

FORM 1

I Basic Information

S. No	Item	Details
1.	Name of the Project/s	: Sudha Medical College and Hospital Promoted by: Indian Mission of Medical Sciences Society
2.	S. No. in the schedule	: 8(a) { <i>Building and Construction projects $\geq 20,000$ sq. m. and $<1,50,000$ sq. m. of built-up area</i> } As per the Gazette Notification no. S.O. 3252 (E) dated 22.12.2014 and subsequent amendment vide office memorandum no. 19-2/2013-IA-III dated 09.06.2015, educational institutes including Universities are exempted from obtaining prior Environmental Clearance. However, in case of Medical universities/Institutes the component of Hospitals requires prior Environmental Clearance.
3.	Proposed capacity/ area/ length/ tonnage to be handled/ command area/ lease area/ number of wells to be drilled	: Total Plot Area : 1,84,100 sq. m. Built up Area : 65,146.59 sq. m. (Hospital component) Total built up area : 1,18,063.13 sq. m. (including Hospital, medical college and residential areas) The project involves the construction of hospital & medical college project with capacity 750 beds & 750 nos. of students and other facilities like students & staff housing. The details of the project are tabulated as under:

S. No	No. Of Blocks	No. of Floors	Capacity	Built up area
1.	Hospital Block	G+3	750 beds	65146.59
2.	Medical College	G+3	750nos.	22550
3.	UG Hostel Boys	G+3	124 rooms	8012.00
4.	UG Hostel Girls	G+3	60 rooms	4832.44
5.	Resident Hostel Boys	G+3	48 rooms	1717.20
6.	Resident Hostel Girls	G+2	36 rooms	1287.90

7.	Nursing Hostel boys	G+3	49 rooms	2194.40
8.	Nursing Hostel girls	G+2	30 rooms	1281.60
9.	Interns Hostel (Male)	G+2	48 rooms	1470.00
10.	Interns Hostel (Female)	G+2	30 rooms	1044.00
11.	Teaching staff	G+3	16 flats	2728.00
12.	Non Teaching staff	G+2	18 flats	2376.00
13.	Dean & principal residence	Ground	-	900.00
14.	Mortuary	Ground	-	330.24
15.	Animal House Shed	Ground	-	223.26
16.	Security office	Ground	-	60.50
17.	Sub Station	Ground	-	51.00
18.	Gym	Ground	-	200.00
19.	Gas Manifold Shed	Ground	-	170.00
20.	Outside Change Room	Ground	-	288.00
21.	Laundry	Ground	-	200.00
22.	Misc.	Ground	-	1000
Total				118063.13

4.	New/Expansion/Modernization	:	New
5.	Existing capacity/area etc	:	No applicable
6.	Category of project i.e. 'A' or 'B'	:	Category- B2
7.	Does it attract the general condition? If yes, please specify.	:	General conditions are not applicable on projects listed under Item 8 of Schedule of EIA Notification, 2006 and its subsequent amendments thereof.
8.	Does it attract the specific condition? If yes, please specify.	:	Specific conditions are not applicable on projects listed under item 8 of the schedule- EIA notification, 2006 and its subsequent amendments thereof.
9.	Location		
	Plot/Survey/Khasra no.	:	-
	Village	:	Umedpura, via Jagpura
	Tehsil	:	Ladpura
	District	:	Kota
	State	:	Rajasthan

The Geographical Location is as under :																
<table border="1"> <tr> <td> 1. Point 1 Latitude : 25° 3' 34.40" N Longitude : 75° 52' 35.44" E </td> <td> 2. Point 2 Latitude : 25° 3' 36.40" N Longitude : 75° 52' 46.65" E </td> </tr> <tr> <td> 3. Point 3 Latitude : 25° 3'37.13"N Longitude : 75° 52' 52.47"E </td> <td> 4. Point 4 Latitude : 25° 3' 28.52"N Longitude : 75° 52' 56.74"E </td> </tr> <tr> <td> 4. Point 5 Latitude : 25° 3'24.12"N Longitude : 75° 52' 54.59"E </td> <td> 5. Point 6 Latitude : 25° 3' 21.69"N Longitude : 75° 52' 49.25"E </td> </tr> <tr> <td> 6. Point 7 Latitude : 25° 3'25.23"N Longitude : 75° 52' 38.25"E </td> <td> 7. Point 8 Latitude : 25° 3' 29.86"N Longitude : 75° 52' 33.35"E </td> </tr> </table>		1. Point 1 Latitude : 25° 3' 34.40" N Longitude : 75° 52' 35.44" E	2. Point 2 Latitude : 25° 3' 36.40" N Longitude : 75° 52' 46.65" E	3. Point 3 Latitude : 25° 3'37.13"N Longitude : 75° 52' 52.47"E	4. Point 4 Latitude : 25° 3' 28.52"N Longitude : 75° 52' 56.74"E	4. Point 5 Latitude : 25° 3'24.12"N Longitude : 75° 52' 54.59"E	5. Point 6 Latitude : 25° 3' 21.69"N Longitude : 75° 52' 49.25"E	6. Point 7 Latitude : 25° 3'25.23"N Longitude : 75° 52' 38.25"E	7. Point 8 Latitude : 25° 3' 29.86"N Longitude : 75° 52' 33.35"E							
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10.	Nearest Railway station/ Airport : along with distance in kms.															
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11.	Nearest Town, City, District : Headquarters along with distance in kms.															
Nearest District Headquarter: Collectorate- 16.07 km. towards NNW.																
12.	Village Panchayat, Zilla Parishad, : Municipal Corporation, Local body (Complete postal address with telephone no. to be given)															
The proposed project site is under the jurisdiction of Urban Improvement Trust. <u>Address:</u> Urban Improvement Trust Near C.A.D. Circle, Kota, Rajasthan E-mail: kotaut@yahoo.com																

13.	Name of the applicant	:	Indian mission of Medical Science Society
14.	Registered address	:	Gram Ummedpura, Jagpura, Behind the Jagpura Police Chowki, at Jagpura, Daad Devi Road, Tehsil Ladpura, N.H. 12, Distt. Kota, Rajasthan -324005
15.	Address for correspondence:		
	Name	:	Dr. R. K. Agarwal
	Designation (Owner/Partner/ CEO)	:	President
	Address	:	Gram Ummedpura, Jagpura, Behind the Jagpura Police Chowki, at Jagpura, Daad Devi Road, Tehsil Ladpura, N.H. 12, Distt. Kota, Rajasthan.
	Pin Code	:	324005
	E-mail	:	sudha.hospital17@gmail.com
	Telephone no.	:	-
	Fax No.	:	-
16.	Details of alternative sites examined, if any. Location of these sites should be shown on a Toposheet.	:	No alternative site was examined.
17.	Interlinked projects	:	No
18.	Whether separate application of interlinked project has been submitted?	:	No
19.	If yes, date of submission	:	No
20.	If no, reason	:	There is no interlinked project.

21.	Whether the proposal involves approval/ Clearance under: if yes, details of the same and their status to be given. a. The Forest (Conservation) Act, (1980)? b. The Wildlife (Protection) Act, 1972? c. The C.R.Z. Notification, 1991?	:	No
22.	Whether there is any Government Order/ Policy relevant/ relating to the site	:	Yes, as per the Gazette Notification no. S.O. 3252 (E) dated 22.12.2014 and subsequent amendment vide office memorandum no. 19-2/2013-IA-III dated 09.06.2015, educational institutes including Universities are exempted from obtaining prior Environmental Clearance. However, in case of Medical universities/Institutes the component of Hospitals requires prior Environmental Clearance.
23.	Forest land involved (hectares)	:	No
24.	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up? a. Name of the Court b. Case No. c. Orders/directions of the court, if any and its relevance with the proposed project.	:	No litigation is pending against the project and/or land in which the project is proposed to be set up.

