred
6. The species should be permeable to help create air turbulence and mixing within the belt
7. There should be no large gaps for the air to spill through
8. Trees with high foliage density, leaves with larger leaf area and hairy on both the surfaces
9. Ability to withstand conditions like inundation and drought
10. Soil improving plants (Nitrogen fixing rapidly decomposable leaf litter)
11. Attractive appearance with good flowering and fruit bearing
12. Bird and insect attracting tree species
13. Sustainable green cover with minimal maintenance.

Parks and Avenue Plantation

- Parks and gardens maintained for recreational and ornamental purposes will not only improve the quality of existing ecology at the project site but also will improve the aesthetic value.
- Avenue Plantation

1. Trees with colonial canopy with attractive flowering
2. Trees with branching at 7 feet and above
3. Trees with medium spreading branches to avoid obstruction to the traffic
4. Fruit trees to be avoided because children may obstruct traffic and general movement of public

10.2.6 EMP for Socio-Economic Environment

The social management plan has been designed to take proactive steps and adopt best practices, which are sensitive to the socio-cultural setting of the region. The Social Management Plan for Expansion of group housing project" focuses on the following components:

- **Income Generation Opportunity during Construction and Operation Phase**

The project would provide employment opportunity during construction and operation phase. There would also be a wide economic impact in terms of generating opportunities for secondary occupation within and around the complex. The main principles considered for employment and income generation opportunities are out lined below:

- Employment strategy will provide for preferential employment of local people
- Conditions of employment would address issues like minimum wages and medical care for the workers. Contractors would be required to abide to employment priority towards locals and abide by the labor laws regarding standards on employee terms and conditions.

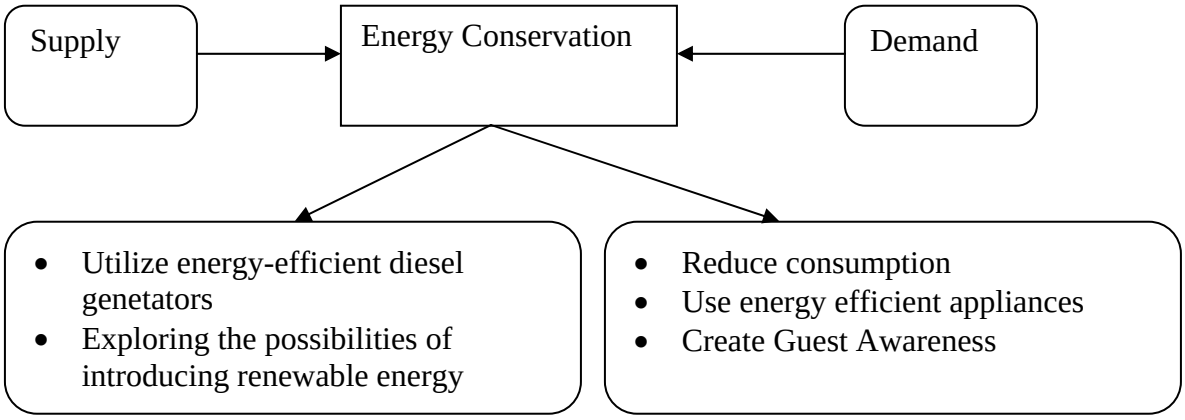
- **Improved Working Environment for Employees**

The project would provide safe and improved working conditions for the workers employed at the facility during construction and operation phase. With the proposed ambience and facilities provided, the complex will provide a new experience in living and recreations. Following measures would be taken to improve the working environment of the area:

- Less use of chemicals and biological agents with hazard potential
- Developing a proper interface between the work and the human resource through a system of skill improvement
- Provision of facilities for nature care and recreation e.g. indoor games facilities
- Measures to reduce the incidence of work related injuries, fatalities and diseases
- Maintenance and beautifications of the complex and the surrounding roads.

10.2.7 EMP FOR ENERGY CONSERVATION

Energy conservation program will be implemented through measures taken both on energy demand and supply.



Energy conservation will be one of the main focuses during the complex planning and operation stages. The conservation efforts would consist of the following:

❖ **Architectural design**

- Maximum utilization of solar light will be done.
- Maximize the use of natural lighting through design.
- The orientation of the buildings will be done in such a way that maximum daylight is available.
- The green areas will be spaced, so that a significant reduction in the temperature can take place.

❖ **Energy Saving Practices**

- Energy efficient lamps will be provided within the complex.
- Constant monitoring of energy consumption and defining targets for energy conservation.
- Adjusting the settings and illumination levels to ensure minimum energy used for desired comfort levels.

❖ **Behavioral Change on Consumption**

- Promoting resident awareness on energy conservation
- Training staff on methods of energy conservation and to be vigilant to such opportunities.

10.3 ENVIRONMENTAL MANAGEMENT SYSTEM AND MONITORING PLAN

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

- An Environmental management cell.
- Environmental Monitoring.
- Personnel Training.
- Regular Environmental audits and Correction measures.
- Documentation – standards operation procedures Environmental Management Plan and other records.

10.3.1 ENVIRONMENTAL MANAGEMENT CELL

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

- To implement the environmental management plan.
- To assure regulatory compliance with all relevant rules and regulations.
- To ensure regular operation and maintenance of pollution control devices.
- To minimize environmental impact of operations as by strict adherence to the EMP.
- To initiate environmental monitoring as per approved schedule.
- Review and interpretation of monitored results and corrective measures in case monitored results are above the specified limit.

- Maintain documentation of good environmental practices and applicable environmental laws for a ready reference.
- Maintain environmental related records.
- Coordination with regulatory agencies, external consultants, monitoring laboratories.
- Maintenance of log of public complaints and the action taken.

Hierarchical Structure of Environmental Management Cell

Normal activities of the EMP cell would be supervised by a dedicated person who will report to the site manager/coordinator of the Expansion of Group Housing Project.. The hierarchical structure of suggested Environmental Management Cell is given in following Figure 7.

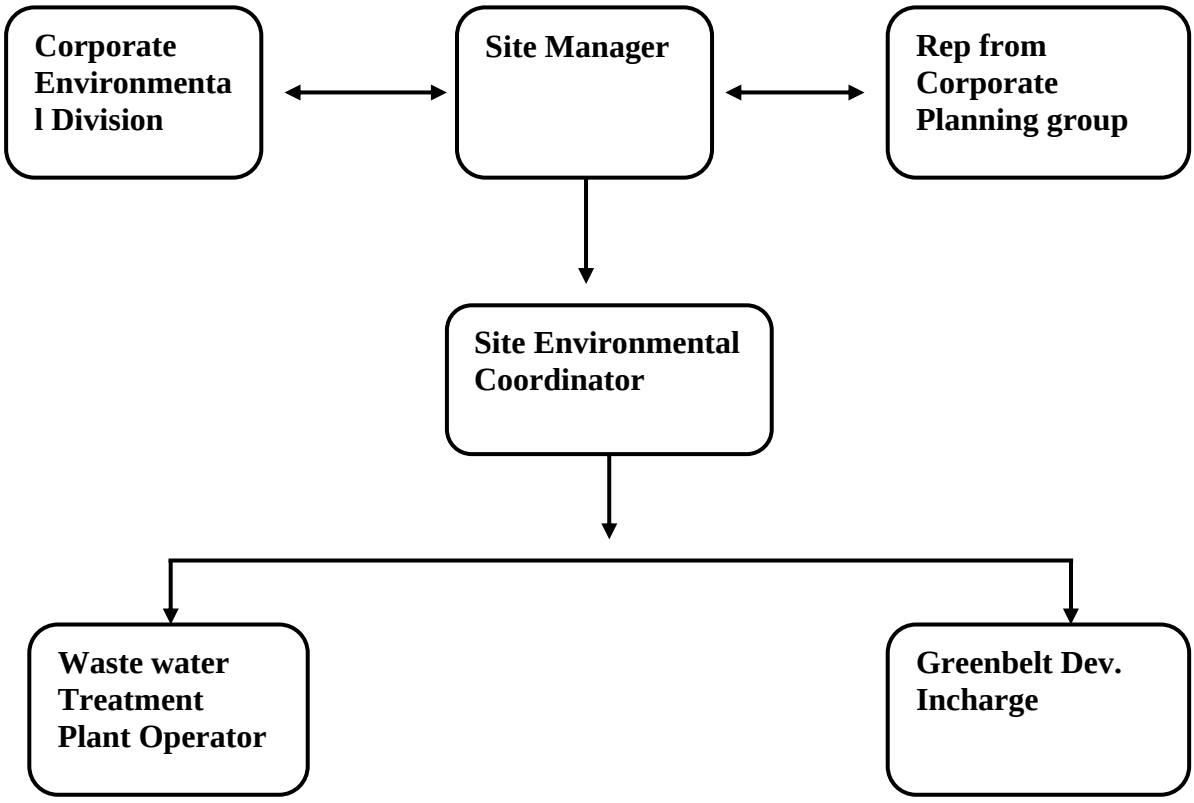


Figure 7: Environment Management Cell Structure

10.3.2 ENVIRONMENTAL MONITORING

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

Table 6: Suggested Monitoring Program for Group housing

S. No.	Type	Locations	Parameters	Period and Frequency
1.	Ambient Air Quality	Project Site	Criteria Pollutants: SO_2, NO_2, PM_{10}, $PM_{2.5}$, CO	Twice in a Year as per EIA Notification 2006.
2.	Groundwater (Portability testing)	Project site	Drinking water parameters as per IS 10500.	Twice in a Year as per EIA Notification 2006.
3.	Ambient Noise	Project site	dB (A) levels	Twice in a Year as per EIA Notification 2006.
4.	Potable water quality	Ghaziabad Development Authority	As per IS 10500 potable water standards	Twice in a Year as per EIA Notification 2006.
5.	Soil quality	Project site	Organic matter, C.H., N, Alkalinity, Acidity, heavy metals and trace metal, Alkalinity, Acidity.	Twice in a Year as per EIA Notification 2006.
6.	Waste Characterization	Residential	Physical and Chemical composition	Daily.
7.	Treated water	Outlet of STP	BOD, MPN, coliform count, etc.	Daily.

