

CONCEPTUAL PLAN

1.0 INTRODUCTION

Improvements in national economy and literacy rates have changed the patterns and extent of use of health services in the country. Now, people are increasingly becoming concerned about their health and are acquiring the ability to make a deliberate choice of the health services they need. Also, staffs benefits in government, trade and industry and third party financing of Medicare through voluntary and social insurance are further augment this demand.

Moreover, India is a signatory to the "Alma Ate' declaration (1978) and is committed to attain the global objective of "Health for All by Year 2000 A.D. Thus, in order to augment and back up balanced development of health care services in the country, to achieve the above objective, private investment in health care is being welcomed especially at the tertiary level and upgraded secondary level care where investments are highly capital intensive.

It is in this scenario that the proposed hospital project of **BLUE DIAMOND MEDICAL COLLEGE & HOSPITAL (A Unit of Vaishnavi Mata Memorial Trust)** will have social relevance and develop lead models for delivery of high quality medical-care, which are efficient, affordable and humane.

Proposed hospital project of **BLUE DIAMOND MEDICAL COLLEGE & HOSPITAL (A Project of Vaishnavi Mata Memorial Trust)** has proposed of 605 bedded Hospital, 100 seats medical college with hostel, and residential quarters and Site infrastructure development work which include road, sewer line, Drainage work, parking Area, Landscaping, electrification, water supply, waste disposal system etc. as per standard laid down. **Total cost of project will be Rs. 163 Crores..**

Features of the project are:

- ❖ In-patient services: Proposed 605 No of beds
- ❖ Out-patient & ambulance services
- ❖ Operation Theatre, labor room & Diagnostic services
- ❖ Help desk
- ❖ Solid /Biomedical/Waste water Treatment Facility
- ❖ Rain Water Harvesting Facility

1.1 SITE LOCATION AND SURROUNDINGS

The proposed project site is located at Mauza Bazidpur Majhauri (P.S. 720 & 721), Block Bochaha, District Muzaffarpur, Bihar. The proposed project consist of 605 bedded hospital with OPD, and Site infrastructure development work which include road, sewer line, Drainage work, parking Area, Landscaping, electrification, water supply, waste disposal system etc. as per standard.

Land documents are attached as Annexure I. Layout Plan is attached as Annexure 2.

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1.2 CONNECTIVITY

Project site is accessible and is well connected via network of rail & road. It is connected by a network of state and roads to the neighboring states. Connecting Roads are NH 57. Nearest Railway Station is Muzaffarpur, which is at distance of 10 Km. in SW direction.

1.3 AREA STATEMENT

Total plot area for development of proposed project is 33235 Sq. M. (3.3235 Ha.)
Statement of area detailing the propose development is given below:

Project Details and Specification	• Total Built-up Area: 61936.10. M. • Total Plot Area: 33235 Sq. M. (3.32 Ha.) • FAR = 1.86 • Proposed Ground Coverage = 28.56% • No. of beds = 605 • OPD= 1000 • Medical College Student seats: 100 • Boys/Girls Hostel: 400 • Residential Quarters : 80 Built-up Area Details are as under ;
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Area Statement

BUILDING BLOCK	BUILT-UP AREA (BuA) in SQM.					
	Main Building (Hospital Medical College) (Block A+B+C+D)	Boys Hostel (Block E)	Staff Qtrs. Residence (Block F)	Doctor Residence (Block G)	Multipurpose Building (Block H)	Girls Hostel (Block I)
Basement Area	1481.13	-----	----	---	-----	-----
Ground Floor	5564.35	841.0	842.7	870.7	689.55	684.0
01 st Floor	5991.18	841.0	842.7	870.7	689.55	684.0
02 nd Floor	5991.18	841.0	842.7	870.7	689.55	684.0
03 rd Floor	5991.18	841.0	842.7	870.7	689.55	684.0
04 th Floor	5991.18	841.0	842.7	870.7	-----	684.0
05 th Floor	5991.18	841.0	842.7	870.7	-----	684.0
Terrace Floor	1032	-----	-----	-----	-----	----
06 th Floor	----	-----	842.7	870.7	-----	-----
TOTAL	38034.10	5046.0	5898.9	6094.9	2758.20	4104.0
TOTAL BuA						61936.1
Maxm. height of Buildings, m.						25
Parking Area, Sqm.						16112.56
Green Belt Area (25.09%) , Sqm.						8452.4

1.3 ESTIMATED POPULATION

Estimated population at project site is 2910 including patients, attendants, staff and visitors.

1.4 PROJECT COST

Total cost of the project including land & development cost is Rs. 163 crore.

