

# **APPLICATION FOR ENVIRONMENTAL CLEARANCE FORM I**

*Proposed Commercial Project,  
at Village Patto Panjim, Goa*

*Project Proponent  
M/s DLF Limited*

*Prepared by*  
**Aditya Environmental Services Pvt. Ltd.,**  
107, Hiren Light Industrial Estate,  
Mogul Lane, Mahim,  
Mumbai - 400 016  
Tel. No.: 2445 6473  
email: adityaenviro@vsnl.com

## **CONTENTS**

1. APPENDIX – I, FORM 1
2. APPENDIX – II, FORM 1 A: CHECK LIST OF ENVIRONMENTAL IMPACTS
3. ANNEXURES
4. PLATES

### **LIST OF ANNEXURES**

Annexure I	: Proposed Area Statement
Annexure II	: Water Supply and Waste Water Management
Annexure III	: Proposed Scheme for Waste Management
Annexure IV	: Environmental Management Plan
Annexure V	: Land Ownership document- Form I _ XIV
Annexure VI	: Environmental Clearance dated 8 May 2008
Annexure VII	: Electrical Hazardous Management Plan
Annexure VIII	HVAC Preliminary Design Report
Annexure IX	Energy Conservation Measures
Annexure X	Rainwater Harvesting Details

### **LIST OF PLATES**

Plate I	: Map showing surrounding features within 500 m
Plate II	: Map showing surrounding features within 10 km
Plate III	: Contour Plan
Plate IV	: Basement Plan , Ground Floor Plan ,Roof Plan,Section Plan
	:

**APPENDIX - I**  
**FORM 1**

Sr. No.	Item	Details
1.	Name of the project/s	Construction of proposed Commercial Complex
2.	S. No. in the schedule	8(a)
3.	Proposed capacity/ area/ length/ tonnage to be handled/ command area/ lease area/ number of wells to be drilled	Total Plot Area:- 18,120.00 sq.m Proposed Built Up Area:-74,411.00sq.m Detail Area Statement is Enclosed
4.	New/ Expansion/Modernization	New
5.	Existing Capacity/Area in sq.m	Total Plot Area:- 18,120,00 sq.m
6.	Category of Project i.e. 'A' or 'B'	B
7.	Does it attract the general condition? If yes, please specify.	Not Applicable
8.	Does it attract the specific condition? If yes, please specify.	Not Applicable
9.	Location	
	Plot/ Survey/ Khasra No.	Plot No. 35 , EDC Plot Estate, Patto Plaza,
	Village	Panjim Town
	Tehsil	Tiswadi
	District	North Goa
	State	Goa
10.	Nearest railway station/airport along with distance in kms.	Nearest railway station is Karmali railway station at distance of 15 km. Nearest airport is Dabolim airport at distance of 29 km
11.	Nearest Town, City, District Headquarters along with distance in kms.	Panjim
12.	Village Panchayats, Zilla Parishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given)	Panjim Municipal Corporation Jardim Garcia de Orta Cunha Rivera Road.
13.	Name of the applicant	M/s DLF Limited
14.	Registered Address	Landscape Excelsior Opposite to Kala Academy DB Road Panjim
15.	Address for correspondence:	
	Name	Prakash Chandra
	Designation (Owner/Partner/CEO)	Authorized Signatory
	Address	Landscape Excelsior Opposite to Kala Academy DB Road

Sr. No.	Item	Details
		Panjim
	Pin Code	403001
	Telephone no.	9822582040
	Fax No.	---
16.	Details of Alternative Sites examined, if any. Location of these sites should be shown on a topo sheet.	Not Applicable
17.	Interlinked Projects	Not Applicable
18.	Whether separate application of interlinked project has been submitted?	Not Applicable
19.	If yes, date 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?	Not Applicable
22.	Whether there is any Government Order/ Policy relevant/ relating to the site?	Not Applicable
23.	Forest land involved (hectares)	None
24.	Whether there is any litigation pending against the project and/or land in which the project is proposed 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 proposed project.	Not Applicable

## (II) Activity

**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.)**

Sr. 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.	Plot 35 of EDC Patto Plaza, Panjim falls under commercial zone as per ODP.
1.2	Clearance of existing Land, vegetation and building?	Yes	Land-At present the land is vacant Vegetation- There are bushes existing on site
1.3	Creation of new land uses?	Yes	Activity proposed is the construction of commercial complex
1.4	Pre-construction investigation e.g. borehole, soil testing?	Yes	Soil Investigation will be submitted
1.5	Construction works	Yes	Proposal consists of construction of commercial complex which will be comprises of Shops, Offices, Retail Foodcourt and Multiplex
1.6	Demolition work	No	Not Applicable
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	Temporary sheds with all the basic sanitation facilities will be provided at the site as an accommodation for the construction workers
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	Yes	Activity involves proposed construction of commercial complex
1.9	Underground works including mining or tunneling?	No	Not Applicable
1.10	Reclamation works?	No	Not Applicable
1.11	Dredging?	No	Not Applicable
1.12	Offshore structures?	No	Not Applicable
1.13	Production and manufacturing processes?	No	Not Applicable
1.14	Facilities for storage of goods or materials?	Yes	Temporary Sheds properly covered will be used for storage of the construction goods and material on the site.
1.15	Facilities for treatment or disposal of solid waste or liquid effluent?	Yes	<b>Construction Phase:-</b> Construction waste will be segregated and reused on site or sent for recycling. Balance construction waste will be