10.3.3 Awareness and Training

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

Residents and Contractors

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

10.3.4 Environmental Audits and Corrective Action Plans

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

CONCEPTUAL PLAN

Group Housing "Red Apple Homes"

At

Khasra No. 1108m, 1109m, 1110m, Village: Morta, Ghaziabad (U.P.)

For

M/s Manju J Homes India Ltd.

Prepared By

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CONCEPTUAL PLAN

INTRODUCTION

The Group Housing Project "Red Apple Homes" is being constructed by M/s Manju J Homes India Ltd.The group is developing a Group Housing Project "Red Apple Homes" which is located at Morta, Ghaziabad, U.P. on a land measuring 38,663.00 m^2 (or 3.86 ha.). The Group Housing is designed as a self-sufficient establishment, wherein infrastructure facilities such as road network, water supply, electric supply, emergency power supply and communication facilities are proposed. Further, the project proponent has made provisions for waste collection and disposal, rain water harvesting and wastewater treatment to ensure that the project is environment friendly. The project proponent also proposes to arrange for safety, maintenance and security.

SITE LOCATION AND SURROUNDINGS

The site is located at at Morta, Ghaziabad, U.P. The coordinates of the site are **28°42'48.1"N** and **77°26'53.4"E**. Google earth image of 500 m and Toposheet map of 10+15 km showing location of project site and surroundings, are enclosed as **Annexure I (a) & I (b)** respectively.

CONNECTIVITY

The site has good connectivity with various transport facilities as shown in table below.

Table 1: Connectivity & Locational Features

S. No.	Features	Description	Distance & Direction
1.	Nearest Railway Station	Ghaziabad railway station	4.84 km (SSW)
2.	Nearest Airport	IGI Airport Safdarjung Airport	38.6 km (WSW) 28 km (WSW)

S. No.	Features	Description	Distance & Direction
3.	Nearest Road	NH-58	800 m SE
4.	Nearest School	Springdales Public School, Block G. Rajnagar, UP	2.53 km (SSE)
5.	Nearest Densely Populated area	Morta Village	1 km NE

AREA STATEMENT

The project is spread over an area of 38,663 m^2 with a ground coverage area of 8,763.35 m^2. The area statement of the project is given in **Table 2.**

Table 2: Detailed Area Statement

SI. No.	PARTICULARS	AREA (Sq.m.)	Percentage (%)
1.	Plot Area	38,663	
2.	Less road widening area	1,621.65	
3.	Area left for zonal plan green	6,577.50	
4.	Net Plot Area	30,463.85	100
5.	Permissible ground coverage (@ 40% of plot area)	12,185.54	
6.	Proposed ground coverage (@ 28.76% of plot area)	8,763.35	28.76
7.	Total Permissible FAR	1,25,318.88	
	a. Permissible FAR (@ 3.75 of plot area) b. Incentive FAR against EWS & L.I.G	1,14,239.43 11,079.45	
8.	Proposed FAR	1,25,103.52	
	a. Residential FAR* b. Nursery School Area c. Convenient shopping d. 5% Excess Non F.A.R area count in F.A.R	1,21,641.24 2,000.00 997.20 465.08	
9.	Total fire staircase area	2220.42	
10.	Area for garbage collection chamber	105	
11.	Electric sub-station & guard room area	49.50	

12.	Basement Area	42,964.28	
	• Upper Basement • Lower Basement	21,834.09 21,130.19	
13.	EWS/LIG area	11,079.45	
14.	Non- FAR (Mumty and Machine Room)	6322.34	
15.	Built Up Area	**1,87,844.51**	
16.	Open Area	21,700.5	71.24
17.	Landscape area (@ 10% of net plot area)	3,046.38	10
18.	Remaining open area	18,654.12	61.24

*FAR = Floor Area Ratio

POPULATION DENSITY

The total population of the project will be 9,315 persons. The detailed population breakup is given below in the following Table 3.

Table 3: Population Break up

S. No.	Unit Type	Dwelling Units /Area (in m^2)	PPU/ m^2 per person	Total Population
A.	**Residents**	1654	4.5	7,443
B.	**EWS/LIG**	146	4.5	657
C.	**Staff**	@ 5% of total population		405
D.	**Visitors**	@ 10% of total population		810
Total Population (A+B+C)				**9,315**

PROJECT COST

The total estimated cost of the project is Rs 350 Crores which includes the cost of the land as well as the developmental cost.

WATER REQUIREMENT

The total water requirement will be approx. 683 KLD, out of which total domestic water requirement will be 663 KLD. The fresh water requirement will be approx. 464 KLD. However, one time Fresh water requirement will be 663 KLD. The daily water requirement calculation is given below in **Table 4**:

Table 4: Calculation For Daily Water Requirement

S. No.	Description	Area (in m^2)	Total Occupancy	Rate of water demand (lpcd)	Total Water Requirement (KLD)
A.	**Domestic Water**				
	I) Residential		7,443	86	6,40,098
	II) Staff		372	30	11,160

	III) Visitors		744	15	11,160
Total Domestic water (A=I+II+III)					**662.42 say 663 KLD**
B.	**Horticulture and Landscape development**	3,046.38 m^2		3 lt./sqm/day	9
C.	**DG Set Cooling (2 × 2,000 kVA)***	4,000 KVA		0.9 lt./KVA/hr	21.6 say 22
Grand Total (A+B+C) = 694 KLD					

**DG sets operational hours are considered as 6 hrs.*

Table 5: Wastewater Calculations

Domestic Water Requirement	663 KLD
• Total Fresh water (70% of domestic)	464 KLD
• Flushing (@ 30% of domestic)	199 KLD
Wastewater Generated (@ 80% fresh + 100% flushing)	371 + 199 = **570 KLD**
STP Capacity	684 KLD