1.5 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. 643 KLD out of which 332 KLD is fresh water requirement for domestic use and 311 KLD water requirement for Flushing (Recycled water) Purpose and other purposes.

Wastewater Calculations

Details	Water (KLD)
Water requirement for domestic purpose	332
Wastewater generated from domestic use (@85% of domestic water requirement)	278
Waste Water from Hospital Premises	4.5
Water requirement for Flushing Purpose	164
Wastewater generated from Flushing (@ 100% of flushing requirement)	164
Total Wastewater generated	446.5 (442 STP + 4.5 ETP)
Recycled water form STP @ 90% of wastewater generated	311 KLD
Use of Recycled Water	Landscape/Horticulture and DG set: 34 KLD Flushing : 164 KLD Fire Tank: 100 KLD HVAC/DG Cooling : 13 KLD Total : 311 KLD Rest of recycled water 91.5 KLD will be discharge through govt. sewer line.

Wastewater Generation & Treatment

Water requirement during the operational phase of the proposed project of fresh water 332 KLD will be met through Ground water. This will be withdrawn only after getting permission of CGWB. The total water requirement for the proposed project has been estimated 643 KLD. This includes domestic water requirement, flushing, landscaping, Construction Activity. Total wastewater generated will be 446.5 KLD. After Treatment ~311 KLD water will be used for Flushing and Horticulture, and other Construction activity.

1.6 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. 25 Nos. recharge pits will be provided in the proposed project. The proposed rainwater will be recharged to the ground water level.

In general the rainwater from terraces and other-elevated open areas shall be collected through Rainwater down "take pipes and connected to catch basins. The Rain water from hard courts and landscaped area shall be collected by catch basins through a RCC pipe network/or open drains with gratings and connected to the storm water manholes/channels in the complex. The collected water from the catch basins will be diverted to rain water harvesting pits. Provision shall be made for Rain Water Harvesting as required by the Codes.

The rain water harvesting pits will contain circular RCC retention tanks of 2.5 m radius. It will be fitted with RCC lids and will be provided with separate inlet and outlet (overflow) pipes. The base of the retention tank will be filled with cores sand of 1.5-2 mm dia, gravel of 5-10mm dia and finally by boulders of 5-15 mm dia laid one.

1.7 VEHICLE PARKING FACILITIES

Adequate parking is provided to accommodate the expected vehicles during operation phase of the project. Proposed parking is 605 ECS, 3 Ambulance and 450 2 Wheelers.

1.8 POWER REQUIREMENT

Maximum power demand for the project will be 1800 KW Power supply will be taken from BSEB. 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 4 X 125 KVA & 2 x 250 KVA will be used as power backup during power failure. DG sets are open to air & will be provided with acoustic enclosure.

1.9 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. Details of the solid waste management plan during construction phase

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.

Once the Complex is completely occupied the Proposed project at 100% occupancy is expected to generate about 1727 Kg/per day of municipal solid waste.

Category	Capacity (Nos.) / Area	Waste Generation (Kg/day/capita) Max^m.	Waste generated (kg/day) Max^m.	Bio Degradable Waste (Kg/day/capita) Max^m.	Bio Degradable, Max^m.	Non Degradable, Max^m.
Patient (650 beds)	605	0.36	217.8	0.25	151.25	66.55
Attendant with Patient	605	0.36	217.8	0.25	151.25	66.55
OPD Visitors	1000	0.36	360	0.25	250	110
Hospital Staff	100	0.36	36	0.25	25	11
Kitchen & Pantry	50	0.45	23	0.30	15	8
Medical College (150 Seats per year)	100	0.36	36	0.25	25	11
Medical College Staff	50	0.36	18	0.25	13	5
Residential Quarters	400	0.45	180	0.36	144	36

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Greenbelt and Landscape Area/ Development	8452.4 Sqm. OR 2.09 Acres	5 Kg/acres /day	10.45	5	10.45	0
Total Municipal waste generation			1099 Kg/Day		785 Kg/Day	314 Kg/Day
Bio Medical Waste - Hospital Bed: 151 Kg/day (@0.25 Kg/Day/Bed) - OPD BMW: 250 Kg/day (@0.25 Kg/Day/Bed) - Total: 401 Kg/day ; will be disposed off through CBMWTF - MEMPL at Bela, Muzaffarpur.						

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 below ;

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. STP sludge will be used as manure for landscape area.
3. Recyclable waste like plastics, paper, Thermacol, glass etc will be collected & sold to authorized vendors.

