

# FORM-1A

**FORM-I A**

**FORM-1 A (only for construction projects listed under item 8 of the Schedule)**

**CHECK LIST OF ENVIRONMENTAL IMPACTS**

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

**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 not in consistent with the surroundings? (Proposed land use must conform to the approved Master Plan / Development Plan of the area. Change of land use if any and the statutory approval from the competent authority are submitted). Attach Maps of (i) site location, (ii) surrounding features of the proposed site (within 500 meters) and (iii) the site (indicating levels & contours) to appropriate scales. If not available attach only conceptual plans.	: The land is duly converted for housing scheme purpose Under Provisions of Chief Minister’s Jan Awaas Yojna 2015 on 20.09.2018.  Copy enclosed as <b>Annexure VIII</b> .  Site Plan is enclosed as <b>Annexure XI</b>  Map Showing surrounding features is enclosed as <b>Annexure IX</b>
1.2	List out all the major project requirements in terms of the land area, built up area, water consumption, power requirement, connectivity, community facilities, parking needs etc.	: The major requirements of the project are as under:  <ul style="list-style-type: none"> <li>• Plot Total Plot Area: 85,744.09 Sq.m.</li> <li>• Gross Built Up Area: 27,031.67 Sq.m.</li> <li>• Water Consumption: <ul style="list-style-type: none"> <li>➤ Total water demand: 370 KLD</li> <li>➤ Fresh water demand : 300 KLD</li> <li>➤ Treated waste water demand: 70 KLD</li> </ul> </li> <li>• Power Requirement: <ul style="list-style-type: none"> <li>➤ Connected Load: 1634.81 KW</li> <li>➤ Demand Load : 817.41 KW</li> </ul> </li> <li>• Connectivity :</li> </ul>

		<ul style="list-style-type: none"> <li>➤ Kherli Railway Station: 2.3 km (SSW)*</li> <li>➤ Jaipur Airport: 130 km (WSW)*</li> <li>➤ SH-22: 0.10 km (W)*</li> <li>➤ SH-44: 0.10 km (N)*</li> <li>• Parking Needs:                         <ul style="list-style-type: none"> <li>➤ Parking Required : 180 ECU</li> <li>➤ Parking Provided: 180 ECU</li> </ul> </li> </ul> <p>The details of the more connectivity and community facilities are given in Form 1 under point Environmental sensitivity.</p>
1.3	<p>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, disturbance to the local ecology).</p>	<p>: The project site is surrounded by road in North and West and in East &amp; South direction it has vacant agricultural land.</p> <p>During construction phase possible impacts may be increase in the traffic loads, increase in the noise levels and dust emissions emanating from various activities. Due care will be taken during construction as well as operational phase to minimize the impact on surroundings.</p> <p><b>Local ecology:</b> Project site supports some common floral-faunal species which uses wide variety of habitats of the adjacent ecosystem (Semi-urban). So, present project will not have any adverse impact on the ecological conditions.</p>
1.4	<p>Will there be any significant land disturbance resulting in erosion, subsidence &amp; instability? (Details of soil type, slope analysis, vulnerability to subsidence, seismicity, etc may be given).</p>	<p>: There will be no significant land disturbance resulting in erosion, subsidence &amp; instability</p> <ul style="list-style-type: none"> <li>• <b>Soil</b> Texture at project site is Sandy Clay. Soil analysis report enclosed as <b>Annexure - X</b>.</li> <li>• <b>Slope</b> of the site is almost flat with gentle slope tending towards East from West. The highest elevation at 220 mRL and the lowest elevation is 218 mRL.</li> <li>• <b>Vulnerability to Subsidence:</b> There is no</li> </ul>