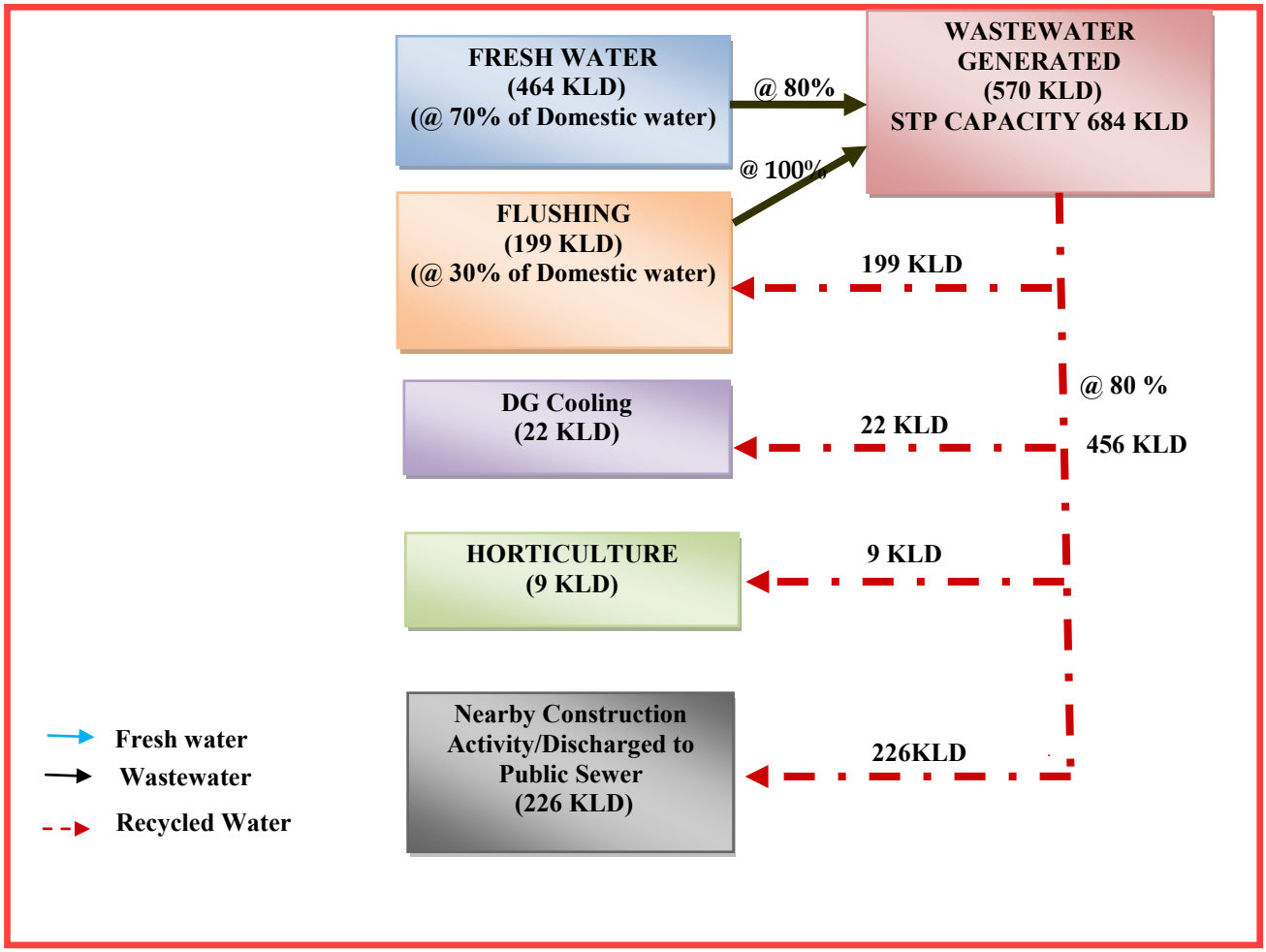
FRESHWATER REQUIREMENT

Water Balance for Non-Rainy Season

It is expected that the project will generate approx. 570 KLD of wastewater. The wastewater will be treated in 684 KLD capacity of STP provided within the complex generating 456 KLD of recoverable water from STP which will be recycled within the project but 237 KLD in non-rainy season & 246 KLD in rainy season will become surplus and surplus treated water will be discharged to Nearby Construction Activity/Discharged to Public Sewer.

The water balance diagram has been provided for non-Rainy season is as follows:

Figure 1(a): Water Balance Diagram (Non-rainy Season)



Since air-cooled DG set will be used, there will be no requirement of water for DG set cooling. Therefore calculation for DG Cooling has not been considered for average water requirement throughout the year.

Water Balance for Rainy season

During rainy season there shall be no demand of water for horticulture and thus this excess amount of water will be used in nearby construction activity. Only emergency discharge will be made to sewer.

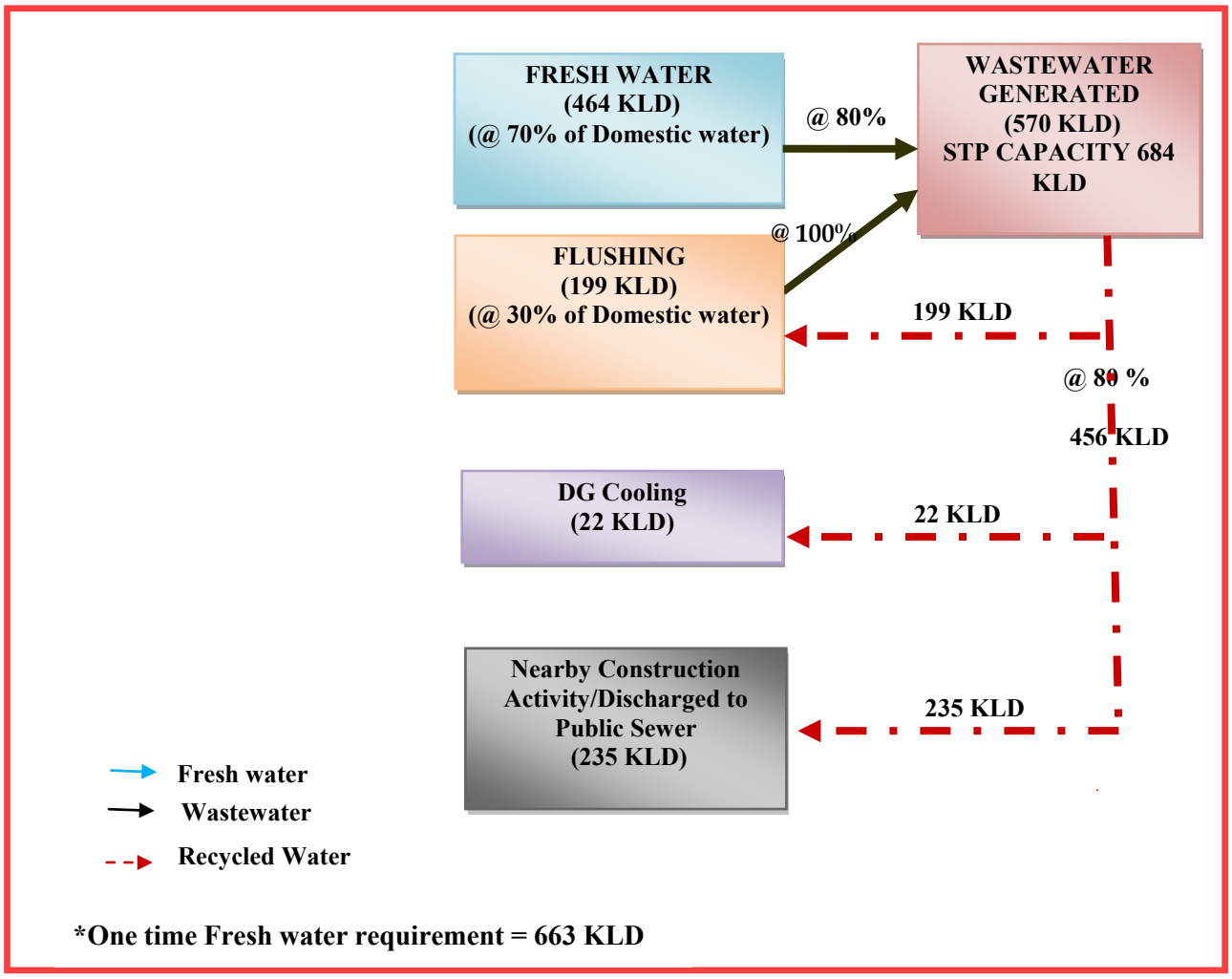


Figure 1 (b): Water Balance Diagram (Rainy season)

Wastewater Generation & Treatment

The wastewater generated in the project will be about 570 KLD (as calculated) and whole of wastewater will be treated in a well-designed Sewage Treatment Plant of capacity 684 KLD (20% higher than the wastewater generated).

The proposed STP within the project site will be based on FAB technology which will be installed by the proponent to take care of the discharge from the project. The expected recovery of recycled water is approx. 80% of the wastewater and during non rainy season 456 KLD treated water will be used for flushing, horticulture and filter backwash. During rainy season (since there is no requirement of treated water for horticulture) will be used in nearby construction/sewer.

SEWAGE TREATMENT TECHNOLOGY

FAB TECHNOLOGY

Sewerage System

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

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

- Reduced net daily water requirements, source for Horticultural purposes by utilization of the treated waste water.
- Reduced dependence on the public utilities for water supply and sewerage systems.
- Sludge generated from the Sewage Treatment Plant shall be rich in organic content and an excellent fertilizer for horticultural purposes.

a. Sullage Details

(a)Daily load	:	570 KLD
(b)Duration of flow to STP	:	24 hours
(c)Temperature	:	Maximum $32^{o}C$
(d) pH	:	7 to 9.5
(e)Colour	:	Mild
(f)T.S.S. (mg/l)	:	100-400 mg/l
(g)BOD_5 (mg/l)	:	200-300 mg/l
(h)COD (mg/l)	:	500-700 mg/l

b. Final discharge characteristics

(a)	pH	: 6.5 to 7.5
(b)	Oil & Grease	: < 10 mg/l
(c)	B.O.D.	: < 10 mg/l
(d)	C.O.D.	: < 30 mg/l
(e)	Total Suspended Solids	: <10 mg/l

c. Treatment Technology

The technology is based on attached growth aerobic treatment followed by clarification by a tube settler. Lime will be dosed in for suppression of foaming tendencies. The clarified water will be filtered in a pressure sand filter after dosing of coagulant (alum) for removal of unsettled suspended impurities. This water will be passed through an activated carbon filter for removal of organics. The filtered water from ACF is then chlorinated & stored in the flushing tank.

The attached growth fluidized aerobic bed reactor (FAB) process combines the biological processes of attached & suspended growth. It combines submerged fixed film with extended aeration for treatment of the waste water.

The waste water after screening is collected in an equalization tank. The equalization tank is required for preventing surges in flow & facilitating equalization of characteristics over the entire quantity of effluent in a given time. A provision for pre-aeration is made in the equalization tank in order to ensure mixing & to prevent the sewage from going septic.

The equalized sewage is then pumped into the FAB reactor for biological processing. The water enters the bottom of the reactor & flows up through the fixed film media which grossly enhances the hydraulic retention time & provides a large surface area for growth of biological micro – organisms. The FAB reactor is aerated by fine pore sub – surface diffusers which provide the oxygen for organic removal. The synthetic media floats on the water & the air agitation ensures good water to micro-organism contact.