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4. Bio-Medical waste will be collected in Bio-medical waste storage room & will be handed over to authorized vendors of CBMWTF at Gaya / Patna 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

1.10 GREEN AREA/LANDSCAPING

An area of 8452.4 Sqm. area (25.09% of total land area) on ground will be developed and maintained for green belt within the project premises.

As per the requirement of EIA Notification 2006 amendment vide Gazette Notification No. S.O. 3999(E) dt: 09.12.2016, one tree / 80 Sq. M. should be planted in case of building & construction projects, approx. 415 nos. of trees will be planted within and all around the proposed project premises.

While carrying out plantation within premises or outside the following considerations will be given for choice of types of trees :

- Species of trees and plants suitable for the local agro-climatic and soil conditions will be selected.
- Natural hedgerows will be preferred over fencing wherever possible.
- Trees with large canopies will be chosen which will serve as natural air filters, noise attenuators and umbrellas.
- Automatic irrigation systems will be installed. Irrigation will preferably be carried out at night so that less water is lost in evaporation and most of the water naturally percolates to groundwater through the soil.
- Location of trees and shrubs will be chosen such that they provide a natural shield to the buildings from natural ailments like excessive sunlight and rain.
- Organic manure made from garden waste (dry leaves etc.) & STP sludge will be used so that dependence on chemical fertilizer can be reduced.

Following species will be planted within the premises of proposed Project :

S. No.	Scientific Name	Family	Common Name	Hindi Name
1	<i>Azadirachta indica</i>	Meliaceae	Indian Lilac	Neem
2	<i>Alstonia scholaris</i>	Apocynaceae	Blackboard Tree	Chitvan

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3	<i>Cocos nucifera</i>	Arecaceae	Coconut Palm	Nariyal
4	<i>Cassia fistula</i>	Fabaceae	Golden Shower Tree	Amaltas
5	<i>Delonix regia</i>	Fabaceae	Royal Poinciana	Gulmohar
6	<i>Ficus benghalensis</i>	Moraceae	Banyan Fig	Bargad
7	<i>Ficus virens</i>	Moraceae	White Fig	Pakhad
8	<i>Ficus racemosa</i>	Moraceae	Cluster Fig	Gular
9	<i>Mangifera indica</i>	Anacardiaceae	Mango Tree	Aam
10	<i>Monoon longifolium</i>	Annonaceae	False Ashoka	Ashoka
11	<i>Psidium guajava</i>	Myrtaceae	Guava Tree	Amrud
12	<i>Saraca asoca</i>	Fabaceae	Ashoka Tree (Sacred)	Ashok
13	<i>Syzygium cumini</i>	Myrtaceae	Java Plum	Jamun
14	<i>Dalbergia sissoo</i>	Fabaceae	Indian Rosewood	Shisham
15	<i>Butea monosperma</i>	Fabaceae	Flame of the Forest	Palash
16	<i>Terminalia arjuna</i>	Combretaceae	Arjun Tree	Arjun
17	<i>Tectona grandis</i>	Lamiaceae	Teak	Sagwan

1.11 ENVIRONMENT CONSERVATION CONSIDERATIONS ;

Following initiatives may be considered (if feasible within economic constraints) for energy conservation & preserving the environment ;

- Switching to low-flow toilets or installing toilet tank fill diverters.
- Installation of low-flow showerheads and sink aerators.
- Switching to compact fluorescent light bulbs in lobbies and common areas and use of sensors and/or timers for areas that are infrequently used.
- Awareness program for residential owner of the proposed Residential Housing Project to close drapes and turn off lights and turn off heating / air conditioning when rooms are unoccupied.
- Installation of window film to lower heating and cooling loads
- Provision of recycler baskets for newspaper, white paper glass, aluminum, cardboard and plastic.
- Provision of recycling bins to make recycling as easy as possible.
- Use of least toxic cleaners, sanitizers, paints, pesticides etc. throughout and ensuring all chemicals are stored safely in a well-ventilated area.
- Monitoring and tracking rates of energy and water use. Making repairs or replace equipment when rate changes indicate problems.
- Creating an incentive program to encourage management staff to participate in and improve upon environmentally friendly practices.