Sr. No	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
			<p>disposed to existing authorized agency. Proper facility for storage of construction wastes will be made on site.</p> <p><b>Operation Phase:</b>  Total domestic solid waste:- 2229 kg/day.  Organic waste: 892 kg/day.  Inorganic waste:1337 kg/day.</p> <p>Domestic solid waste would be segregated into organic and inorganic wastes and then disposed. The inorganic waste will be disposed through authorized vendor and the organic waste will be disposed through Organic Waste Converter manure from which will be used onsite.  The site will have sewage treatment plant (STP) for treatment and reuse of waste water generated on site. Recycled water will be used for flushing and landscaping.</p>
1.16	Facilities for long term housing of operational workers?	No	Not Applicable
1.17	New road, rail or sea traffic during construction or operation?	Yes	<p><b>Construction Phase:-</b> There will be temporary and minor increase in traffic due to transportation of construction material.</p> <p><b>Operation Phase:</b> There will be increase in traffic due to people visiting to the commercial building.</p>
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No	Not Applicable.
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	Not Applicable.
1.20	New or diverted transmission lines or pipelines?	No	Not Applicable.
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	Not Applicable.

Sr. No	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.22	Stream crossing?	No	Not Applicable.
1.23	Abstraction or transfers of water from ground or surface waters?	No	Not Applicable
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	Yes	Storm water drains with rainwater harvesting systems will be designed along the natural slope of the site.
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	<b>Construction Phase :</b> Construction material will be transported to the site by means of trucks/dumpers. Workforce employed for the construction works will use existing transport facility. <b>Operation Phase:</b> Commuters during the operation phase will use self owned /public transportation facilities.
1.26	Long-term dismantling or decommissioning or restoration works?	No	Not Applicable.
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	Not Applicable.
1.28	Influx of people to an area either temporarily or permanently?		<b>Construction Phase:</b> There will be a temporary and minor influx of construction laborers due to employment opportunities generated during construction phase.  <b>Operation Phase:-</b> There will be influx as the people will start utilizing the proposed development
1.29	Introduction of alien species?	No	Not Applicable
1.30	Loss of native species or genetic diversity?	No	Not Applicable
1.31	Any other actions?	No	Not Applicable

**2.0 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):**

Sr. 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)	Yes	Undeveloped land which falls under Commercial zone as per ODP
2.2	Water (expected source & competing users) unit: KLD	Yes	<b>Construction Phase :</b> <b>Source:</b> Private tankers + PWD (domestic)



Sr. No.	Information/checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data																														
			Requirement: 30 cmd (Construction activity :30 cmd + Domestic use :10 cmd) <b>Operation Phase :</b> <b>Source :</b> PWD + treated water from STP. Total water requirement: 271 cmd Fresh water : 93 cmd Treated water recycle :178 cmd Water and waste water management is Enclosed																														
2.3	Minerals (MT)	No	Not Applicable.																														
2.4	Construction material – stone, aggregates, sand / soil (expected source – MT)	Yes	Raw material requirement for construction: <table><tr><th>Raw material</th><th>Quantity</th><th>Unit</th></tr><tr><td>Cement</td><td>420660</td><td>Bags</td></tr><tr><td>Stone</td><td>624000</td><td>Nos</td></tr><tr><td>Metal</td><td>19050</td><td>Cu Mts.</td></tr><tr><td>Sand</td><td>33750</td><td>Cu mts</td></tr><tr><td>Bricks</td><td>2911500</td><td>Nos</td></tr><tr><td>Binding Wire</td><td>379</td><td>kgs</td></tr><tr><td>Paints</td><td>39080</td><td>Ltrs</td></tr><tr><td>Timber</td><td>540</td><td>Cu ft</td></tr><tr><td>Steel</td><td>37490</td><td>Kgs</td></tr></table> <p>Materials shall be procured from local dealers and Government approved quarries.</p>	Raw material	Quantity	Unit	Cement	420660	Bags	Stone	624000	Nos	Metal	19050	Cu Mts.	Sand	33750	Cu mts	Bricks	2911500	Nos	Binding Wire	379	kgs	Paints	39080	Ltrs	Timber	540	Cu ft	Steel	37490	Kgs
Raw material	Quantity	Unit																															
Cement	420660	Bags																															
Stone	624000	Nos																															
Metal	19050	Cu Mts.																															
Sand	33750	Cu mts																															
Bricks	2911500	Nos																															
Binding Wire	379	kgs																															
Paints	39080	Ltrs																															
Timber	540	Cu ft																															
Steel	37490	Kgs																															
2.5	Forests and timber (source – MT)	No	Not Applicable.																														
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	<b>Source:-</b> Goa State Electricity Board. Requirement <b>Construction Phase:</b> 500 KVA Power backup : DG - 1X150 KVA <b>Operation Phase:</b> 3763 KW Power back up :- Diesel Generator (DG) sets : 3x 1500 kva & 1010 kva																														
2.7	Any other natural resources (use appropriate standard units)	No	Not Applicable.																														

