

DISASTER MANAGEMENT PLAN & ENVIRONMENTAL MANAGEMENT PLAN

For

**Kerala Medicity Medical Services Pvt Ltd at
Thonnakkal, Thiruvananthapuram.**

at

**Re. Sy. No.402/5-2,6,6-1,7,17-1-1, 403/1,11,12-1,
404/1-1,4-1,5-1,6-1,
405/8-1,9-1-1,11-2,13,13-1,14-1-1,14-2,15 of Mel
Thonnakkal Village
Tehsil: Thiruvananthapuram
District: Thiruvananthapuram
Kerala**

**Prepared by
KITCO Ltd.
Cochin, Kerala -28**

Disaster Management Plan

DISASTER AND EMERGENCY MANAGEMENT PLAN

1.0 Introduction

A disaster is a sudden, calamitous phenomenon that can cause damage to life and property and destroy the economic, social and cultural life of people. Though often caused by nature, disasters can have human origins. Disaster management is the discipline of dealing with and avoiding both natural and manmade disasters. It involves preparedness, response and recovery in order to lessen the impact of disasters.

The proposed project will improve medical care facilities near the project vicinity. This will increase the employment opportunity and there could be increased influx of people in the region for utilizing the treatment facilities. There could be increase influx of people in the region for developing new residential areas or increasing of use of existing facilities through by the way of rent/lease. Thus it is necessary to prepare a proper disaster management plan to reduce damages of any sudden events. Disaster Management means a continuous and integrated process of planning, organizing, coordinating and implementing measures which are necessary or expedient for-

- Prevention of danger or threat of any disaster.
- Mitigation or reduction of risk of any disaster or its severity or consequences.
- Preparedness to deal with any disaster.
- Prompt response to any threatening disaster situation or disaster.
- Assessing the severity or magnitude of effects of any disaster.
- Evacuation, Rescue and Relief.
- Rehabilitation and Reconstruction.

2.0 The Aim & Objectives of the Disaster Management Plan

The aim of this document is to serve as a ready reference at times of disasters and to assess the preparedness and filling the gaps in capacity to tackle such events in a continuous manner.

3.0 Profile of Super Speciality Hospital

The Kerala Medicity Medical Services Pvt. Ltd., propose to develop a Super Specialty hospital building at Thonakkal. The proposed site for Super Specialty Hospital is situated at the eastern side of the National Highway 47(NH-47) at Thonakkal. The area has not fallen under the land use planning and categorization of Town Planning Department.

The proposed project will improve medical care facilities near the project vicinity. This will increase the employment opportunity and there could be increased influx of people in the region for utilizing the treatment facilities. There could be increase influx of people in the region for developing new residential areas or increasing of use of existing facilities through by the way of rent/lease. The same may also lead to an increase in the local commercial activities. As the site does not have any ecological sensitive features, the development will have limited impact on the local ecology.

Sl no	Particulars	Details
1	Thrust Areas	Advance medical treatment facilities
2	Total site area	1.70 ha
3	Airport connectivity	Thiruvananthapuram International Airport, 20.9 km
4	Rail connectivity	Thiruvananthapuram Central Railway Station, 24.2 km
5	Road connectivity	NH 47, 0.2 km
6	Sea connectivity	Kochi Seaport International Container Transshipment Terminal : 192km