II. Activity

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

S. No	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	Yes/ No	<p>Land-use: With coming up of the project, the land use will not change as the proposed land has been allotted for construction of Medical College & Hospital purposes. The land documents are enclosed as Annexure II.</p> <p>Land cover: There will be permanent change in the land cover and the intensity of land use w.r.t. project site. The site is mostly vacant covered with perennial vegetation which will be cleared and the site will be developed into a residential building. The intensity of land cover will change from presently vacant land to medical college & hospital project having a foot print area of about 15.25 % (28091sq.m.)</p> <p>Topography: The topography of the site is undulating. Contour plan enclosed as Annexure III.</p>
1.2	Clearance of existing land, vegetation and buildings?	Yes/ No	<p>Land & Building: There will be scraping off the land cover during the excavation of basement/lower ground floor, which will be balanced within the project site itself to the best possible extent.</p> <p>Vegetation: Neem (<i>Azadirachta indica</i>-10 nos.), Siris (<i>Albizia lebbek</i>-5 nos.) and Kikar (<i>Acacia nilotica</i>-3 nos.) trees are present at project site. Apart from this minor vegetation clearance will be done.</p>
1.3	Creation of new land uses?	Yes/ No	The proposed land is already designated for

			<p>construction of Medical college and hospital. The internal land-use break-up (project) is given as under:</p>
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S. No.	Particulars	Permissible	Proposed
1	Total Plot Area	1,84,100 sq.m.	
2	BAR	2 (368200 sq.m.)	0.64 (1,18,063 sq. m.)
3	Built-up Area	1,18,063 sq. m.	
4	Ground coverage	25 % (46025 sq. m.)	15.25 %(28091sq.m.)
5	Landscape Area	-	66,193.75sq.m. (35.96%)
6	Paved area including parking area	-	89,815.25 sq.m.(48.79%)

1.4	Pre-construction investigations e.g. bore houses, soil testing?	No	There will be no physical impacts on the locality due to the soil testing or other pre-construction investigations.										
1.5	Constriction works?	Yes	<p>The project will envisage a built up area of 1,18,063 sq. m.</p> <table border="1"> <thead> <tr> <th colspan="2">Anticipated Environmental Impacts on physical environment</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Increase in fugitive emissions during construction phase</td> </tr> <tr> <td>2.</td> <td>Increase in traffic levels</td> </tr> <tr> <td>3.</td> <td>Drainage</td> </tr> <tr> <td>4.</td> <td>Landscape & Visual considerations</td> </tr> </tbody> </table> <p>The impact on physical environment will be temporary in terms of fugitive emissions. Best construction practices will be adhered to minimize the impacts.</p>	Anticipated Environmental Impacts on physical environment		1.	Increase in fugitive emissions during construction phase	2.	Increase in traffic levels	3.	Drainage	4.	Landscape & Visual considerations
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S. No.	Guidance on	Practices to reduce emission
1.	Water Application	Water will be applied by variety of methods, for instance trucks, hoses, sprinklers, etc to mitigate dust generation from the construction site.
2.	Storage Piles	<ul style="list-style-type: none"> • Storage pile activity will be conducted downwind • Enclosures/ coverings will be used for storage piles • Properly shape storage piles will be considered.
3.	Vehicles & Equipments	<ul style="list-style-type: none"> • Engines & exhaust systems will be properly maintained. • Low sulphur diesel (HSD) will be used. • Idling time will be eliminated/ reduced to the minimum • Evaporative losses will be minimized
4.	Material Handling & Transfer systems	<ul style="list-style-type: none"> • Mud and dirt track-out and carryout will be controlled properly. • Material drop will be minimized at the transfer point and enclosure • Loads on haul trucks will be secured. • PM emissions from spills will be prevented. • Material handling operations will be minimized.
5.	Road Surfaces	<ul style="list-style-type: none"> • On-site vehicle restrictions will be established. • Unpaved roads will be properly maintained.

1.6	Demolition works?	No.	The proposed project will not involve any demolition work.
1.7	Temporary sites used for construction works or housing of construction workers?	No	<p>Temporary store-rooms and site office built which will be removed later. The impact due to the same will be confined to the construction phase only and thus can be categorized as temporary.</p> <p>Following facilities have been provided to the construction labourers:</p> <ul style="list-style-type: none"> • Temporary housing facility • Sanitation (including separate toilet (mobile) for male and female workers) • Drinking water facility • Crèche

1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	Yes	The project will attain a maximum height of 18.65 m (up to terrace level). Thus, there will be a visual impact from the project. However, the project will have about 35.96 % area under landscape, which will enhance the landscape of the area.
1.9	Underground works including mining or tunnelling?	No	Not Applicable
1.10	Reclamation works?	No	Not Applicable
1.11	Dredging?	No	Not Applicable
1.12	Offshore structures?	No	Not Applicable
1.13	Production & manufacturing processes?	No	Not Applicable
1.14	Facilities for storage of goods or materials?	No	Temporary store rooms for the storage of construction materials will be built at the site which will be removed later. Thus, the impact on physical environment will be temporal. During the operational phase, there will be well-designated confined storage areas within the building, which will not have impact on the physical environment.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	Construction phase: During construction phase about 7083 MT of construction waste will be generated which will be reutilized to the extent possible and will be disposed off through authorized vendors. About 27 kg/day of municipal solid waste will be generated which will be disposed off to the municipality disposal site. Post Construction Phase: Municipal Solid Waste: About 2127 kg/day of municipal solid waste will be generated from the project. The solid waste generated will be disposed

			<p>off as per MSW Rules.</p> <p>Bio Medical Waste: About 532 kg/day (@25% of total hospital waste) of Bio medical waste will be generated from the hospital which will be disposed off to Common bio-medical waste treatment facilities.</p>														
1.16	Facilities for long term housing of operational workers?	No	<p>In the post construction phase, residential facilities will be provided for staff and students.</p> <table border="1"> <tr> <td>Total no of UG hostel rooms</td> <td>184 nos</td> </tr> <tr> <td>Total no of Resident Hostel rooms</td> <td>84 nos.</td> </tr> <tr> <td>Total no of Nursing Hostel rooms</td> <td>79 nos.</td> </tr> <tr> <td>Total no of Inter Hostel rooms</td> <td>78 nos</td> </tr> <tr> <td>Total no of Teaching staff (2 BHK)</td> <td>16 nos.</td> </tr> <tr> <td>Non Teaching staff (1 BHK)</td> <td>18 nos.</td> </tr> <tr> <td>Dean, Principal & guest house</td> <td>4 nos.</td> </tr> </table> <p>In situ accommodation will benefit by contributing to reduced carbon footprint due to vehicular emissions and congestions. Thus, will have positive impact on physical environment.</p>	Total no of UG hostel rooms	184 nos	Total no of Resident Hostel rooms	84 nos.	Total no of Nursing Hostel rooms	79 nos.	Total no of Inter Hostel rooms	78 nos	Total no of Teaching staff (2 BHK)	16 nos.	Non Teaching staff (1 BHK)	18 nos.	Dean, Principal & guest house	4 nos.
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1.17	New road rail or sea traffic during construction or operation?	No	<p>There will be no new road and rail.</p> <p>During construction phase, traffic will increase due to movement of vehicles carrying construction material.</p> <p>The impact in terms of traffic movements will be significant, though the project is coming up in the outskirts of Kota city having moderate levels of traffic movements.</p>														
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No	<p>There is no new rail, air-borne transport infrastructure required for the project.</p>														
1.19	Closure or diversion of	No	<p>Due to the upcoming project, there will be no</p>														

	existing transport routes or infrastructure leading to changes in traffic movements?		closure or diversion of existing transport routes or infrastructures leading to changes in traffic movements.
1.20	New or diverted transmission lines or pipelines?	No	There will be no diversion of transmission and pipelines, though the project involves construction of new internal pipelines for fresh water, recycled water, rain water harvesting, sewer lines and internal power distribution lines.
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	The project will not involve any impoundment, damming, culverting or realignment or other changes to the hydrology of watercourses or aquifers.
1.22	Stream crossings?	No	None
1.23	Abstraction or transfers of water from ground or surface waters?	No	The daily fresh water demand to the tune of about 370 KLD (135050cu. m./ annum) will be met through ground water (bore wells: 6 nos.). The project area is falling under Ladpura Block which is classified as semi critical for ground water use. Rain water harvesting has been devised to recharge the ground water aquifer.
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	No	Water body: There is no water body in and around project premises. Land Surface Run-off: The land surface affecting the drainage will be altered (retaining the same direction - though slope will be made gentle), however the impact will be confined to the site. There will be increase of 291 % in total surface run-off during post construction phase, which will be capturing through well designed storm-water pipe network of rain-water harvesting and will be

			used for recharge of the aquifers. The details are tabulated as under:								
<table border="1"> <thead> <tr> <th>Phase</th> <th>Total discharge (m³/ annum)</th> <th>% increase in run-off</th> </tr> </thead> <tbody> <tr> <td>Pre construction</td> <td>43576.47</td> <td rowspan="2">291%</td> </tr> <tr> <td>Post construction</td> <td>12,7,109</td> </tr> </tbody> </table>				Phase	Total discharge (m ³ / annum)	% increase in run-off	Pre construction	43576.47	291%	Post construction	12,7,109
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1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	<p>Construction:</p> <p>There will be movement of personnel, materials and machineries during the construction phase.</p> <p>The impact due to the movement of personnel will be negligible as local people will be deployed and temporary housing facility will be provided for outside workers. The construction material and machinery required will be mobilized from the local area.</p> <p>Thus there will be contribution of marginal noise & vehicular emissions which will be mitigated by implementation of effective EMP.</p> <p>Post Construction:</p> <p>During commissioning, there will be transportation of personnel and materials in and out of the project regularly. There will be 1376 ECU peak on road due to the project on completion of project with 100% occupancy.</p>								
1.26	Long-term dismantling or decommissioning or restoration works?	No	Restoration works for the project on long-term will be an ongoing activity which will not have any impact on physical environment.								
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	There will be no decommissioning activity related to the project.								
1.28	Influx of people to an area in	Yes	During the construction phase, there will be inward								

	either temporarily or permanently?		and outward movement of local labour in the construction site, this will be an ongoing temporary activity and will not call for permanent influx of people. However, during the post construction phase, there will be regular influx of residents, patients, students, staff and related personals.
1.29	Introduction of alien species?	No	No alien species are present there.
1.30	Loss of native species or genetic diversity?	No	Native species of trees, shrubs and herbs will be planted in post construction period for sustain the environment.
1.31	Any other actions?	No	None

