CHECK LIST OF ENVIRONMENTAL IMPACTS

(Project proponents are required to provide full information and wherever necessary attach explanatory notes with the Form and submit along with proposed Environmental Management Plan & Monitoring Programmed).

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? (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 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. The land falls under the Agriculture Land as per the Panipat master plan 2021 which is now converted into Industrial land as per the Integrated Industrial Licensing Policy (IILP) for development of Integrated Industrial Colonies in Industrial/ Agriculture Zone issued by Haryana Government on 11th October, 2017 copy of which is attached as Annexure. The development of green belt and other landscaping will enhance the visual aesthetics of the area.

Figure-1: Google image showing the project site

CONNECTIVITY

The proposed project site is located at Village Diwana, District- Panipat, Haryana which is easily approachable through NH-1 which is at a distance of 1.08 Km away from project site towards East and Panipat Bypass corridor at a distance of 1.92 Km towards North and nearest railway station is Panipat junction Railway station at a distance of 9.02 Km from project site in NW direction. Nearest airport is IGI, at a distance of 184.25 Km from the project site in South direction

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

S. no	Description	Area (Sq.mt)
1	**Total Plot area**	239091.9449 m^2

2	**Net Plot area**	234709.206 m^2
3	**Permissible ground coverage @ 60%**	140825.5236 m^2
4	**Proposed ground coverage @ 56.7%**	133169.69 m^2
5	**Permissible FAR @100 %**	234709.206 m^2
6	**Proposed FAR**	234709.206 m^2
7	**Non-FAR area (Service floor + Basement area)**	11735.46 m^2
8	**Built up area (FAR+ Non-FAR area)**	246444.666 m^2
9	**Green area**	11938.207 m^2
10	**Road and paved area**	89601.309 m^2

S. No	Particulates	Total
1	No. of DG sets	1 no's total capacity =50 KVA (1 x 50 KVA)
2	Total Population	4,133
3	Water Requirement (KLD)	197 KLD
4	Wastewater Generation (KLD)	122 KLD
5	Capacity of STP (LKD)	**150 KLD**
6	Rain Water Harvesting Pits	**59**
7	Solid Waste Generation kg/day	743 Kg/day
8	Power Requirement & Sources (KVA)	4.2 MW UHBVN
9	Maximum Height of the Building	18 m
10	Cost of project	179.82 Crore (Approx)

1.3 What are the likely impacts of the activity on the existing facilities adjacent to the 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 **11938.207 m^2** i.e. **5 %** of the net plot 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.

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 moderate 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.

- Western Yamuna Canal-1.77 Km towards West
- Main Drain no 2-7.27 Km towards East

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 only excavation work is involved in the proposed project for establishing the pillar. The filling works will be done by the excavated material and no extra material will be used. All the topsoil

excavated from construction activities shall be stored separately and used in greenbelt development within the project site. 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.

- During construction phase, water demand will be fulfilled by STP from HUDA.
- 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.

1.8 Will the low lying areas & wetlands get altered? (Provide details of how low lying and wetlands are getting modified from the 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 vicinity of the project site.

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 significant health hazard is associated with the proposed construction.

- During construction period, source of fugitive dust generation will be material handling and vehicular movement. Impact due to fugitive dust emission is negligible as water sprinklers will be used to suppress fugitive dust emission as and when generate. However, the impacts will be confined to laborers/workers particularly with regard to occupational exposure. Proper Personal Protective Equipments will be provided to the workers working in the potential areas (e.g. masks, ear plugs etc.).

- Careful design, planning and good site management would minimize waste of materials such as concrete, mortars and cement grouts. Construction wastes will be segregated as much as possible at site itself to increase the feasibility of recycling concrete and masonry as filling material and steel pieces as saleable scrap. Litter disposal and collection points will be established around the work sites. Empty packaging materials, drums, glass, tin, paper, plastic, pet bottles, wood, thermocol and other packaging materials, etc will be disposed through recyclers. The construction spoils will be temporarily stored at designated dumpsite located inside the site premises. Later on these wastes will be used for land filling / leveling work within the site premises. An estimate of the average composition of waste generated from the onsite construction activities given in Table-2.

Table-2: Waste Composition - During Construction Phase

S. No.	Constituents	Percentage Composition (%)
1	Soil, Sand and Gravel	35.80
2	Brick and Masonry	30.66
3	Concrete	23.24
5	Bitumen	2.10
6	Wood	2.10
7	Other	1.00
	Total	**100.00**

Source: TIFAC Report "Utilization of Waste from Construction Industry," 2001

SECTION-2 WATER REQUIREMENT

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

Total water requirement for the said project will be 197 KLD, out of which 79 KLD is fresh water requirement and 1118 KLD is recycled/treated water requirement which will be met from HUDA water supply.

Table 3: Total Water Requirement within the project

Total Water Requirement = 197 KLD	
For Domestic Purpose	79 KLD
For Flushing	58 KLD
For Gardening / Horticulture	60 KLD
TOTAL	**197 KLD**

Total **122 KLD** of waste water would be generated from the proposed project which will be treated in STP of 150 KLD. The Rotating MBBR of 150 KLD will be constructed for the treatment of waste water during operational phase. Total 110 KLD treated water will be available from STP and 8 KLD will be purchased from outside during summer season which will be totally reused in flushing and horticulture and 16 KLD during winter season and 40 KLD during monsoon season will be disposed off in sewer line.

