APPENDIX II

(See paragraph 6)

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).

1. LAND ENVIRONMENT

Attach panoramic view of the project site and the vicinity)

1.1. Will the existing land use get significantly altered from the project that is 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) and (iii) the site (indicating levels & contours) to appropriate scales. If not available attach only conceptual plans.

About the project

This is proposal for Proposed Residential & Commercial Township Project at Khasra Nos.: 114/2, 114/5, 115, 129, 122/1, 124/1, 124, 125, 126, 126/1, 127/1, 127/2, 127/3, 127/4 in Village Pal & Khasra No. 210, 211 & 212 in Village Gangana, Tehsil & District: Jodhpur (Rajasthan) by M/s. Aasan Realty Pvt. Ltd. The total land area for entire project is 308425.19 sq. m. (76.2135 Acres) which will be developed in phase wise as per market scenario and demand. In Phase-1 we are planning to develop area about 184956.77 sq. m (45.7038 Acres), having Built-up area 119553.78 sq. m. and rest land area 123468.42 sq. m (30.5097 Acres) will be developed later on.

The project entails of development of residential township & Commercial Scheme providing Residential and commercial facilities like Villas, Group Housing, Shopping Mall with Multiplex, Hotel, convenient shopping & Community Centre, Club House, Mini Hospital, School, Worship Place, Aadhyatmic Sansthan etc.

Proposed Land use

The development in the project site will be consistent with the surrounding. There will be no change in land-use due to project activities and the land-use will be conforming to the approved development Plan of the area.

The proposed site is plain and devoid of rocky outcrops, and is not covered by any notified forests or ecological sensitive area.

The Google image showing 500 m surrounding area of the project site is being 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.

Salient Features of the Project

<table>
<tr><th>Items</th><th>Details</th></tr>
<tr><td>Project Name</td><td>Proposed Residential & Commercial Township Project</td></tr>
<tr><td>Location</td><td>At Khasra Nos.: 114/2, 114/5, 115, 129, 122/1, 124/1, 124, 125, 126, 126/1, 127/1, 127/2, 127/3, 127/4 in Village Pal & Khasra No. 210, 211 & 212 in Village Gangana, Tehsil & District: Jodhpur (Rajasthan)</td></tr>
<tr><td>Type of Project</td><td>Building Construction Project [Activity 8 (a)]</td></tr>
<tr><td>Plot area (sq. m.)</td><td>308425.19 sq. m (76.2135 Acres)</td></tr>
<tr><td>Area reserve for future developments</td><td>123468.42 sq. m (30.5097 Acres)</td></tr>
<tr><td>Net Planned Area of the project (Phase 1)</td><td>184956.77 sq. m (45.7038 Acres), Details are as follows:
<table>
<tr><th>S. No.</th><th>Particulars</th><th>Area (sq. m)</th></tr>
<tr><td>1</td><td>AREA UNDER RESIDENTIAL USE</td><td>52637.20</td></tr>
<tr><td>a.</td><td>Area Under Group Housing-3</td><td>5916.70</td></tr>
<tr><td>b.</td><td>Area Under Plotted Development (Villas)</td><td>46720.50</td></tr>
<tr><td>2</td><td>AREA UNDER COMMERCIAL USE</td><td>1474.58</td></tr>
<tr><td>a.</td><td>Area Under Convenient Shopping</td><td>1474.58</td></tr>
<tr><td>3</td><td>AREA UNDER FACILITIES</td><td>8741.32</td></tr>
<tr><td>a.</td><td>Area under Substation</td><td>3948.97</td></tr>
<tr><td>b.</td><td>Area under Treated Water Plant</td><td>1469.42</td></tr>
<tr><td>c.</td><td>Area under STP</td><td>2881.64</td></tr>
<tr><td>d.</td><td>Area under TE / PO</td><td>441.29</td></tr>
<tr><td>e.</td><td>PARK & COMMON OPEN SPACE</td><td>30848.02</td></tr>
</table></td></tr>
</table>

	f. **AREA UNDER ROADS** — **91255.64** **Total** — **184956.77**
Total Built up area (sq. m.) for Phase 1	119553.78 sq. m. (BAR: 100472.18 sq. m + Non FAR: 11541.60 sq. m + Basement : 7540 sq. m)
Ground Coverage (sq. m.) for Phase 1	Proposed: 33733.62 sq. m.
B.A.R. (sq. m.) for Phase 1	Proposed: 100472.18 sq. m.
Total Green-area	30848.02 sq. m (~ 10 % of total plot Area)
Maximum Height (m)	Maximum Hight of building: 45.0 M.
Basement Area detail	**Particular** / **Area** Lower Basement (sq. m) — 3770 Upper Basement (sq. m) — 3770 Total Basement (sq. m) — 7540
Number of Towers/Blocks	1 Tower of Group Housing + Villas + Convenaient Shoping
No. of Dwelling Units	Total = 600 dwelling units (320 Villas + 280 units Flats)
Number of floors	2 Basement + Stilt + 14 Uper Floors
Parking Facilities	Required Parking: 682 ECU Proposed Parking: 765 ECU
Power Requirement & Source	Connected Load : 11751 KW, Essential : 5916 KW, Source: JDVVNL
Power Backup	2 No. of D.G. sets of total capacity 360 KVA (2X180 KVA)
Water Requirement & Source	Total Water requirement will be 538 KLD Fresh Water: 267 KLD Recycled Water: 271 KLD Source: Municipal Water Supply
Sewage Treatment & Disposal	**Sewage treatment facility:** 351 KLD capacity **Sewage discharge:** No untreated sewage will be discharged outside the project site. The sewage water will be treated and utilized for flushing;

<table>
<tr><td></td><td>Green area irrigation etc.
Effluent discharge: No waste or treated water will be discharged outside the project site; the project will be zero-discharge project.</td></tr>
<tr><td>Estimated Population</td><td>Total population: 4556 Persons
Fixed population: 3960 Persons
Floating population: 596 Persons</td></tr>
<tr><td>Connectivity</td><td>The project is adjacent to 24.0 m & 36.0 m wide service road.</td></tr>
<tr><td>Solid waste generation</td><td>1931 kg/day</td></tr>
<tr><td>Cost Details</td><td>Project Cost = Rs. 156 Cr. (Approx)
ESR/CSR Cost = Rs. 2.34 Cr (1.5 % of total project cost as per MoEFCC OM dated 01.05.2018)
<table>
<tr><td colspan="4">EMP Cost</td></tr>
<tr><td colspan="2">Construction Phase</td><td colspan="2">Operation Phase</td></tr>
<tr><td>Approximate Cost (Lacs)</td><td>Recurring Cost (Lacs)</td><td>Approximate Cost (Lacs)</td><td>Recurring Cost (Lacs)</td></tr>
<tr><td>55.00</td><td>15.00</td><td>103.00</td><td>30.00</td></tr>
</table></td></tr>
</table>

Site plan, Elevation & Section for proposed project (Phase-I) is enclosed.

Connectivity: The Project site is connected with 24 & 36 m wide road and connected to other parts of the Jodhpur. Basni Railway Station is approximately 6.0 km in East direction, Bhagat Ki Kothi Railway Station is approximately 7.5 km in NE direction, Jodhpur Airport- Approx 9.0 km in ENE direction from the project site. National Highway-112 is approx. 6.00 km in ESE direction from the project site. So the project site is well connected by network of roads leading to various parts of state. Thus no new road will be laid during construction or operation of the project activities except internal roads & pathways.

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, disturbance to the local ecology).