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

S. No.	Information/checklist confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data									
2.1	Land especially undeveloped or agricultural land (ha)	No	The plot area envisaged for the project is about 1,84,100 sq.m. (18.41 hectare).									
2.2	Water (expected source & competing users) unit:	Yes	As under: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Fresh</th> <th>Recycled</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>370 KLD</td> <td>399 KLD</td> <td>769 KLD</td> </tr> <tr> <td>370 KLD</td> <td>399 KLD</td> <td>769 KLD</td> </tr> </tbody> </table> <p>Expected Source: Fresh water: Ground water supply Recycled water: Treated water from STP The competing users are varied.</p>	Fresh	Recycled	Total	370 KLD	399 KLD	769 KLD	370 KLD	399 KLD	769 KLD
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2.3	Minerals (MT)	Yes	Bricks and stone (locally available in the market)									

2.4	Construction material – stone, aggregates, sand/soil (expected source – MT)	Yes	The approximate quantities of construction materials to be used are as under: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Material</th> <th>Quantity</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>Coarse aggregate</td> <td>57850 cu. m.</td> <td rowspan="5" style="text-align: center; vertical-align: middle;">Nearest market</td> </tr> <tr> <td>Fine aggregate</td> <td>61390 cu. m</td> </tr> <tr> <td>Cement (PPC/ OPC)</td> <td>850050bags</td> </tr> <tr> <td>Structural Steel</td> <td>7080 MT</td> </tr> <tr> <td>Bricks</td> <td>17945580 nos.</td> </tr> </tbody> </table>	Material	Quantity	Source	Coarse aggregate	57850 cu. m.	Nearest market	Fine aggregate	61390 cu. m	Cement (PPC/ OPC)	850050bags	Structural Steel	7080 MT	Bricks	17945580 nos.
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2.5	Forests and timber (source – MT)	Yes	The use of wood in the project has been planned to the minimum extent possible. Wood with recycled content such as MDF boards will be used to the extent possible.														
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	As under:														

S. No.	Description	
1.	Source of supply	33 kV supply will be from nearest JVVNL GSS.
2.	Electrical Load	Connected load : 11613.89 KW Demand load : 4134.42 KW
3.	Transformer	No. of transformers : 3 nos.
		Capacity : 3150 kVA : 2 no. 500 kVA : 1 no.
4.	DG Sets	No. of DG sets : 4 nos.
		Capacity : 750 kVA each
		Fuel Consumption : 120 lt/hr/D.G. Set

2.7	Any other natural resources (use appropriate standard units)	Yes	Medical gases
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3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

S. No	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	Yes	<p>Since it is a Hospital project, there will be provisions of laboratories with all the pathological, biochemical, microbiological and histopathological diagnostic tests which include the usage of chemicals covered under MSIHC Rules.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Chemicals as per Schedule I (Part II) of MSIHC Rules, 1989</p> <p>Acetone, Acetic acid, Formaldehyde, phenol, Isopropyl alcohol, Nitric acid, Sodium hydroxide etc. The amount of storage of each chemical will be less than threshold limit thus MSIHC rules are not applicable.</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>Storage & Management</p> <ul style="list-style-type: none"> • Will be stored within an enclosure such as cabinet, locker, etc. • Laboratory shelves will have a raised lip along the outer edge to prevent containers from falling. • Open shelves will be sturdy, securely fastened & fitted with a barrier or lip (1 to 1.5 inches high). • All hazardous chemicals will be stored in containers of 2.5 litres or more. • Chemicals will not be stored near heat sources, such as steam pipes or laboratory </div>

			<p>ovens. Chemicals will never be stored in direct sunlight.</p> <ul style="list-style-type: none"> • Storage areas will be clean, dry and away from heat and direct sunlight. • The storage containers will have: • Compatible with the waste being stored. • Leak-proof, in good condition, and capable of being sealed tightly. • Properly labeled. <p>Moreover, all mandatory & precautionary will be taken to minimize the risk of accidents.</p> <p>The project also involves the storage of HSD to the tune of 8.6 KL (approx.) in the project in the HSD storage yards. This will not call for any approval from CIF&B as it is less than 40 KL.</p> <p>The significant hazard due to the same will be negligible as the exposure level will be confined within a small area in the consequence of unforeseen hazard.</p>
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	Yes	<p>The wastes generated from medical activities are hazardous, toxic and even lethal because of their high potential for diseases transmission. Infectious waste is suspected to contain pathogens (bacteria, viruses, parasites or fungi's) in sufficient concentration or quantity to cause disease in susceptible host. Infectious waste includes:</p> <ul style="list-style-type: none"> • Cultures and stocks of infectious agents from laboratories • Waste from surgery and autopsies of infectious patients& in isolation wards • Materials that have been in contact with

			<p>infected patients.</p> <p>Infectious waste will be kept separately in bins with lid and lined with Red/Yellow color polythene bags wherever needed. The following measures will be adopted:</p> <ul style="list-style-type: none"> • Proper labeling of waste containers will be done to minimize the confusion in handling and disposal of waste. • The bag lining the bin will be only 3/4th full to ensure that the waste does not spill out • The bags containing infectious waste will be collected at the temporary biomedical waste storage area & while carrying the bag containing infectious waste it will be sealed/tied. <p>Due care will be taken that under no circumstances the infectious waste will be mixed with the non-infectious waste.</p> <p>Further, hospital waste will be segregated, treated according to their characteristics and finally sent to the common biomedical treatment facilities.</p> <p>There will be no disposal of liquid as well as solid waste onto the land or water surfaces.</p>
3.3	Affect the welfare of people e.g. by changing living conditions?	Yes	<p>The coming up of medical college and hospital will enhance the status of health-care in the surrounding areas. It will positively change the living conditions and provide advanced medical health-care facilities.</p> <p>Additionally, there will be a proper treatment and disposal of Biomedical waste including the general waste and due care will be taken to avoid any risk of infection.</p>

3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	The project planning has been done to avoid any adverse impact by means of proper waste management during construction as well as operation phase.
3.5	Any other causes	No	None

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

S. No	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	No	Not Applicable
4.2	Municipal waste (domestic and or commercial wastes)	Yes	The details of the various activities generating solid waste, its classification, collection facilities, treatment and disposal is given in CP & EMP.
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	No	<p>Construction Phase: The domestic hazardous waste like tiles, containers of paints, acrylics, PVC, chemicals, admixtures, lamps and tubelights, electrical scrap etc. are likely to be generated. Provisions will be made to segregate and send to the vendors for recycling.</p> <p>Post Construction Phase: In addition to above, there will be generation of spent oil from DG sets and transformers, which will be disposed off to the registered actual users.</p>
4.4	Other industrial process wastes.	No	There are no industrial process waste
4.5	Surplus product.	No	No surplus product is anticipated

4.6	Sewage sludge or other sludge from effluent treatment.	Yes	STP Sludge: About 44 KLD sludge will be generated from STP which will be sent to municipality disposal site.
4.7	Construction or demolition wastes.	Yes	The same is detailed at CP & EMP.
4.8	Redundant machinery or equipment.	No	There will not be any redundant machinery or equipment at site.
4.9	Contaminated soils or other materials.	No	Proper care will be taken to avoid contaminated soil and if oil spilled soil will be found; the same will be scrapped off and stored at earmarked places and sent to disposal sites.
4.10	Agricultural wastes.	No	There will be no agriculture waste.
4.11	Other solid wastes.	No	There will be no other solid waste.