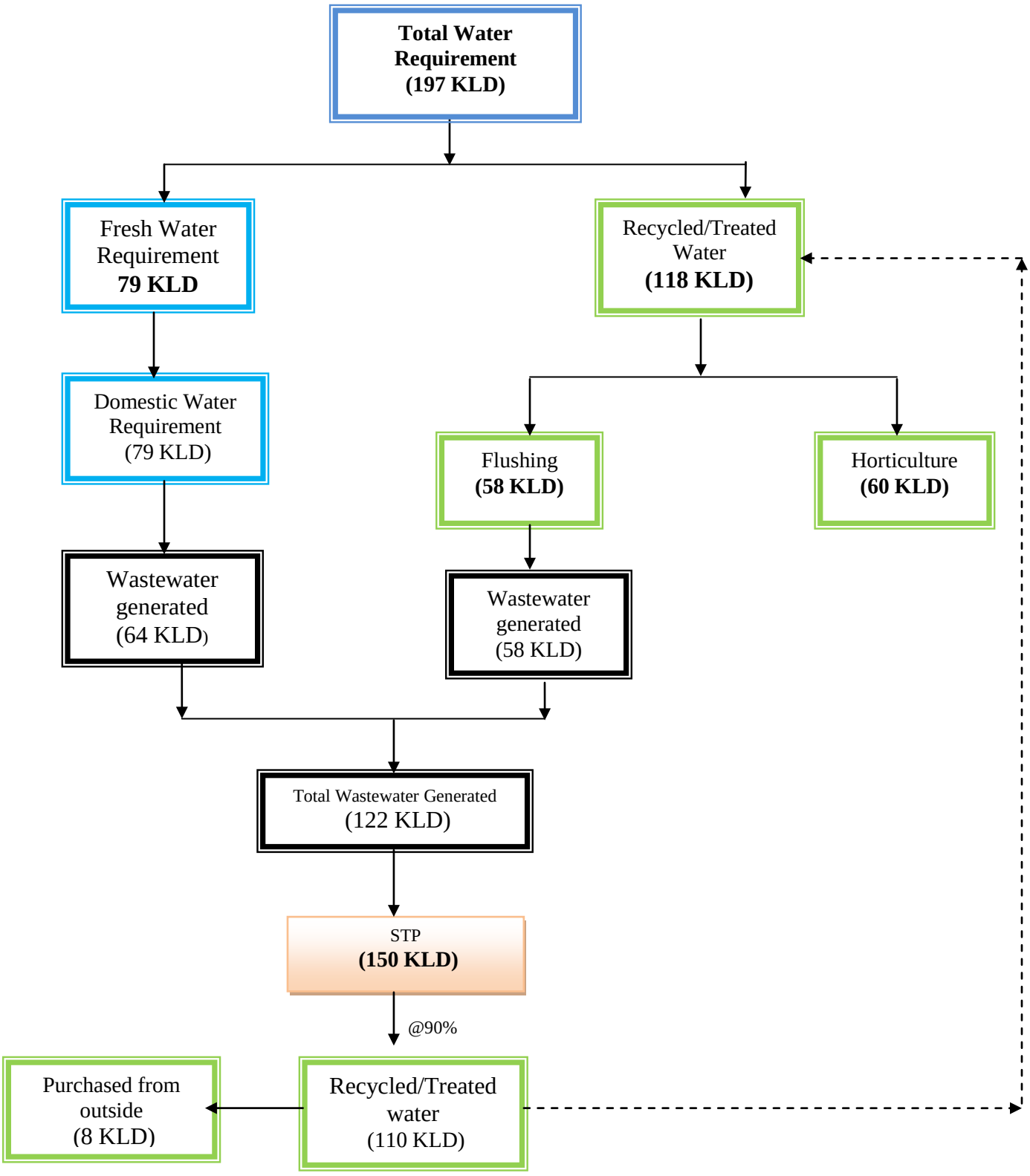

Figure 2: Water Balance Diagram during Summer Season

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

Water requirement will be fulfilled by HUDA.

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

Not Applicable as the water requirement will be fulfilled from HUDA.

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

The water requirement for flushing, landscaping, will be met through treated water from Sewage Treatment Plant (STP) of 150 KLD. The Rotating MBBR of 150 KLD will be constructed for the treatment of waste water.

Table-4: Details of Treated/Recycled Water from STP

Details	Water (KLD)
Water requirement for domestic purpose	79
Wastewater generated from domestic use (@ 80% of domestic water requirement)	64
Water requirement for Flushing Purpose	58
Wastewater generated from Flushing (@ 100% of flushing requirement)	58
Total wastewater generated	64+58=122 KLD
Recycled water available for use @ approx. 90% of wastewater generated	110
Use of Recycled Water (110 + 8 =118 KLD) (8 KLD will be sourced from other project site during summer season)	1. Flushing : 58 KLD 2. Horticulture : 60 KLD

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

No, there will be no diversion of water from other users.

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

Approximately 122 KLD of waste water during operational phase will be generated from the proposed project.

This wastewater generated will be treated in well designed Sewage Treatment Plant (STP) of 150 KLD. The Rotating MBBR of 150 KLD will be constructed for the treatment of waste water during operational phase. Dual plumbing system will be provided for reuse of recycled water in flushing, landscaping. Hence, no incremental pollution load is been expected from wastewater generated from the activity.