4. Probable Disaster Expected in the proposed site

4.1 Earth quake

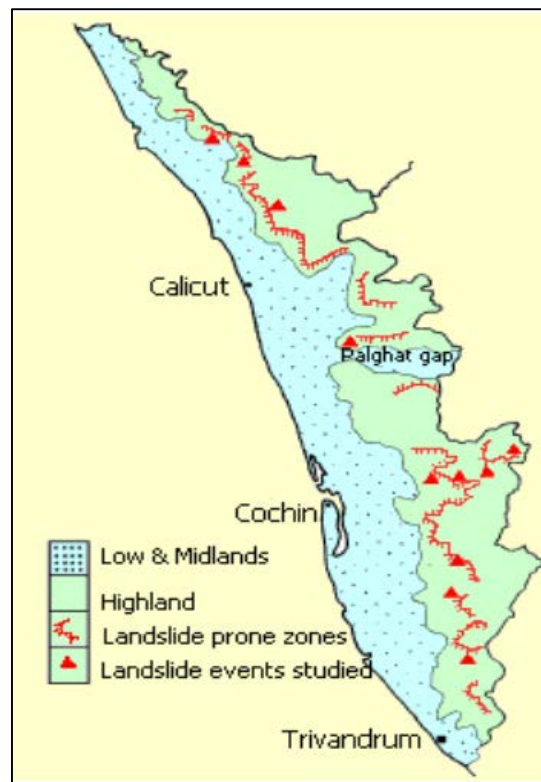
As per the latest seismic zoning map of India, the country is divided into four seismic zones- Zone V (very high risk zone), Zone IV (High risk zone), Zone III (moderate risk zone), and Zone II (Low risk zone). About 60% of the country is prone to moderate or higher seismic risk. Most parts (95.5%) of the state of Kerala fall under Zone III. The whole of Thiruvananthapuram District falls under Moderate Risk Zone where a maximum intensity of VII can be expected. The earthquake hazard map of India has been shown as **Form IA of Annexure VII**.

However the district was also affected by the infamous Tsunami on 26th December 2004, triggered by the earthquake in Sumatra region. At 6:58 a.m. on December 26, 2004,

the tsunami affected a total of 2,260km of India's coastline besides the entire group of Nicobar Islands.

4.2. Land slide/ Mud flow/ Debris flow

About 40% of the total area of Kerala state falls within the highland region, forming a part of the Western Ghats. Here several types of mass movements/ landslides have been reported. In Trivandrum several types of mass movements/ landslides have been reported. These include rock falls, rock slips, debris flows, debris topple, overburden slump and in few cases.



As per the **Figure1** it is understood that the the proposed area is not landslide prone area

4.3. Fire

It is an unavoidable accidental hazard that have the chance to occur any time and any day as per the building condition and environmental condition.

4.4. Floods

As per the flood atlas of India, 18.2 % of Thiruvananthapuram District is flood prone (The area liable to floods is the aggregate of different areas in any year during the record period). 6.6 % of the area falls under protected category. The protected area is also vulnerable

to flood as the flood control structures may breach during severe flood and protected areas may be flooded. The damage under failure of protection work may be more severe. 75.2 % of the areas are categorized as areas outside the flood prone areas, and are not generally vulnerable to flood. But experiences show that heavy rains in some of these areas can result in flood condition and at times flooding in such areas may be very severe and create more acute problem than in the identified flood prone areas. In the district, Vamanapuram River, Karamana River, Killi River and Amayizhanchan Thodu, Nadayara backwaters and Kadinamkulam backwaters are flood prone.

4.5. Cyclones

96.6% of Kerala falls under Moderate Damage Risk Zone- B, as per BMTPC Vulnerability Atlas, with probable wind speeds between 140.4 km/ hour to 158.4 km/hour and 3 to 4.2 m high storm surges. Thiruvananthapuram district also falls under Moderate Damage Risk Zone B.

4.6. Thunder and Lightning:

Lightning has become a major cause of concern as far as loss of life and property is concerned. In addition to casualty to people, incidence of damage to property, mortality to cattle etc is numerous. Most of the damage to property goes unreported. The number of lightning strikes to overhead cable networks like power, telephone, television cable and the like are higher because of the larger probability of incidences to such networks spread over a wide area. Many a time's lightning affects the communication system. Agricultural loss due to loss of trees is also reported. Most lightning deaths and injuries occur when people are caught outdoors in the months of April- May and October – November, during the afternoon and in the evenings.