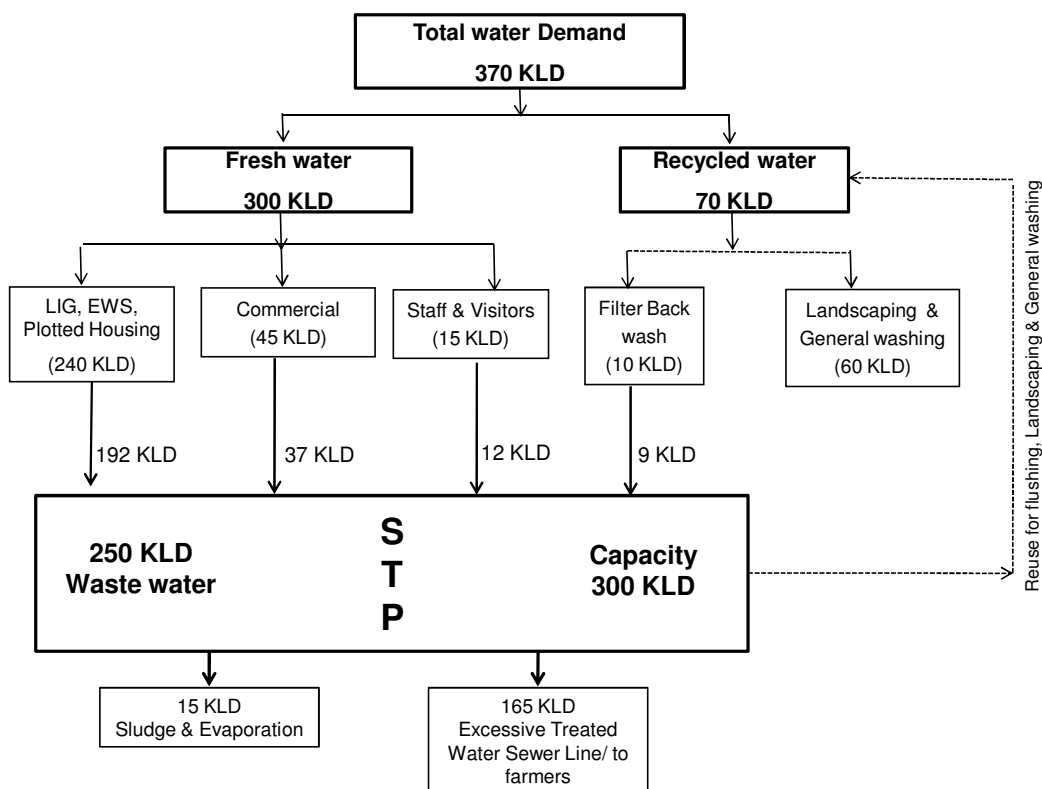
		<p>subsidence reported in the area.</p> <ul style="list-style-type: none"> <li>• <b>Seismicity:</b> The area is classified as Zone III (Moderate Damage Risk Zone) as per the BIS classification. The building design will be made with earthquake resistant design structure.</li> </ul>
1.5	Will the proposal involve alteration of natural drainage systems? (Give details on a contour map showing the natural drainage near the proposed project site)	: The topography of the site is almost flat with gentle slope tending towards East from West. The highest elevation at 220 mRL and the lowest elevation is 218 mRL. The surface run-off will increase due to increase in paved areas. The same will be channelized to well connected storm water drains designed on the basis of peak intensity of rainfall (40 mm/hr).
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?)	: No excavation will be done. However, top soil will be utilized within the site itself.
1.7	Give details regarding water supply, waste handling etc during the construction period.	<p><b>Water supply:</b> The peak domestic water demand during construction phase will be about 9 KLD (@45 lpcd/ person – 200 No.) which will be met from tanker supply.</p> <p><b>Waste handling:</b> During construction phase around 5 KLD effluent will be generated which will be treated in septic tank followed by soak-pit.</p> <p><b>Solid waste:</b> 20 kg/day municipal solid-waste (peak) will be generated during construction phase and will be sent to disposal site.</p>
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)	: There are no wetlands and low lying areas around the 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 labour and the means of disposal)	: Details of the same are given in Form 1 under point 1.15 and Environmental Management Plan.
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**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.	<p>The daily water requirement for the proposed project will be 370 KLD with fresh water demand of 300 KLD and the recycled water demand of 70 KLD. The daily fresh water demand will be met from the ground water supply.</p> <p>The water budget flowchart showing break up of requirements for various uses is given as under:</p>
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**WATER BUDGET**