**3.0 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.**

Sr. 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 are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna and water supplies)	Yes	Diesel during construction and operation phase for DG sets
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	Not Applicable.
3.3	Affect the welfare of people e.g. by changing living conditions?	No	Not Applicable.
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	Not Applicable.
3.5	Any other causes	No	Not Applicable.

#### 4.0 Production of solid wastes during Construction or Operation or Decommissioning (MT/month)

Sr. 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	Not Applicable.
4.2	Municipal waste (domestic and/ or commercial wastes)	Yes	<b>Construction Phase:</b> Packaging materials (gunny bags, cardboard cartons, plastic bags etc), broken glass, cut aluminum sections – these will be segregated and sold to scrap dealers <b>Operation Phase:</b> Total domestic solid waste:- 2229 kg/day. Organic waste: 892 kg/day. Inorganic waste:1337 kg/day.
4.3	Hazardous waste(as per Hazardous Waste Management Rules)	No	Not Applicable
4.4	Other industrial process wastes	No	Not Applicable
4.5	Surplus product	No	Not Applicable.
4.6	Sewage sludge or other sludge from	Yes	<b>Operation Phase:</b> About 10kg/day sludge will be generated from proposed STP during operation phase.
4.7	Construction or demolition wastes	Yes	<b>Construction Phase:</b> Approximately 1-2 MT day debris will be generated during construction.
4.8	Redundant machinery and	No	Not Applicable

	equipments		
4.9	Contaminated soils or other materials	No	Not Applicable
4.10	Agriculture Wastes	No	Not Applicable

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

Sr. 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	Use of diesel in DG sets during power failure will lead to air emissions from fuel burning
5.2	Emissions from production processes	No	Not Applicable.
5.3	Emissions from materials handling including storage or transport	Yes	There will be some dust generation due to construction activity and movement of carrying raw material. Hence there will be a slight increase in SPM/SPM level during construction phase. Appropriate measures will be taken to curb dust and noise generation during construction phase.
5.4	Emissions from construction activities including plant and equipment	Yes	There will be minor emission from construction equipment and dust generation during construction activity and material handling.
5.5	Dust or odors from handling of materials including construction materials, sewage and waste	Yes	During the construction phase there will be some dust generation due to construction material equipment and movement of vehicles carrying raw material at site.
5.6	Emissions from incineration of waste	No	Not Applicable.
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	Not Applicable.
5.8	Emissions from any other sources	No	Not Applicable.

#### 6.0 Generation of Noise and Vibration, and Emissions of Light and Heat:

Sr. 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	<b>Construction phase:</b> Noise will be generated from following sources during construction phase:

Sr. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
			1. Construction machinery 2. On-going construction activity  <b>Operation Phase: -</b> Potential noise generating sources during operation phase are: 1. DG sets (only in case of power failure) 2. Vehicular traffic
6.2	From industrial or similar processes	No	Not Applicable.
6.3	From construction or demolition	Yes	Noise will be generated from construction activity
6.4	From blasting or piling	Yes	Piling will be required at the project site. However, noise reduction measures like provision of temporary barricading around site, prohibition for use of equipment emitting noise of greater than 90 dB (A) for 8 hour operation, prohibition of noise causing construction activities during night time etc. will be taken in order to curb noise generation.
6.5	From construction or operational traffic	Yes	<b>Construction phase:</b> Noise will be generated due to truck carrying the raw material and construction machinery.  <b>Operation phase:</b> Noise will be generated due to traffic of residents and certain noise generated from the household appliances and activities.
6.6	From lighting or cooling systems	No	Not Applicable.
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:**

Sr. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	No	Not Applicable.
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	No	Sewage generated will be treated in the proposed sewage treatment plant. Recycled water will be used for flushing and Landscaping.
7.3	By deposition of pollutants emitted to air into the land or into water	Yes	Water will be sprinkled to settle dust particles during construction phase.
7.4	From any other sources	No	Not Applicable.