Table-5: Composition of Wastewater Generation

Before Treatment Final discharge characteristics

a) pH	:	6.5 to 8.5
b) Colour	:	Mild
c) T.S.S. (mg/l)	:	150-300 mg/l
d) BOD_5 (mg/l)	:	200-350 mg/l
e) COD (mg/l)	:	500-600 mg/l

After Treatment Final discharge characteristics

(a) pH	:	6.5 to 8.5
(b) Oil & Grease	:	<2 mg/l
(c) B.O.D.	:	<10 mg/l
(d) C.O.D.	:	<15 mg/l

(e) Total Suspended Solids	:	<10 mg/l

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

Rainwater harvesting is proposed as a water conservation tool. Total **59 nos.** rain water harvesting pits will be provided for the storm water drainage within the project premises at selected locations, which will catch the maximum run-off from the area. It is self-sufficient to avoid any collection/stagnation and flooding of water.

1) Since the existing topography is congenial to surface disposal, a network of storm water pipe drains is planned adjacent to roads. All building roof water will be brought down through rain water pipes.

2) Proposed storm water system consists of pipe drain, catch basins and seepage pits at regular intervals for rain water harvesting and ground water recharging.

3) 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 45 mm/hr shall be considered for designing the storm water drainage system. Rain water harvesting has been catered to and designed as per the guidelines of CGWA. The ground water level in the area is 28 meters bgl. The bottom of the recharge structure will be kept 3 m above this 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.

2.8 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 pits for groundwater recharging. The quality of the runoff is expected to improve due to paved areas.

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

Water demand will be fulfilled from HUDA. No adverse impact is expected on this account as extensive rainwater harvesting will be implemented across the project site. To reduce the freshwater demand and hence the groundwater stress, treated wastewater will be used for landscaping and flushing.

2.10 What precautions/ measures have been taken to prevent the run-off from construction activities pollution land and aquifers? (Give details of quantities and the measures taken to avoid the adverse impact)

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

- Avoid excavation during monsoon season.
- Care would be taken to avoid soil erosion.
- 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.
- Any area with loose debris/soil within the site shall be fully planted by local plant species.
- 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.

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

Most of the storm water produced on site will be harvested for ground water recharge. Thus proper management of this resource is 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.

2.12 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.

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

- It is expected that the project will generate approximately 122 KLD of waste water from the operational phase of the proposed project.

- This wastewater generated will be treated in well designed Sewage Treatment Plant (STP) of 150 KLD. The Rotating MBBR of 150 KLD will be constructed for the treatment of waste water during operational phase within the premises generating 110 KLD of recoverable/recycled water which will be used in flushing and horticulture. Therefore 8 KLD will be purchased from outside during summer season and 16 KLD during winter season and 40 KLD during monsoon season will be disposed off in sewer line.

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

Total water requirement for the project will be approximately 197 KLD out of which 79 KLD is fresh water requirement and 11/8 KLD is recycled/treated water requirement which will be met from HUDA water supply.

During operation phase, approximately 122 KLD of waste water from proposed project which will be treated in STP of 150 KLD. The Rotating MBBR of 150 KLD will be constructed for the treatment of waste water during operational phase within the premises. Treated water obtained from STP shall be

110 KLD and 8 KLD will be purchased from outside which shall be utilized for the purpose of flushing (58 KLD) and Horticulture (60 KLD) during summer season.

SECTION-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 to develop a multilayered peripheral greenbelt of native plant species to enhance the aesthetic value of the region and also provide an excellent habitat for various faunal groups.

3.3 What are the measures 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. **11938.207 m^2** i.e. **5 %** will be developed as green belt and organized green spaces. 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. Multi-layered plantation comprising of medium height trees (7 m to 10 m) and shrubs (5 m height) are for the green belt. In addition creepers will be planted along the boundary wall to enhance its insulation capacity.

SECTION 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 multilayered 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 trees bearing fruits 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.

No direct or indirect impact on fauna is envisaged.

SECTION 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 construction).

The proposed project will not increase heat Island effect significantly, as it does not involve any significant change in the land use pattern. The effect will be negligible due to reduction in hard area and more plantations to shade of hard area along roads and parking lots. Ambient air monitoring was carried out at the project site during the environmental assessment.

During the construction phase, cars, scooter/motorcycle will be owned by the workers and staff of Textile Park. Vehicular emissions will be the major source of air pollution in addition to DG set. Quantum and dispersion of pollutants from vehicular emission will depend upon the following:

- Volume of traffic on the roads,
- Meteorological conditions
- Emission sources

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

As per the study of dispersion model, the incremental GLC shows that there is no any major increment in the pollution load.

Mitigation Measures: The proposed project will develop a green belt inside the premises of the project site and along the internal road, which will work as a 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.

During operational phase of the project, there will be increase in atmospheric concentration of gases and particulate matter due to running of DG sets. Total 01 DG sets of total capacity of 50 KVA (1 x 50 KVA) will be provided as back up during power failure. This will cause emissions of PM, SO_2, NO_2 and CO. However, the D.G. sets will be run only during power failure and low sulphur diesel (HSD) will be used. Adequate stack height of D.G. sets will be provided as per the stipulated guidelines of Central Pollution Control Board (CPCB) to facilitate natural dispersion of exhaust gases.

Sources of Air pollution During Construction Phase:

• Increase in level of dust and other air pollutants due to building construction and other related Activities.

• Emissions from vehicles carrying the construction materials

• Emissions from DG sets

• Open burning of solid wastes can cause air pollution

Mitigation Measures:

• Use of water for dust suppression and polymeric dust suppression system (wherever possible).

• Use of covering sheets shall be done for trucks carrying construction material to prevent air borne dust.

• All material storages shall be adequately covered to avoid dust / particulate emissions.

• Use of CPCB approved DG sets.

• Proper maintenance of DG sets.