The FAB treatment is an attached growth type biological treatment process where in, the majority of biological activity takes place on the surface of the PVC media. Continuous aeration ensures aerobic activity on the surface of the media. Micro – organisms attach themselves on the media & grow into dense films of a viscous jelly like nature. Waste water passes over this film with dissolved organics passing into the bio-film due to concentration gradients within the film. Suspended particles & colloid may get retained on this sticky surface where they are decomposed into soluble products. Oxygen from the aeration process in the waste water provides oxygen for the aerobic reactions at the bio-film surface. Waste products from the metabolic processes diffuse outward & get carried away by the waste water or air currents through the voids of the media.

The aerated effluent passes into a tube deck settler for clarification. The theory of gravity tube settler system is that the carrier fluid maintains laminar flow in the settling media at specified maximum viscosity. These two parameters of a carrier fluid, flowing through a hydraulic configuration, will determine the velocity gradients of the flow, the height of boundary layer at the inclined surface and the residence time within the media.

The carrier fluid must be viscous Newtonian, exhibiting a Reynolds number of less than 1000 and preferably, a number under 400. The laminar flow, through the inclined tubes, will produce velocity gradients sufficiently large to form an adequate boundary layer, where the velocity of fluid approaches zero. Boundary layers are necessary in functioning tube settlers, to allow suspended solids to separate from the viscous carrier fluid. Under gravitational forces, they will settle to the hydraulic surface of the tube and subsequently from the clarifier media.

Since the tubes are inclined at 60 degrees, solids settled on the tubes are continually discharged down. This downward rolling action increases particle contact and hence further agglomeration, which increases the sludge settle ability. Studies show that these agglomerated sludge particles can have a settling rate in excess of ten times the settling rate of the individual floc particles in the influent. These heavy agglomerated masses quickly slide down the 60 degree inclined tube and settle at the bottom of the tank.

At the bottom of the Tubedeck, where the sludge leaves the Tube surface, the larger agglomerated captures smaller particles in the upcoming stream. This solid contact phenomenon greatly enhances the capture efficiency.

Stages of Treatment: The treatment process consists of the following stages:

- Equalization
- Bio- Degradation
- Clarification & Settling
- Filtration

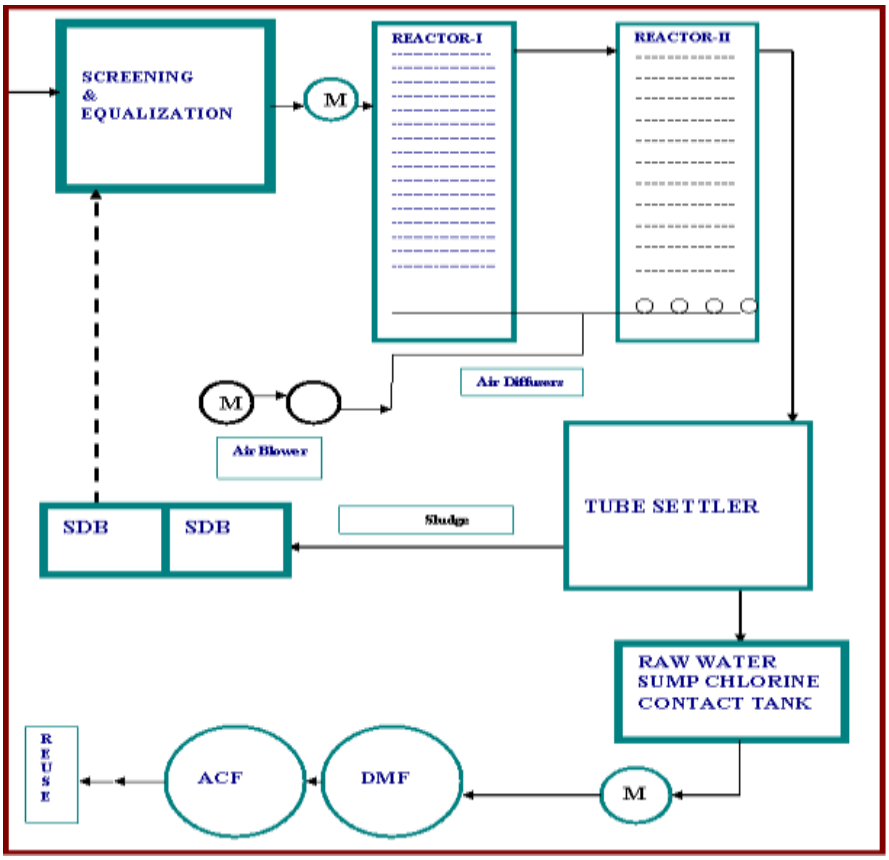


Figure 3: Schematic Diagram of STP

Sewer System

The alignment and slope of the sewer line will follow the road network, drains or natural ground surface and will be connected to the trunk sewers. The discharge point will be a treatment plant, a pumping station, a water course or an intercepting sewer. Pumping stations would be provided at places where the natural slope of the terrain is insufficient to permit gravity flow or the cost of excavation is uneconomical to do the same.

RAIN WATER HARVESTING

Rain water harvesting has been catered to and designed as per the guideline of CGWA. Peak hourly rainfall has been considered as 50 mm/hr. The effective length, breadth and depth, of a Recharge pit is 4.0 m, 1.3 m and 3.5 m respectively and effective length, breadth and depth of a desilting chamber 2.0 m, 1.3 m and 1.25 m respectively is constructed for recharging the water, also the rainwater harvesting tank of 2 m, 3 m and 2 m have been proposed. The bottom of the recharge structure will be kept 5 m above ground water level. At the bottom of the recharge well, a filter media is provided to avoid choking of the recharge bore. Design specifications of the rain water harvesting plan are as follows:

- Catchments/roofs would be accessible for regular cleaning.
- The roof will have smooth, hard and dense surface which is less likely to be damaged allowing release of material into the water. Roof painting has been avoided since most paints contain toxic substances and may peel off.
- All gutter ends will be fitted with a wire mesh screen and a first flush device would be installed. Most of the debris carried by the water from the rooftop like leaves, plastic bags and paper pieces will get arrested by the mesh at the terrace outlet and to prevent contamination by ensuring that the runoff from the first 10-20 minutes of rainfall is flushed off.
- No sewage or wastewater would be admitted into the system.
- No wastewater from areas likely to have oil, grease, or other pollutants has been connected to the system.

Storm Water Drainage

The storm water collection system for the premises shall be self-sufficient to avoid any collection/stagnation and flooding of water. The amount of storm water run-off depends upon many factors such as intensity and duration of precipitation, characteristics of the tributary area and the time required for such flow to reach the drains. The drains shall be located near the carriage way along either side of the roads. Taking the advantage of road camber, the rainfall run off from roads shall flow towards the drains. Storm water from various plots/buildings shall be connected to adjacent drain by a pipe through catch basins. Therefore, it has been calculated to provide 4 rainwater harvesting pits and 12 tanks at selected locations, which will catch the maximum run-off from the area.

1. Since the existing topography is congenial to surface disposal, a network of storm water pipe drains is planned adjacent to roads. All building roof water will be brought down through rain water pipes.
2. Storm water system consists of pipe drain, catch basins and seepage pits at regular intervals for rain water harvesting and ground water recharging.
3. Peak Hourly Rainfall of 50 mm/hr shall be considered for designing the storm water drainage system.
4. Pits will be used to store water form roof top area and tanks will be proposed to store water from green and paved areas.

Rain Water Harvesting

The India Meteorological Department (IMD) designates four official seasons.

- **Winter**
- **Summer** or **pre-monsoon**
- **Monsoon** or **rainy** season
- **Post-monsoon** season