<b>Sr. No.</b>	<b>Information/Checklist confirmation</b>	<b>Yes/No</b>	<b>Details thereof (with approximate quantities/ rates, wherever possible) with source of information data</b>
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:**

<b>Sr. No.</b>	<b>Information/Checklist confirmation</b>	<b>Yes/No</b>	<b>Details thereof (with approximate quantities/ rates, wherever possible) with source of information data</b>
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances	No	Not Applicable.
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	Goa lies in Zone-III of seismic region and design and construction will be done as per Indian standards for Zone-III seismic category

**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:**

<b>Sr. No.</b>	<b>Information/Checklist confirmation</b>	<b>Yes/No</b>	<b>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</b>
9.1	Lead to development of supporting. facilities, 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.) Housing development Extractive industries Supply industries Other	Yes	The proposed development is located on survey no 35 of EDC Patto Plaza, and falls under commercial zone as per ODP. The project proposal is a construction of commercial complex with amenities like swimming pool, convenience shopping, offices, entertainment. STP for treatment and recycling of waste water generated on site. Composting of organic waste generated on site. Common amenity areas, landscaping etc for green belt development.
9.2	Lead to after-use of the site, which could have an impact on the environment	No	Not Applicable.
9.3	Set a precedent for later	No	Not Applicable.

Sr. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
	developments		
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	yes	The proposed site is located in commercial area. The proposed project will help in the development of this region and will provide employment opportunities to the educated local youth.

**(III) Environmental Sensitivity**

Sr. 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	No	Not Applicable.
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	Miramar lake Mandovi River	2 km 700 m
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	Salim Ali Bird Sanctuary	2.2 km
4	Inland, coastal, marine or underground waters	Arabian Sea	3.5 km
5	State/ National boundaries	No	Not Applicable
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	No	Not Applicable. -
7	Defense installations	No	Not Applicable.
8	Densely populated or built-up area	Miramar Donapaula	Surrounding densely populated area
9	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Goa Science centre; VM Salgoankar Law College; Dhempe college; Reis Magos Fort	3.2 km 2.8 km 2.9 km 2.7 km (Aerial)

Sr. No.	Areas	Name/ Identity	Aerial distance (within 15 km) Proposed project location boundary
		Aguada Fort	6.3 km (Aerial)
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	No	Not Applicable
11	Areas already subjected to pollution or environmental damage. (Those where existing legal environmental standards are exceeded)	No	Not Applicable.
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)	Goa lies in Zone-III of seismic region	Goa lies in Zone-III of seismic region and designing and construction will be done accordingly.

**NOTE:**

1. The projects involving clearance under Coastal Regulation Zone Notification, 1991 shall submit with the application a C.R.Z map duly demarcated by one of the authorized agencies, showing the project activities, w.r.t C.R.Z (at the stage of TOR) and the recommendations of the State Coastal Zone Management Authority (at the stage of EC). Simultaneous action shall also be taken to obtain the requisite clearance under the provisions of the C.R.Z Notification, 1991 for the activities to be located in the CRZ.

**Not applicable**

2. The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-a-vis the project location and the recommendations or comments or the Chief Wildlife Warden thereon (at the stage of EC).

**Not applicable- Construction project under Category 8(a)**

3. All correspondence with the Ministry of Environment & Forests including submission of application for TOR/ Environmental Clearance, subsequent clarifications, as may be required from time to time, participation in the EAC Meeting on behalf of the project proponent shall be made by the authorized signatory only. The authorized signatory should also submit a document in support of his claim of being an authorized signatory for the specific project.

I hereby given undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information

submitted is found to be false or misleading at any stage, the project will be rejected and clearance give, if any to the project will be revoked at our risk and cost.

**Date:**

**Place: Goa**

**Sign:**

**Authorized Signatory**



# **APPLICATION FOR ENVIRONMENTAL CLEARANCE FORM IA**

*Proposed Commercial Project,  
at Village Patto Panjim, Goa*

*Project Proponent  
M/s DLF Limited*

*Prepared by*  
**Aditya Environmental Services Pvt. Ltd.,**  
107, Hiren Light Industrial Estate,  
Mogul Lane, Mahim,  
Mumbai - 400 016  
Tel. No.: 2445 6473  
email: adityaenviro@vsnl.com

## APPENDIX - II

### FORM-1 A CHECK LIST OF ENVIRONMENTAL IMPACTS

#### 1. LAND ENVIRONMENT:

- 1.1 Will the existing land use get significantly altered from the project that is not 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)
- (iii) Contour plan

The proposed development is the construction of new commercial complex. Site is located on Plot 35 of EDC Patto Plaza, Taluka Tiswadi, North Goa which is presently undeveloped.

- (i) Site location -Enclosed
- (ii) Surrounding features of the proposed site (within 500 meters)-Enclosed
- (iii) Contour plan -Enclosed

- 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.