• Adequate parking provision and proper traffic movement for smooth traffic flow.

• Vehicles having valid pollution under control certificate shall be allowed to ply on site.

• Open burning of solid waste shall be prohibited.

• Regular health checkup of the workers.

• Use of the standard personal protective equipment like masks, goggles etc.

Sources of Air pollution During Operational phase:

• The gaseous emissions from vehicles.

• Emissions from DG sets.

Mitigation Measures:

• DG sets with acoustic enclosures is to be installed and stacks height to be kept as per Central Pollution Control Board (CPCB) norms to allow effective dispersion of pollutants.

• Periodic monitoring of SPM and SO_2 concentration and thereby schedule and implement proper maintenance of DG sets.

• Plantation of trees of various varieties shall be planted on ground.

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

The proposed project is located in well-developed urbanized area. The project will have separate entry and exit for the vehicles to avoid any congestion at entry and exit points. Adequate provision

will be kept for car/vehicles parking at site. There shall also be adequate provision for visitors parking so as not to disturb the traffic and allow smooth movement at the site.

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. The detailed traffic movement patterns are mentioned in Traffic and Circulation plan. The total road and paved areas within the project site is 89601.309 m^2.

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

During Construction Phase:

Anticipated Impacts-

- Noise due to construction activities.
- Impact due to transportation activities.
- Nuisance to nearby areas due to noise polluting work at night.
- Noise generation due to DG sets.

Mitigation Measures-

- During construction activities the noise monitoring will be done to ascertain the noise levels are within limits.
- All precautions for noise abatement shall be taken during the construction activities.

- It is recommended that Contractors to use well maintained & relatively newer equipment to mitigate noise generation in initial stages when excavation and earth removal is carried out.
- During high noise construction activity there will be provision of ear plugs for construction labour and staff.
- No noise polluting work in night shifts.
- Provision of barricades along the periphery of the site.
- Acoustic enclosure for DG sets

During Operation Phase

Anticipated Impacts-

- Impact of Noise due to vehicular Traffic.
- Noise generation due to DG sets.

Mitigation Measures-

- Provision of proper parking arrangement, traffic management plan for smooth flow of a vehicles helps to abate noise pollution due to vehicular traffic.
- Plantation of trees of various varieties shall be planted on ground that shall act as natural noise buffer.
- Acoustic enclosure for DG sets.

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 operational phase of the project, vehicular movement and operation of DG sets will be 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 Commercial settlements and will be enclosed with suitable enclosures.

Hence, no or minimal impact will be anticipated due to DG set and vehicular emission. It is envisaged that the movement of the motor vehicles will be restricted to designated carriageways only.

D.G. Sets will be operated only in case of power failures during construction and operational phase. The Pollutants like PM, SO2 that may arise from emissions from D.G. sets will be discharged through vent of proper height. D.G. sets will be installed within built acoustic enclosures to reduce the noise of D.G. sets while in construction or operation. Plantation of trees would act as noise barrier and will reduce noise level.

Impacts on Air Quality due to DG Sets

- 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.

Mitigation Measures for Impacts of DG Sets 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.

SECTION-6 : AESTHETICS

6.1 Will the 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 Building Regulation Norms of NBC, HUDA building by-laws and norms of Town and Country Planning 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.

SECTION-7: SOCIO-ECONOMIC ASPECTS

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

The project is situated in the Agriculture zone which is now converted into Industrial Land as pet the Integrated Industrial Licensing Policy (IILP) for development of Integrated Industrial Colonies in Industrial/ Agriculture Zone issued by Haryana Government on 11th October, 2017 copy of which is attached as Annexure.

Construction phase: Since local laborers 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 area around the project is surrounded by local land area and project site is located in the development area under Panipat master plan 2021.. However all sorts of social infrastructure like transportation facilities, water supply & sanitation facilities, communication facilities, educational institutes, hospital, markets, banks, cultural amenities etc. already exist in Panipat, some of them are mentioned here:

Nearest Road –
a) NH-1 – 1.08 Km towards East
b) Panipat Bypass corridor-1.92 Km towards North

Nearest Railway station- Panipat Junction Railway Station – 9.02 km towards NW

Nearest Airport- Indira Gandhi International airport- 84.25 Km towards South

Nearest Village-
a) Khalila-1.49 Km towards South
b) Jhattipur- 2.16 Km towards East

Nearest School-
a) Prayaag International School- 1.24 Km towards NNE
b) Mount Litera Zee School- 2.23 km towards SE

Nearest Hospital-
b) Park Hospital – 2.61 Km towards North
c) GC Gupta Hospital- 6.59 km towards North

Nearest Temple-
a) Shiv Mandir- 3.12 km towards North
b) Ghouse Ali shah Masjid- 7.02 Km towards North

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

Construction phase: There is no religious site 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 labor 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 facility in the area, thereby improving the quality of life. A Commercial project of such scale will also boost the local economy.

SECTION-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)

While selecting the building materials appropriate weight-age will be given to select materials with low embodied energy. The aim is to replace at least a part of high energy intensive materials with low energy intensive materials and utilize regionally available materials. Products which use recycled materials like glass, crushed stone, and other waste which are resource efficient finishes such as finished concrete flooring, ceiling tiles, and ceramic tiles are useful. The advantages of using products with recycled content: Few examples are use of Fly ash based products e.g. Fly ash brick, AAC Block, PPC Cement, use of fly ash in RCC and Plaster. Materials with high recycle content e.g. steel, tiles, aluminum, pavers shall be selected. Use of glass which is manufactured using waste glass cullets saves about 26% of the total energy required for procuring and transportation of raw materials.