4.7. Drought:

Drought is a natural hazard that results from the departure of precipitation from expected or normal that, when a season or longer period of time extended over, is insufficient to meet the demands of human, plant and animal activities. Drought is a slow onset disaster. Several parts of Kerala face drought from time to time. Kerala gets 68% of its rainfall during southwest monsoon and 17% during north east monsoon and remaining 15% as summer rains. A deviation in the rainfall pattern leads to drought situation in the state. In Thiruvananthapuram,

in the year 2003-04, 1909.796 Ha of paddy and 187.991 Ha of other crops were affected by drought. A total of 16116 farmers were affected due to the disaster. As per the estimation of ground water estimation committee 2003, Chirayankeezhu block has been placed under “Over Exploited” category, Parassala and Athyannur fall under “Critical” and Nemom is classified as “Semi-critical”. As such the ground water availability in other blocks for future exploitation is observed to be very less thereby limiting the scope for further exploitation. This underscores the need for larger adoption of water conservation practices and this situation again gives the treat of drought if rainfall is not in time.

The multi hazard map of Kerala is shown as Figure 2 below. The districts of Kerala shaded by the risk faced from cyclonic winds (denoted as "W/C"), earthquakes ("E"), and catastrophic flooding ("F"). Risk levels range from high ("H") to medium ("M") to low/none ("L").

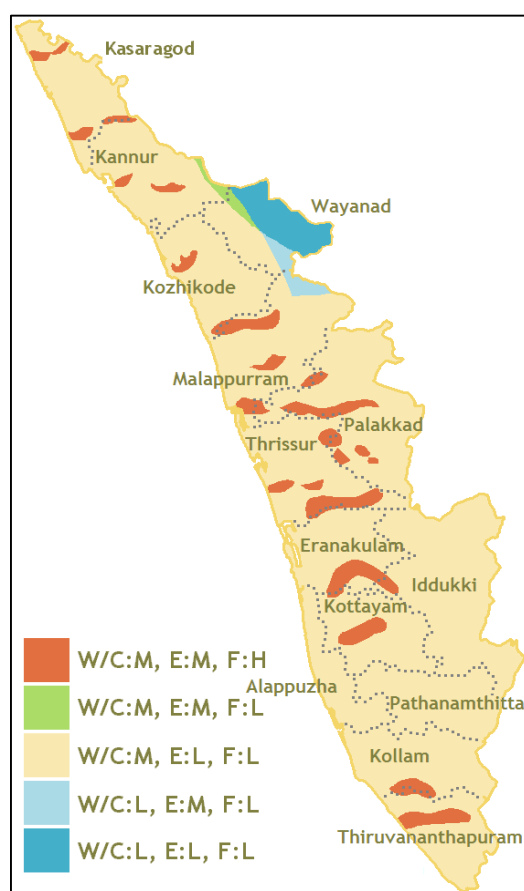


Figure 2. Multi Hazard map of Kerala

Source: (UNDP 2002).

4.8. Epidemics

The main epidemics reported in the last four years in Thiruvananthapuram district are Cholera, Dengue Fever, Malaria, Viral fever and Leptospirosis.

4.0 Disaster Management plan

Disaster Management is defined as ‘the body of policy and administrative decisions and operational activities which pertain to various stages (pre-disaster, disaster occurrence & post-disaster) of disaster at all levels’. It covers the entire range of activities designed to maintain control over disasters / emergency situations and to provide a frame work for helping people to avoid, reduce the effects of or recover from the impact of a disaster.

The Kerala State Disaster Management Policy underscores an integrated approach to disaster management covering all phases of managing disasters such as,

- Pre Disaster phase - prevention, mitigation and preparedness.
- Disaster response phase / during disaster.
- Post Disaster phase – recovery (rehabilitation and reconstruction).

The state government's disaster management policy would lay emphasis on pre-disaster activities such as prevention, mitigation and preparedness rather than on post - disaster response.

4.1. Pre-Disaster Phase (Phase of Planning)

The pre-disaster phase includes prevention, mitigation and preparedness activities and all these activities together form ‘Disaster Risk Management’.

Prevention: - Measures aimed at eliminating the occurrence of a disaster event and/or reducing the severity of a disaster.