Total Plot Area:-18,120.00 sq.m

Proposed Built Up Area:-74,411.00 sq.m

**Water Consumption:-**

**Construction phase:**

Source: Private tankers

Requirement: 30 cmd

[Construction activity: 20 cmd + Domestic use: 10 cmd]

**Operation Phase :**

**Source :** PWD + treated water from STP.

Total water requirement: 271 cmd

Fresh water : 93 cmd

Treated water recycle :178 cmd

Water and waste water management is Enclosed

**POWER REQUIREMENT:**

**Construction Phase:** 500 KVA

Power backup : DG - 1X150 KVA

**Operation Phase:** 3763 KW

Power back up :-

Diesel Generator (DG) sets : 3x 1500 kva & 1010 kva

**CONNECTIVITY:**

Nearest railway station is Karmali railway station at distance of 15 km.

Nearest airport is Dabolim airport at distance of 29 km

**COMMUNITY FACILITY:**

As a part of the proposed development, facilities like Multiplex, foodcourt and landscape area will be developed.

**PARKING NEEDS:**

Adequate facility will be provided for parking.

Basement Parking -823 Nos

Surface Parking -83 Nos

Total Parking -906 Nos

- 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 proposal pertains to construction of commercial complex. Proposed site is vacant land and will result in making new space available for commercial development.

As a part of the proposed development, facilities like Multiplex, foodcourt and landscape area will be developed. Thus the development will make available better facilities for all the users.

There are few monsoon bushes on site. Local indigenous tree species native to area will be planted and proper landscaped areas will be developed to ensure impact on local ecology is a minimum.

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

The site is almost in plain, no much cutting filling will be required. Site is located in Seismic zone III and structures will be so designed for this zone

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

No, The development is planned so that natural drainage at the site will be unaffected. Contour map showing the natural drainage near the proposed project site is enclosed.

- 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.)**

There will be excavation for the proposed foundation.

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

**Water supply:** Water supply from PWD for domestic consumption of construction laborers and tankers for construction activity.

Fresh water : 30 cmd (20 cmd for construction and 10 cmd for domestic use of labourers)

**Waste handling:**

The details are as follows:

1. Various types of construction debris such as broken bricks, blocks, cut pieces of steel scrap, formwork, finishing materials, etc. will be generated.
2. Broken Bricks, metal chips, cut tiles will be used for internal paving or making coba for waterproofing.
3. The damaged/ cut pieces of steel, glass etc. and wastes such as empty cement bags, card boards cartons etc. will be sold to scrap dealer
4. Substratum removed during foundation and excavation will be used as far as possible as filling material.

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

Not Applicable.

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

- There will be no health hazards as no potentially harmful substances are used for the construction activity.
- Various types of construction debris such as bricks, blocks, steel, Formwork packaging and paper products, door and window casings, tiles, glass, furnishings etc will be generated.
- Materials such as broken bricks, metal chips, cut tiles will be used for internal paving, plinth filling, etc.
- Substratum removed during foundation and excavation will be used as filling material.
- The debris will be segregated and stored in separately earmarked area at a distance from construction site.
- The damaged/ cut pieces of steel, glass etc. will be sold to scrap dealers. Proper disposal measures will be undertaken for collecting solid waste at site as otherwise it may lead to unaesthetic situation on site. All the dry wastes generated will be kept covered in a temporary shed to avoid any kind of littering and scavenging by birds.
- Proper sanitation facilities at the proposed labour camp and resting areas will be provided during the working hours of the laborers.

**2. WATER ENVIRONMENT:**

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

**Water Consumption:-**

**Construction phase:**

Source: Private tankers +PWD

Requirement:30 cmd

[Construction activity: 20 cmd + Domestic Use: 10 cmd]

**Operation Phase :**

**Source :** PWD + treated water from STP.

Total water requirement: 271 cmd  
Fresh water : 93 cmd  
Treated water recycle :178 cmd  
Water and waste water management is Enclosed

- 2.2 What is the capacity (dependable flow or yield) of the proposed source of water?**  
It is proposed to obtain fresh water for domestic use from PWD. Secondary Water requirement (eg flushing and gardening) will be met by making use of treated sewage from proposed STP.

Please refer water supply and waste water management system.

- 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)**

The source of water for domestic use is PWD. Use of recycled water from the proposed STP will be made for flushing, gardening.

Characteristics of treated sewage water from STP will be as follows

Parameter	Value
pH	6.0 – 8.0
BOD	Less than 30 Mg / L
Suspended Solids	Less than 50 Mg / L
COD	Less than 150 Mg / L
Oil & Grease	Less than 5 Mg / L
Detergents	Less than 5 Mg / L

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

**Operation Phase :**

**Source :** PWD + treated water from STP.

Total water requirement: 271 cmd

Fresh water : 93 cmd

Treated water recycle :178 cmd

Recycled water will be entirely reused onsite for flushing and gardening.

Please refer Water supply and waste water management system.

- 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, water will not be diverted from other sources. Water requirement will be augmented by use of recycled sewage.