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

S. No	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources.	Yes	There will be emissions from vehicular exhaust (line source). Mitigation measures: <ul style="list-style-type: none"> • Around 66,193.75sq.m. (35.96%) will be under landscape which will help to contain the emissions within the permissible range. • Effective traffic management plan including guided traffic ways and separate entry/ exits will help to avoid congestions during peak traffic hours.
5.2	Emissions form production process.	No	There is no production process in the project.
5.3	Emissions from materials handling including storage or	Yes	The emission expected from construction phase will be dust arising from material handling and

	transport		vehicular emission from transport vehicles. These include the emissions due to idling of the vehicles during loading and unloading activities. Management: The same is explained at point no. 1.5 above																																															
5.4	Emissions from construction activities including plant and equipment	Yes	<p>The dust emission sources are:</p> <ul style="list-style-type: none"> • Excavation • Haul-road movements • Construction • Material Handling • Finishing <p>Emissions factors for construction equipment are given in table below:</p> <table border="1"> <thead> <tr> <th rowspan="2">Equipment</th> <th colspan="5">Emissions Factors (g/hr)</th> </tr> <tr> <th>CO</th> <th>VOC</th> <th>NO_x</th> <th>SO_x</th> <th>PM₁₀</th> </tr> </thead> <tbody> <tr> <td>Backhoe/ Front end loader</td> <td>190.05</td> <td>56.69</td> <td>370.13</td> <td>1.58</td> <td>37.64</td> </tr> <tr> <td>Rubber tired crane</td> <td>161.02</td> <td>39.00</td> <td>464.02</td> <td>2.67</td> <td>23.58</td> </tr> <tr> <td>Hydraulic Crane</td> <td>161.02</td> <td>39.00</td> <td>464.02</td> <td>2.67</td> <td>23.58</td> </tr> <tr> <td>Concrete Vibrator</td> <td>72.57</td> <td>13.60</td> <td>122.46</td> <td>0</td> <td>4.53</td> </tr> <tr> <td>Paving Equipment</td> <td>186.42</td> <td>48.53</td> <td>412.31</td> <td>1.95</td> <td>29.93</td> </tr> <tr> <td>Roller/ Compactor</td> <td>165.10</td> <td>34.92</td> <td>316.15</td> <td>1.90</td> <td>23.13</td> </tr> </tbody> </table> <p><i>*Source: SCAQMD CEQA Handbook</i></p> <p>Impacts: Increased levels of PM₁₀, PM_{2.5}, NO_x, HC, VOC etc. from the above activities.</p> <p>Mitigation:</p> <ul style="list-style-type: none"> • Minimizing drop heights of debris, 	Equipment	Emissions Factors (g/hr)					CO	VOC	NO _x	SO _x	PM ₁₀	Backhoe/ Front end loader	190.05	56.69	370.13	1.58	37.64	Rubber tired crane	161.02	39.00	464.02	2.67	23.58	Hydraulic Crane	161.02	39.00	464.02	2.67	23.58	Concrete Vibrator	72.57	13.60	122.46	0	4.53	Paving Equipment	186.42	48.53	412.31	1.95	29.93	Roller/ Compactor	165.10	34.92	316.15	1.90	23.13
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			<ul style="list-style-type: none"> • Enclosures, • Covered transport, • Use of barriers, • Wetting of surfaces, • Plantation, • Avoiding idling of vehicles etc.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste.	Yes	The dust etc. emanating from various construction activities are described along with the impact & mitigation measures are given in CP & EMP.
5.6	Emissions from incineration of waste	No	There will be no incineration of waste.
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	No open burning of waste will be allowed. The civil contractor along with site manager will be responsible for the same.
5.8	Emissions from any other sources	No	None

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

S. No	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data												
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	<p>Noise may be generated from the construction equipments</p> <p>Noise levels from the construction equipments will be as:</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Name of Source</th> <th>Noise Level at 16 m (50 ft) from Source in db (A)</th> <th>Noise level at 1 m from source in dB (A)</th> </tr> </thead> <tbody> <tr> <td>Back hoe/ Loader</td> <td>81</td> <td>105</td> </tr> <tr> <td>Cranes-mobile</td> <td>81</td> <td>105</td> </tr> <tr> <td>Dump truck</td> <td>83</td> <td>107</td> </tr> </tbody> </table>	Name of Source	Noise Level at 16 m (50 ft) from Source in db (A)	Noise level at 1 m from source in dB (A)	Back hoe/ Loader	81	105	Cranes-mobile	81	105	Dump truck	83	107
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Generator	Not considered	75 (as prescribed by CPCB)				
6.2	From industrial or similar processes	No	Not Applicable			
6.3	From construction or demolition	Yes	During construction work D.G. Sets, Pumps, Trucks, vibrators, drilling machine, etc will be the tentative sources of noise. The same will be mitigated by effective EMP such as use of Ready mix concrete to reduce the noise & vibrations due to the operation of concrete mixer truck, etc.			
6.4	From blasting or piling	No	No blasting or piling operations are anticipated.			
6.5	From construction or operational traffic	Yes	There may be increase in the noise levels due to constructional /operational traffic arising due to the project, which will be minimized by: <ul style="list-style-type: none"> • Effective traffic management including sufficient width of driveways to avoid traffic congestions especially during the peak hours. • Provisions of multiple entry/ exits to avoid traffic congestions during peak traffic hours. 			

			<ul style="list-style-type: none"> • Provisions of internalized designated parking facilities to ensure smooth traffic movement. • Effective green belt 66,193.75 sq.m. (35.96%) will help in reducing the noise propagation.
6.6	From lighting or cooling systems	Yes	There will be change in the light pollution level of the project area. Use of focused lights to the active areas of construction is envisaged. Further, there will be no sky-lighting during the construction as well as post-construction phase.
6.7	From any other sources	No	None

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

S. No	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	Yes	There will be storage and usage of some toxic chemicals in the pathology, histopathology laboratories, etc. Toxic chemicals will be stored in specific containers at earmarked places and proper segregation and collection of chemical waste will be done. The details are explained at point 3.1
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	Yes	There is risk of contamination of land and water due to discharge of untreated waste-water. However, no untreated effluent will be discharged into the open surfaces causing the contamination of ground water. The wastewater generated will be treated in STP based on MBBR technology with cumulative capacity of 500 KLD. (250 KLD each).
7.3	By deposition of pollutants emitted to air into the land	Yes	During construction, there will be emissions generated from excavation, material transfer,

	or into water		construction operations, finishing operations, road construction, exhaust from vehicles, and stationary sources, etc. The management of the same has been described at relevant sections.
7.4	From any other sources	No	There will not be any other sources, which will contaminate land & water resources.
7.5	Is there a risk of long term build-up of pollutants in the environment from these sources?	No	No significant contribution of long-term built-up of pollutants is envisaged from this project.

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

S. No	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances	Yes	As this is a hospital cum medical project, there will be storage, handling and usage of toxic chemicals in the diagnostic laboratories. <ul style="list-style-type: none"> • Onsite and offsite emergency plan for any accidental spill of hazardous chemicals have been devised. • Standard refrigerators will not be used to store flammable chemicals; only refrigerators of explosion-proof or explosion-safe design will be used. • Safe and secure area will be designated for chemical storage. This will provide an area that reduces the risks of breakage and spills. The storage area will be proper ventilated, locked, and fire-resistant.

			<ul style="list-style-type: none"> Spent oil from DG sets and transformers will be generated which will be stored in the spent oil tank prior to disposal to actual users at earmarked places. The fuel used in the DG sets will be stored in the HSD yard which will be designed to meet out all safety norms. Proper fire-fighting arrangements will be provided all around the project site (as per the norms of the NBC-2016). 						
8.2	From any other causes	Yes	<p>The major risks involved in the project would be working at different construction heights and mishaps due to human errors, bad construction practices and associated electric hazards.</p> <p>All safety measures will be in place prior to commencement of operations so as to avoid any risk to human life and as per the prevailing local by laws. Sources of Construction & Post Construction Risks along with Impact & Mitigation of the same is given in CP & EMP.</p>						
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?	Yes	<p>As under:</p> <table border="1"> <thead> <tr> <th>Natural Disasters</th> <th>Occurrence Probability</th> <th>Management</th> </tr> </thead> <tbody> <tr> <td>Floods</td> <td>As per the secondary data available no such precedents has been reported. However the possibility of such incidents cannot be ruled out.</td> <td> <ul style="list-style-type: none"> For effective functioning, pre-monsoon and post-monsoon checks of the drainage structures will be undertaken The project has planned storm water layout in </td> </tr> </tbody> </table>	Natural Disasters	Occurrence Probability	Management	Floods	As per the secondary data available no such precedents has been reported. However the possibility of such incidents cannot be ruled out.	<ul style="list-style-type: none"> For effective functioning, pre-monsoon and post-monsoon checks of the drainage structures will be undertaken The project has planned storm water layout in
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					regards to the peak intensity of the rainfall so far received as recorded by IMD.
			Earth- quakes	The site is located in the Seismic Zone II, as per the seismic zoning map of India given in BIS code IS: 1893 (Part1)-2002, which is Low Damage Risk Zone.	<ul style="list-style-type: none"> • The building design will be made with earthquake resistant design structure. • Structure with ductile detailing is considered as per IS: 13920-1993.
			Landslides	No such precedent has been reported.	--
			Cloudburst	No such precedent has been reported.	--

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

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data.
9.1	Lead to development of supporting cities, ancillary development or development stimulated by the project which could have impact on the environment e.g.	Yes	The project will develop immense health facilities and will generate large employment opportunities during post construction phase, which will also lead to the project stimulated development of the surrounding areas.