2.2	What is the capacity (dependable flow or yield) of the proposed source of water?	: The daily fresh water requirement will be approximately 300 KLD, which will be met from ground water supply.																					
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 supply will be ground water. The ground water quality was analyzed by Ultra Testing and Research Laboratory as per the IS 10500 standards. Monitoring reports are enclosed <b>Annexure X.</b>																					
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)	: Total 70 KLD water demand will be met from recycling of treated waste water from STP. The treated waste water will be utilized for, Landscaping & General washing (60 KLD) and STP Filter back wash (10 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 the other users as the daily fresh water demand to the tune of 300 KLD will be met from ground water supply.																					
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).	: Presently no waste water is being discharge at project site so the BOD and COD pollution load does not exist. The project activities at the time of 100% occupancy will generated 250 KLD waste water. If untreated waste water will be discharged by the project it will result in 46.25 kg/day BOD load and 69.38 Kg/COD load. The approximate characteristic of influent & effluent is given as:  <table border="1" data-bbox="792 1570 1425 1860"> <thead> <tr> <th>Parameters</th> <th>Influent (mg/l)</th> <th>Effluent (mg/l)</th> </tr> </thead> <tbody> <tr> <td>pH</td> <td>7.5 - 8.5</td> <td>7 - 8</td> </tr> <tr> <td>Suspended solids</td> <td>275 - 325</td> <td>&lt;10 mg/l</td> </tr> <tr> <td>BOD</td> <td>250 - 300</td> <td>&lt;10 mg/l</td> </tr> <tr> <td>COD</td> <td>375 - 450</td> <td>&lt;50 mg/l</td> </tr> <tr> <td>Oil &amp; Grease</td> <td>35 - 50</td> <td>&lt;5 mg/l</td> </tr> <tr> <td>Coliforms (MPN / 100 ml)</td> <td>10<sup>5</sup> - 10<sup>7</sup></td> <td>50 - 500 / less</td> </tr> </tbody> </table>	Parameters	Influent (mg/l)	Effluent (mg/l)	pH	7.5 - 8.5	7 - 8	Suspended solids	275 - 325	<10 mg/l	BOD	250 - 300	<10 mg/l	COD	375 - 450	<50 mg/l	Oil & Grease	35 - 50	<5 mg/l	Coliforms (MPN / 100 ml)	10 <sup>5</sup> - 10 <sup>7</sup>	50 - 500 / less
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2.7	Give details of the water requirements met from water harvesting? Furnish details of the facilities created.	: Water harvesting and its reuse is not feasible due to uncertainty in rainy days. However, ground water recharge will be done by harvesting rain water run off from the terraces, paved areas and landscaped/open areas. Annual recharge of 43,625.00 cu.m. is anticipated. Detailed calculations and design of the system is given in EMP.
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?	: In post-construction phase the project construction will result in increase in paved areas and hence, quantity of run-off will increase due to reduced infiltration & increase in surface run-off coefficient as compared to the present scenario. This will not aggravate the problem of flooding or water logging as the overflow during abnormally heavy rains will follow the run-off pattern. Further, rainwater structures have also been designed for accommodating peak-rainfall intensity (40 mm/hr).
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)	: There will be no tapping of ground water without obtaining prior permission. The source of water supply will be ground water supply.
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)	: Effective measures will be adopted to reduce the storm water run-off from the construction site are as under- <ul style="list-style-type: none"> <li>• Storage of construction material at the earmarked places with a temporary shed ensuring that no leach ate or spoilage of land occurs.</li> <li>• Silt fencing with sausage, Temporary silt fencing will be installed at selected locations across the site.</li> </ul>