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

Waste water from all sources will be treated in the proposed STP. Characteristics of sewage at inlet of STP are as follows:

Characteristics of Untreated Sewage

Parameter	Value
pH	6-8
BOD	300 Mg / L
Suspended Solids	300 Mg / L
COD	600 Mg / L
Oil & Grease	30 Mg / L
Detergents	50 – 100 Mg / L

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

The entire site is provided with extensive planned underground drainage system with gravity connections to the Recharge pits. Overflow from last Recharge pit shall be connected to City Storm Water Drain. The arrangement provides appropriate protection to the site against flooding.

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

No. The plot will be used for commercial development. Run off characteristics will not change since the storm water drains will be constructed as per specifications of Planning & Development Authority, North Goa.

**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)**

No. Ground water will not be abstracted. Moreover with the proposal for rainwater harvesting there will be an opportunity to recharge the existing groundwater table.

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

The construction areas will be provided with garland drains and settling pits so that any run off carrying loose earth and suspended matter and there will be no carryover of solids into the drains. Thus, the possibility of pollution from construction run-off will be prevented.

**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)**

The site will have a well designed storm water drainage system which will prevent any flooding.

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

No. Adequate temporary sanitation facilities will be provided for the construction workers at proposed labour camp. Also clean drinking water will be provided. It will also be ensured that no accumulation of water will take place. Septic tanks will be provided for treatment and disposal of sewage from labour camp.

**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)**

1. Waste water will be conveyed by a well designed sewer system
2. The quantity of waste water generated will be 248 cmd which will be treated in a proposed STP of capacity of 250 cmd
3. Treated waste water from STP will be used for flushing & landscaping,

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

- PWD water supply will be used for domestic purpose There will be separate lines & tanks for treated sewage to be used for flushing and landscaping

**3. VEGETATION:**

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

Primarily, there will not be a threat to the local biodiversity. The proponent aims to preserve most of the existing flora on site. Proposal also gives a landscape plan and local and indigenous species of trees will be planted as part of this proposal.

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

There are few monsoon bushes existing on site which will be cut for the proposed construction. However green belt will be developed with landscaping using local endogenous species to ensure better survival rate.

**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 with landscaping using local endogenous species to ensure better survival rate. Green belt development will be done using 3 year old saplings to ensure better survival rate.

**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 displacement of fauna will take place.

**4.2 Any direct or indirect impacts on the avifauna of the area? Provide details**  
Not Applicable.

**4.3 Prescribe measures such as corridors, fish ladders etc to mitigate adverse impacts on fauna**  
No. 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 constructions)**

There will be temporary increase in air pollution (particularly dust levels) due to transport of materials, excavation and land development during the construction phase. Mitigation measures like planting trees in the vicinity and barricades will be adopted to minimize the dust generated during the construction activity.

During operation phase, there will be minor increase in air pollution due to increase in vehicular exhausts generated due to traffic.

The proposed plan includes sufficient landscape areas and green belt over 15% area and also proposes to utilize energy efficient materials in the construction of the building. All these factors will together check and offset any heat island effects. Energy Conservation measures like solar water heating systems, LED lights will be provided to minimize energy consumption from conventional sources.

**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.**

There will be some increase in the SPM levels during construction phase, due to handling of substratum and fill materials which will be of temporary nature. The site being about 1km from Arabian sea, the winds are mostly westerly during the day and easterly during night time. There are no habitats to west or east of site – thus there will be no impacts due to dust generated during construction periods. However, as an abundant safety measure, water sprinkling will be resorted to suppress dust generated. During operational phase, vehicular exhausts will be the only source of air pollution

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

Site is located on EDC Patto, road which is a two lane road having low density traffic. Construction activity to take place during the daytime. Part of plot will be kept for parking of construction trucks and no trucks will be allowed to be parked on adjacent public road. Also a log will be maintained to monitor the vehicles entry and exit . These measures will curb the traffic congestion on adjacent public road.

Operation Phase : Adequate facility will be provided for parking. Following table provides details on total parking provided by project proponent :

Basement Parking	-823 Nos
Surface Parking	-83 Nos
Total Parking	-906 Nos

**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 will be constructed so that there is free movement of traffic. Entry/exits will be designed so that traffic from the site does not impinge on the main road.

**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. The internal roads, exit and entry points will be designed with adequate width to minimize traffic congestion inside the plot. Mitigation measures to curb traffic noise and vibrations are as follows:

**Construction phase**

Use of construction machinery having sound not greater than 90 dB(A)

Noise generating activities will be carried out only during day time

Workers will be provided with ear muffs/ ear plugs.

Barricades will be provided around construction site

**Operation phase**

The entry/ exit to the site will be with adequate curvature at Krebs so that vehicles coming out/ entering the building do not impinge on road traffic directly

Buffer in form of wall and tree plantation will be provided along the plot periphery to act as sound barrier

Smooth flow of traffic will be ensured on the internal road to avoid idling of vehicles.

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

DG sets are proposed to supply power as the emergency supply system in case of shut down/ break down of main power supply. All DG sets will be housed in noise insulated enclosures designed to meet standards as laid under Environment (Protection) Act. Noise and vibrations from DG sets will be eliminated with vibration mounts and silencers.