	<ul style="list-style-type: none"> • Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.) • housing development • extractive industries • supply industries • other 		
9.2	Lead to after use of the site, which could have an impact on environment	No	No lead to after use of the site, which could have an impact on environment.
9.3	Set a precedent for later developments	No	--
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects.	Yes	The cumulative effects of the other planned projects may have positive impacts such a better drainage facilities, better recharge into the ground water aquifers by capturing the run-off, tree plantation in the area, etc.

III. Environmental Sensitivity

S. No	Areas	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value.	National Chambal Gharial Sanctuary	12.55 km towards NW.

2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests.	<p>As under:</p> <table border="1"> <thead> <tr> <th colspan="2" style="background-color: #d9ead3;">Forest</th> </tr> </thead> <tbody> <tr> <td>R.F</td> <td>0.6 km towards NE</td> </tr> <tr> <td>R.F</td> <td>5.9 km towards NW</td> </tr> <tr> <td>R.F</td> <td>6.13 km towards SW</td> </tr> <tr> <td>R.F</td> <td>7.26 km towards SSE</td> </tr> <tr> <td>R.F</td> <td>11.8 km towards SW</td> </tr> <tr> <td>P.F</td> <td>12.0 km towards ESE</td> </tr> <tr> <td>Barkalaji R.F</td> <td>12.5 km towards SE</td> </tr> <tr> <td>P.F</td> <td>13.5 km towards SE</td> </tr> <tr> <th colspan="2" style="background-color: #d9ead3;">Water bodies</th> </tr> <tr> <td>Alnia Nadi</td> <td>5.0 km towards NE</td> </tr> <tr> <td>Right Main Canal</td> <td>7.45 km towards NE</td> </tr> <tr> <td>Sur Sagar</td> <td>10.0 km towards N</td> </tr> <tr> <td>Kanswa Nadi</td> <td>10.7 km towards SSE</td> </tr> <tr> <td>Chamawati Nadi</td> <td>10.9 km towards SSE</td> </tr> <tr> <td>Chambal River</td> <td>12.2 km towards NNW</td> </tr> <tr> <td>Kishor Sagar</td> <td>13.4 km towards NNW</td> </tr> </tbody> </table>	Forest		R.F	0.6 km towards NE	R.F	5.9 km towards NW	R.F	6.13 km towards SW	R.F	7.26 km towards SSE	R.F	11.8 km towards SW	P.F	12.0 km towards ESE	Barkalaji R.F	12.5 km towards SE	P.F	13.5 km towards SE	Water bodies		Alnia Nadi	5.0 km towards NE	Right Main Canal	7.45 km towards NE	Sur Sagar	10.0 km towards N	Kanswa Nadi	10.7 km towards SSE	Chamawati Nadi	10.9 km towards SSE	Chambal River	12.2 km towards NNW	Kishor Sagar	13.4 km towards NNW
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3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	National Chambal Gharial Sanctuary 12.55 km towards NW.																																		
4	Inland, coastal, marine or underground waters	None																																		
5	State, National boundaries	None																																		
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas.	<p>As under:</p> <table border="1"> <thead> <tr> <th style="background-color: #d9ead3;">Name</th> <th style="background-color: #d9ead3;">Distance (aerial)</th> <th style="background-color: #d9ead3;">Direction</th> </tr> </thead> <tbody> <tr> <td>NH-12</td> <td>0.81 km</td> <td>SW</td> </tr> <tr> <td>NH-76</td> <td>4.47 km</td> <td>N</td> </tr> <tr> <td>SH-51</td> <td>9.82 km</td> <td>NNE</td> </tr> </tbody> </table>	Name	Distance (aerial)	Direction	NH-12	0.81 km	SW	NH-76	4.47 km	N	SH-51	9.82 km	NNE																						
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7	Defence installations	None																																		
8	Densely populated or built-up area	Ladpura																																		

9	Areas occupied by sensitive man-made land uses (<i>hospitals, schools, places of worship, community facilities</i>)	As under:	
		Name	Distance with Direction
		Educational Facilities	
		Maharishi Arvind public School	3.06 km towards WNW
		LBS day boarding cum residential school	2.82 km towards WNW
		Rayan International School	3.91 km towards WNW
		Medical Facilities	
		New Medical college hospital	8.35 km towards NNW
		Indian Spine & Bone Hospital	8.30 km towards NNW
		Apollo hospital	10.60 km towards NW
		Places of Worship	
		Teja ji Temple	3.7 km towards SE
		Ramdev Ji Temple	4.4 km towards SSW
		Shiv Ganesh Temple	4.0 km towards NW
St. Mary's orthodox church	10.58 km towards NNW		
Blakund Masjid	10.7 km towards NNW		
10	Areas containing important, high quality or scarce resources (<i>ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals</i>)	Ladpura	The entire block is categorized as semi critical for ground water use.
11	Areas already subjected to pollution or environmental damage. (<i>those where existing legal environmental standards are exceeded</i>)	None	Not Applicable
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (<i>earthquakes, subsidence, landslides, erosion,</i>	Earthquake Zone II	The area is classified as Zone II (Least to moderate) as per the BIS classification. Suitable seismic coefficients in horizontal and vertical directions respectively will

	<i>flooding or extreme or adverse climatic conditions)</i>		be adopted while designing the structures.
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*(As per secondary source available)

"I hereby give an undertaking that the data and information given in the application and enclosure are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any, to the project will be revoked at our risk and cost."

Date:

Place:

(Dr. R. K. Agarwal)

President

Indian mission of Medical Science Society

FORM-1A

(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 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 proposed project is coming up on a land allotted for construction of medical college and hospital. Copy of land documents enclosed as **Annexure**.

The following are hereby enclosed:

1. Contour map : **Annexure**
2. Conceptual Plan & Environmental Management Plan : **Annexure**

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.

As under:

A. Land area:

Total plot area : 1,84,100 sq.m.

B. Built up area:

Built up area : 1,18,063 sq. m.

C. Water consumption:

Total Water Demand : 769 KLD (fresh: 370 KLD + Recycled: 399 KLD)

D. Power requirement:

Connected load : 11613.89 KW

Maximum demand : 4134.42 KW

E. Connectivity:

The project is coming up near NH-12 which is 0.81 km away from site. Kota Junction Station is 18.0 km towards N from the project. Jaipur International Air port is 196.3 km towards N from the project site.

F. Community facilities:

There are number of community facilities within a distance of 2-3 km from the building entrance viz.:

- Bus stop
- Educational institutions
- Medical clinic/ Hospital
- Park/ Garden
- Place of Worship
- Refueling station for automobiles

G. Parking needs:

Total ECU required : 1284 ECU

Total ECU provided : 1376 ECU

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).*

Existing Facilities & Impact-Mitigation:

Direction	Facilities	Impact	Mitigation
East	Vacant land	• Increase in traffic load by addition of 1376 ECU	• Sufficient width of driveways will be provided to ensure smooth traffic movements.
North	Vacant land		
South	Vacant Land		

West	Vacant land		
			<ul style="list-style-type: none"> • Provisions of fully internalized parking including the parking facilities for the visitors. • Separate entry and exit & Guided traffic ways will be provided to smooth traffic movements. • Speed humps will be installed for speed restrictions inside the project area.
		<ul style="list-style-type: none"> • Increase in noise levels due to construction activities 	<ul style="list-style-type: none"> • Temporary noise barriers will be provided all around the project site. • PUC certified vehicles will be used. • All construction equipment and machineries will be maintained in good conditions. • DG set (construction phase), conforming to the CPCB standards for noise will be used.
		<ul style="list-style-type: none"> • Dust emissions due to construction activities 	<ul style="list-style-type: none"> • Water spraying to prevent dust pollution from different sources of construction. • All transportation vehicles will be suitably covered & overloading of the vehicles will be avoided. • Covering of the construction site on all four sides to a considerable height to prevent dust emissions and other pollutants to the surrounding environment. • Ensuring vehicles stick to the access track to prevent mud and dirt being deposited on roads.