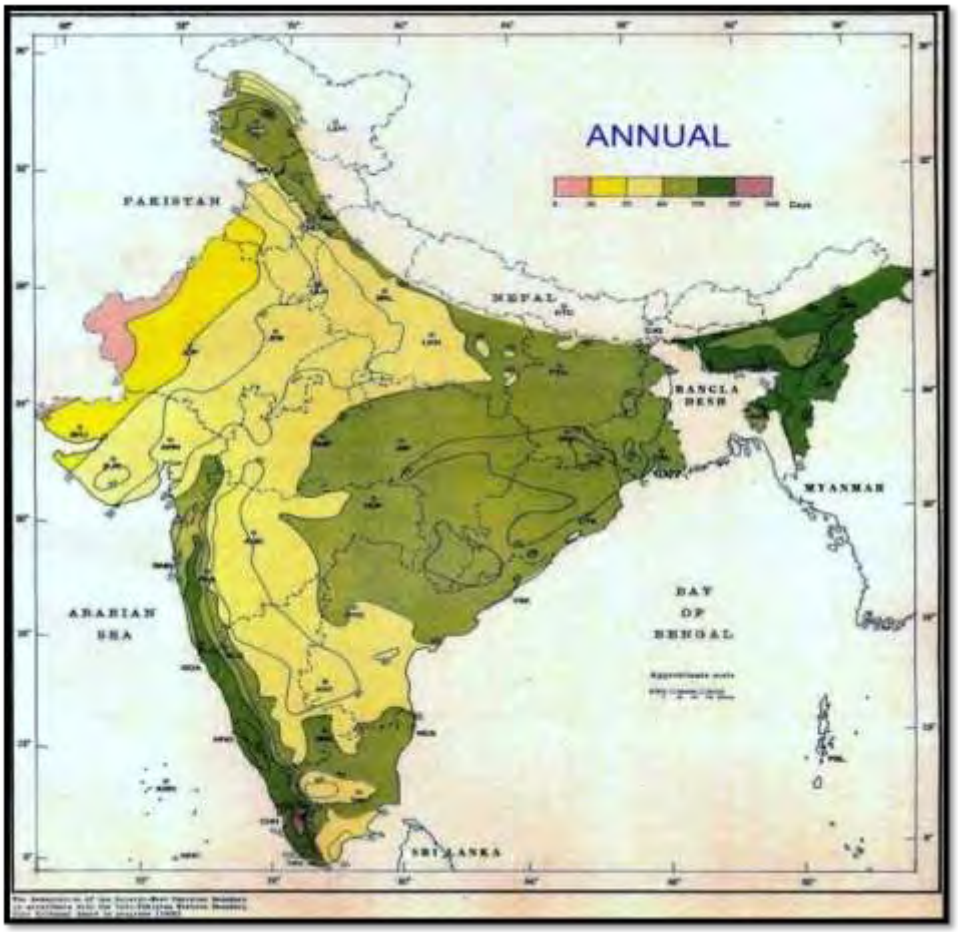


Figure 4: Annual Rainfall Pattern in India

From above map it is concluded that our site i.e. Ghaziabad, U.P will come in the region where annual rainfall varies between 20 to 50 days, whereas rainfall in the winter season will be in between 1 to 5 cm as shown in Figure 5.

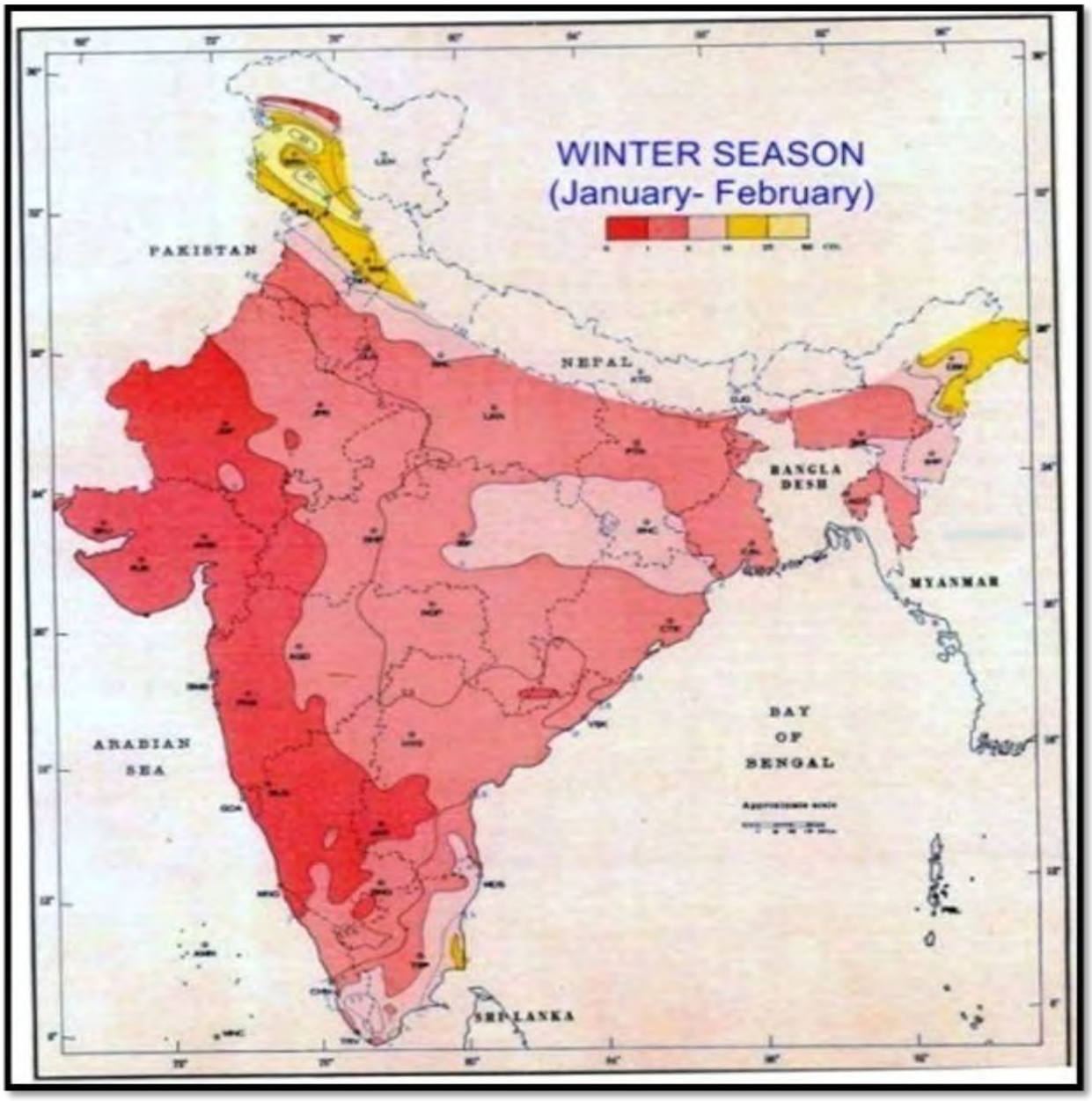


Figure 5: Rainfall Pattern in India during Winter Season

Rainfall at the site during pre monsoon season is found to be in between 1 to 5 cm as shown in Fig 6

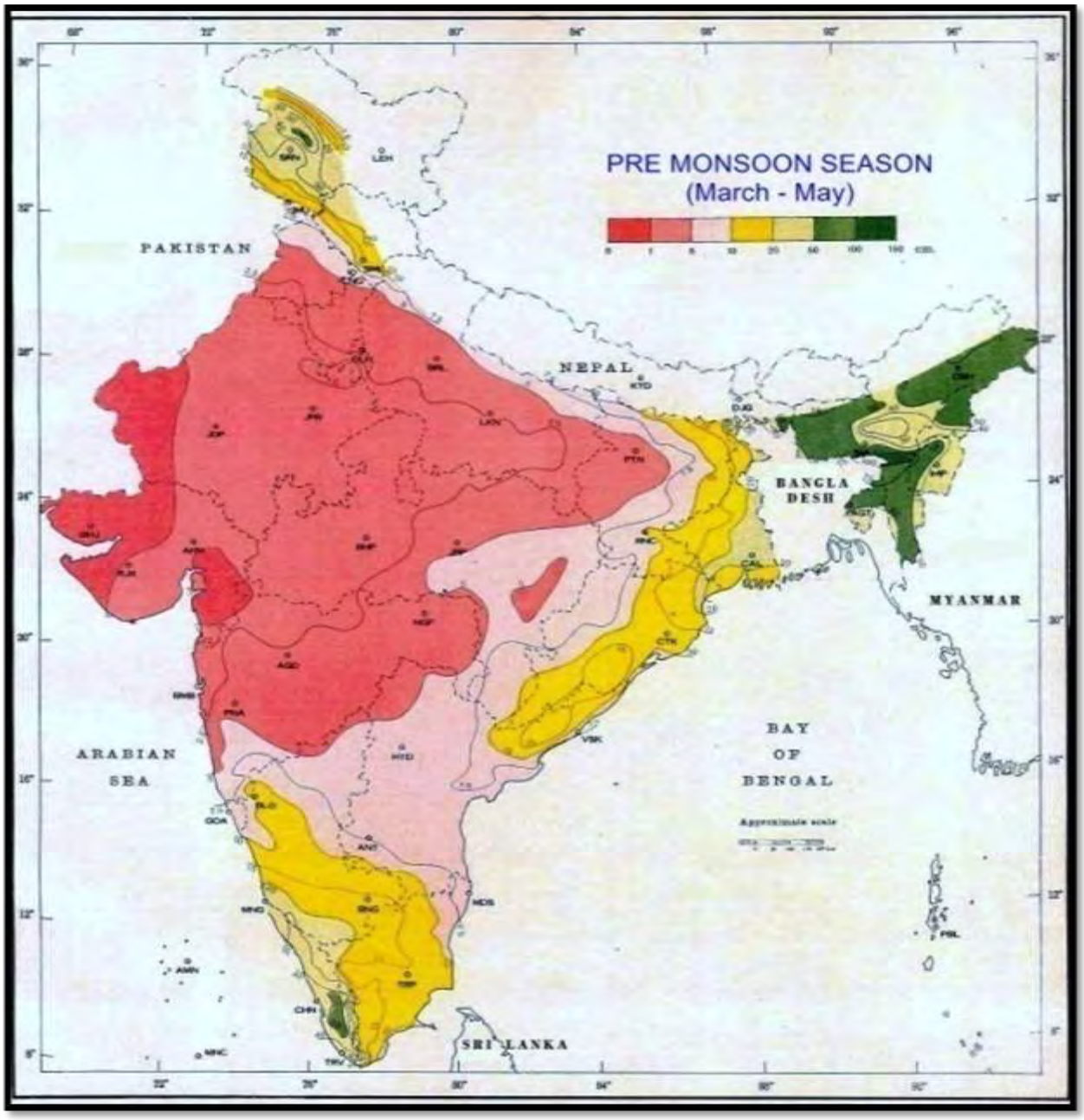


Figure 6: Rainfall Pattern in India during Pre Monsoon Season

Rainfall at the site during monsoon season is found to be in between 50 to 100 cm as shown in Fig 7