**6. AESTHETICS:**

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

Project will have landscaped features to make it aesthetically pleasing

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

No. Not applicable. – since there are no buildings on site at the present

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

No. Not applicable.

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

No

**7. SOCIOECONOMIC IMPACT:**

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

Yes, the project will result in marginal urbanization of area

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

Nearest social infra structure is Central Library at the distance of 400 m

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

No. Not Applicable. Site is away from nearby communities –with some residential complexes. Additional measures taken will be as follows:

**Construction phase**

Transportation of raw materials during day time

Use of dust covers over construction material during transportation

Water sprinkling to prevent re-entrainment of dust

Temporary barriers to be erected to reduce dust/noise impact to nearby areas

Trucks will be parked inside the compound and not obstruct traffic on public road

**Operation phase**

The entry/ exit to the site will be with adequate curvature at kerbs so that vehicles coming out/ entering the building do not impinge on road traffic.

Regular maintenance & upkeep of internal roads.

**8. BUILDING MATERIAL:**

**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)**

The project is designed to be energy efficient and special care has been taken in the planning stage to ensure an efficient system. The salient features in the design and planning of the project aimed at energy conservation are:

1. Energy efficient fluorescent tube lights & CFL lamps which give approx. 30% more light output for the same watts consumed and therefore require less nos. of fixtures and corresponding lower point wiring costs.
2. All fluorescent light fixtures will be specified to incorporate electronic chokes, which have less watt-loss, compared to electromagnetic chokes and result in superior operating power factor. Electronic chokes also improve the life of the fluorescent lamps.
3. Bus bars in all distribution panels are specified as copper bus bars to reduce losses and improve reliability.
4. Copper conductor cables will be specified for sizes of 16 mm and below, this will reduce losses and improve reliability.
5. All cables will be de-rated to avoid heating during use. This also indirectly reduces losses and improves reliability.
6. Variable frequency drives will be incorporated on motor feeders, which will save considerable energy.
7. Power factor of the complete electrical system will be maintained close to unity. This will reduce electrical power distribution losses in the installation.
8. An APFC relay based on thirster switching will be proposed to effect the power factor correction / improvement within a few cycles of deviation from the setting & also to reduce inrush currents.
9. Solar operated pole lights will be proposed to power pathway lights at some strategic locations or solar water heaters will be provided where ever feasible.
10. Presence sensors & day-light sensors will be provided where ever feasible.

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

Following measures will be taken to minimize the impacts caused by transportation & handling of materials during construction:

1. Materials will be purchased from the nearest authorized supplier.
2. Transportation of raw material will be done in covered trucks.
3. The movement of these vehicles will be restricted only during non-peak hours.
4. Water will be sprinkled on the site to prevent dust emissions.
5. Barricades will be raised along the boundary of the plot to prevent noise pollution.

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

Substratum removed during foundation and piling will be used for filling of plot upto road level. Also Panaji Corporation will be asked to give details of demolition rubble if any available for use for filling of plot.

Construction wastes such as broken brick will be used for making coba on terrace for water proofing

Broken pieces of tile, construction blocks etc will be used for making internal pathways and footpaths.

It is estimated that about 30% saving in fresh earth requirement for filling can be effected by above measures.

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

Solid waste generated will be collected on a daily basis by an authorized agency. Sufficient area will be provided for segregating the non-biodegradable waste and laborers provided with personal protective equipments like hand gloves, masks etc. This segregation will take place onsite and solid wastes generated to be kept in covered shed. Recyclable materials segregated will be disposed through authorized agency or sold as scrap in the market. The inert wastes will be disposed through authorized vendor and the organic waste will be treated in Organic Waste Converter and manure so generated will be used onsite.

**9. ENERGY CONSERVATION:**

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

**POWER REQUIREMENT:**

**Construction Phase:** 500 KVA

Power backup : DG - 1X150 KVA

**Operation Phase:** 3763 KW

Power back up :-

Diesel Generator (DG) sets : 3x 1500 kva & 1010 kva

In order to minimise the energy consumption initiatives like solar water heaters, solar lamps, electronic ballasts, energy efficient transformer and pump/lift motors, CFL and LED lights etc are proposed

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

**POWER REQUIREMENT:**

**Construction Phase:** 500 KVA

Power backup : DG - 1X150 KVA

**Operation Phase:** 3763 KW

Power back up :-

Diesel Generator (DG) sets : 3x 1500 kva & 1010 kva

Back up will be also provided by use of solar water heaters, solar lamps etc to supplement atleast 20% of power needs during operation phase.

**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?**

Minimum amount of glass will be used.

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

Attempts will be made to maximize the use of natural lighting through design

Besides this, a green cover consisting of trees of native species with large canopy size will be made.

Sloping roofs with decorative tiles are planned which will assist in heat reduction

**9.5 Does the layout of streets & buildings maximise 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.**

Solar energy will be used for heating the water and also for lighting in common areas.