The proposed site is consisting of wild grasses and weeds which shall be cleared at the time of construction; the proposed project will be constructed as per urban development area authority as per the defined building by-laws. The area adjacent to the project is under development plan (evident from Google Image). The area adjacent to the project is under development. The project activities will be confined within the project in the site only and the likely impacts on land-use,

commercial facilities and open space will be very meager. The proposed project will not have any adverse impact on the surrounding environment. Instead, the development of proposed township Project in this area will increase employment opportunities and development activities. There will be no major disturbance to local ecology as no tree will cut for proposed development, trees will retain and will pert of green area.; the proposed project has a proposal of green area development, which will increase the aesthetic value of the area. Total Green area development will be done on 30848.02 sq. m (~ 10 % of total plot Area). The indigenous / local plants will be planted all around the periphery of the project area and along the roadside & lawn.

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 proposed activity will not affect any significant land disturbance resulting in soil erosion, subsidence and instability. The area is not susceptible to erosion. The excavated earth material will be utilized at the site for leveling, backfilling and green area development.

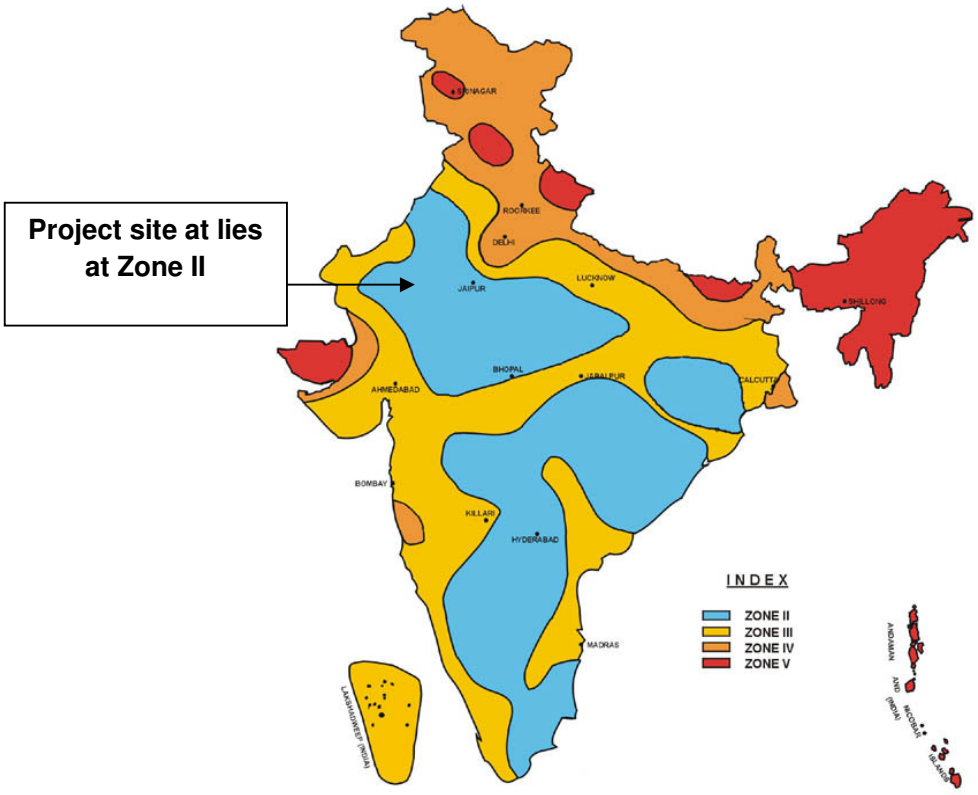
This is residential & commercial township project, so minor demolition work will be required. Land/soil environment may be temporarily affected due to activities like site preparation, excavation, material handling & storage etc. during construction phase. Proper drainage system shall be provided to deal with the storm water in case of rain.

Soil type: A quantitative assessment of the particle size distribution in the soil was made by wet sieve analysis and sedimentation analysis using hydrometer, as per procedures laid down is IS: 2720 Part IV. The particle sizes were designated according to the scale given in IS: 1498, which is given in table below and the soil type in the area is found to be sandy loam

PARTICLE SIZE SCALE (IS: 1498)

S.No.	Soil Type		Particle Size Range
1.	Gravel		4.75-20mm
2.	Sand	Coarse	2.0-4.75 mm
		Medium	0.425-2.0 mm
		Fine	0.075-0.425
3.	Silt & clay		Less than 0.075 mm

The area is located in an area of seismic zone II by national standards



Source: *BIS 2002*

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 ground surface of the project is almost level. The project is not likely to alter or obstruct any natural drainage courses.

There is no natural watercourse passing through the project site. Hence the proposal does not involve alteration of natural drainage systems. As a result of excavation of topsoil during construction phase, the impact on drainage pattern, and run off characteristics will be restricted to the small area. Proper rain water drainage facility will be provided and the run-off generated will be used for recharging the ground water level.

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?)

Excavation will also be carried out for foundation and construction of building. The total soil generated will be used at the site itself for the purpose of Site development and Green area development.

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

Water demand of 40-50 KLD in the construction period will be met through hired private tankers; hence no ground water at the site will be utilized for construction.

The solid waste generated during the construction phase like metal cuttings, debris, plastic material, and wooden logs etc. will be collected and disposed. The soil excavated will be used for backfilling and top fertile soil will be reused for green belt development purpose. Demolished debris shall be reuse for road pathway construction.

The waste generated during construction activities shall be limited to project site only and during construction phase only. These will be reused for backfilling and road development after manual segregation. This waste shall be utilized for construction of roads. Conclusively, it can be stated that impacts may be confined to small area (mainly to project site) and for short duration. Proposed mitigation plan suggests maximum re-use of construction waste on site, removal of non-reusable waste from the site and its proper disposal, which would reduce the impact significantly.

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 or low-lying area present in and around the project site. So, there will be no impact.

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).

During the construction phase, there will be no waste generated which can cause health hazard. The surplus earth will be disposed off into low lying areas, will be utilized for landscaping. Construction debris will be collected and stored at earmarked place for reuse immediately from the construction site and no accumulation shall be allowed.

There will be mostly local labours deployed which will have no contribution to the pollution. The construction labours will have all residential infrastructure facility and rest shelter, so waste water generated from temporary labour hutments shall be disposed in soak pits via septic tanks.

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.

The total water requirement of the project (Phase-I) will be 538 KLD. The fresh water required will be 267 KLD and recycled treated water required will be 271 KLD, this recycle water will be available from the onsite STP.

Water Management:

The water conservation is a prime requirement of a present scenario, so we are also taking initiative to meet the objective of water conservation by adopting the water conservation methods to reduce the water demand of our proposed township Project. The detail of water conservation methods is mention below-

Details of Water Conservation Measures proposed Project:

The water requirement of the project will be reduced by adopting water conservation measures through efficient use of Water and Water Recycling in the project.

Water use in a residential building includes the demand for human consumption, cleaning, washing, flushing, and gardening. Water usage for applications such as flushing, bathing and washing is as high as 93% of water demand in any building. However, measures can be adopted to reduce this demand through use of water efficient practices and devices (efficient plumbing fixtures). These would result in significant saving of water and contribute towards protection of the environment.

Use of water saving devices/ fixtures: About 40% of all water used indoors is in the bathroom and toilets and more than 10% of that used is in the kitchen. The conventional fixtures used in toilets use water at the rate of 12-15 liters per flush. In normal scenario, the taps and showerheads in buildings consume water at the rate of 20 litres of water per minute. The flow rates of these fixtures depend on the pressure at which these are operated. However there exists the opportunity to lower the consumption through the use of following efficient fixtures:

By using low flow flushing systems: Water consumption is more for flushing applications in any building. Use of more efficient water saving toilets having dual flush system can result in a saving of at least 50% of water. Dual flush systems can be installed in order to allow different volume of water for flushing liquids and solids. To facilitate efficient cleaning at low volume, it is possible to install suitable water closets.