		<ul style="list-style-type: none"> <li>• Stockpiles will not be located in proximity to existing or proposed drainage lines and storm water inlets</li> <li>• Cleaning all mud and dirt deposited on roads.</li> </ul>
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)	<p>: The run-off from roof-top, paved surfaces and landscaped surfaces will be properly channelized to the rain-water harvesting sumps through efficient storm water network. The storm-water drain has been designed to cater the flow during peak intensity of rain (40 mm/hr). The water recharge structure has also been designed for peak intensity and for maximum capture of surface run-off. The rain-water harvested will be used for ground-water recharge.</p> <p>The storm-water drains will be cleaned in the pre-monsoon phase so that the possibility of the groundwater pollution &amp; water-logging can be minimized / avoided.</p>
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)	<p>: Local people will be deployed during construction. Provision of separate toilets for the construction workers will be provided. Further, temporary septic-tank followed by soak-pit will be provided for effluent treatment. There will be no stagnant water at site, as the run-off from the relevant areas will be systematically drained.</p> <p>The civil contractor will be made responsible for site sanitation and will be bound by the management to adhere to healthy level of sanitation. All sanitary and hygienic measures will be provided and maintained throughout the construction phase.</p>



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)	: In the operational phase the waste water generation will be 250 KLD. For the treatment of waste water a STP of 300 KLD capacity and based on MBBR technology will be installed. The treated waste water will be reused in Landscaping & General washing (60 KLD) and STP Filter back wash (10 KLD). Excessive treated water to the tune of 165 KLD will be discharged in sewer line or supplied to nearby farmers.
2.14	Give details of dual plumbing system if treated waste is used for flushing of toilets or any other use.	: There will be separate pipelines for the supply of the fresh-water and treated-water from STP. Treated-water will be used for landscaping and general washing purposes, while the fresh water will be used for domestic consumption.
<b>3. VEGETATION</b>		
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)	: The site is situated in the urban ecosystem. The surrounding habitat of the site possesses local/common floral species. No endangered or threatened species of flora and fauna have been reported during the survey, so there is no major threat to the biodiversity.  Proper landscaping in an area of 4,324.72 Sq. m (5.04%) will be done in the operational period with some local and native species to support the similar habitats and species.
3.2	Will the construction involve extensive clearing or modification of vegetation? (Provide a detailed account of the trees & vegetation affected by the project)	: Few herb and shrub were present at site which will be cleared during site preparation.
3.3	What are the measures proposed to be taken to minimize the likely impacts on important site features	: A total of 4,324.72 Sq. m (5.04%) area will be under landscape which will help in minimizing the impacts. Total trees will be planted for the green belt

	(Give details of proposal for tree plantation, landscaping, creation of water bodies etc along with a layout plan to an appropriate scale)	development. The same is detailed as under: <table border="1" data-bbox="797 268 1425 695"> <thead> <tr> <th>S. No.</th> <th>Local Name</th> <th>Scientific Name</th> <th>Nos</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Neem</td> <td>Azadirachta indica</td> <td>15</td> </tr> <tr> <td>2</td> <td>Shisham</td> <td>Dalbergia sissoo</td> <td>20</td> </tr> <tr> <td>3</td> <td>Ashok</td> <td>Polyalthia longifolia</td> <td>50</td> </tr> <tr> <td>4</td> <td>Amaltas</td> <td>Cassia fistula</td> <td>20</td> </tr> <tr> <td>5</td> <td>Sirish</td> <td>Albizia lebbeck</td> <td>25</td> </tr> <tr> <td>6</td> <td>Aam</td> <td>Mangifera indica</td> <td>15</td> </tr> <tr> <td>7</td> <td>Ardu</td> <td>Ailanthus sp</td> <td>10</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>TOTAL</b></td> <td><b>155</b></td> </tr> </tbody> </table> <p>No water body will be created.</p>	S. No.	Local Name	Scientific Name	Nos	1	Neem	Azadirachta indica	15	2	Shisham	Dalbergia sissoo	20	3	Ashok	Polyalthia longifolia	50	4	Amaltas	Cassia fistula	20	5	Sirish	Albizia lebbeck	25	6	Aam	Mangifera indica	15	7	Ardu	Ailanthus sp	10	<b>TOTAL</b>			<b>155</b>
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<b>4.</b>	<b>FAUNA</b>																																					
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.	: Only reptiles & small mammal species observed at site which is of Least concern category as per IUCN (version 3.1). Hence, the impact significance is Low and Localized.  Further, site is situated in the semi-urban ecosystem which possesses faunal species which are well adapted to the human dominated areas. So this project will not be barrier for movement of any faunal species.																																				
4.2	Any direct or indirect impacts on the avifauna of the area? Provide details.	: There were no breeding or foraging grounds observed during the site visit, which indicates the temporary movements of avifauna in the project site. Therefore, there will be no direct impact on the avifauna.																																				
4.3	Prescribe measures such as corridors, fish ladders, etc to mitigate adverse impacts on fauna	: Small mammal species (Northern Palm Squirrel { <i>Funambulus pennantii</i> } and reptile (Garden Lizard { <i>Calotes versicolor</i> } observed at site are of Least concern category as per IUCN (version 3.1).  The impact will be localized for construction phase only with low magnitude.																																				
<b>5</b>	<b>AIR ENVIRONMENT</b>																																					