Gypsum boards use 92% gypsum, which can either be sourced naturally or is produced as a by-product of power plants. Thus gypsum boards used contain 100% post-industrial recycle content. Gypsum has high recyclability potential as well. Ceramic tiles are extremely durable and require minimum maintenance. Ceramic tiles usually have 100% recycled content in the form of recycled glass.

Majority of the building materials are sourced locally e.g. sand, aggregate; stone are sourced from local areas. The RCC is constructed by mixing locally sourced sand, cement and aggregate to reduce transportation energy consumption.

Composite wood products such as hardboards block boards, lumber-core plywood, veneered panels, particle boards, medium/low density fiberboards made from recycled wood scrap from sawmill dust, agriculture waste will be preferred.

Alternatively, rapidly renewable materials/products, which are made from small diameter trees and fast growing low utilized species harvested within 10 year cycle or shorter such as bamboo, rubber, eucrasia, eucalyptus, poplar, jute/cotton stalks, and so on.

Embodied energy is the energy consumed by all of the processes associated with the production of a building, from the mining and processing of natural resources to manufacturing, transport and product delivery. Embodied energy does not include the operation and disposal of the building material, which would be considered in a life cycle approach. Embodied energy is the 'upstream' or 'front-end' component of the life cycle impact of a home.

Gross energy requirement (GER) is a measure of the true embodied energy of a material, which would ideally include all of the above and more. In practice this is usually impractical to measure.

Process energy requirement (PER) is a measure of the energy directly related to the manufacture of the material. This is simpler to quantify. Consequently, most figures quoted for embodied energy are based on the PER. This would include the energy used in transporting the raw materials to the factory but not energy used to transport the final product to the building site.

In general, PER accounts for 50–80% of GER. Even within this narrower definition, arriving at a single figure for a material is impractical as it depends on:

1. Efficiency of the individual manufacturing process
2. The fuels used in the manufacture of the materials
3. The distances materials are transported
4. The amount of recycled product used.

Each of these factors varies according to product, process, manufacturer and application. They also vary depending on how the embodied energy has been assessed.

Estimates of embodied energy can vary by a factor of up to ten. As a result, figures quoted for embodied energy are broad guidelines only and should not be taken as correct. We will consider the relative relationships and try to use materials that have the lower embodied energy.

Typical figures for some materials are given in the tables that follow. Generally, the more highly processed a material is the higher its embodied energy.

Embodied energy for common building materials

Material	**PER embodied energy MJ/kg**
* Fibre cement figure updated from earlier version and endorsed by Dr Lawson. Source: Lawson 1996	
Kiln dried sawn softwood	3.4
Kiln dried sawn hardwood	2.0
Air dried sawn hardwood	0.5
Hardboard	24.2
Particleboard	8.0
MDF (medium density fibreboard)	11.3
Plywood	10.4
Glue-laminated timber	11.0
Laminated veneer lumber	11.0
Plastics — general	90.0
PVC (polyvinyl chloride)	80.0

Embodied energy for common building materials

Material	PER embodied energy MJ/kg
Synthetic rubber	110.0
Acrylic paint	61.5
Stabilised earth	0.7
Imported dimensioned granite	13.9
Local dimensioned granite	5.9
Gypsum plaster	2.9
Plasterboard	4.4
Fibre cement	4.8*
Cement	5.6
In situ concrete	1.9
Precast steam-cured concrete	2.0
Precast tilt-up concrete	1.9
Clay bricks	2.5
Concrete blocks	1.5
Autoclaved aerated concrete (AAC)	3.6
Glass	12.7
Aluminium	170.0
Copper	100.0
Galvanised steel	38.0

These figures should be used with caution because: the actual embodied energy of a material manufactured and used in one location, is very different from the same material transported by road to other location.

Aluminium from a recycled source contains less than 10% of the embodied energy of aluminium manufactured from raw materials.

Materials of high monetary and high embodied energy value, such as stainless steel, are almost certain to have been recycled many times, reducing their life cycle impact.

Materials with the lowest embodied energy, such as concrete, bricks and timber, will be usually consumed in large quantities. Materials with high energy content such as stainless steel are often used in much smaller amounts. As a result, the greatest amount of embodied energy in a building can be from either low embodied energy materials such as concrete or high embodied energy materials such as steel.

Guidelines for reducing embodied energy

Lightweight building construction such as timber frame is usually lower in embodied energy than heavyweight construction. This is not necessarily the case if large amounts of light but high energy materials such as steel or aluminum are used.

There are many situations where a lightweight building is the most appropriate and may result in the lowest life cycle energy use (e.g. hot, humid climates; sloping or shaded sites; sensitive landscapes).

In climates with greater heating and cooling requirements and significant day–night temperature variations, embodied energy in a high level of well-insulated thermal mass can significantly offset the energy used for heating and cooling.

There is little benefit in building a house with high embodied energy in the thermal mass or other elements of the envelope in areas where heating and cooling requirements are minimal or where other passive design principles are not applied.

Each design should select the best combination for its application based on climate, transport distances, availability of materials and budget, balanced against known embodied energy content.

