CONCEPTUAL PLAN

FOR 100 SEATS MEDICAL COLLEGE & 500 BEDS HOSPITAL PROJECT

AT

SHAHDOL-KUDRI ROAD, TEHSIL- SHAHDOL, DIST-SHAHDOL, MADHYA PRADESH

BY

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1.0 INTRODUCTION

Madhya Pradesh Road Development Corporation has proposed 100 seats Medical College of Graduate level, associated 500 bedded Hospital including Hostel complex, Residential complex, Guest House, Recreational Facilities and Site infrastructure development work which include road, sewer line, Drainage work, parking Area, Landscaping, electrification, water supply, waste disposal system etc. in Shahdol-Kudri Road, Dist-Shahdol as per standard laid down by Medical Council of India (MCI).

Features of the project are:

1. In-patient services: 500 beds
2. Medical College at Graduate level: 100 seats
3. Out-patient & ambulance services
4. Operation Theatre, labor room, Central Sterile Service Department (CSSD)& Diagnostic services
5. Help desk & Medical record Department
6. Solid /Biomedical/Waste water Treatment Facility
7. Rain Water Harvesting Facility

1.1 SITE LOCATION AND SURROUNDINGS

Proposed project site is located at Shahdol-Kudri, Tehsil & Dist-Shahdol, M.P. Geographical co-ordinates of the project site are $23^0$18'21.94" N &$81^0$23'09.20" E. Land has been allotted by Madhya Pradesh Medical Education Department. Land documents are attached as **Annexure I**. Conceptual Site plan is attached as **Annexure II**. Google image showing location of project site &its surroundings within 10 km is shown below:

1.2 CONNECTIVITY

Project site is accessible and is well connected via network of rail & road. Shahdol-kudri road connect project site and NH-78 is at 3.5 km away in west direction from project site. Nearest Railway Station is Shahdol which is at distance of 3.50 km, in N direction. The Shahdol city is approx. is 3.50 km away from the site

1.3 AREA STATEMENT

Total plot area for development of proposed project is 160638.65 Square Meter. Statement of area detailing the propose development is given below in **Table 1**below:

Table 1: Area Statement

PROPOSED MEDICAL COLLEGE AT SHAHDOL, MADHYA PRADESH						
				TOTAL PLOT AREA- 160638.65 sqm		
Sl N	Name of Building	No. of Floors	Total Area with 100% circulation	Plinth area	% of Plinth area	
1	Hospital Building (500 Bedded) with Kitchen & Laundry	OPD - G+2, OT & IPD - G+3	39,767.90	13,026.59	8.109	
2	Mortuary	G	500.00	500.00	0.311	
3	Incinerator	G	100.00	100.00	0.062	
4	Sub Station	G	102.11	102.11	0.064	
5	Medical College (Academic Block)	G+3	18740.51	6771.17	4.215	
6	Hostel (Girls& Nurses)-188 Girls & 75 Nurses Capacity(single seated) including Dining Block	G+3 Girls G+2 Nurses	6490.56	2019.74	1.257	
7	Hostel (Boys)-189 Capacity(single seated) including Dining Block	G+4	5282.38	1371.56	0.853	
8	Hostel- Interns (Boys) 50 capacity(single seated)	G+2	1606.41	694.02	0.432	
9	Hostel- Interns (Girls) 57 capacity(single seated)	G+2	1735.37	660.07	0.410	
10	Hostel - Junior Resident - 34 & 34 Capacity(Boys & girls)	G+1	2490.00	1284.07	0.799	
11	Shopping Complex/Guest House	G+1	1463.34	708.81	0.441	
12	Principal Residence	G+1(Bunglow)	391.14	276.86	0.172	
13	Superintendent Residence	G+1(Duplex)	271.81	171.59	0.107	
14	Type- V (Staff Quarters- 8 Units)	1 Block- S+2	1,852.04	930.02	0.578	
15	Type- IV (Staff Quarters- 18 Units)	1 Block- S+3	3609.96	1422.11	0.885	
16	Type- III (Staff Quarters-28 Units)	1 Block- S+5	2679.11	665.1	0.414	
17	Type- II (Staff Quarters- 60 Units)	2 Block- S+5	4521.9	1094.78	0.685	
18	Type- I (Staff Quarters- 48 Units)	2 Block- S+3	2184.90	743.56	0.463	
19	Canteen	G	155.22	155.22	0.097	
20	Rain Basera	G	733.20	733.20	0.456	
21	Sulabh Complex	G+1	500.00	250.00	0.155	
22	Auditorium	G	2,500.00	2,500.00	1.556	
			97,677.86	35,261.41	22.520	%
	ROAD AREA			**41892.23**	**26.07**	**%**
	GREEN AREA			**82584.33**	**51.41**	**%**
					100	**%**