One solar water heating system will provided.

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

Sloping roofs are being planned which will assist in heat reduction. This project emphasizes mainly on providing comfort to the residents and thereby aims at incorporating the green initiatives focusing on saving the energy and reduce the power consumption overall . Hence it creates lesser footprint.

Besides this, a green cover consisting of trees of native species with large canopy size will be made.

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

**Lighting:** Lighting of Common Area, Utility Rooms shall be based on the following average lighting level considerations which are as per NBC 2005.

Area/Space	Average Illumination Range in lux
Service areas/Utility Areas such as DG Set Room, substation area, Electrical Room, Pump Room, Plant Room.	100-150-200

**External and Landscaping lighting** shall be provided in consultation with the landscape architect. Road, Parking and Area lighting shall be provided for visual guidance and security purposes. Around 5 to10 lux shall be maintained for road lighting. Pathways, Garden and landscape lighting shall be designed keeping in mind

the architectural features.

Area/Space	Average Illumination Range in lux
Road and Parking Areas	5 to 10 Lux
Path and landscape areas	Aesthetics more important

**Energy Conservation Measures for lighting :**

- Using energy efficient light fixtures with good photometric properties.
- Using CFL's in external lighting bollards.
- Using T-5 (28W) fluorescent lamps in place of T-8 lamps (26W) in basements, stilts and underground parking areas.
- Putting external lighting control on time switch /timer control.
- Using time switch control / timer control for basement and landscape lighting.
- Employing LED light sources for some of the external lighting fixtures.
- Employing solar powered lighting for part of the external lighting fixtures.

Will be providing CFC and HCFC free chiller

Our air conditioning load assumptions are as follows-

Indoor air quality are as per Ashrae standard 62.1 2010, lighting load is 1 watt/sq.ft for shop and offices , equipment load is 3.5 watt/sqft for retail area.

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

Energy conservation will be one of the focuses during the building planning.

Attempts will be made to maximize the use of natural lighting through design

Besides this, a green cover consisting of trees of native species with large canopy size will be made.

All these factors will help in reducing heat island effects.

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

(a.) Roof design: Roof will meet prescriptive requirement as per ECBC by using appropriate thermal insulation material to fulfill requirement.

(b.) Vertical fenestration: Vertical fenestration will comply with SHGC requirements to meet prescriptive requirement as per ECBC by use of appropriate solar control strategies.

(c.) Glazing: Tinted glass absorbs a large fraction of the incoming solar radiation through a window. This reduces the solar heat gain coefficient, visible transmittance, and glare.

Following is the Envelope Performance Factor coefficients for building with 24 hour occupancy located in hot humid climate

Envelope Performance Factor Coefficients

Building Components	U-factor (W/sq mtr deg C)	R -Value (sq mtr deg C/W)	SHGC
Vertical Fenestration	3.17	2.2	0.2 to 0.25

Walls,	0.35	2.35	-
Roofs	0.26	3.5	-

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

All safety measures will be incorporated to avoid any accidents during the construction phase and operation phases. Buildings will have sufficient open spaces all around and internal roads to have adequate width (6m minimum) and easy turning radius (>9m) for fire engine movement. Following precautions will be taken to fight the fire:

1. CO2 Fire extinguisher near main panel and Electrical Panel of each building.
2. ABC type Fire extinguishers at each floor level of all the buildings.
3. Manual Call Point and Hooter at each floor level of all the buildings.
4. Hose Reels are provided at each floor level of all the buildings.
5. Alarm shall be provided in the security to alert all the occupants in case of fire.

**OTHER DETAILS**

- Evacuation drill will be conducted & evacuation time will be determined.
- Drill will be conducted once in six months so that evacuation time will be reduced to at least 2.5 min as specified in NBC.
- The building shall be of type 1 & hence evacuation time shall be considered as 2.5 min.
- Assembly point shall be ear marked.

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

The specifications including emissive & thermal characteristics are as follows:

Characteristics of Vertical Fenestration

Climate Zone	Maximum U factor (w/sq mtr deg C)	WWR<40%	40%<WWR<60%	VLT
		Maximum SHGC	Maximum SHGC	0.27 (For WWR 0.1- 0.3) and 0.2(For WWR 0.31- 0.4)
Warm and Humid	3.3	0.25	0.2	

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

1. Mechanical ventilation & exhaust will be provided for the following spaces: Mechanical plant rooms, DG room and electrical substation & panel rooms.
2. Fans will be centrifugal limit load, centrifugal cabinet, axial flow or propeller type depending on the application.
3. Fans will be complete with filters and gravity louvers wherever required

**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 used for street lights and garden lights and /or for water heating and energy efficient fixtures will be provided to meet more than 15% of the total energy requirement.

10. ENVIRONMENTAL MANAGEMENT PLAN:

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

The Environment Management Plan enclosed shows the stage wise activities that may be potential sources of pollution and the mitigation measures for the same.