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)	:	<p>The construction of buildings has a very important impact on the environment, and the process of manufacturing and transporting of building materials, and installing and constructing of buildings consumes great energy and emits large quantity of greenhouse gas (GHG).</p> <p>Base line air quality monitoring of project site shows that all the prescribed parameters all well within the limits. Incremental concentration of 0.641 <math>\mu\text{g}/\text{m}^3</math> and 0.35 <math>\mu\text{g}/\text{m}^3</math> for <math>\text{NO}_x</math> and CO respectively is predicted by ambient air quality modeling. The resultant concentration will be well within the limit.</p> <p>However, the following measures will be adopted to mitigate the impacts:</p> <ul style="list-style-type: none"> <li>• Use of fuel efficient Construction equipment</li> <li>• Reduce electricity use in the construction office</li> <li>• Use of locally sourced or recycled materials for construction materials</li> <li>• Use of RMC and other low energy embodied materials.</li> </ul>
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.	:	<p>The impacts of dust and gaseous pollutants due to different construction activities will be localized and may affect the surrounding environment. Wind rose diagram shows wind direction from NW to SE direction. No immediate adjacent structure exists.. However, ambient air quality modeling shows that the incremental ground level concentration of pollutants will be minimal and resultant concentration will be well within the limits. All necessary measures like water sprinkling, PUC certification of vehicles, covering of construction site etc will be taken to avoid adverse impact</p>
5.3	Will the proposal create shortage of	:	No, the proposal will not create shortage of parking

	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.		space. The total parking required as per local by laws is 180 ECUs and 180 ECUs will be provided. Fully internalize parking, guided traffic way, speed restriction by installation of speed hump, separate entry and exit etc measures will be adopted to manage traffic movement.
5.4	Provide details of the movement patterns with internal roads, bicycle tracks, pedestrian pathways, footpaths etc., with areas under each category.	:	The movement pattern inside the project area will be guided traffic-ways. There will not be any separate bicycle-tracks or pedestrian-pathways on the periphery (driveway).
5.5	Will there be significant increase in traffic noise & vibrations? Give details of the sources and the measures proposed for mitigation of the above.		There is no significant increase in noise and vibration. The noise and vibration levels will be well within the norms. Both entry and exit will be manned with trained and efficient security and road markings, Stop lines, parking lanes will be painted to guide the internal road user.
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.	:	The noise level due to construction activity and in operational phase will be localized to the source. During the construction phase, noise will be generated from the construction equipments and the operation of DG set. Emission level due to vehicles carrying construction material along with its mitigation measure is given in Form 1 under point 5.1
<b>6.</b>	<b>AESTHETICS</b>		
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?	:	There will be a visual impact on the surroundings. This will add to the change in the localized physical impact.