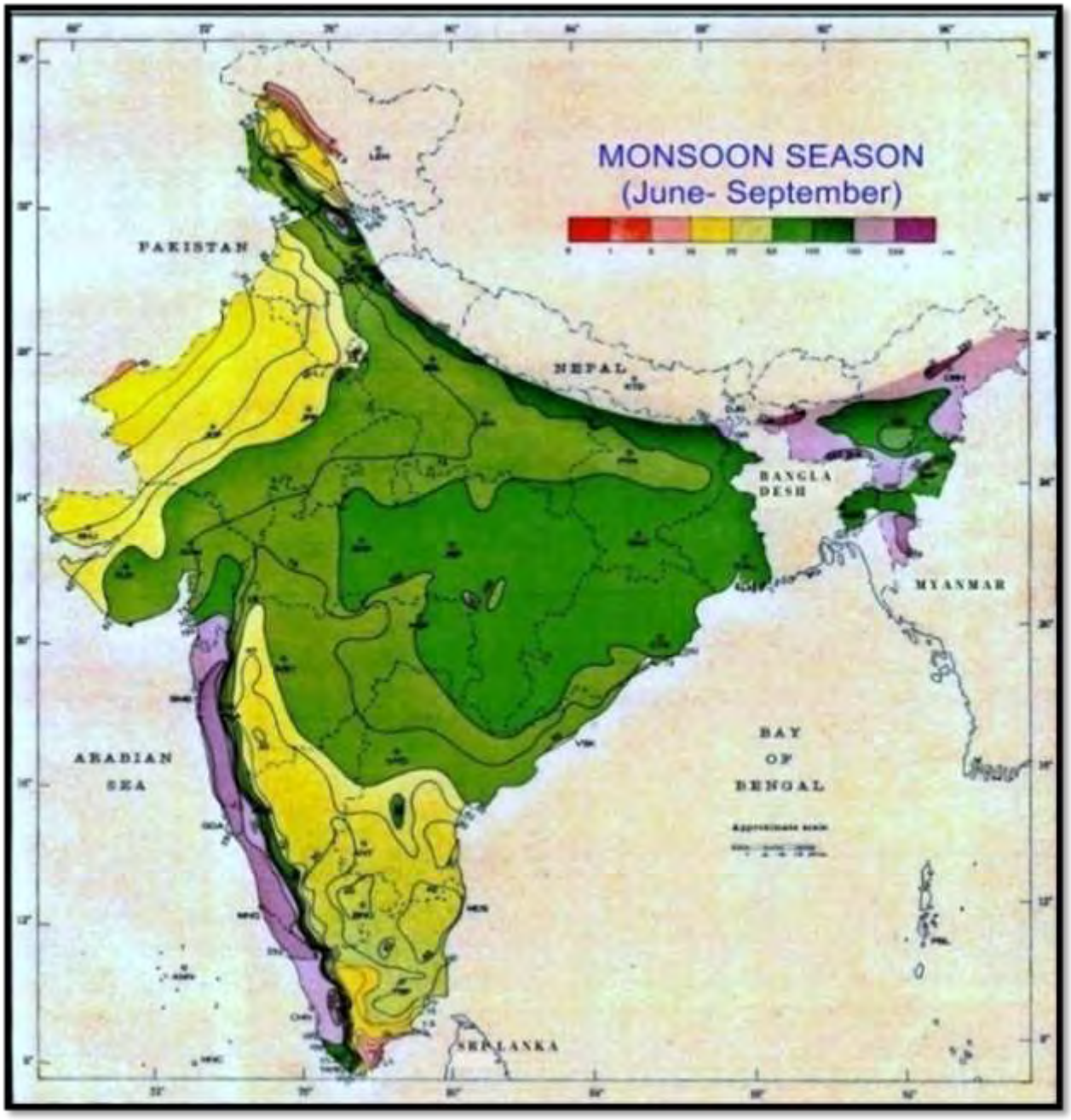


Figure 7: Rainfall Pattern in India during Monsoon Season

Rainfall at the site during post monsoon season is found to be in between 1 to 5 cm as shown in Fig 8

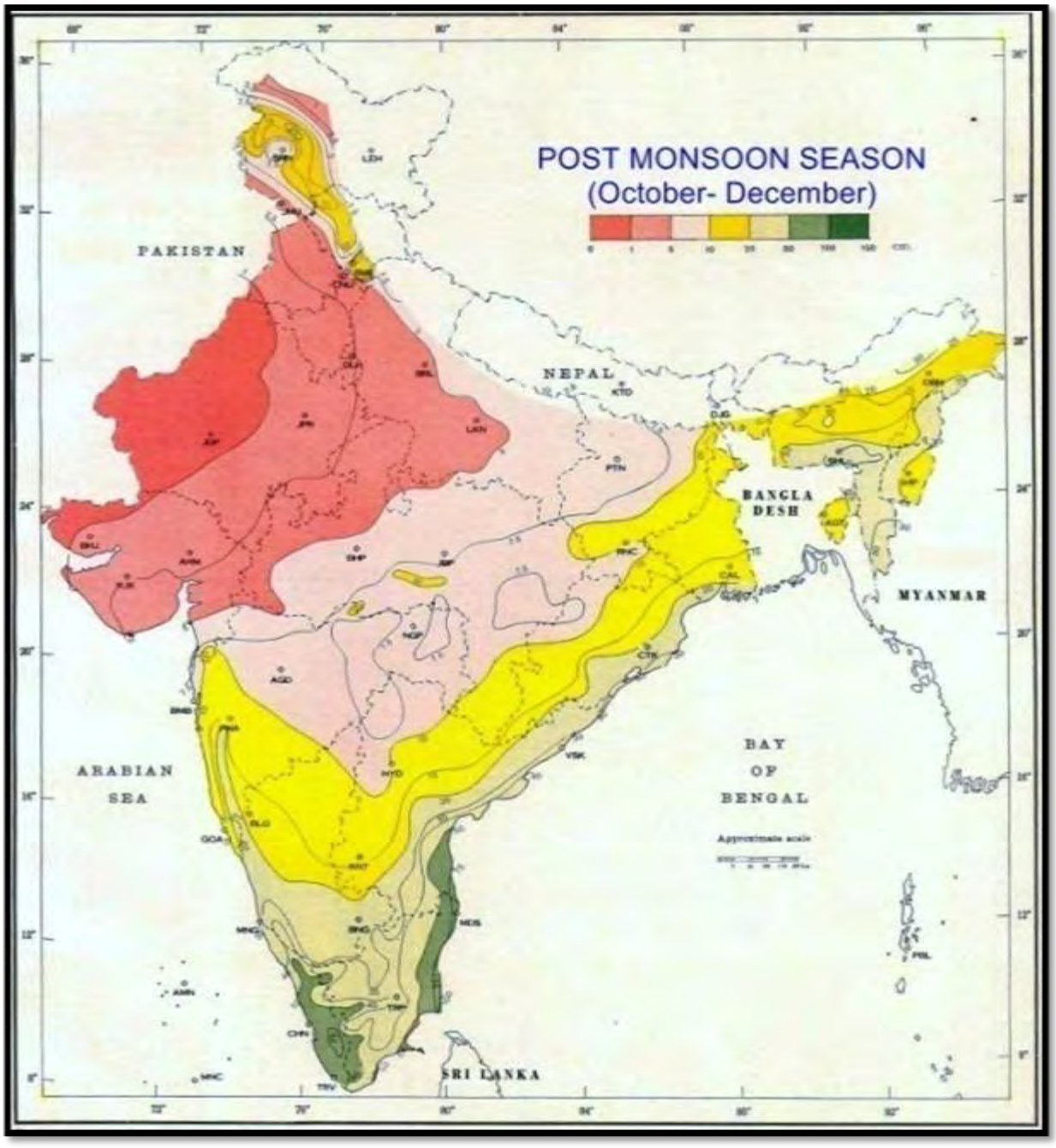


Figure 8: Rainfall Pattern in India during Post Monsoon Season

From above rainfall pattern it is clear that over all rainfall at the site is found to be very less, so it explains soil erosion will not be much significantly at the site. Although M/s. Manju J Homes India Ltd. is taking all preventive measures to prevent soil erosion. To conserve water, a rainwater harvesting system is proposed across the project. Since the existing topography is congenial to surface disposal, a network of storm water pipe drains is planned adjacent to

roads. All building roof water will be brought down through rain water pipes and connected to the storm water drains.