Mitigation: - Long term measures taken in advance which decrease or lessen the impact of a disaster on society and environment by improving a community’s ability to absorb the impact with minimum damage or disruptive effect.

Preparedness: - Measures which enable the government, communities and individuals to respond rapidly and effectively to disaster situations and ensure that communities and services are capable of coping with the effect of disasters.

Pre-Disaster Phase stage consists of the following particulars

4.1.1. Building design precaution.

The impacts of natural hazards and the costs of the disasters they cause will be reduced by adapting mitigation measures during new construction. A variety of techniques are available to mitigate the effects of natural hazards on the built environment. Depending on the hazards identified, the location and construction type of a proposed building or facility, and the specific performance requirements for the building, the structure can be designed to resist hazard effects such as induced loads.

Structural components like shear walls, braced frames, moment resisting frames, and diaphragms, base isolation, energy dissipating devices such as visco-elastic dampers, elastomeric dampers and hysteretic-loop dampers, and bracing of non-structural components are proposed in the buildings in tune with seismic resistant criteria.

A well planned circulation system and assembling point within the plot will be detailed so that easy evacuation of the inhabitants during the disaster can be achieved. Emergency exit at necessary points will be incorporated during building design.

A common assembling point within the plot will be clearly marked and declared in order to ease the evacuation process of the inhabitants at the time of hazard. A temporary short and unobstructed entry and exit provision for the Ambulance during the emergency will be provided in the proposed plot

A well planned drainage plan will be executed within the plot in order to resist the flooding in the area. Drought monitoring which is the continuous observation of rainfall situation, water availability in reservoirs, lakes, rivers and comparing with the existing water needs of various sectors of the society, will be executed. Drought mitigation can be done through water rationing, watershed management practices, construction of irrigation structures, conserving soil and reducing erosion rates through soil conservation practices, introduction of flexible farming and cropping patterns etc.

4.1.2. Training for the inhabitants

Training programme for the inhabitant during each expected disaster will be arranged. The awareness regarding the disaster will be 10 times more effective than any other mitigation measures

4.1.3. Constitution of a Disaster/ Emergency Management Cell (EMC)

A disaster management committee should be planned before the operation phase of the project. The committee is constituted by the representative from Kerala Medicity Medicals Services Pvt. Ltd. The Committee would monitor the functionary of the Hospitals depending upon the situation and the type of disaster. It would also form sub-committee/s to assist it as and when necessary. The Committee will meet at least once in 3 months to review the working of contingency plan, problem faced in recent disaster and amendment modification to be adopted in future. The Committee will be responsible for overall managing the disaster situation, take administrative decisions as and when required, review the disaster plan and to inform the Government on the situation.

4.1.4 Provision for circuit breaker

Circuit breaker always trip the circuit but open contacts of breaker cannot be visible physically from outside of the breaker and that is why it is recommended not to touch any electrical circuit just by switching off the circuit breaker. So for better safety there must be some arrangement so that one can see open condition of the section of the circuit before touching it. Isolator is a mechanical switch which isolates a part of circuit from system as and when required. Electrical isolators separate a part of the system from rest for safe maintenance works

4.1.5 Provision for Fire hazard resistant system

Fire is hazard that is having the probability to occur at any time depending on the situation of the building and atmospheric conditions. The proposed project will be incorporate a detailed fire hazard resistant plan in line with the prevailing building rule.

As per the mandatory requirements, the Super speciality hospital would have approved Fire Fighting system including the following essential components.

Fire Escape Staircase	:	Proposed
Fire Extinguisher	:	Proposed
Hose Reel	:	Proposed
Wet Riser	:	Proposed
Sprinkler Riser	:	Proposed
Fire brigade inlet	:	Proposed
Yard Hydrant	:	Proposed
Automatic Sprinkler System in all Floors	:	Proposed
Manual Fire Alarm System	:	Proposed
Automatic Detection System in all Floors	:	Proposed
Electric Motor Driven Pump 2280 LPM	:	Proposed
Jockey pump:180 LPM	:	Proposed
Diesel Engine Driven Pump 2280 LPM	:	Proposed

4.1.6 Provision of Assembly Points

Pre-designated areas where the personnel like workers, staff, contractor workers etc. not involved in emergency operations (as per Emergency Preparedness Plan) shall assemble in case of an emergency is demarcated in the master plan. Depending on the location of the emergency, the assembly point can vary. During emergency, predesignated persons would take charge of this point and take the roll call of the people reporting.