	<ul style="list-style-type: none">• Disturbance to the local ecology	<ul style="list-style-type: none">• About 66,193.75sq.m. (35.96%). area will be under landscaping/ green belt. Measures will be adopted during post construction phase to re-establish landform proficient of maintaining the ecological conditions and capacity of the project site to support similar habitats and species.
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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).

There will be some land disturbance due to the upcoming project as the project will involve clearing, grading and construction of impervious surfaces.

Following mitigation measures will be used to mitigate the same:

- **Construction Sequencing:** Construction sequencing (involves disturbing only part of a site at a time to prevent erosion from dormant parts) will be done at site. Grading activities and construction are completed and soils will be effectively stabilized on one part of the site before grading and construction commencement at another part.
- **Compost Blankets:** A compost blanket is a layer of loosely applied composted material placed on the soil in disturbed areas to reduce storm water runoff and erosion. This material fills in small rills and voids to limit channelized flow, provides a more permeable surface to facilitate storm water infiltration, and promotes re-vegetation.
- Perimeter protection
- Stabilize construction site entrance/Exit
- Dust control

Soil:

Soil analysis report enclosed as **Annexure.**

Slope Analysis:

The topography of the site is undulating. Contour plan enclosed as **Annexure**.

Vulnerability to Subsidence:

There is no subsidence reported in the area. To avoid instability during excavation, piling will be done.

Seismicity:

The area is classified as Zone II (Least to moderate) as per the BIS classification. The building design will be made with earthquake resistant design structure. Structure with ductile detailing is considered as per IS: 13920-1993.

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

No, there will be no change in the overall natural drainage system. However, the internal run-off will be channelized to the well connected network of storm water drains.

The contour map is enclosed as **Annexure**.

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 be done upto the foundation level only. The total estimated excavated quantity of earth material will be used at the site itself for the purpose of backfilling & leveling at project site.

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

Water supply:

The peak water demand during construction phase will be about 9 KLD (@45 lpcd/ person – 200 nos.) which will be met from tanker supply.

Waste handling:

Around 5 KLD effluent will be generated which will be treated in temporary septic tank followed by soak-pits.

Solid waste:

27 kg/day solid waste (peak) will be generated during construction phase which will be sent to MC disposal site.

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)

Construction debris & waste will comprise of various domestic hazardous waste like paints, electrical fittings, plastics, varnishes, empty containers, adhesives, etc.

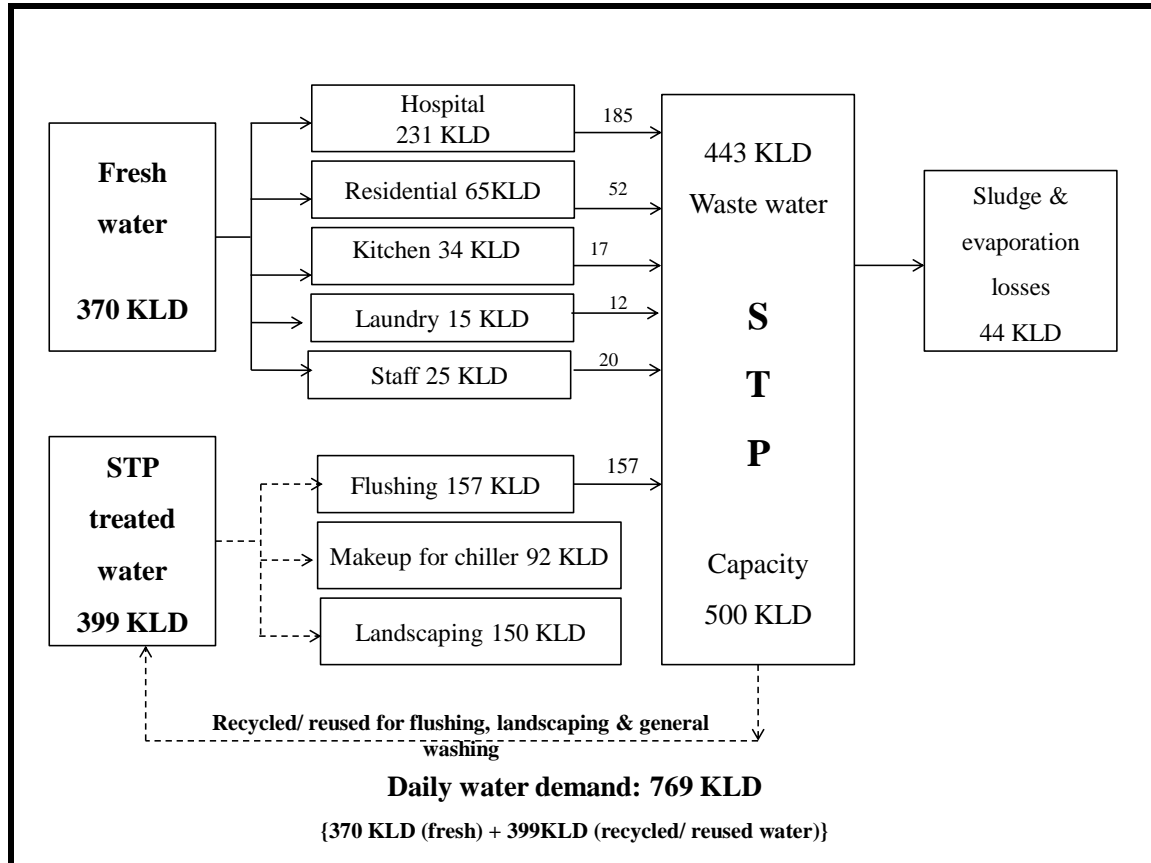
Detailed quantification & management of the same are given in CP & EMP.

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 daily water requirement for the project will be 769 KLD (fresh water: 370 KLD and the recycled/reused water demand: 399 KLD).

WATER BALANCE



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

The daily fresh water requirement will be approximately 370 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 fresh water demand for the project will be met from ground water supply. The ground water quality was analyzed as per IS 10500 standards.

**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)**

About 399 KLD of the water demand will be met through recycling & reusing the waste water for flushing (157 KLD), landscaping (150KLD) and make up for cooling tower (92 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 370 KLD will be met through 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).

The total waste water generated from the project is 443 KLD. The waste-water generated from hospital and medical college will be treated in sewage treatment plant of capacity 500 KLD based on MBBR technology.

Sewage Treatment Plant:

Parameters	Influent	Treated effluent
pH	7.5 - 8.5	7 - 8
Suspended solids	200- 225 mg/l	<50 mg/l
BOD	200 - 250 mg/l	<30 mg/l
COD	350 - 400 mg/l	<60 mg/l
Oil & Grease	20-25 mg/l	<5 mg/l
Coliform (CFU /100 ml)	10 ³ - 10 ⁵	50-500 or less

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

Run-off from the terraces, paved areas and landscaped areas will be channelized to well connected storm water network, which in turn will be harvested and used for ground water recharge.

The details are tabulated as under:

Design Parameters	
Average annual rainfall	789 mm*
Peak intensity of rainfall	40 mm/hr
Details of structures	
Number of structures	43
Capacity of each structure	27 cu. m.
Annual recharge (max)	12,8,626 m ³ / annum.

*Source: Water Resources Department, Rajasthan

Design of rain water harvesting system is detailed at CP & 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?

The project will involve construction of roof-top & paved areas and hence, quantity of run-off will increase due to reduced infiltration & increased surface run-off coefficient in post-construction phase as compared to the pre-construction phase.

Quantitative Impact: The runoff will be increase by 291 % during post construction phase, which will be capturing through well designed storm-water pipe network of rain-water harvesting and will be used for recharge of the aquifers. The details are tabulated as under:

Phase	Total discharge (m ³ / annum)	% increase in run-off
Pre construction	43576.47	291%
Post construction	12,7,109	

The overflow during abnormally heavy rains will follow the run-off pattern. The proposed rain-water structures have been designed for accommodating peak rainfall intensity (40 mm/hr), which will not aggravate the problem of flooding in the project area. The storm-water drains will be cleaned in the pre-monsoon phase so that the water logging can be avoided.