Showerheads: In a conventional shower, water is delivered at the rate of 20 litres of water per minute at a pressure of 60 psi. A significant reduction in water consumption is possible through use of low flow shower which results in a flow of 7.5 lpm at design pressure of 80 psi. Flow restrictors and temporary cut-off valves can further save water. In addition to the use of low water consuming fixtures, it is also possible to introduce other features such as aerators, use of

spray nozzles, automatic shut-off nozzles, and pressure reducing valves along with these fixtures.

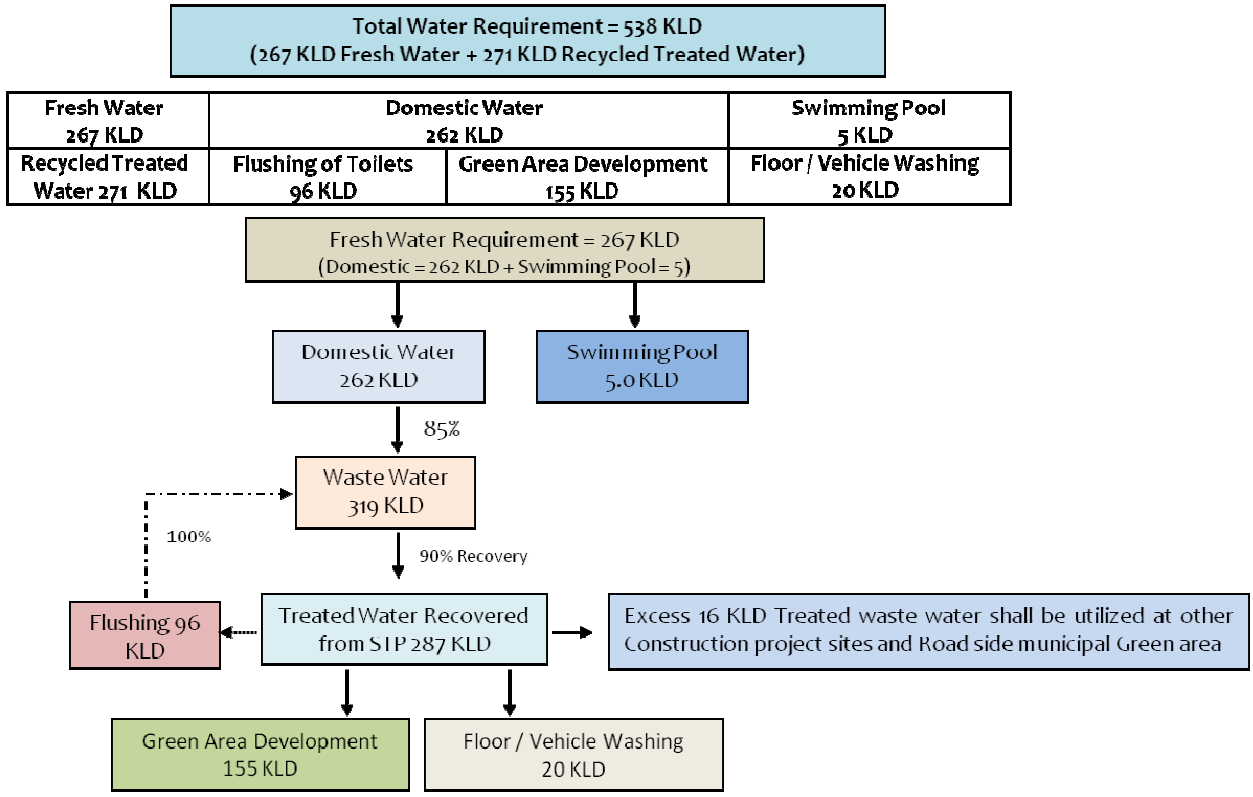
Dual pipe plumbing: Installation of dual pipe plumbing for using recycled water / rain water can save the potable water from municipal supply or ground water. There can be two lines, one supplying fresh water for drinking, cooking and bathing etc and other for supply of recycled water for flushing, landscape irrigation etc.

Estimation of Water use reduction as per Manual on norms and standards for environment clearance of large construction projects

WATER REQUIREMENT CALCULATION

S. No.	Particulars	Type of Use	Expected Population	Base of Calculation (Lpcd)	Recycled Treated Water		Fresh Water		Total Water Consumption (KLD)
					Flushing (KLD)	Others (KLD)	Domestic (KLD)	Others (KLD)	
1.	Villas (320)	Residential	2560 @8 per/unit	86	53.76	-	166.40	-	220.16
2.	Dwelling Unit (280)	Residential	1400 @5 per/unit	86	29.40	-	91.00	-	120.40
3.	Visitors (10% of residential population)	Floating	396 (10% of residential population)	28	8.31	-	2.77	-	11.08
4.	Convenient shopping	Floating	200	28	4.20	-	1.40	-	5.60
5.	Swimming Pool	-	-	LSM	-	-	-	5.0	5.00
6.	Green Area	-	-	LSM	-	155	-	-	155
7.	Floor/Vehicle washing	-	-	LSM	-	20	-	-	20
Grand Total		-	4556	--	95.67 Say 96	175	261.57 Say 262	5.00	537.24 say 538 KLD
					271 KLD		267.00 KLD		

WATER BALANCE



WATER REQUIREMENT :	
TOTAL WATER REQUIREMENT (FRESH 267 KLD + RECYCLED 271 KLD)	538 KLD
TOTAL FRESH WATER REQUIREMENT	267 KLD
DOMESTIC WATER REQUIREMENT	262 KLD
WATER REQUIRED FOR GREEN AREA DEVELOPMENT	155 KLD
TOTAL WASTE WATER GENERATION	319 KLD
TREATED WATER RECOVER FROM STP	287 KLD

Calculated as according to the MoEF's Manual on Norms and Standards for Environmental Clearance of Large Construction Project.

The fresh water requirement of the project will be reduced by adopting above said water conservation measures & using treated water. The waste water generated in the form of sewage will be treated in STP and reutilized in flushing of toilets & green area development / plantation.

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

Total water requirement of proposed project (Phase-1) will be 538 KLD, which will be included the fresh water requirement of 267 KLD and recycled treated water requirement of 271 KLD for flushing. Total waste water generation from the project (Phase-1) will be 319 KLD, which will be includes 80% of sewage generation from domestic uses and 100% of flushing uses. The water requirement will be fulfilled by hired private water tanker and the bore wells after the permission granted from the concerned authority.

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 quality of ground water samples near project site has been analyzed.

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 water requirement of proposed project (Phase-1) will be 538 KLD, which will be included the fresh water requirement of 267 KLD and recycled treated water requirement of 271 KLD for flushing. Total waste water generation from the project (Phase-1) will be 319 KLD, which will be includes 80% of sewage generation from domestic uses and 100% of flushing uses. The total capacity of STP will be 351 KLD. Treated water recovery from STP in Phase-1 will be 287 KLD, out of which 96 KLD water will be reuse in flushing of toilets, 155 KLD in Green Area Development/Plantation, 20 KLD Floor/Road Washing and (16 KLD Excess treated water will be used in irrigation of municipal; road side green area, our other construction project.).

Details of Dual Plumbing: - There will be a dual plumbing system for use of Ground water and treated Water which will result in optimal use of water for different applications thus saving on the high quality water. Installation of dual plumbing for using recycled water will save the potable water from municipal supply or ground water. There will be two pipe lines, one supplying freshwater for drinking, cooking etc. And other for supply of recycled water for flushing, landscape irrigation, etc. this will result in saving of fresh water demand and life of existing sewerage will be improved.

Water supply plans has been attached.

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

No, there will not be any diversion of water from other users. Rise in water demand is a local phenomenon but the project would have limited regional impact on water reserves.