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1.12 Environmental Monitoring Program during Construction period

Based on the above, the following environmental monitoring program during construction activities is proposed for the Project. The monitoring program would be discussed and approved by State Pollution Control Board are given in table below ;

Proposed Monitoring Program for Construction Phase of the Project

S. No.	Type	Locations	Parameters	Period and Frequency
1.	Ambient Air Quality Monitoring	As per NAAQS requirement	SO ₂ , NO ₂ , PM ₁₀ , PM _{2.5} and CO	As per State Pollution Control Board's requirements
2.	Ambient Noise Monitoring	As per requirement	Noise level Leq both during daytime and nighttime	As per State Pollution Control Board's requirements
3.	Water Quality Testing (Portability testing)	(i) Any operational bore well (ii) One of the Drinking Water Point	Drinking water parameters as per IS 10500:2005.	As per State Pollution Control Board's requirements
4.	Treated Wastewater Quality	Inlet and outlet of the STP	Parameters for assessing compliance with standards for recycling and horticulture use	As per State Pollution Control Board's requirements

1.13 Post-Project Environmental Monitoring Program

Based on the above, the following post-project environmental monitoring program is proposed for the Project. The monitoring program would be discussed and approved by State Pollution Control Board are given in table below ;.

Proposed Monitoring Program for Operational Phase of the Project

S. No.	Type	Locations	Parameters	Frequency
1.	Ambient Air Quality Monitoring	As per requirement	SO ₂ , NO ₂ , PM ₁₀ , PM _{2.5} and CO	Quarterly
2.	Ambient Noise Monitoring	As per requirement	Noise level Leq both during daytime and night time	Quarterly

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3.	Water Quality Testing (Portability testing)	Any operational borewell, One of the Drinking Water Point	Drinking water parameters as per IS 10500:2012.	Quarterly
4.	Treated Wastewater Quality	Inlet and outlet of the STP & ETP	Parameters for assessing compliance with standards for recycling and Horticulture use	Monthly

1.14 Environmental Documentation and Env. Budget

Documentation and reporting of environmental performance is an important management tool for ensuring sustainable operation of the Project. Documents/Records shall be maintained for regulatory, monitoring and operational issues.

Environmental Documentation for Operational Phase of the Project

PARAMETER	PARTICULARS
Air Emissions (incl. Noise)	• Consent to Establish from State Pollution Control Committee. • Consent to Operate for Air Emissions from State Pollution Control Committee. • Ambient Air Quality Monitoring records • Ambient Noise Monitoring Records
Water Supply	• Water Quality Monitoring records • Water Cess Returns
Wastewater Discharges	• <i>Consent to Establish</i> from State Pollution Control Committee. • <i>Consent to Operate for Wastewater Discharges</i> from State Pollution Control Committee. • Details of quantity of wastewater discharged from various sources and discharged from the outlet of the STP for recycling/into the sewer • Operational details of STP including number of hours of operation, chemical usage, in-process wastewater quality, etc. • Wastewater Quality and Quantity Monitoring records
Waste Management	• Permission for disposal of solid wastes from concerned municipality/authority • Wastes Management Inventory including details of quantity of wastes generated on-site and mode of their disposal • Inventory of wastes stored on-site • Records of hazardous wastes stored on-site (as per rules) (if generated) • Annual Returns for hazardous wastes to State Pollution Control Board

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	Documentation related to off-site transportation and disposal of hazardous wastes as per rules
Environmental Statement	Submission of Environmental Statement to State Pollution Control Board before 30th September every year
Petroleum Storage	- License from PESO for storage of HSD and other petroleum substances (based on their quantities) - Inventory of petroleum substances stored on-site both at storage and usage locations - Regular integrity testing/inspection reports for the storage tanks

Environmental Management Cost during Construction

Sr. No.	Component	Particulars	Capital Investment (Lakhs)	Recurring Expenditure per Annum (Lakhs)
1.	Air	Anti-smog Gun	10.0	2.0
2.	Water	Sedimentation Tank	5.0	2.0
3.	Solid and C&D Waste and its Management	Storage yard and its management	10.0	3.0
4.	Environment Monitoring & Management	Environment Monitoring as per monitoring plan ➤ Construction of wind breaking wall Green Curtains on under construction building	5.0	2.0
5.	Green Belt	Development and maintenance of green belt	5.0	3.0
Total (Rs.)			35	12

Environmental Management Cost during Operation

Sr. No.	Component	Particulars	Capital Investment (Lakhs)	Recurring Expenditure per Annum (Lakhs)
1.	Air	Exhaust System	15.0	3.0
2.	Water	Sewage Treatment Plant (STP) & ETP	150.0	10.0
3.	Rain Water Harvesting	Installation of RWH System	25.0	2.5
4.	Solid waste Area and its Management	Purchase of Containers for Storage of Waste & OWC of 500 kg/day @ 2 Nos.	10.0	2.5

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Sr. No.	Component	Particulars	Capital Investment (Lakhs)	Recurring Expenditure per Annum (Lakhs)
5.	Environment Monitoring & Management	Environment Monitoring as per monitoring plan	0.00	5.0
6.	Green Belt	Development and maintenance of green belt	25.0	5.0
Total (Rs.)			225.0	28.0

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