Qualitative Impact:

Contamination from different sources may affect the quality of runoff water. Contaminants commonly found in storm water runoff and their likely sources are summarized below:

S. No.	Contaminant	Sources	Impact Mitigation
1.	Sediment Floatables	Streets, lawns, driveways, roads, construction activities,	During construction, sediment fencing or other erosion control devices will be used to mitigate the short-term adverse impacts of sedimentation.
2.	Oil & Grease	Roads, driveways, parking lots etc.	Oil & Grease trap will be provided to remove oil & grease, suspended matter, and ensure the quality of 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, if any)

Ground water to the tune of 370 KLD will be abstracted for the proposed project. The area falls under the Ladpura Block, which is semi critical block as per CGWA classification. The annual average recharge anticipated from the project will be approx 12,7,109 cu. m. Ground-water resources availability, utilization and stage of development is summarized as:

Net annual GW availability	557.50 mcm
Existing Ground Water Draft for all uses	619.44 mcm
Stage of GW development	90.27 %
Ground water table	Pre mansoon : 2-10 mbgl Post mansoon: 0-10 mbgl

**Source: District Groundwater Brochure, Kota District, 2013.*

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)

There will be effective measures adapted to reduce the storm water run-off from the construction site such as-

- **Compost Blankets:** A compost blanket is a layer of loosely applied composted material placed on the soil in disturbed areas to reduce storm water runoff and erosion. This material fills in small rills and voids to limit channelized flow, provides a more permeable surface to facilitate storm water infiltration, and promotes re-vegetation.
- Temporary stabilization of the excavated soil will be done to reduce infiltration,
- Spillage of construction material will not be allowed at site.
- Silt fencing will be done to check the unwanted materials entering into ground water aquifers.
- Oil & grease traps will be provided.

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 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 to 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.

The storm-water drains will be cleaned in the pre-monsoon phase so that the possibility of the groundwater pollution & water logging can be minimized / avoided.

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)

The local people will be deployed during construction. There will be no stagnant water at site, as the run-off from the relevant areas will be systematically drained.

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 such as:

- Provision of separate toilets for the construction workers.
- Temporary septic-tank followed by soak-pit will be provided for construction workers.
- The solid waste generated during the construction phase will be disposed off through Municipal Corporation authorized vendors.

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)

Details of onsite facilities provided for collection, treatment & safe disposal of sewage:

Quantity	443 KLD
Collection & Treatment	Will be treated in effluent treatment plant
STP Capacity	Cumulative capacity: 500 KLD (STP : 250 KLD each)
Technology	MBBR Technology
Recycling/ Disposal	Treated water will be used for <ul style="list-style-type: none">• Flushing (157 KLD)• Landscaping (150 KLD)• Make up for cooling towers (92 KLD)

2.14 Give details of dual plumbing system if treated waste used 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 the flushing, landscaping purposes, while the fresh water will be used for other domestic consumption.

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)

The site is situated in the urban area which is dominated by some common floral-faunal species with herbs and shrubs.

The surrounding habitat/ adjoining spaces of the site possess local/common floral species; and the site has the same common flora composition, some of which will be cleared during the construction phase.

No endangered or threatened species of flora and fauna have been reported during the survey, so there is no major threat to the biodiversity. 66,193.75sq.m. (35.96%) area will be under landscaping. Measures will be adopted during post construction phase to re-establish landform proficient of maintaining the ecological conditions and capacity 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)

Minor vegetation clearance required for the project.

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)

The site is dominated by natural occurring shrubs and herbs. Neem (*Azadirachta indica*), Siris (*Albizia lebbek*) and Kikar (*Acacia nilotica*) trees are present at site. About 66,193.75sq.m. (35.96%) area will be under landscape which will help in minimizing the impacts. Trees will be

planted on the periphery for the green belt development. Native and local species will be preferred for plantation.

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.

There is no water body at the site. Terrestrial species may be displaced during site preparation while avifaunal species will migrate due to site preparation disturbances.

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. However, landscaping/green belt development in post construction phase will help to attract avifauna and provide the suitable habitats to them for daily activities.

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

An area of about 66,193.75 sq. m. (35.96%) will be under landscape, which will help in creating a positive impact on the avifauna of the area. Further, shade giving trees will be planted (preferred over ornamental trees).

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 source of heat islands from construction activities could be largely related to increase in the paved areas. Emissions from DG sets, construction equipments, & other non construction activities (Such as idling of vehicles, material transfer), line emissions during to increase in traffic levels also contribute largely to the increase in atmospheric concentration of gases resulting in heat island effect. However, the same cannot be solely attributed to a single project and is also a cumulative impact due to cluster of similar projects.

The following measures will be adopted:

- Use of fuel efficient Construction equipment
- Avoiding idling of construction equipments/ vehicles
- Use of locally sourced or recycled materials for construction materials
- Use of RMC and other low energy embodied materials.

Mitigation measures:

- Encourage carpools, shuttle vans, transit passes.
- Effective stack height above the roof of DG house to contain the emissions within the permissible limits.
- DG sets conforming to the CPCB standards will be deployed.
- Separate entry and exit for smooth flow of vehicular movements.
- Provisions of separate visitors parking and fully internalized parking spaces.

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.

The impacts of dust and gaseous pollutants due to different construction activities will be localized. All necessary measures will be taken.

A. Dust:

Sources: Site preparation, excavation, construction, traffic.

Type: Area Source, Line Source

Extent: Localized

Mitigation:

- Minimise dust generating activities
- The site will be covered from all four sides.
- Water sprinkling on haul roads.
- Water or Dust suppressants which are more effective than water, will be applied judiciously
- Covering the stockpiles to prevent wind whipping
- Unpaved roads will be properly maintained.
- Minimizing the haul roads by construction of semi pucca roads during construction phase
- All transportation vehicles will be suitably covered to prevent dust from the trucks and overloading of the vehicles and vehicles will be PUC certified.

B. Smoke:

Sources: vehicular exhaust, DG Set

Type: Line sources, Point Sources

Extent: Localized

Mitigation:

- D.G. set will be provided with adequate stack-height to contain the emissions within the permissible norms.
- Low-sulphur-content fuel will be used which will help to contain the emissions within the permissible range.

C. Odorous fumes:

Sources: Unsanitized conditions, indoor finishing

Type: Gases, vapors, fumes, dusts, fibres, mists.

Extent: localized

Mitigation:

- Avoid unsanitized conditions
- VOC free paints will be used
- Properly ventilated work space

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.

No, there will no shortage of parking space.

Following measures will be adopted for smooth traffic movements:

- Sufficient width of driveways
- Dedicated parking lots
- Provisions of fully internalized parking including the parking facilities for the visitors.
- Guided traffic ways within the project site.
- Speed humps will be installed for speed restrictions inside the project area.

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. Separate entry and exit will be provided to avoid congestion during peak hours. Adequate road width will be provided for smooth traffic movements. 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 will be no significant increase in noise and vibration. The noise and vibrations level will be well within the norms.

The following measures will be adopted to reduce the noise:

- Trees with heavy foliage will be planted at the periphery so as to restrict the noise levels within the permissible norms.
- Adequate road width will be provided for smooth traffic movements.

- Both entry and exit are manned with trained and efficient security.
- Road markings, stop lines, parking lanes are 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.

Construction Phase:

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 equipment's and the operation of DG set. DG sets will be provided with inbuilt acoustic enclosures.

Emission level due to vehicles carrying construction material along with its mitigation measure is given in Form 1 under point 1.5

Post Construction phase:

The source of emission will be from D.G. set of cumulative capacity of 3000 kVA (750 kVA: 4 nos.) used in case of power cuts or failure). The DG sets will be housed in an inbuilt acoustic enclosure for maximum noise attenuation.

The details of the DG set stack-height (above the roof of DG house), fuel consumption is given as under:

S. No	Capacity of DG set	Fuel	Fuel consumption	Stack height
1.	750 kVA – 4 nos.	HSD	120 lt/hr/D.G. Set	30 m

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?

There are no scenic amenities/ views in the study area, thus the project offers no obstruction of a view. About 66,193.75 sq. m. (35.96%) of the total plot area will be under landscape which includes tree plantation, which will add to the scenic beauty of the area.

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

Design considerations to avoid impact on adjacent structures:

- Evaluation of foundation of adjacent properties and their tolerances
- Selection of type of retaining wall and design
- Selection of type of supporting system.

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

Urban design criteria including passive solar features have been incorporated in the building design.

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 are no anthropological or archaeological sites or artifacts nearby as per the available secondary records.

7. SOCIO-ECONOMIC ASPECTS

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

The proposed Hospital project will result in changes in the demographic structure.

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

The proposed location is in the developing area of village Umedpura, Kota, Rajasthan.

Name	Distance with Direction
Educational Facilities	
Maharishi Arvind public School	3.06 km towards WNW
LBS day boarding cum residential school	2.82 km towards WNW
Rayan International School	3.91 km towards WNW
Medical Facilities	
New Medical college hospital	8.35 km towards NNW
Indian Spine & Bone Hospital	8.30 km towards NNW
Apollo hospital	10.60 km towards NW
Places of Worship	
Teja ji Temple	3.7 km towards SE
Ramdev Ji Temple	4.4 km towards SSW
Shiv Ganesh Temple	4.0 km towards NW
St. Mary's orthodox church	10.58 km towards NNW
Blakund Masjid	10.7 km towards NNW

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

There is no significant impact anticipated.