The guidelines

1. Design for long life and adaptability, using durable low maintenance materials.
2. Ensure materials can be easily separated.
3. Avoid building a bigger house than you need — and save materials.
4. Modify or refurbish instead of demolishing or adding.
5. Ensure construction wastes and materials from demolition of existing buildings are reused or recycled.
6. Use locally sourced materials (including materials salvaged on site) to reduce transport.
7. Select low embodied energy materials (which may include materials with a high recycled content), preferably based on supplier-specific data.
8. Avoid wasteful material use. For example, specify standard sizes wherever possible (windows, door, and panels) to avoid using additional materials as fillers. Some energy intensive finishes, such as paints, often have high wastage levels so try to buy only as much as you need.
9. Ensure offcuts are recycled and use only sufficient structural materials to ensure stability and meet construction standards.
10. Select materials that can be reused or recycled easily at the end of their lives using existing recycling systems.
11. Give preference to materials that have been manufactured using renewable energy sources.
12. Use efficient building envelope design and fittings to minimize materials (e.g. energy efficient building envelope can downsize or eliminate the need for heaters and coolers, water-efficient taps can allow downsizing of water pipes).

Reuse and recycling

Reuse of building materials commonly saves about 95% of embodied energy that would otherwise be wasted. However, some materials such as bricks and roof tiles may be damaged when reused.

Savings from recycling of materials for reprocessing varies considerably, with savings up to 95% for aluminum but only 20% for glass. Also, some reprocessing may use more energy, particularly if long transport distances are involved.

Life cycle assessment

Life cycle assessment (LCA) examines the total environmental impact of a material or product through every step of its life — from obtaining raw materials (e.g. through mining or logging) all the way through manufacture, transport to a store, and using it in the home, to disposal or recycling.

LCA can consider a range of environmental impacts such as resource depletion, energy and water use, greenhouse emissions, waste generation and so on.

LCA can be applied to a whole product (a house or unit) or to an individual element or process included in that product. An internationally agreed standard (ISO 14040:2006, Environmental management — life cycle assessment — principles and framework) defines standard LCA methodologies and protocols.

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. The project will use materials with recycled content such that the total recycled content constitutes at least 10% of the total cost of the materials used in the roads & structure.

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 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 the government authorized recyclers. Proper guidelines for segregation, collection and storage will be prepared as per Solid Wastes Management Rules, 2016.

SECTION-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 details of power requirement, sources, and backup power requirement are given in the Table below:

Power Requirement, Sources and Backup Plan

Power Requirement	4.2 MW
Sources of Power	Uttar Haryana BijliVitran Nigam (UHBVN)
Backup power supply arrangement	01 no. of DG sets having total capacity of 50 KVA (1 x 50 KVA) will be used in case of power failure only.
Assumed Power Consumption	0.00163 kw/sq.ft

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

Energy Saving Practices

- Automatic Control of Power factors through APFC Relay controlled capacitor Panel.
- VRV system for air-conditioning which gives 30% more efficiency as compared with the conventional chiller based systems thereby consuming less power.
- Use of solar energy for external lighting.
- Purchase of energy efficient appliances, motors & pumps.
- Use of Energy Efficient lighting i.e LED, 9/18W and T-5 fixtures. T5- 21/28W fluorescent lights will be used in basement parking instead of conventional 40W tube lights to save a lot of energy as compared with 40W TL.
- Constant monitoring of energy consumption and defining targets for energy conservation.

Architectural design

- Maximize the use of natural lighting through design
- Passive solar cooling utilizing building shading through overhangs.
- Glazed areas on the façade are limited to 40% of the total façade area which will be provided with double glazed units.

- Over deck insulation on roof meeting thermal conductivity as defined under ECBC along with the reflective surface on roof top with High Solar Reflectance Index.

Urban Heat Island Impact

In order to reduce impact of urban Heat Island and improving the microclimate at site, following measures are being undertaken:

- Reduced surface parking
- Light colored paving materials for hard paved areas at pedestrian level
- Grass lawn with shrubs in the center of the complex
- Provision of Trees to shade open surface areas

Behavioral change on consumption

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

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

Backup power units will be provided by 1 Nos. of DG sets of total capacity 50 KVA (1 x 50 KVA). The DG sets will be operated only during power failure. The DG sets will be air cooled.

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?

Glass plays a unique and important role in building design and the environment. It affects design, appearance, thermal performance and occupant comfort. The selection of the right glass is a crucial component of the design process.

India being a tropical country, we need to be careful while selecting a glass. Selection of glass has become more complex since a variety of glasses are available to choose from, ranging from performance to aesthetics.

Key factors which play an important role in designing the building envelope with glass are as follows.

- Solar Factor (SF) / Solar Heat Gain Co-efficient (SHGC)

- U-Value
- Relative Heat Gain (RHG)
- Visual Comfort

Solar Factor (SF) /Solar Heat Gain Co-efficient (SHGC)

A combination of the directly transmitted solar and radiant energy and the proportion of the absorbed solar energy that enters into the building are interior. We will use low SF/SHGC type of glass.

U-Factor (U-Value)

This is the measurement of air-to-air thermal conductance or insulation between indoors and outdoors through the glass. We will use low U-Value type of glass.

Relative Heat Gain (RHG)

RHG is calculated as follow = (Solar heat gain factor (ASHRAE) 630° W/m2 X shading coefficient of the glass) + (Temperature Difference x U value)

- Heat gain due to Solar Factor contributes to 80% of RHG value
- Heat gain due to U-value contributes to 20% of RHG value

  As we have proposed for low U-value and low SF/SHGC value, thus RHG value will remain low.

Visual Comfort

Visual Light Transmission

It is defined as the percentage of light transmitted through the glass. It does not determine the color of the glass.

We will use Glass that should provide for optimum daylight inside as per the outside condition. Excessive daylight creates glare and makes the occupant uncomfortable.