The fresh water requirement of the project will be reduced by adopting above said Water Conservation Measures in construction of Building structures of Housing project. The waste water generated in the form of sewage will be treated in STP and reutilized in irrigation of municipal; road side green area, our other construction project and treated water drain to municipal sever.

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).

The incremental pollution load from waste water generated from the proposed activity is negligible. We are adopting the measures like-STP for the treatment of waste water generated from the proposed project & whole treated water will used in the project premises.

Total water requirement of proposed project (Phase-1) will be 538 KLD, which will be included the fresh water requirement of 267 KLD and recycled treated water requirement of 271 KLD for flushing. Total waste water generation from the project (Phase-1) will be 319 KLD, which will be includes 80% of sewage generation from domestic uses and 100% of flushing uses. The total capacity of STP will be 351 KLD. Treated water recovery from STP in Phase-1 will be 287 KLD, out of which 96 KLD water will be reuse in flushing of toilets, 155 KLD in Green Area Development/Plantation, 20 KLD Floor/Road Washing and (16 KLD Excess treated water will be used in irrigation of municipal; road side green area, our other construction project.).

The fresh water requirement of the project will be reduced by adopting above said Water Conservation Measures in construction of proposed project.

The expected characteristics of wastewater and treated wastewater are as given below:

CHARACTERISTICS OF WASTE WATER

S. No.	Parameters	Raw sewage	Treated sewage
1.	Quantity of sewage	319	287
2.	PH	6.0	8.5
3.	BOD	250-300 mg/L	<30 mg/L
4.	Total Suspended Solids	300-450 mg/L	<90 mg/L
5.	COD	300-450 mg/L	< 150 mg/L
6.	Oil & Grease	50 mg/L	<10 mg/L

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

The rainwater collected from the rooftop and other paved areas within the project area will be conveyed into to the rainwater harvesting system consisting of de-silting-cum-filter Chamber, Oil & Grease Separators and Boreholes for recharge into the groundwater. The cross section of Rain water Harvesting pits and the site Plan showing location of STP and RWH pits are enclosed**.** Rainwater harvesting plan is as per the design approved in the manual issued by the GOI.

Details of rainwater harvesting calculation are given below:

RAIN WATER HARVESTING DETAILS

S. No.	Type of Surface	Catchment's Area		Run off Co-eff. [C]	Intensity of Rainfall (mm/hr)	Discharge (Run Off) [Q=10CIA] m^3/hr	Total (m^3/hr) [Q]
		sq. m.	Ha.				
1	**Building/ Rooftop (Ground Coverage)**						
(a)	Area	33733.62	3.373362	0.90	45	10X0.90X45X3.373362	1366.21
2	**Paved Surface / Road Surface**						
(a)	Area	115481.64	11.548164	0.70	45	10X0.70X45X11.548164	3637.67
3	**Natural Ground & Greens Area**						
(a)	Area	35741.50	3.57415	0.20	45	10X0.20X45X3.57415	321.67
Grand Total (1+2+3)							**5325.55 say 5326 cu. m.**

Considering 15 min (0.250 Hr) Retention Period

Volume Required = 5326 X 0.250

Volume = 1331.5 say 1332 cu.m. /hr

Volume of 1 Rain Water Harvesting Pit

Length of Pit (L) : 4.75 M, Width of Pit (W) :4.75 M, Depth of Pit (D);: 7.25 M

Volume of Pit = L x W x D

= 3.5 x 3.5 x 7.0 = 85.75 SAY 86 cu. m.

Total no. of Rainwater Harvesting Pits required

= 1332/86 = 15.48 Say 16

Total Number 16 no. of Rainwater Harvesting Pits required; however we are providing 19 pits.

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 adverse impacts are envisaged due to proposed project on the runoff characteristics of the area as adequate arrangements will be made to trap the rainwater and suitable storm water drainage system will be provided. During the post-construction phase, Runoff from the project shall not be allowed to stand or enter into the roadside or nearby drain. Adequate measures shall be taken to collect such run off and either shall be reused or recharged through pits Suitable garlanding drain as per the existing contours of the plot will be developed. No problem of flooding and water logging is envisaged as excess run-off will be drained to Ground water.

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?

The proposed building structure will have rainwater-harvesting infrastructure. The rainwater harvesting facility will recharge the ground water, which will have positive impact on the ground water. Water requirement will be reduced by recycling of treated water. The ground water will be abstracted to meet the fresh water requirement of the project in operational phase but it will be done only after getting prior approval from competent authority.

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).

To prevent degradation and maintain the quality of the water source, adequate control measure has been proposed to check the surface run-off. Following management measures are suggested to protect the water quality during the construction phase: -

- Avoiding excavation during monsoon season.
- Care will be taken to avoid soil erosion.
- The storm water disposal system for the premises shall be self-sufficient to avoid any

collection/ stagnation and flooding of water. Maximum harvesting will be done within the site.

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 storm water disposal system for the premises shall be self-sufficient to avoid any collection/stagnation and flooding of water. Maximum harvesting will be done within the site.

A detailed "Storm Water Management Plan" will be developed. The plan will incorporate best management practices which will include following:

- Rain water outlets/ spouts/Khurras will be provided in terrace for taking out rainwater.
- Percolation wells will be provided for rainwater harvesting and to raise subsoil water level.
- The rainwater collected through channels and catch basins will be disposed off into Percolation / rain water harvesting pits. The overflow from the percolation / rainwater harvesting pits will be connected to the nearby storm water drain available from local public body.
- A grating at the main entrance will be provided to prevent entry of outside rainwater to the premises.
- All road crossings for services shall be provided with RCC Hume pipe and manholes for the ease of maintenance and to avoid any digging of roads.

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

No, temporary sites will be provided for housing of construction labours. Most of the workers will come from the nearby areas. They will be coming by their own and will return same day after their work is over. Rest shelters, wash place, toilets will be provided to local labourers on the project site. Portable toilets with soak pit/mobile STP facility will be provided to treat the wastewater generated during construction phase. This water will be recycled back, to be re-used during construction phase.

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).

Total water requirement of proposed project (Phase-1) will be 538 KLD, which will be included the fresh water requirement of 267 KLD and recycled treated water requirement of 271 KLD for flushing. Total waste water generation from the project (Phase-1) will be 319 KLD, which will be

includes 80% of sewage generation from domestic uses and 100% of flushing uses. The total capacity of STP will be 351 KLD. Treated water recovery from STP in Phase-1 will be 287 KLD, out of which 96 KLD water will be reuse in flushing of toilets, 155 KLD in Green Area Development/Plantation, 20 KLD Floor/Road Washing and (16 KLD Excess treated water will be used in irrigation of municipal; road side green area, our other construction project.).

The fresh water requirement of the project will be reduced by adopting above said Water Conservation Measures in construction of proposed project.

Sewage Quantity, Treatment, Reuse & Disposal

Quantity of sewage	319 KLD
Collection of sewage	Sewage generated during the operation phase will be collected through underground sewerage system (pipe drain) for treatment in STP.
Treatment of sewage	STP of 351 KLD capacity (Phase 1)
Reuse/recycle and Disposal of treated sewage	96 KLD will be used in flushing + 155 KLD shall be utilized for the purpose of green area development, 20 KLD Vehicle /Floor washing, and 16 KLD excess treated water will be used in irrigation of municipal; road side green area, our other construction project.
Location of the STP	Underground

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

Total water requirement of proposed project (Phase-1) will be 538 KLD, which will be included the fresh water requirement of 267 KLD and recycled treated water requirement of 271 KLD for flushing. Total waste water generation from the project (Phase-1) will be 319 KLD, which will be includes 80% of sewage generation from domestic uses and 100% of flushing uses. The total capacity of STP will be 351 KLD. Treated water recovery from STP in Phase-1 will be 287 KLD, out of which 96 KLD water will be reuse in flushing of toilets, 155 KLD in Green Area Development/Plantation, 20 KLD Floor/Road Washing and (16 KLD Excess treated water will be used in irrigation of municipal; road side green area, our other construction project.).