1.4 ESTIMATED POPULATION

Estimated population at project site is 4000 including patients, staff and visitors. Details of population are given below in **Table 2.**

Table 2Estimated Population for project

S. No.	Category	Nos./Capacity
1.	In-patient	**500**
2.	Out-Patient/Visitors	**1500**
3.	Staff (Administration & Medical)	**1100**
4.	Security & Misc. Staff	**150**
5.	Guest	**750**
	Total	**4000**

1.5 PROJECT COST

Total cost of the project including land & development cost is INR251.26Crores.

1.6 WATER REQUIREMENT

During construction phase water supply will be taken from local water supply. During operation phase, water will be taken from local water supply. Total water requirement is approx. 958KLD out of which 450is fresh water requirement and 408from recycled water. Daily water requirement calculation is given below in **Table 3& waste water calculation is given in table 4**

Table 3: Calculations for Daily Water Demand

S. No.	Category	Capacity	Per capita Req. (LPCD)	Water Requirement (KLD)	Fresh Water Demand	Recycled water Demand
A	**Domestic**					
1	In-patient	500	450	225	225	-
2	Out-patient/Visitors	1500	15	22.5	22.5	-
3	Staff	1250	135	168.75	168.75	-
4	Guest	750	45	33.75	33.75	-
	Total Domestic water Req. (1+2+3+4)			**450**	**450**	**-**
B	**Pathology**	--	--	50	50	--
C	**CSSD**	--	--	25	25	--
D	**Mortuary**	--	--	25	25	--
E	**Landscape**	20.4Acres	20 KLD/Acres	408	--	408
	Total Water Requirement (A+B+C+D+E)			**958**	**550**	**408**

Table 4:Wastewater Calculations

Category	Quantity (KLD)
Sewage Generated (90% domestic water requirement)	405
Effluent from pathology laboratory	50.0
Capacity of STP	500

Capacity of ETP	50
Recovered Water from STP (90% of Waste Water)	365
Recovered Water from ETP (@90%)	45
Total Recovered water	410
Total Water used for landscaping	408
Water to be Disposed	2

Wastewater Generation & Treatment

It is expected that the project will generate approx. 365KLD of sewage &45 KLD of lab effluent. Sewage will be treated in STP of capacity 500 KLD and effluent from lab will be treated in ETP of capacity 50 KLD. Total 410 KLD waste water will be generated and out of which about 408KLD of treated water from STP will be used for horticulture &land escaping whereas balance 2KLD will be disposed off.

1.7 RAIN WATER HARVESTING

Storm water harvesting system will be provided within the project site as per CPCB guideline on Rainwater Harvesting & Artificial Ground water Recharge. Storm water from roof-top & surface will be collected via storm water drainage network and will be led into recharge pits proposed to be provided at various locations. Storm water drainage will be designed in line of existing drainage pattern and considering the natural flow direction of water. First flushing system will be provided to prevent water from first rain to enter the ground as it is believed to contain several impurities. Rain water harvesting system is designed considering maximum peak hourly rainfall (90 mm/hr). Thus pits are designed to capture the maximum possible rainfall which could occur. De-silting chamber is provided with each RWH pit. Oil trap is provided to remove oil & grease, if any in the storm water. Periodic cleaning & maintenance of RWH system will be done. Conceptual design for rain water harvesting pit is given in figure-1.