6.2	Will there be any adverse impacts from new constructions on the existing structures? What are the considerations taken into account?	:	Two residential apartments exist adjacent to project site. Due measures as explained in environmental management plan will be taken to avoid any adverse impact.
6.3	Whether there are any local considerations of urban form & urban design influencing the design criteria? They may be explicitly spelt out.	:	The building is designed on the urban architectural form basis.
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, there is no anthropological or archaeological site in the close vicinity as per the data available from secondary sources.
<b>7.</b>	<b>SOCIO-ECONOMIC ASPECTS</b>		
7.1	Will the proposal result in any changes to the demographic structure of local population? Provide details.	:	The proposed project will provide housing facilities to approx. 2765 residents.
7.2	Give details of the existing social infrastructure around the proposed project.		<p>The same is as under:</p> <p><b>Educational Facilities:</b></p> <ul style="list-style-type: none"> <li>• Vidyasthali Public School : 0.5 Km (WNW),</li> <li>• Dimond Public School :0.8 km (S).</li> <li>• Govt. Sr. Sec. Akhaigarh: 1.5 km. (ENE)*</li> <li>• Govt.High School, Kherli: 1.7 km. (SSW)*</li> <li>• Govt.Girls High School, Kherli: 1.9 km. (S)*</li> <li>• Govt.Sr Sec School, Sonkhar: 2.0 km. (SW)*</li> <li>• Govt. Sr Sec School, Kherli Rail: 2.2 km. (S)*</li> <li>• Apex Public School: 1.8 km. (S)*</li> </ul> <p><b>Medical Facilities:</b></p> <ul style="list-style-type: none"> <li>• Jeevandan Hospital: 1.8 km ( SSW)*</li> <li>• Govt. Hospital, Kherli: 2.0 km (S)*</li> <li>• Govt. Hospital Garoo: 3.4 km. (SW)*</li> <li>• Shri Nurshing Hospital: 1.9 km (S)*</li> </ul> <p><b>Worship Places:</b></p>

		<ul style="list-style-type: none"> <li>• Shiv Mandir: 1.6 km. (ENE)*</li> <li>• Hanuman Mandir: 1.5 km. (NE)*</li> <li>• Ganesh Temple : 1.7 km. (SW)*</li> <li>• Baki Mata Mandir: 1.4 km. (S)*</li> </ul> <p><i>*Aerial distance measured from Google earth.</i></p>
7.3	Will the project cause adverse effects on local communities, disturbance to sacred sites or other cultural values? What are the safeguards proposed?	: None, as there is no such places around.
<b>8.</b>	<b>BUILDING MATERIALS</b>	
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)	<p>: The basic materials used will be PPC cement, steel, pre-cast hollow bricks, stones, ready-mix concrete, sand, hard-wood, glass, etc.</p> <ul style="list-style-type: none"> <li>• Low energy embodied materials will be given preference.</li> <li>• Ready-Mix concrete will be used.</li> <li>• Minimizing the transport of temporary structures, scaffolding, framework, consumables and building product to the construction site.</li> </ul>
8.2	Transport and handling of materials during construction may result in pollution, noise & public nuisance. What measures are taken to minimize the impacts?	<p>: During the construction phase, the following measures will be taken to prevent pollution.</p> <ul style="list-style-type: none"> <li>• All transportation vehicles will be suitably covered with tarpaulin &amp; overloading of the vehicles will be avoided and pollution checked vehicle will be must.</li> <li>• Covering of the construction site from all four sides to prevent dust emissions and other pollutants into surrounding area.</li> <li>• Covering loads to limit materials or litter blowing off and reducing smells.</li> <li>• Ready-mix concrete will be used for concreting.</li> <li>• Water spraying to prevent dust pollution from</li> </ul>

			<p>different sources of construction.</p> <ul style="list-style-type: none"> <li>• Speed restriction of all the vehicles approaching the site and within the site.</li> </ul>
8.3	Are recycled materials used in roads and structures? State the extent of savings achieved?	:	Yes, the waste generated as PPC cement, reinforced steel, ceramic tiles may be used as a construction material depending on the feasibility of availability and economics.
8.4	Give details of the methods of collection, segregation & disposal of the garbage generated during the operation phases of the project.	:	All the wastes from different sections will be collected and treated as per the Municipal Handling rules. The waste will be collected in colour coded bins and reuse or send to the authorized vendor.
<b>9.</b>	<b>ENERGY CONSERVATION</b>		
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?	:	<p><b>Power Requirement:</b> Connected load will be 1634.81 KW; Maximum Demand- 817.41 KW.</p> <p><b>Source of Supply:</b> Vidyut Vitran Nigam.</p> <p>For energy Conservation design has been made taking advantage of day lighting wherever possible to reduce the need for electric lights. Power factor will be maintained around unity.</p> <p>Total energy conservation of 40.75% (3456.02 kWh) will be achieved by using solar lights, LED lamps.</p>
9.2	What type of, and capacity of, power back-up to you plan to provide?	:	There will be no power back up for common areas.
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?	:	No glass will be used as building material.
9.4	What passive solar architectural features are being used in the building? Illustrate the applications made in the proposed	:	Passive solar cooling is incorporated in the building design. Buildings are suitably oriented for ensuring natural ventilation and day lighting. Building design and envelope may be optimized through selection of