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

Passive solar design refers the use of the sun's energy for 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.
- Solar power packs/inverters.
- Roof top SPV (Solar Photo voltaic) systems with or without grid interaction.

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.

Suitable energy optimization will be adopted during the calculation of energy load of proposed project. The space heating load will be minimized using solar structure and suitable buildings

envelop material. Uses of incandescent lamp and halogen lamps have been avoided and energy efficient LED shall be used for all common area.

The diesel generator sets shall be automatically controlled to optimize their usage based on the actual load requirements at any time. Space conditioning will be provided as per national Building Code – 8; lighting intensity will be done as per the National Building Code Guidelines. No, we are using CFC and HCFC free chillers as this is Proposed Textile park project.

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 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 Commercial 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 for water proofing and thermal insulation. Roof tops will also have partly landscaped area/gardens.
External wall-external opening will have regular door windows with slightly tinted glass. Regular walls have some cladding/fixture paints.

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

Fire fighting 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.

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

The project being an Textile Park 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 with 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 effects of infiltration will be reduced by adopting the following measures:

1. Air change rates will be maintained by introducing the fresh air to dilute and remove the contaminants generated in the space.
2. Building room pressure gradient will be achieved by controlling the quality and quantity of intake and exhaust air, maintaining differential air pressures between adjacent areas, and designing patterns of airflow for particular clinical purposes.
3. Appropriate air distribution will be achieved in the compartments being air condition.

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.
- Solar blinkers.
- Solar power packs/inverters.
- Roof top SPV (Solar Photo voltaic) systems with or without grid interaction.

Green area is provided along with tree plantation which will result in natural air cooling and will reduce the load on conventional energy sources.

SECTION-10: ENVIRONMENT MANAGEMENT PLAN

10.1 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.

A detailed environmental management plan is presented in **Table-6, 7 & 8** to mitigate all the identified environmental impacts that are found to be significant.

Table-6: Environmental Management Plan – Construction Phase

S. No	Environmental Impacts	Mitigation Measures	Implementing Agency	Monitoring Agency
(i)	Air pollution due to emissions from construction machinery and movement of vehicles.	a) Vehicles transporting construction materials prone to fugitive dust emissions should be covered. b) Trucks carrying sand should be provided with tarpaulin sheets to cover the bed and sides of the trucks. c) Idling of delivery trucks or other equipment should not be permitted during loading and unloading. d) All construction vehicles should comply with air emission	Building Contractor	Project proponent

		standards and be maintained properly. e) Development of alternative access routes to the site by passing the commercial areas to avoid air pollution		
(ii)	Air pollution, noise and safety hazard due to movement of construction vehicles through internal roads of project premises.	a) Improvement of road surface to standards adequate to withstand movement of heavy construction vehicles b) Installing appropriate signage and deploying flagmen during peak traffic period to regulate the movement of traffic	Building Contractor	Project proponent
(iii)	Noise pollution due to operation of construction machinery at the site.	a) Construction contracts should specify that the construction equipment should meet the noise and air emission levels as per EPA Rules, 1986. b) Generator sets should be provided with noise shields around them. c) Vehicles used for transportation of construction material should be well maintained. d) The workers operating high noise machinery or operating near it should be provided with ear plugs e) The high noise generating stationary machinery should be located at the southern or central portion of the site	Building Contractor	Project proponent

(iv)	Impact on community water resources (quality).	a) All waste water discharges from construction site will be received in septic tanks, adequate capacity and soak pits. b) Oil handling and storage area will be surfaced and provided with catch pit to intercept any accidental spillages.	Building Contractor	Project proponent
(v)	Sanitation and healthcare at workers camp	a) The contractor shall install adequate lavatories; soak pits and baths at the construction camp to cater to the requirements of the workers. b) The construction camp should be located on the south-west corner of the site c) The contractor shall build septic tanks with adequate capacity at the workers colony and at construction yard. d) All organic waste guaranteed at construction yard and worker camp should be composted in compost trench. e) Quarterly health check-ups of construction workers should be organized at workers colony. f) Adequate provision of water supply and fuel for cooking should be made at workers colony.	Building Contractor	Project proponent
(vii)	Improvement of Access Roads to the site	a) Improvement and widening of the existing access roads. b) Establishing road connection c) Relocation of the encroachments in temporary shelters if the	Building Contractor	Project proponent

		approach road along the boundary of the project site connecting the road is used for transportation of construction materials to the site.		
(viii)	Impact on Micro Climate	a) On-site planting of shading trees b) Planting of numbers of trees, of species suitable to the semi arid climatic condition and alluvial soil of the project site along the roads and on the designated open spaces to ensure the improvement of micro-climatic condition of the project site.	Building Contractor	Project proponent

Table-7: Environmental Management Plan - Operational Phase

S. No	Environmental Impacts	Mitigation Measures	Organizational / Monitoring Arrangements	Training Requirements	Implementing Arrangements
(i)	Unsanitary conditions in the rehabilitation site due to inadequate management of solid waste	1. Provision for door–to-door collection of waste from blocks and arrangement for its regular removal from the site	Formation of society by involving community voluntary groups and creation of a corpus funds that could be utilized for the solid waste management in the project site.	1. Training and awareness programs with the community members. 2. Training for the segregation of waste.	Staffs would monitor the solid waste collection and will be responsible for the disposal of the waste. Day to day functioning of waste collection and management of fund would be the responsibility of the society