4.1.8 Conduction of Mock Drills

Mock drills activating the Emergency Preparedness Plan will be conducted periodically for ensuring its efficiency during emergency as well as for refinement and updating. The mock drill for an on-site emergency plan will be carried out once in six months.

4.2. Disaster response phase / during disaster.

4.2.1. During minor disaster

The facilities within the plot will be used. The disaster management committee will head the rescue services during the disaster. The disaster management training will be provided to securities of the building.

The important point of contacts for various departments for the management of disaster is listed in **Table 01** and contact list of emergency services in Thiruvanthapuram is listed in **Table 02**.

4.2.2. During Major disaster

If the disaster management committee itself could not manage the disaster, they will inform to District disaster management committee, Fire and Rescue Centre , Water Authority , KSEB as per the requirement and they will take over the management of disaster .

5.3. Post Disaster phase

After disaster, the emergency period will be declared within the plot .The emergency period depends on the extent of disaster and the rehabilitation time requirement.The activities within the buildings will be restarted after the withdrawal of the emergency notification.

Table 01 Point of Contacts for Various Departments in Thiruvanthapuram, Kerala

Sl. No	Designation	Office	Mobile
1.	District Collector	0471-2731177,2462361	9447700222
2.	ADM	0471-2731188,2472165	
3.	RDO	0471-2462309	9447700111
4.	Deputy Collector Election	0471-2731122	
5.	Medi. College Supdt.	0471 2442234	
6.	Medi. College casualty.	0471 2528300	
7.	Medi. College Blood Bank	0471 2528230	
8.	General Hospital	0471 2443870	
9.	Fort Hospital	0471 2471766	
10.	Govt. Hospital Peroorkada	0471 2432081	
11.	Regional Cancer Centre	0471 2442541	
12.	Govt. Hospital Nemom	0471 2490276	
13.	Govt. Hospital Parassala	0471 2202266	
14.	Govt. Hospital Varkala	0470 2602549	
15.	PHC Kanniakulangara	0472 2832209	
16.	PHC Kallara	0470 2860857	
17.	PHC Palode	0472 2840561	
18.	PHC Vellanadu	0472 2882199	
19.	PHC Malayinkil	0471 2282490	
20.	PHC Vilappilsala	0471 2289185	
21.	A J Hospital, Kazhakkuttom	0471 2418452	
22.	Cosmopolitain Hospital, Pattom	0471 2448182	
23.	G G Hospital, Murinjapalam	0471 2445832	
24.	Jublee Hospital, Palayam	0471 2334562	
25.	Kims Hospital	0471 2447575	
26.	Medical mission Hopital, Kochuloor	0471 2443829	
27.	P R S Hospital Killippalam	0471 2344443	
28.	S K Hospital Edappazhinji	0471 2356256	
29.	Sree Rama Krishna Hospital,	0471 2322125	

	Sasthamangalam		
30.	Karatte Medical Centre, Karette	0472 2836533	
31.	A J Hospital, Kazhakkuttom	0471 2418452	
32.	DGP	0471 2421601	
33.	ADGP (Operations)	0471 2721553	
34.	ADGP (HQ)	0471 2728415	
35.	ADGP	(Intelligence) 0471 2554452	
36.	ADGP	(Crime Branch) 0471 2453448	
37.	IGP South Zone	0471 2323775	
38.	DIG Thiruvananthapuram Range	0471 2330768	
39.	Superintendent of Police (Rural)	0471 2315803	
40.	Crime Stopper	1090	
41.	Control Room (City)	0471 2331403	
42.	Supdt. of Police, Marine Enforcement	0471 2317524	
43.	KSEB Control Room	0471 2461399	
44.	Electricity Repairs	1912	
45.	KSEB Rural Offices : Kattakkada Circle	0472 2290050	
46.	Fire and Rescue Station, Thiruvananthapuram	0471-2333101	
47.	Fire and Rescue Station, Chakka, Thiruvananthapuram	0471-2501255	
48.	Fire and Rescue Station, Vizhinjam	0471-2480300 0471-2482101	
49.	Fire and Rescue Station, Varkala	0470-2607700	