The fresh water requirement of the project will be reduced by adopting above said Water Conservation Measures in construction of proposed project.

There will be a dual plumbing system for use of water with different water quality namely Municipal Supply Water/Ground water and Recycled Water which will result in optimal use of water

for different applications thus saving on the high quality water. Installation of dual plumbing for using recycled water will save the potable water from municipal supply or ground water. There will be two pipe lines, one supplying freshwater for drinking, cooking etc. and other for supply of recycled water for flushing, landscape irrigation, etc. This will result in saving fresh water demand and life of existing sewerage will be improved.

a. The first alternative would be to directly re-lift the domestic water from the underground tank to the terrace fire tank, from where it will overflow into the domestic water tank. From this terrace tank, water shall be supplied by gravity to all end users points, as per requirement of building, through the detailed distribution system.

b. It is possible that all mechanical equipments shall have 100 % backup to prevent any break-down in the system.

c. Domestic overhead tank- thereby gravity this tank will feed to all usage points.

3. VEGETATION

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

Only wild grasses and small bushy shrubs with few trees on boundary are found on the area. No threatened, rare, endangered or endemic species were observed during the survey in core zone.

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

The land for proposed project is a private land & will be used for the development of residential & commercial project. There is no major vegetation within the core zone; so, there will be no modification or clearing due to proposed project. Further as the project related activities (during construction and operation) are confined within the project premises, no cutting of tree in the project influence area is anticipated.

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?).

Extensive plantation and green area development in the area of 30848.02 sq. m (~ 10 % of total plot Area) is planned in the proposed project along with landscaping. This is here by ensured that the indigenous / local plants will be planted all around the periphery of the project area and along the roadsides. Plantations would be of large leaf trees that provide adequate shade and are evergreen to semi-evergreen. Efforts will be made to plant species like – *Ficus religiosa (Pipal), Saraca asoca (Ashok), Dalbargia sissoo (Shisham), Delonix regia (Gulmohar), Alostonia, scholaris (Saptparni),*

Phoenix sylvestris (Khajoor), Plumeria alba (Champa), Cassia fistula (Amaltas), Azadirachta indica (Neem), Thespesia populaenea (Paras pipal) etc.

Green-area development on the project lay-out is enclosed**.**

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 threatened, rare, endangered or endemic faunal species were observed during the survey in core zone. No displacement of fauna is envisaged due to this project. The proposed site and its surrounding urban set up do not support any habitat for any group of wild animals except a few small animals which are well adapted to urban areas.

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

No direct or indirect impact on avifauna is envisaged. However, after the commissioning of the project the better environmental conditions may provide a better habitat to the avifauna of the area.

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

No direct or indirect impact on fauna is envisaged. However, after the commissioning of the project the better environmental conditions may provide a better habitat to the avifauna of the area.

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).

The baseline study of the ambient air quality reveals that the air quality parameters are below NAAQS standards.

Laboratory test results of Ambient Air Quality Monitoring of the project site are enclosed**.** The D.G. sets will have a stack height of as per CPCB norms.

The project activities will not increase the atmospheric concentration of gases to such an extent that it may lead to the formation of heat islands. Emissions will only be through D.G sets only in case of power failure and vehicular movement.

There will be the provision of acoustic enclosures & adequate stack height as per the CPCB guidelines to minimize the impact due to DG sets.

The marginal increase in traffic due to project is not going to cause any significant increase in atmospheric concentration of gases and will not result in heat island formation.

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 burning of fuel through D.G. sets, traffic movements, operation of construction machines / equipment and domestic activities at site.

Construction activities will lead to dust generation, emission of NO_2, SO_2 and PM.

The impacts on the ambient air quality during construction phase will be temporarily and reversible in nature (for short duration) and will be restricted to only a small area. During operation phase, D.G. set will be having adequate stack height, there will be development of green-area and maintenance of vehicles, all these efforts will reduce the impact.

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.

There will be the sufficient parking space for the vehicles. The provision of parking space will be as per the Norms. The parking provision will be made at open surface, stilt and basement. As this Project phase 1, the proposed parking will be 765 ECU.

REQUIRED PARKING

Particular	Calculation	Total Required Parking (ECU)
Parking Requirement for Villas	1 Villa required Parking @1 ECU (up to Plot Area 250 sq.m.) 320 Villas x 1ECU =320 ECU	320
Parking requirement for Flats	**BAR/115 sq.m.** 32142.20/115 sq.m.= 280 ECU **Extra Visitor Parking**= up to 100 ECU@25% + Further 100 ECU@20% and Further 200-300 ECU@15% = 57 Total = 280+57=337 ECU	337
Commercial Parking Requirements	Commercial Area Parking = BAR/75 1474.58/75= 19.66 Say 20 ECU 25% Visitor Parking =5 ECU Total Parking = 25 ECU	25
Total Required Parking		**682 ECU**

PROPOSED PARKING

Type of Parking	Total Area (in sq. m.)	Proposed Parking ECU
Surface Parking (@23 sq. m. per ECU)	11408.40	496
Stilt Parking (@28 sq. m. per ECU)	1293.80	39
Basement Parking (@32 sq. m. per ECU)	7540	230
Total	**-**	**765 ECU**

Parking plans are enclosed.

Transport Infrastructure:

Connectivity: The Project site is connected with 24 & 36 m wide road and connected to other parts of the Jodhpur. Basni Railway Station is approximately 6.0 km in East direction, Bhagat Ki Kothi Railway Station is approximately 7.5 km in NE direction, Jodhpur Airport- Approx 9.0 km in ENE direction from the project site. National Highway-112 is approx. 6.00 km in ESE direction from the project site. So the project site is well connected by network of roads leading to various parts of state. Thus no new road will be laid during construction or operation of the project activities except internal roads & pathways.

Adequate measures have been proposed to manage the traffic within and outside the site. There will be a proper entrance and exits for the proposed project to segregate the incoming and outgoing traffic. The vehicular traffic will move around the periphery of the project without disturbing the landscaped areas and organized open spaces.

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

In the circulation plan of the project, there will be proper entry and exit points for systematic control of the vehicular movement within the project.

The project has roads running on the periphery at all sides that will facilitate the movement of traffic. Internal roads, footpaths, with suitable width have also been provided. Adequate lighting arrangement has been provided covering all corners.

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

There will be a marginal increase in the traffic noise; the sources are due to traffic movement within the project area.

The traffic movement will be only in daytime during the construction phase. In operational phase, only residents and visitors to the proposed project will come and vehicular movement due to them only will be occurring. The pollution will be in very small quantity and it will be further minimized by plantation on the sides and around the periphery of whole project.

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

Total capacity of 2 No. of D.G. sets of total capacity 360 KVA (2X180 KVA) will be used for back-up. So, DG Sets will be used for power back-up. So, D.G. set will be the main source of air and noise pollution. Gaseous pollutants like NO_2, SO_2 and PM shall be generated from activities like burning of fuel through D.G. sets. LSD diesel will be used.

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

Impacts on Air Quality

Impacts on ambient air quality during operation due to emissions from the stacks attached to standby D.G. sets would be very less. However suitable mitigation measures will be adopted.

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

- D.G. sets will be used only during power failure
- D.G. sets will comply with the applicable emission norms.
- Adequate stack height for D.G. sets will be provided as per C.P.C.B. norms.
- During operation stage, monitoring of emissions from D.G. sets and ambient air quality will be carried out as per norms.

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?

As the proposed site consist of wild grasses and weeds which shall be cleared during the construction phase. Moreover the approval of the architectural plan of the building will be taken from local development authority.