(ii)	Maintenance of adequate quality of life standard in the resettlement site	1. Provision of rainwater infiltration through shallow wells at the site to augment ground water resources	Association between the community group, society and project proponent for the maintenance and operation of the system	Training and awareness program with the community members for the proper maintenance of the facility	Staff through the community group
		2. Provision for regular potable water supply to meet the drinking water needs of the staff	project proponent forming a task force with the Local Municipal Corporation to monitor the consistency in supply of potable water	Awareness program with the resident's population for the conservation of potable water	--
		3. Provision for adequate maintenance of assets to ensure their smooth functioning	Association between the community group, society and project proponent for the maintenance and operation of the system	Training for the community groups on the maintenance needs.	Society with the Community group
		4. Development and maintenance of green-belt and green areas to	project proponent in association with the community monitoring	Training to the community group on plant maintenance	Society with the community group

		overcome micro-climatic impacts	group		

Table- 8: 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.	No significant impact as majority of labors would be locally deployed	
			Operation Phase Discharge from the project	• Proponent will provide the STP to treat the discharge of Textile Park.	No negative impact on ground water quality envisaged. Not significant.	
2.	Ground Water Quantity	Ground Water Depletion	Construction Phase Use of ground water for construction activity.	• No abstraction & thereby use of ground water during	No significant impact on ground water quantity	

				construction & STP treated water from HUDA shall be sourced.	envisaged.	
			Operation Phase The source of water during operation phase is HUDA Supply.	• Rain water harvesting shall be done to recharge the ground. • Black and Grey water recycling and reuse such that fresh water will be less. • Percolation well to be introduced in landscape plan. • Awareness Campaign to reduce the water consumption	No significant impact on surface/ground water quantity envisaged.	In an unlikely event of non-availability of water supply, water will be brought using tankers.
3.	Surface Water	Surface water contamination	Construction Phase Surface runoff from site	• Silt traps and other measures such as	No off-site impact envisaged as no	

	Quality		during construction activity.	additional on site diversion ditches will be constructed to control surface run-off during site development	surface water receiving body is present in the core zone.	
			<u>Operation Phase</u> Treatment of domestic wastewater in STP proposed on site.	• Domestic water will be treated in STP & only treated water will be disposed off in the sewer.	No off-site impact envisaged	Excess treated water will be either used for irrigation purposes outside the project site after proper treatment or disposed off in the sewer. CPCB standards for usage of treated waste water will be followed.
4.	Air Quality	Dust Emissions	<u>Construction Phase</u> All heavy construction activities. Storage of construction	• Suitable control measures will be adopted for mitigating the $PM_{2.5}$& PM_{10} level in	Not significant because dust generation will be temporary and will	During construction phase the labours will be provided masks. Water sprinklers will

			material at site. Site excavation.	the air as per air pollution control plan.	settle fast due to dust suppression techniques.	be used for suppression of dust during construction phase.
		Emissions of $PM_{2.5}$& PM_{10}, SO_2, NOx and CO	<u>Construction Phase</u> Operation of construction equipment and vehicles during site development. Running D.G. set (back up)	• Rapid on-site construction and improved maintenance of equipment	Not significant.	Regular monitoring of emissions and control measures will be taken to reduce the emission levels.
			<u>Operation Phase</u> Power generation by DG Set during power failure Emission from vehicular traffic in use	• Use of low sulphur diesel if available • Providing Footpath and pedestrian ways within the site to suppress the dust • Green belt will be developed with specific species to help to reduce $PM_{2.5}$& PM_{10} level	Not significant DG set would be used as power back-up (approx 6 hours) No significant increase in ambient air quality level is expected from the project's activities.	Stack height of DG set above the tallest building as per CPCB standards

				• Proper maintenance of equipment • Stack height of DG sets will be provided sufficiently high as per CPCB standards.	There are no sensitive receptors located within the vicinity of site.	
5.	Noise Environment		<u>Construction Phase</u> Noise from construction activities Noise from heavy machineries, DG sets, etc.	Construction activity will be limited to day time hours only Provision of noise shields near the heavy construction operations and acoustic enclosures for DG set.	Minimal or no impact is envisaged	Use of Personal Protective Equipment (PPE) like earmuffs and earplugs during construction activities.

			Operation Phase Noise from vehicular movement Noise from DG set operation	• Green Belt Development • Development of silence zones to check the traffic movement • Use of equipment fitted with silencers • DG set rooms will be equipped with acoustic enclosures	No significant impact due to suitable width of Greenbelt.	
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	• The solid waste generated will be managed as per Solid Waste Management Rules, 2016. • Collection, segregation, treatment and disposal will be done as per Solid Waste Management Rules, 2016 by the authorized agency • Used oil generated will be sold to authorized recyclers	Since biodegradable waste will be treated at site & other solid waste will be handled by the authorized agency, waste dumping will not be allowed. Hence, No significant impact is expected. Negligible impact.	

7.	Biological Environment (Flora and Fauna)	Displacement of Flora and Fauna on site	Construction Phase 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 vegetation at site.	
			Operation Phase Increase in green covered area	• Suitable green belts will be developed as per landscaping plan in and around the site using local flora	Beneficial impact.	
8.	Socio-Economic Environment	Population displacement and loss of income	Construction Phase Construction activities leading to relocation	Commercial project as per the Panipat Master Plan.	No negative impact.	
			Operation Phase Site operation	• Project 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 during construction	• Heavy Vehicular movement will be restricted to daytime only and adequate parking facility will be provided	No negative impact	

			Operation Phase Traffic due to residents and visitors once the project is operational	• Vehicular movement will be regulated inside the project with adequate roads and parking lots in the colony.	No major significant impact as green belt will be developed which will help in minimizing the impact on environment.	