Summary of Seasonal - Rainfall (cm)

Season		Rainfall (cm)
Winter	-	1-5 cm
Summer	-	1-5 cm
Monsoon	-	50-100 cm
Post-monsoon	-	1-5 cm

RAIN WATER HARVESTING

Calculations for storm water load

Roof-top area = Ground Coverage = 8,763.35 m2

Green Area = 3,046.38 m^2

Paved Area = Total Plot Area – (Roof-top Area + Green Area)

= 30,463.85 – (8,763.35 + 3,046.38)

= 18,654.12 m^2

Runoff Load

Roof-top Area = 8,763.35 × 0.05 × 0.8

= 350.534 m^3/hr

Taking 15 minutes Retention Time, Total volume of storm water = 350.534/4

= 87.6335 say 88 m^3

The effective length, breadth and depth of a Recharge pit is 4.0 m, 1.3 and 3.5 m respectively.

Volume of a single Recharge pit (a) = L X B X H = 4.0 x 1.3 x 3.5

= 18.2 m^3

Volume of single desilting chamber (b) = L X B X H = 2.0 x 1.3 x 1.25

= 3.25 m^3

Total Combine Capacity (a) + (b) = 18.2 + 3.25 = 21.45 say 22 m^3

Hence No. of pit required = 88/22 = 4 pits.

Total of 4 Rain Water Harvesting pits are being proposed for artificial rain water recharge from roof runoff within the project premises.

Runoff from green area and paved area will be collected in rain-water harvesting tank.

Rain water harvesting potential from Green Area = Green area × Max^{m} monthly rainfall (m) × runoff coefficient for landscape area/garden/park
= 3,046.38 × 0.10 × 0.10
= 30.46 m^3

Rain water harvesting potential from Paved Area = 18,654.12 × 0.10 × 0.75
= 1,399.06 m^3

Total Runoff Load for 30 days = 30.46 + 1,399.06 m3
= 1429.52 m^3

Total runoff project site for 3 days = 1429.52/10 m^3
= 142.95 m^3

Taking length, breadth and depth of harvesting tank to be 2 m, 3 m and 2 m; Volume of tank will be 2 m × 3 m × 2 m = 12 m^3.

Number of tanks required = 142.95/12
= 11.9 say 12 tanks required.

Total of 12 tanks are being proposed for harvesting rainwater from run off from green and paved area.

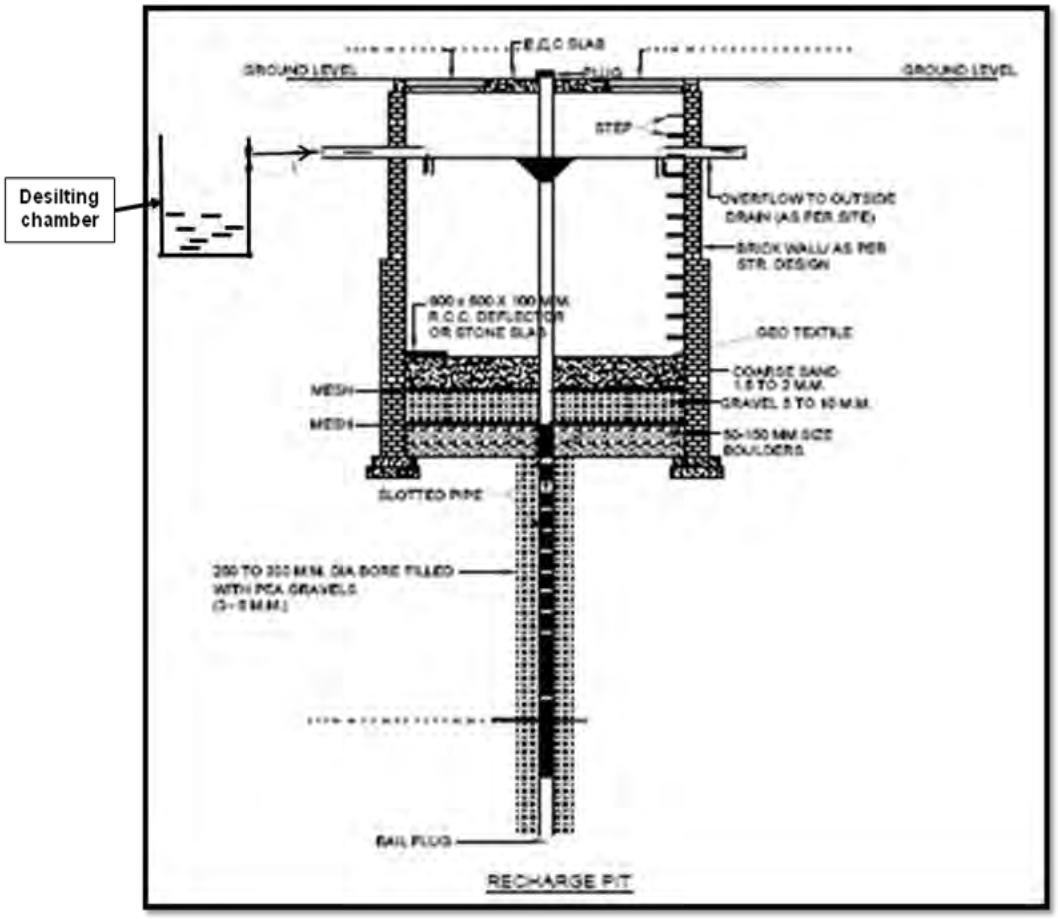


Figure 9: Typical Design of RWH pit Design

VEHICLE PARKING FACILITIES

Adequate provision is being kept for car/vehicles parking at the Group Housing Project. The parking details for the project are illustrated below:

Parking Required:

As per MoEF Norms:

For residential facilities = 1 ECS/100 m^2 FAR

= 1,21,641.24/100 = **1216.4 ECS say 1216 ECS**

For Commercial & Community Facilities = 1 ECS/50 m^2 FAR

= 2997.20/50 = **59.9 say 60 ECS**

Total Parking required as per MoEF Norms = 1216 + 60 ECS = 1276 ECS

As per Ghaziabad Bye Laws:

For residential facilities = 1.5 ECS/100 m^2 FAR
= 1,21,641.24 X 1.5/100 = **1824.6 say 1825 ECS**

For Convenient Shops = 2 ECS/100 m^2 FAR
= 997.20 X 2/100 = **19.9 say 20 ECS**

For Community area = 1.25 ECS/100 m^2 FAR
= 2,000 X 1.25/100 = **25 ECS**

Total parking required = 1825 + 20 + 25 = 1870 ECS

Parking Proposed:

Area proposed for upper basement parking = 21,834.09 m^2
Area required for 1 ECS of basement parking = 32 m^2
Parking proposed in upper basement = 682.3 say 682 ECS

Area proposed for lower basement parking = 21,130.19 m^2
Area required for 1 ECS of basement parking = 32 m^2
Parking proposed in lower basement = 660.3 say 660 ECS

Area proposed for stilt parking = 37,083.86 m^2
Area required for 1 ECS of stilt parking = 28 m^2
Parking proposed in stilt parking = 1324.4 say 1,324 ECS

Total Parking proposed = 682 + 660 + 1,324 = 2, 666 ECS

Out of which, 5% of the parking will be proposed for physically handicapped persons near staircases.

Parking Proposed for LIG and EWS:

S. No.	Description	Area (m^2)	Norms	Parking proposed (ECS)
1.	Parking proposed in upper basement	21,834.09 m^2	1ECS/32m^2	682
2.	Parking proposed in lower basement	21,130.19 m^2	1ECS/32m^2	660
3.	Parking proposed in stilt parking	37,083.86 m^2	1ECS/28m^2	1324
	TOTAL PARKING PROPOSED			**2666 ECS**

Total Parking proposed=682 + 660 + 1324 = 2666 ECS

POWER REQUIREMENT

The power supply shall be supplied by Uttar Pradesh Power Corporation Limited (UPPCL). The connected load for the Group Housing project will be approx. 1,011.79 kVA which shall be supplied by transformer of 1,250 kVA.

Details of D.G Sets

There is provision of 2 no. of DG set of 4000 kVA capacity (2*2000KVA) for power back up in the Group Housing Project. The DG set will be equipped with acoustic enclosure to minimize noise generation and adequate stack height for proper dispersion.

SOLID WASTE GENERATION

Waste quantification is carried out to estimate the amount of waste generated by different activities in the project site. For estimation of quantity of solid waste generated from the project, waste generation factors are selected for each activity based on case studies available for similar type of projects, assumptions and past experience.

Solid Waste Generation

Solid waste generation rate as 0.50 Kg/Capita/day for residents and 0.15 Kg/Capita/day for visitors and 0.25 Kg/Capita/day for staff members and landscape waste @ 0.2 kg/acre/day and STP sludge) have been considered which generates about 3, 960 kg/day for the entire area. Collection systems comprise waste containers at ground floor of each tower, the solid waste collected in garbage room shall be disposed to the appropriate site as per municipal authority. The solid waste so generated shall be first segregated as plastic, glass, paper and other waste separately and disposed off as per MSW Rules, 2000. STP sludge will be used as manure.