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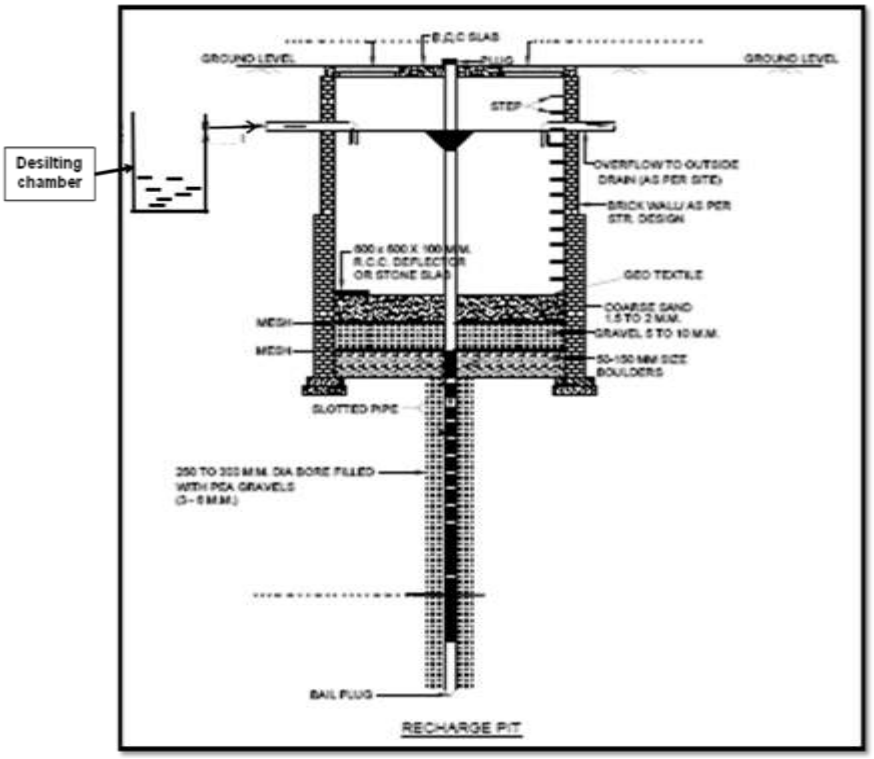

Figure 1: Schematic Diagram of Rain Water Harvesting Pit

1.8 VEHICLE PARKING FACILITIES

Adequate parking is provided to accommodate the expected vehicles during operation phase of the project. Parking is provided in accordance to M.P. State Development Authority norms and provisions for 1050 vehicles parking is proposed.

1.9 POWER REQUIREMENT

Maximum power demand for the project will be 6250KW. Power supply will be taken from MPSEB. **Electrical system is designed as per following standards:**

- National Building Code of India – 2005
- National fire Codes 2000
- Relevant Bureau of Indian Standard
- Indian Electricity Supply Rules & Act

Details of D.G Sets

DG sets of total capacity 4040 KVA (4 X 1010 KVA) will be provided to provide uninterrupted power supply during power failure. DG sets are open to air & will be provided with acoustic enclosure.

1.10 SOLID WASTE GENERATION AND MANAGEMENT

Solid waste would be generated both during construction as well as during operation phase. Solid waste expected to be generated during construction phase will comprise of excavated materials, used bags, bricks, concrete, MS rods, tiles, wood etc. **Table 5** details the solid waste management plan during construction phase

Table5: Solid Waste Management during Construction Phase

S. No.	Solid waste	Solid waste Management
1.	Waste materials like MS Rods, bricks, concrete, broken tiles, wood pieces, cement bags etc.	Material would be segregated. Recyclable material will be sold to authorize dealers. Rest will be used within project site for filling & leveling purpose. Remaining will be sent for disposal through government authorized vendors. Cement bags will be used for road making.
2.	Excavated Soil	Top soil will be stored in covered areas and will be later used for landscaping purpose. Remaining soil will be used for back filling & leveling of site. Un-used soil will be disposed off to designated side through authorized vendors on payment basis.

During operation phase, waste will comprise of both municipal &bio-medical waste as it is a hospital project. Municipal waste will comprises of domestic & landscape waste, Municipal waste expected to generate from the project is estimated to be approx.2176 kg per day (@1.5 kg for patients, 0.5 kg per capita per day for the guests, 0.15 kg per capita per day for the visitor, 0.25 kg per capita per day for the students &staff members, whereas 1 kg/acres/day is considered for landscape wastes). Approx. 550 kg/day of bio-medical waste generation is expected. Estimations for solid waste generation during operation phase are given in **Table 6.**

Table 6: Calculation of Solid Waste Generation

S. No.	Category	Capacity (Nos.)/Area	Waste Generation (Kg/day/capita)	Waste generated (kg/day)
1.	Inpatients	500	1.5 kg/person	750.0
2.	Outpatients/visitors	1500	0.15 kg/person	225.0
3.	Staff	1250	0.25 kg/person	312.5
4.	Guests	750	0.5 kg/acre	375.0
5.	Landscape Waste	20.4 acres	5 kg/acres	102
Total Municipal waste generation				**1764.5 Say 1765 kg/day**
Bio-Medical Waste (@25% of hospital waste after deducting horticulture waste)				**416 kg/day**

(Source: For Waste Collection, Chapter 3, Table 3.6, Page no. 49, & Bio-Medical waste Chapter 7, page 148 of Central Public Health & Environment Engineering Organization, Ministry of Urban Development, (Government of India, May 2000))