The proposed proposal will not in any way result in the obstruction of a view scenic amenity or landscapes. The present project itself is planned with provisions of landscaping and green area development. This will surely enhance the aesthetic beauty of the area.

The external finishes proposed are consistent with the contemporary image of efficient and utilitarian built environment.

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

Proposed Residential & Commercial Township Project at Khasra Nos.: 114/2, 114/5, 115, 129, 122/1, 124/1, 124, 125, 126, 126/1, 127/1, 127/2, 127/3, 127/4 in Pal Village & Khasra No. 210, 211 & 212 in Gangana Village, Tehsil & District: Jodhpur (Rajasthan) by M/s. Aasan Realty Pvt. Ltd. The project is envisaged as a zero discharge project which will be self-sustaining and environmentally friendly using passive cooling measures such as cavity walls, deep recesses and introduction of green belts in the architectural design. This will be further augmented by active strategies in energy conservation for street lighting, hot water provision, rain water harvesting, recycling and reuse of treated water for air conditioning, flushing and irrigation. The design of the master plan shall also encourage walking by creating shaded walkways and bicycle tracks for movement. Local materials will be used as far as possible to enhance the economic viability of the project. Hence, no adverse impacts are anticipated from township Project on the existing structures in this area.

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

There are no local considerations of urban forms & urban design influencing the design criteria. The proposed township pproject will be constructed within the designed site as per the defined building by-laws of Local Development Authority.

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

There is not any anthropological or archaeological site or artifacts or any other significant features in the vicinity of the proposed site.

7. SOCIO-ECONOMIC ASPECTS

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

The proposed project shall provide value addition to the existing infrastructure, as due to development of this Project facility such as public transport, water supply, telex-communications, power lines, road maintenance etc. shall be upgraded in and around the project premises.

The project is situated in the residential zone and hence there will be no change in demographic structure.

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

The project site is located in the development area under the Urban Improvement Trust. The ancillary infrastructure like roads, markets, public health, amenities, conveyance facilities are under development in the project area. However all sorts of social infrastructure like transportation facilities, water supply & sanitation facilities, communication facilities, educational institutions, hospitals, markets, banks, cultural amenities etc. already exist in the area.

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

The proposed township project will be constructed within the designated site as per the defined building by-laws, There is no sacred site or cultural heritage site in nearby vicinity of proposed project hence any kind of adverse impacts are not envisaged. So, the proposed project will not cause any adverse effects on local communities or disturbance to sacred sites or other cultural values.

8. BUILDING MATERIALS

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

Conventional construction material will be used. Energy efficient building materials will be used as specified in the Energy Conservation Building Code. The major materials used for the construction of the proposed project will be steel, cement, bricks, metal, flooring tiles/stones, sanitary and hardware items, electrical fittings, water etc.

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

During the construction phase the air quality will have adverse impact. Construction activities especially related to handling of loose material likely to cause generation of fugitive dust that adversely impacts the air quality of the surrounding area of the project site. To minimize the impact, loose material will be either stacked or transported with proper covering.

During construction phase the expected noise levels will be between 70 – 85 dB (A), which will decreases with increase in distance. Administrative as well as engineering control of noise will be implemented.

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

As there is no availability of the recyclable building material in the vicinity of the proposed project site so recyclable materials cannot be used in the construction of proposed project.

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

The total solid waste generated from the project in the form of garbage (dry & wet) will be 1931 kg/day. Solid Waste garbage generated from residential/permanent population will be 1782 kg/day & 149 kg/day from visitors / floating population (which is calculated @ 450 gm/person/day for residential/permanent population & @ 250 gm/person/day for visitors / floating population respectively, as per the norms of MoEF's Manual on Norms & Standards for Environment Clearance of Large Construction Projects).

WASTE GENERATION DETAILS:

SOLID WASTE GENERATION: - 1931 kg/day

(i) From Residential/Permanent population: 3960 X @ 450 gm /person/day = 1782 kg/day

(ii) From Floating/Commercial Fixed population: 596 X @250 gm /person/day = 149 kg/day

Biodegradable & non bio degradable waste:

(i) Biodegradable Waste generation: 1931 (Total Solid waste) X 60% = 1159 kg/day

(ii) Non -Biodegradable Waste generation: 1931 (Total Solid waste) X 40% = 772 kg/day

(A**) Dry Waste generation**: - 1079 kg/day

From Residential population: 3960 X @250 gm /person/day =990 kg/day

From Floating population: 596 X @150 gm /person/day = 89 kg/day

(B) **Wet Waste generation**: - 852 kg/day

From Residential population: 3960 X @ 200 gm /person/day =792 kg/day

From Floating population: 596 X @100 gm /person/day = 60 kg/day

E-WASTE:

E-waste will be generated 0.10 MT/annum after 5 Years, shall be sold to authorized Vendors

C & D WASTE:

C & D waste will be generated 8-10% of total construction material.

DETAILS OF SOLID WASTE DISPOSAL

Solid wastes which are likely to be generated in project will be domestic in nature. Domestic wastes will be collected from designated locations and segregated into inorganic and organic wastes. The

inorganic non-biodegradable wastes will be sold to local vendors for recycling and the organic biodegradable wastes shall be composted to form manure.

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?

The total power requirement for proposed project is Connected Load 11751 KW & Essential Load 5916 KW.

The details of power requirement, source, backup power arrangement (i.e. generators) are given in the Table below.

Power Requirement, Source and Backup Arrangement

Sources of power	It will be sourced from JDVVNL
Backup power supply arrangement	2 No. of D.G. sets of total capacity 360 KVA (2X180 KVA) is proposed for Phase –I of the project, DG Sets will be used in case of power failure only.

Energy Conservation Measures & Management Plan :

- All common areas have been provided with LED fixtures to conserve power.
- Chilled water pumps shall be provided with Variable frequency drive system to cater exact loads.
- All external heating system has been provided with photocells to regulate and optimize their operations as per the actual need and thus resulting in power savings.
- Dynamic Balancing valves in piping reduce pump capacity & power consumption due to reducing pipe lengths.
- Tertiary treated water from STP is being utilized for flushing of toilets and green area development. This is not only resulting in saving of natural resources but also the power consumption for drawing extra ground water.
- Air handling unit shall be provided with Variable frequency drive system to cater exact loads.
- There shall be maximum utilization of natural light.
- There shall be provision of solar water heating system and provision of solar lighting for common areas.

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

In emergency situations, power will be supplied by 2 No. of D.G. sets of total capacity 360 KVA (2X180 KVA) to cater the demand load of the proposed residential project.

DG Sets will be available for back-up in case of power failure.

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?

Suitable thickness of glass depending upon the panel size to keep the U value as per the requirement of ECBC.

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

- The orientation of the building would be done in such a manner that most of glazed areas in north and east.
- Public areas will be cooled by natural ventilation as opposed to air conditioning.
- Lesser opening will be provided on the west facing walls.
- Landscape and green areas will be so spaced so as to cool the surrounding environment, which will reduce energy consumption.

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.

- Orientation is done in such a manner so that surface of the building cuts direct radiation of critical hours and thus building will be less affected with the heat. Building units will be made environment friendly with optimum use of solar radiations.
- There will be the provision of solar hot water system.
- Solar Lights shall be provided in Landscaping Area.

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?

The shading has been effective to reduce the cooling loads. The following techniques will be adopted:

- For walls on of the building, a maximum of proper window to wall ratio will be there to minimize solar radiation, which further helps minimizes cooling/ventilation costs.

- Living areas will be aligned to get maximum north south light and services areas are to be located on the western side.
- Shading will be used to increase cooling effect in the buildings.
- There will be less number of openings on the west side and more number of openings on the south side.
- Promoting awareness on energy conservation.
- Training of staff on methods of energy conservation and to be vigilant to such opportunities.
- Passive solar architectural measures will be adopted to provide shading devices for windows and roof, which would effectively reduce heating up of building envelope.
- Roofs will be painted with reflective, aluminum based paints with solar reflectance ranging from 0.3 - 0.6. This will result in less absorption of sunlight causing 40% back reflection and less heating of building structures during summer seasons.