	project.		appropriate wall and roof construction and through adoption of solar passive measures after studying the sun path analysis to provide shading devices for windows and roof which would reduce energy demand.
9.5	Does the layout of streets & buildings maximize the potential for solar energy devices? Have you considered the use of street lighting, emergency lighting and solar hot water systems for use in the building complex? Substantiate with details.	:	Solar stand alone features for common area lighting will be used.
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?	:	Walls that face the east and west will be well insulated as possible, to prevent summer heat gain. Use of PPC cement having fly-ash content and higher reflectance (as compared to OPC cement) will be used. Further, shading by means of Verandah on East Façade will provided and very few Openings and high thermal mass to reject and store the Solar heat on South facing Façade.
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		<p><b>Transformers:</b></p> <ul style="list-style-type: none"> <li>• Automatic power factor compensating multiple capacitor units will be provided for maintaining of average power factor of 0.95 to have effective savings in energy cost.</li> <li>• All cables shall be derated to avoid heating during use. This also indirectly reduces losses and improves reliability.</li> <li>• LV Power supply duly terminated at each floor through XLPE cable with a suitable size MDB.</li> </ul>
9.8	What are the likely effects of the building activity in altering the	:	Heat emission from the project can be from the following sources:



	micro-climates? Provide a self-assessment on the likely impacts of the proposed construction on creation of heat island & inversion effects?		<ul style="list-style-type: none"> <li>• Heat absorbed and radiated from the paved and concrete structures.</li> <li>• Increased population for a particular stretch of land.</li> </ul> <p>An area of about 5.04% will be under landscape which will help in mitigating heat island effect. (non-roof).</p>
9.9	What are the thermal characteristics of the building envelope? (a) Roof; (b) external walls; and (c) fenestration. Give details of the material used and the U-values or the R values of the individual components.		The building materials will be selected with characteristics that limit heat ingress into the inside of the building will be minimized.
9.10	What precautions & safety measures are proposed against fire hazards? Furnish details of emergency plans.		<p>Essential fire safety measures will be installed into the building to ensure the safety of the occupants within the building in the event of fire or other emergency.</p> <p>The entire building will be designed as per NBC-2005 of India pertaining to fire-hazards. Proper fire-exits and exit-signage will be provided. Fire-extinguishers of appropriate type will be placed on a readily accessible place and will be maintained accordingly.</p>
9.11	If you are using glass as wall material provides details and specifications including emissive and thermal characteristics.	:	Glass will not be used as wall material except for the windows and façade.
9.12	What is the rate of air infiltration into the building? Provide details of how you are mitigating the effects of infiltration.	:	Building will be naturally ventilated.
9.13	To what extent the non-conventional energy technologies are utilized in the overall energy consumption? Provide details of	:	<p>The solar energy will be utilized efficiently for-</p> <ul style="list-style-type: none"> <li>• Total external lighting load will be reduced 20% by the use of Standalone Solar fixtures.</li> </ul>

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	the renewable energy technologies used.	
<b>10</b>	<b>ENVIRONMENT MANAGEMENT PLAN</b>	
	The Environment Management Plan would consist of all mitigation measures for each item wise activity to be undertaken during the construction, operation and the entire life cycle to minimize adverse environmental impacts as a result of the activities of the project. It would also delineate the environmental monitoring plan for compliance of various environmental regulations. It will state the steps to be taken in case of emergency such as accidents at the site including fire.	

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