❖ **Waste Segregation, Collection & Disposal**

1. Different color bins will be provided in each section & floor for collection of different type of waste. Three color bins will be provided in wards (green, red & blue) for collection of food waste, medical waste like bandages, medicine covers, soiled waste etc and sharps separately. Visual message for usage of different bins for different purpose indicating its significance will be placed for awareness in all the sections. In pathology lab, Operation Theater, mortuary, pathology lab, medicine room, plaster room different color bins will be provided for collection of different waste as given below in **Table 7.**

Table 7: Bio-medical Waste Collection System

Color Code	Waste Category	Treatment
Yellow	Human anatomical waste, animal waste, Micro biology waste & bio-technology waste, soiled waste	Incineration Deep Burial
Red	Microbiology & Biotechnology waste, soiled waste, solid waste (other than sharp)	Autoclave Microwaving Chemical treatment
Blue/White	Waste Sharp	Autoclave Microwaving Chemical treatment
Black	Discarded medicines & Cytotoxic waste, Chemical waste	Chemically treated Disposal in secured landfill Returning back to vendors

2. Waste will be collected at common place regularly from the localized collection points. Food waste, landscape waste & other municipal waste will be handed over to Municipal Corporation, Delhi. STP sludge will be used as manure for landscape area.
3. Recyclable waste like plastics, paper, thermocole, glass etc will be collected & sold to authorized vendors.
4. Bio-Medical waste along with ETP sludge will be collected in Bio-medical waste storage room & will be handed over to authorized vendors for treatment & safe disposal.
5. Trolleys with bins will be provided for transportation of bio-medical waste from generation points to storage points to protect waste handler from direct exposure.
6. E-waste generated will be stored separately & will be sold to authorized vendors periodically

1.11 GREEN AREA

Total area measuring51.41%of the plotareais proposed to be put under green cover. Evergreen trees, ornamental trees &shrubs have been proposed to be planted inside the premises. Proper aftercare and monitoring of developed green belt will be done. Trees to be planted are given in **Table 8. Green belt development plan is attached as Annexure III.**

Table 8: Trees to be planted

S. No.	Species	Common Name	Type
1.	*Azadirachtaindica*	Neem	Tree
2.	*JacrandaMimosifooolia*	Neeligulmohar	Tree
3.	*Thevetiaperuviana*	Yellow oleander	Tree
4.	*Plumeria alba*	Whitefirangipani	Tree
5.	*Plumeriarubra*	Firangipani	Tree
6.	*Cassia fistula*	Amaltas	Tree
7. `	*Alstoniascholaris*	Saptaparni	Tree
8.	*Delonixregia*	Gulmohar	Tree
9.	*Erythrina variegate*	Indian Coral Tree	Tree
10.	*Lagerstroemia Thorellii*	Pride of India	Tree

11.	*Terminaliaarjuna*	Arjun Tree	Tree
12.	*Polyalthiyalongifolia*	Ashoka tree	Tree
13.	*Bougainvillea glabra*	Bougainvillea	Shrub
14.	*Ficusreligiosa*	Peepal	Tree
15.	*Combretumindicum*	Rangoon Creeper	Creeper
16.	*Vernoniaelaeagnifolia*	Curtain creeper	Creeper
17.	*Clerodendruminereme*	Shrub	Bleeding heart

1.12 MATERIALS USED FOR CONSTRUCTION

Table 9 below lists the construction material

Table 9: List of Construction Materials

S. No.	Type of Construction
1.	**Walls:**
a	Brick: (Fly-ash bricks-Fal G)
b	Plastered both side - 114 mm
c	Plastered both sides -228 mm
d	Autoclaved Aerated Concrete blocks-230 mm (AAC blocks)
e	Autoclaved Aerated Concrete blocks-150 mm (AAC blocks)
f	Tiles or slates on Boarding and felt with plaster ceiling
2.	**Roofs Flat:**
a	Reinforced Concrete slab, 120 mm, secreed 120 mm= brick coba and thermal insulation layer underneath roof slab
3.	**Floors:**
a	Concrete on stilt floor hardcore fill
b	Vitrified /Ceramic tile finish
c	Kota stone /Granite
4.	**Windows: Aluminum**
5.	Exposure all sides
6.	Single glazing using e-glass

LIST OF MACHINERY USED DURING CONSTRUCTION

- Dumper
- Concrete mixer with hopper
- Excavator
- Concrete Batching Plant
- Cranes
- Road roller
- Bulldozer
- Tower Cranes
- Hoist
- Labor Lifts
- Concrete pressure pumps
- Mobile transit mixer