Table 6: Solid Waste Generation

S. No.	Category	Waste Generated (kg per capita per day)	Waste generated (kg/day)
1.	Residents	7,443 @ 0.50 kg/day	3721.5
2.	Staff	405 @ 0.25 kg/day	101.25
3.	Visitors	810 @ 0.15 kg/day	121.5
4.	Landscape waste (0.75 acres)	@ 0.2 kg/acre/day	0.150
5.	STP Sludge		15.96
TOTAL SOLID WASTE GENERATED			**3960.36 say 3, 960 kg/day**

Solid Waste Disposal

Project will adopt a systematic approach for solid waste collection and disposal. Solid waste generated from the project will be collected properly and will manage as per MSW rule, 2000. The solid waste so generated shall be first segregated as plastic, glass, paper and other waste separately and disposed off as per MSW Rules, 2000. The inert solid waste will be transported to a govt. designated landfill site. Used oil will be sold off to authorized recyclers while there will be buy-back arrangements with the supplier for DG Set batteries. The following diagrams will briefly describe the solid waste Management process in the construction as well as during operation phases.

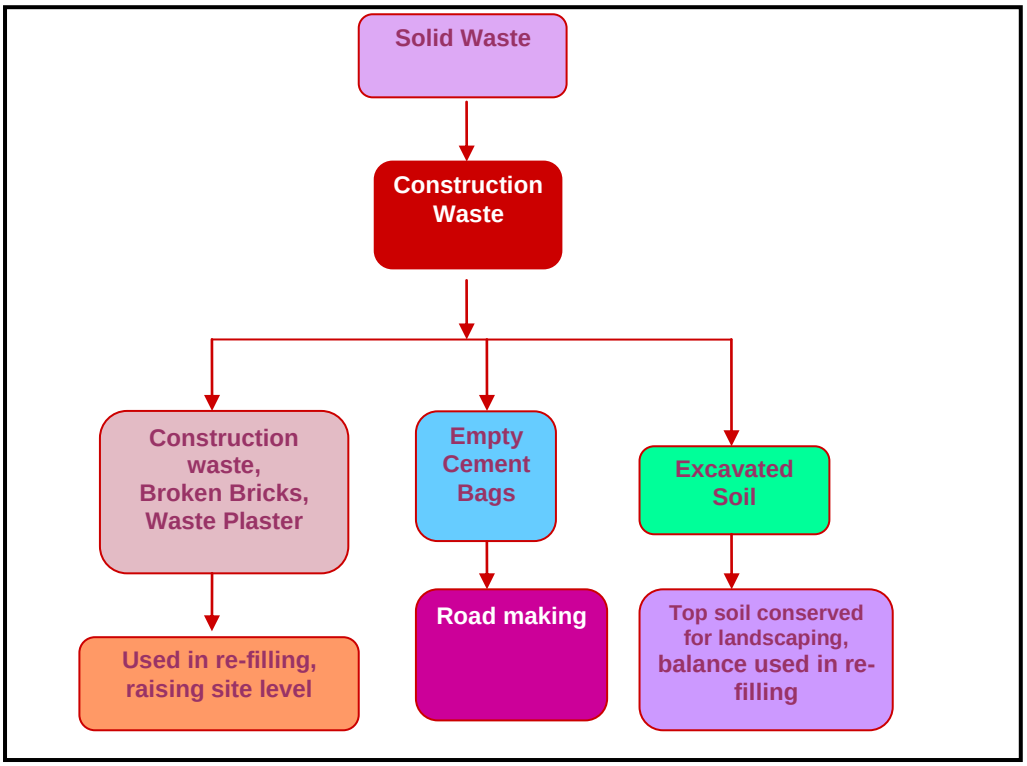


Figure 10: Solid Waste Management During Construction Phase

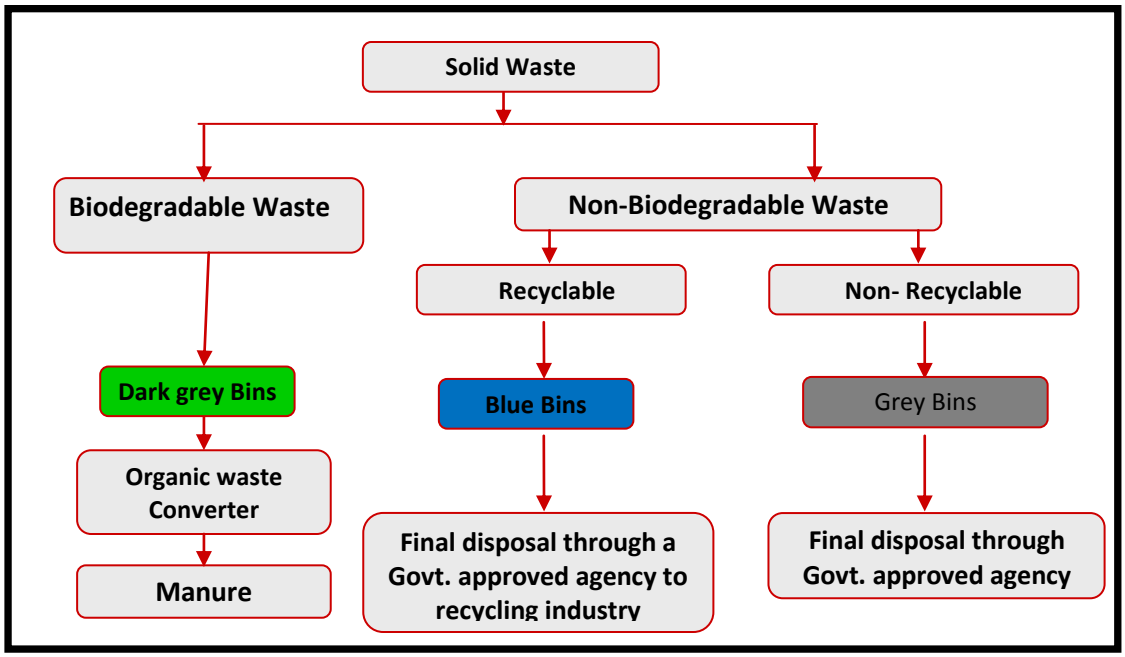


Figure 11: Solid Waste Management During Operational Phase

E-Waste Management & Disposal

"E-waste" is a popular, informal name for electronic products nearing the end of their "useful life". E-wastes are considered dangerous, as certain components of some electronic products contain materials that are hazardous, depending on their condition and density. The hazardous content of these materials pose a threat to human health and environment. Discarded computers, televisions, VCRs, stereos, copiers, electric lamps, cell phones, audio equipment and batteries if improperly disposed can leach lead and other substances into soil and groundwater. Many of these products can be reused, refurbished, or recycled in an environmentally sound manner so that they are less harmful to the ecosystem. Reducing e-waste requires that we reduce, reuse, recycle and recover. The goal is nothing less than zero land fill. Network of scrap dealers will be motivated to procure from door to door for the smaller quantities.

Only hazardous waste to be generated from project site is used oil from D. G. sets. Used oil will be stored in HDPE containers and will be disposed as per hazardous waste (Management, Handling and trans-boundary movement) rules, 2008.

GREEN AREA

Total green area measures 3,046.38 m^2 i.e. 10% of the open area which will be the area under tree plantation within the residential plots and along the roads. Evergreen tall and ornamental trees and ornamental shrubs like *Azadirachta indica, Azadirachtaindica, Delonixregia* have been proposed to be planted inside the premises. Parks are also being developed by the project proponent.

Total Green area = 3,046.38 **m^2 (10% of plot area)**

Tree Details:

As per Ghaziabad bye laws:

Required trees = 50 trees / Hectare

= 0.30 x 50 = 15 trees

As per MoEF&CC norms:

Required trees = 1 tree/80 m^2 of plot area

= 38,663/80 = 483.3 trees say 483 trees

Total trees to be provided = 483 trees

Table 8: Proposed Tree Species

Evergreen Trees		Ornamental Trees
Botanical Name	**Common Name**	**Botanical Name**
Delonixregia	Gulmohar	*Areca palm*
Azadirachtaindica	Neem	*Prunusarmeniaca*
Callistemon lanceolatus	Bottle Brush	*Bougainvillea torch glow*
Cassia fistula	Amaltas	*Cleredendroninerme*
Gravelliarobusta	Silver Oak	*Cycascircinalis*
Ficusbengalensis	Bargad	*Euphorbia carcasana*

DETAILS OF CONSTRUCTION MATERIALS

List of building materials that are being, and will be used at site is as follows:

- Coarse sand
- Fine sand
- Stone aggregate
- Stone for masonry work
- Stone for under floor soling
- Cement
- Reinforcement steel
- Plywood & steel shuttering
- Pipe scaffolding (cup lock system)
- Bricks
- Crazy (white marble) in grey cement
- P.V.C. conduit
- Indo-Asian MCBs
- PVC overhead water tanks

- 2 1/2'' thick red colour paver tiles
- 'B' class GI pipe (ISI marked)
- PVC wastewater lines
- S.W. sewer line upto main sewer
- PVC rain water down take
- Stainless steel sink in kitchen
- 5mm thick plane glass
- 3mm thick ground glass in toilets
- Joinery hardware- ISI marked

LIST OF MACHINERY USED DURING CONSTRUCTION

(i) Dumper	: Shall be used for mud and material handling
(ii) Concrete mixer with hopper	: For RCC work
(iii) JCB	: Shall be used for digging and earth work
(iv) Cranes	: For lifting and moving of materials.
(v) Road roller	: For compacting the earth
(vi) Bulldozer	: For dismantling