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

- The design of the building will be such that maximum use of natural lighting can be achieved. The walls, roofs and opening will be designed that influx of heat is minimum. The design also incorporates the optimal and judicious use of natural lighting.
- It is a Township Project and will not be centrally air conditioned.
- **Energy Efficient Features:**
  - Use of LED lamps in common areas.
  - Will ensure energy efficiency in the building constructed by adopting technologies that can reduce energy consumption without sacrificing comfort and productivity of the occupants.

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

- The building shall use energy efficient and environmental friendly designs that will control formulation of heat island effect. There shall be also green cover at the site to reduce

formation of heat island. Passive design concepts have been used to minimize energy consumption and maximize the energy efficiency.

- Due to the proposed project there would be insignificant emission of air pollutants by vehicular movements and occasional use of D.G/ sets, hence no heat island effect is envisaged.
- To reduce the heat load reflective insulated glass shall be used in fenestrations to cut on heat loads and subsequently capital & operating cost of air conditioning.
- Overall all glazing shall be maintained.

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 envelope for external walls shall be made of bricks, concrete and steel. Proper roof insulation shall be provided to achieve desired thermal comfort. The entire building envelope, opening between conditioned and non- conditioned spaces shall be gasketed, provided with air curtains or sealed with sealants. Bricks, concrete & Glass shall be used as construction material.

R & U values: Achieved / permissible as per ECBC norms:

(i) **Roof:** 0.409/0.409

(ii) **Exposed wall**: 0.44/0.44

(iii) **Glazing:** 2.8/3.3

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

In case of emergency, immediate steps shall be taken to raise alarm and stop fire. The Fire Protection System would be based on the regulations of National Building Code and local fire norms.

- Fire extinguishing system shall include the following: -
  - Portable Fire extinguisher like; Dry chemical powder, CO_2 fire extinguisher, Fire bucket with sand & Foam extinguisher.
  - Yard Hydrant (External Hydrant System)
  - Down Comer in shopping area
- Electrical system except the lighting & fire fighting system shall be isolated.
- Water spray systems in the exposed area shall be used.

- In case of LPG leakage, precautions to avoid source of ignition shall be taken.
- Fire fighting personnel shall be protected with water spray and equipped with fire entry suit, water jet blanket, a safety area and a manned lifeline.
- The water required for fire reserve will be stored in underground and terrace tanks.

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

Glass will not be used as a wall material.

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

- Reduced air infiltration combined with proper ventilation cannot only reduce energy consumption but it can also improve the quality of indoor air.
- Outdoor air for which leakage account for 25 - 40% of energy will be used for heating and cooling in a typical building. For this purpose the building will be designed in a compact manner, leaving ventilation shafts in between for facilitating the escape of hot exhaust air.

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.

Non-conventional energy technologies shall be used to save overall energy consumption. Following technologies would be used in order to conserve energy:

- Replacement of High energy consuming incandescent lights with florescent lighting.
- Use of solar water heater and solar lamps Landscaping Area.
- Renewable energy technologies will be promoted in the form solar water heating. Solar water heating system consisting of solar panels of and hot water storage insulation tank is also proposed. Solar lamps shall be used in landscing areas.
- After testing the viability, solar energy will also be used to meet electricity requirements in landscaping areas.

10.0 ENVIRONMENTAL MANAGEMENT PLAN

DURING CONSTRUCTION PHASE

AIR MANAGEMENT

- Dust generation will be reduced by using sharp teeth for excavation machinery.
- Dust suppression system (water spray) will be used at construction site and unpaved roads.
- A team of safai karamcharis will be made available to remove dirt/debris from the floor/sites.
- During transportation, materials shall be covered by tarpaulin sheets.

- All the D.G. sets will have appropriate stack height as per the CPCB guideline.
- Company operated vehicle will go through regular maintenance & pollution check-up.
- Screens will be put up all along the periphery to contain the dust within the premises.

WATER QUALITY MANAGEMENT

- The water requirement during construction phase will be full filled by water tankers, arranged by the contractor.
- Proper storage and internal supply facilities shall be developed before undertaking construction activities.
- During construction phase proper bunding will be made to prevent runoff.

NOISE MANAGEMENT

- Provision of silencer to modulate padding / noise isolators at equipment / machinery used for construction.
- Provision of silencer to modulate the noise generated by machines.
- D.G. sets will be kept in acoustic enclosures.
- Provision of protective device like ear muff/plugs to the workers.
- Regular maintenance of vehicles & machinery would be taken up.
- Construction activity limited up to Day time only.

SOIL MANAGEMENT

- The excavated earth material generate during construction shall be utilized at site for the purpose of leveling and backfilling.
- Top soil generated during construction will be reuse in plantation and green area development.
- Soil shall be covered by tarpaulin sheets while transporting from site.
- Area shall be properly fenced and provided with proper drainage pattern.
- Construction work will not be carried out during heavy rainfall. It will be ensured that no soil is left unconsolidated after completion of work.
- Construction debris collect and stored at earmarked place for reuse immediately from the construction site and no accumulation shall be allowed.
- Proper collection and disposal of waste will be done during construction such as metal cuttings debris, plastic packing material, wooden logs etc.

WELFARE & SAFETY MEASURES FOR LABOURS

WELFARE:

- Potable drinking water
- Provide proper toilets and bathrooms
- Provide crèche facility for labour children
- Provide dispensary for first aid attended by male and female doctors
- Liaison with hospitals for emergencies

SAFETY:

- Measures for first aid, fire-fighting and premises evacuation
- Necessary contacts with appropriate emergency services (first aid, emergency medical care, rescue work and fire-fighting)
- Safety helmets, belts and slings, nets
- Properly braced scaffoldings
- Properly laid electrical cables and connections
- D.G. sets with acoustic enclosures to reduce noise pollution

ELECTRICAL HAZARDOUS PLAN

THE ELECTRICAL HAZARDS PLAN:

- To keep the power lines at standard heights such that these are beyond the reach of the workers.
- All connections to be provided with proper earthing.
- Provide Electrical Earth Leak Circuit Breakers.
- All equipment to be used in the manner prescribed.
- Avoid improper use of extension/flexible wires
- Provision of proper fuses to avoid short circuits
- Use of insulated tools by the concerned persons.

IN CASE OF ACCIDENTS

- Provide medical aid at site
- To keep liaison with nearest hospitals for emergency services.

ENVIRONMENTAL MANAGEMENT PLAN

DURING OPERATION PHASE

AIR MANAGEMENT

- DG Sets will be provided for power backup in case of power failure. High sulphur HSD will be used as fuel.

- The DG sets shall have appropriate stack height will be as per the guidelines of CPCB on the basis of their capacity.
- Proper ventilation system shall be provided to all part of the work areas of site.
- All operational vehicles will go through regular maintenance and pollution check up.
- All the private vehicle owners will be asked to have updated PUC (Pollution under Control) certificate.
- Large leaf plants will be use in tree plantation all around the project site and road side reduce the impact of the air pollution.

WATER MANAGEMENT

- The total water requirement for the proposed project (Phase-1) is 538 KLD, which includes fresh water 267 KLD and recycled water 271 KLD.
- The waste water generated from the project (Phase-1) will be about 319 KLD and treated water availability will be 287 KLD.
- The waste water generated will be treated in Sewage Treatment Plant by primary, secondary and tertiary treatment. The capacity of sewage treatment plant will be approx. 351 KLD.
- The treated water will be re-utilized in flushing, horticulture, Vehicle/road washing.
- Rain water harvesting system will be established within the premises to recharge ground water.