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)

Every building is a complex combination of many processed materials, each of which contributes to the building's total embodied energy. Choices of materials and construction methods can significantly change the amount of energy embodied in the structure of a building. Embodied

energy content varies enormously between products and materials. Embodied energy of common building materials is tabulated as under:

Name	MJ/kg	MJ/m³
Aggregate	0.10	150
Stone (local)	0.79	2030
Concrete block	0.94	2350
Concrete (30 Mpa)	1.30	3180
Concrete precast	2.00	2780
Brick	2.79	5170
Steel (recycled)	8.90	37210
Steel	32.00	251200
Plywood	10.40	5720
Glass	15.90	37550
PVC	70.00	93620
Paint	93.30	117500
Polystyrene Insulation	117.00	3770
Aluminium (recycled)	8.10	21870
Aluminium	227.00	515700

Low energy embodied materials will be given preference.

- Ready-Mix concrete will be used.
- Minimizing the transport of temporary structures, scaffolding, formwork, consumables and building product to the construction site.
- The energy consumption is summarized as under:

Name	MJ/kg
Steel (recycled)	8.90
Steel	32.00
Aluminium (recycled)	8.10
Aluminium	227.00

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 following measures will be taken to prevent pollution:

- Covering of the construction site from all four sides to a substantial height to prevent dust emissions and other pollutants into surrounding area.
- Covering loads to limit materials or litter blowing off and reducing smells.
- Ready-mix concrete will be used for concreting. This avoids cement and aggregate handling fugitive emissions and noises.
- Unloading of construction material will not be done during night.
- Speed restriction of all the vehicles approaching the site and within the site.
- All transportation vehicles will be suitably covered with tarpaulin & overloading of the vehicles will be avoided and must be pollution checked vehicle.
- Heavy earth-working will be avoided during night.

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, etc. will be used as a construction material.

Building Material	Fly Ash content
Portland Pozzolana Cement	17-20 %
Ready Mix Concrete	30 %

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 details of the various activities generating solid waste, classification, collection facilities, treatment and disposal are given in CP & EMP.

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?

Energy:

Details of electrical load break up are given at CP & EMP along with the application. However, the summary of the electrical demand is given as under:

S. No.	Description		
1.	Source of supply	33 kV supply will be from nearest JVVNL GSS.	
2.	Electrical Load	Connected load	: 11613.89 KW
		Demand load	: 4134.42 KW
3.	Transformer	No. of transformers	3 nos.
		Capacity	3150 kVA : 2 no. 500 kVA : 1 no.
4.	DG Sets	No. of DG sets	4 nos.
		Capacity	750 kVA each
		Fuel Consumption	120 lt/hr/D.G. Set

Energy conservation techniques detailed at CP & EMP

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

There will be power back through DG sets of cumulative capacity 3000 kVA (750 kVA: 4 nos) used in the case of power cuts or failure.

The DG sets shall be in Acoustic Enclosures. All the DG sets will be operated & synchronized through microprocessor based PLC system with auto Start/Stop, auto load sharing and interlocking arrangements with built-in protections. The electrical changeover system shall be capable of restoring power supply within 10 - 15 seconds of disruption (blackout or brown-out) of city power for all areas. Residential type silencer shall be provided for each DG set. Independent flue gas pipe from each DG set shall be brought out.

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?

Double glass will be used for fenestration purposes to reduce the heat ingress inside the building.

The specifications are as under:

U-Value: 3.3W/m²°C (0.588 Btu/hr.ft² °F)

Solar heat gain coefficient: 0.29

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

Building design and envelope may be optimized through selection of 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.

Components of the solar architectural features in the proposed building:

- Adequate natural cross-ventilation.
 - Sufficient day-lighting with direct heat gains
 - Adequate shading devices
1. Window: The major expanse of windows in a passive solar energy structure will be south facing solar windows. Whole design planning includes following considerations: the impact of heat gain in the summer; views; natural lighting; and privacy requirements in determining the placement and size of windows in the structure. For the most part, window areas on East and West facing walls will be kept as small and as minimal as will be consistent with interior requirements.
 2. Shading: South facing glass can be a source of overheating during summer months. The potential for overheating will be controlled by roof over carefully designed to shade the glass during the summer (sun higher in the sky) but not block sunlight during the winter (lower in the sky). The towers are aligned in a way that acts as shading devices.

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.*

Yes. Solar stand alone features and solar geysers 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?*

East and West Elevations:

East and West facing walls 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.

Following additional measures are suggested to be used for maximizing the shading of walls on the East and the West:

- Shading by means of Verandah on East Facade on lower portion of the building.
- Very few Openings and high thermal mass to reject and store the Solar heat on South facing Façade.

Roof:

Roofs will be covered with reflective china mosaic tiles having lower U values for lesser heat gains inside the building.

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*

Transformers:

- Automatic power factor compensating multiple capacitor units are provided for maintaining of average power factor of 0.95 to have effective savings in energy cost.
- All cables shall be derated to avoid heating during use. This also indirectly reduces losses and improves reliability.
- LV Power supply duly terminated at each floor through XLPE cable with a suitable size MDB.

Air Conditioning:

Central air conditioning system has been designed to provide air conditioning for the proposed Hospital Building by a central chilled water recirculation system.

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?*

Heat emission from the project can be from the following sources:

- Heat absorbed and radiated from the paved and concrete structures.
- Increased population for a particular stretch of land.

Heat Island Effect: Roof

- The roofs will be covered with solar panels which will reduce the exposed roof area.
- The other exposed roof can be covered with mosaic tiles/green roof to reduce the heat gains inside the building.

Heat Island Effect: Non-roof:

- Hard paving onsite has been reduced to the best possible extent.
- The parking areas can be shaded with the tree plantation, which will help to contain the emissions from the vehicles within permissible possible.

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. (give for individual building types)

The building materials will be selected with characteristics that limit heat ingress into the inside of the building.

Hospital & Residential Buildings

Building type : 24 hrs. used building

Climate Zone: Hot & Dry

	U value (W/m ² -°C)	R value (m ² °C/W)
Roof	0.261	3.5
Wall	0.440	2.1

College Building

Building type: Day time used building

Climate Zone: Hot & Dry

	U value (W/m ² -°C)	R value (m ² °C/W)
Roof	0.409	2.1
Wall	0.440	2.1

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

Essential fire safety measures will be installed into the building to ensure the safety of the occupants within the building in the event of or other emergency. The entire building will be designed as per NBC-2016 of India pertaining to fire hazards.

Hazard classification as per the NBC-2016, Part IV-Fire & Life Safety:

- a. Hospitals (C-1):
- b. Medical College (B)
- c. Residential Buildings (A-4)

Minimum fire fighting requirement (as per NBC 2016 Part IV Table 23) will be provided in the project. The same is tabulated as under:

S. No.	Description	Minimum Fire Fighting Requirement		
		Hospital Block	College Block	Residential Buildings
1.	Fire extinguisher	Required	Required	Building height is less than 15 m.
2.	First hose reel	Required	Required	
3.	Wet riser	Required	Not Required	
4.	Down comer	Not Required	Required	
5.	Yard hydrant	Required	Not Required	
6.	Automatic sprinkler system	Required	Required	
7.	Manually operated fire alarm system	Required	Required	
8.	Automatic detection & alarm system	Required	Not Required	
9.	Underground water tank	150,000	Required	
10.	Terrace water tank	20,000 L	25,000 L	

Safety measures:-

- Proper fire exits and exit signage will be provided.
- Fire escape will be provided.
- Fire extinguishers of appropriate type will be placed on a readily accessible place and will be maintained accordingly.

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

Structural glazing will be done. Double glazed glass will be used.

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

Undesirable infiltration will be minimized through the following measures:

- Due care will be taken during the construction of towers; by sealing the voids in building envelope and by reducing drafts which can increase the comfort and reducing the amount of heating or cooling that escapes.

- Common air barrier materials include mechanically fastened sheet air/weather barrier materials, self-adhered sheet air/weather barrier materials and various fluid applied air/weather barrier materials.
- Exterior sheathing with taped joints, precast or cast-in-place concrete, spray foam insulation and roof membranes also will be used to create an air barrier.

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.

The solar energy will be utilized efficiently for-

- Solar light for external & landscape lighting load can be reduced by the use of Standalone Solar fixtures.
- Hot water requirement of top two floors will be met through solar hot water generators.

10. ENVIRONMENTAL MANAGEMENT PLAN

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. EMP enclosed as **Annexure**.