NOISE & VIBRATION MANAGEMENT

- Proper road network has been designed as per the prevailing guidelines for smooth operation of traffic; impact in noise level due to the operational traffic will be negligible.
- All the DG sets will be as per the E(P) Rule and noise level from the DG sets will be as per the prevailing standards. The sound control system designed to suppress the sound level to 75 db maximum at 1 meters distance in open free field environment as per ISO 8528 part 10.
- The DG will be built in Damper for anti-vibration.
- High class sheet metal (16 SWG-CRCA-Sheet) will be provided as an acoustic enclosure to reduce the noise level of DG set & also acts as weather proof housing. Genset will be an integral part of acoustic enclosure and whole construction will be on multi-fold sheet channels & ISMC sections.
- Enclosure construction will be fully bolted keeping in view the major service requirements; all doors will be provided with specially designed hinges.
- The D G sets will be used during event of power failure only.

- The landscape design along the periphery of the plot has been developed to achieve attenuation factor conforming to noise standards.
- The open spaces inside the plot is suitably landscaped and covered with vegetation to reduce the impact of noise.
- Provision of silencer to modulate padding / noise isolators at equipment / machinery used for construction.
- Provision of silencer to modulate the noise generated by machines.
- Provision of protective device like ear muff/plugs to the workers.
- Regular maintenance of vehicles & machinery would be taken up.
- Construction activity limited up to Day time only.
- D.G. sets will be kept in acoustic enclosures.
- The technical specification of the Acoustic Enclosure are as follows:
    - Silent DG set container shall be of modular construction with the provision to assemble and dismantle easily at site
    - Enclosure is powder coated (inside as well outside) with a special pure polyester based powder. All Nuts and bolt/external hardware are made from stainless steel.
    - The door handles are lockable type.
    - Soundproofing of enclosure is done with high quality rock wool/mineral wool confirming to IS8183.
    - The rock wool is further covered with fiber glass cloth and perforated powder coated ms sheet.
    - Specially designed attenuators are provided to control sound at air entry to the container and exit from the container.
    - Adequate ventilation is provided to meet air requirement for combustion and heat removal.
    - Temperatures of enclosure does not exceed beyond 5-7˚C of ambient temp.
    - There is no provision for emergency shutdown from outside the enclosure.
    - As per CPCB norms with acoustic enclosure the noise level shall be 75 dBA at one meter in absence of background noise.

SOLID WASTE MANAGEMENT

Total Solid Waste generated from Project (Residential & visiting population) will be 1931 kg/day.

SOLID WASTE GENERATION: - 1931 kg/day

(i) From Residential/Permanent population: 3960 X @ 450 gm /person/day = 1782 kg/day

(ii) From Floating/Commercial Fixed population: 596 X @250 gm /person/day = 149 kg/day

Biodegradable & non bio degradable waste:

(i) Biodegradable Waste generation: 1931 (Total Solid waste) X 60% = 1159 kg/day

(ii) Non -Biodegradable Waste generation: 1931 (Total Solid waste) X 40% = 772 kg/day

(A) **Dry Waste generation**: - 1079 kg/day

- From Residential population: 3960 X @250 gm /person/day =990 kg/day
- From Floating population: 596 X @150 gm /person/day = 89 kg/day

(B) **Wet Waste generation**: - 852 kg/day

- From Residential population: 3960 X @ 200 gm /person/day =792 kg/day
- From Floating population: 596 X @100 gm /person/day = 60 kg/day

E-WASTE:

E-waste will be generated 0.10 MT/annum after 5 Years, shall be sold to authorized Vendors There will be site for solid waste management.

C & D WASTE:

C & D waste will be generated 8-10% of total construction material.

- The type of solid waste generated from the project activity will be only the domestic.
- The solid waste generation will be in the form of sewage sludge generated from the STP.
- The sewage sludge from sewage treatment plant will be converted into an odorless soil conditioner and used as manure for gardening purposes.
- Waste storage bins will be provided for wet and dry garbage. The same shall be segregated and stored in bins.
- The biodegradable waste shall be composted to form manure and inorganic waste shall be sold to authorized vendor for recycling.
- Recyclable inorganic wastes will be sold.
- The collection, transportation, treatment and disposal of MSW will be serviced by the Authorized Agency/ Contractor.

GREEN AREA DEVELOPMENT MANAGEMENT

- Green area will be developed in an area of 30848.02 sq. m (~ 10 % of total plot Area) of the total plot area.

- It has been proposed to plant large leaf trees for roadside plantation and area is proposed for lawns & other green areas.
- Efforts will be made to plant species like *Ficus religiosa (Pipal), Saraca asoca (Ashok), Dalbargia sissoo (Shisham), Delonix regia (Gulmohar), Alostonia, scholaris (Saptparni), Phoenix sylvestris (Khajoor), Plumeria alba (Champa), Cassia fistula (Amaltas), Azadirachta indica (Neem), Thespesia populaenea (Paras pipal) etc.*
- Plantations would be of large leaf trees that provide adequate shade and are semi-evergreen to evergreen.

FIRE & SAFETY MANAGEMENT

- Fire Fighting Designed: As per National Building Code (NBC) 2005.
- As per the NBC / Local norms the present risk is falling under "LIGHT HAZARD".
- Fire System shall cover the following:
  - Portable Fire extinguisher
  - Yard Hydrant (External Hydrant System)
  - Down Comer in shopping area
- Fire Tender route will be given with access to each Tower (as evident from the site plan)
- Provision of fire escape staircase.
- External yard hydrants in galvanized steel fire hose cabinet (weather proof).
- Fire escape staircases as per NBC requirements.
- Fire Sprinklers & Fire Alarm system.
- Fire fighting equipments will be divided into water & Foam based fire fighting depending upon the nature of fire Sand buckets will be placed on each floor of the project.
- Fire fighting plan is being enclosed.

DETAILS OF ENERGY CONSERVATION MEASURES

- The design of the building will be such that maximum use of natural lighting can be achieved. The walls, roofs and opening will be designed that influx of heat is minimum. The design also incorporates the optimal and judicious use of natural lighting.
- It is a Township Project and will not be centrally air conditioned.

Energy Efficient Features:

- Use of LED lamps in common areas.
- Will ensure energy efficiency in the building constructed by adopting technologies that can reduce energy consumption without sacrificing comfort and productivity of the occupants.

ENVIRONMENTAL MONITORING PLAN – CONSTRUCTION PHASE

Source	Monitoring Location	Parameters to be Monitored	Frequency
Ambient Air Quality	At 1 location at boundary of the project site.	$PM_{2.5}$, PM_{10}, SO_x ,NO_x, CO	Once in three months
Ambient Noise	At 1 location at boundary of the project site.	Day and night equivalent noise level	Once in three months
Ground water	At 1 location nearest to the project site.	As per standards	Once in three months
Soil	At 1 location outside the project site.	As per standards	Once in three months

ENVIRONMENTAL MONITORING PLAN – OPERATION PHASE

Source	Monitoring Location	Parameters to be Monitored	Frequency
DG set emissions	DG stacks	PM, SO_x, NO_x, CO	Twice in a year or as per requirement of SPCB
DG set noise	At 0.5 m distance from enclosure	Noise level	Twice in a year or as per requirement of SPCB
Sewage Treatment Plant	Inlet and Outlet	pH,BOD, COD Suspended Solid, Oil & Grease	Twice in a year or as per requirement of SPCB
Ambient Air Quality	At 3 locations	$PM_{2.5}$, PM_{10}, SO_2, NO_2 , CO	Once in each non-monsoon season or as per requirement of SPCB
Ambient Noise	At 3 locations	Day and night equivalent noise level	Once in a season or as per requirement of SPCB