Table 02 Contact List of Emergency Services in Thiruvanthapuram, Kerala

Ambulance services	• 108 Emergency ambulance service, Trivandrum,Kerala -108 • Ambulance helpline service, Thiruvananthapuram GPO 0471-471101. • Amma ambulance and mobile mortuary,Pattor,Vanchiyor-9744240002. • Amrita A/C ambulance and mobile mortuary,Kannamoola-0471-2373895,9746101085. • City corporation ambulance ,Trivandrum,Kerala -0471-247383. • KJ ambulance service and mobile mortuary,Pettah -0471-2468662. • Kerala ambulance,Pattom-0471-2114122, 0471-3250399, 9447771096. • K.R.S ambulance,Ulloor-0471-2440394. • Pooja ambulance and mobile mortuary, Medical college,Trivandrum-0471-2444382, 0471-2553187, 9847165759. • Sevabharathi, near SUT hospital, Pattom-0471-2471991, 0471-2448593. • Shivasena ambulance service, near Sree Padmanabhaswamy
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	temple, Trivandrum- 0471-2460100. • St. John ambulance, Vanchiyoor-9447205853. • Thiruvananthapuram corporation-0471-2320821. • Yesoram ambulance service, Ulloor-0471-2553015, 0471-2558006, 9847124607.
Airlines (counter at airport)	• Trivandrum international airport- 0471-2702600 • Gulf air, Airport office-0471-2500436, Air India -0471-2310310
Bloodbanks	• General Hospital, Trivandrum-0471-2307874. • Medical college hospital, blood bank-0471-2528230, 0471-2444270. • Regional Cancer Centre, Medical college campus-0471-2442541, 0471-2522256. • Sri Chithirathirunal Institute of Medical Science & Technology-0471-2524477,9446777007. • Taluk Head Quarter Hospital, Chiryinkil- 0470-2646565. • Women & Children Hospital, Thycaud- 0471-2323457. • Kerala Institute of Medical Science(KIMS),Anayara- 0471-3041000. • NIMS Medicity, Aralumoodu ,Neyyattinkara- 0471 - 2226513, 2223542, 2223544,0471-3951111. • Regional Institute Of Ophthalmology - General Hospital, Trivandrum-0471-2307749. • PRS Blood Bank - Killipalam, Trivandrum- 0471-2344442. • Superior Blood Bank - GPO, Trivandrum- 0471-2331156. • SreeChitra Blood Bank - Medical College, Trivandrum- 0471-2524606. • Santhwana Hospital, blood bank,Ambalamukku- 0471 2432121, 0471 2435490.
Electricity services	• KSEB Control room-0471-2474625. • KSEB Section Office , Muttathara- 0471-2555544 • KSEB Thycaud Section, Vazhuthacaud – 0471-2321346. • KSEB Office, Vattiyoorkavu- 0471-2360354. • KSEB Office, Mangalapuram- 0471 2618291. • KSEB Office,Naruvamoodu- 0471-2514424. • Kerala State Electricity Regulatory Commission, Palayam-0471 2735544. • Electricity Section Office, Kazhakkootam- 0471-2414999. • Cynosure Electric Company Private Limited, Sasthamangalam-0471-2729381. • Power House KSEB, Chalai- 0470 2461147. • Wattsun Energy Pvt Ltd. International Airport Road-09388106363. • DSK electric power, Mathrubhumi Road- 0471-2308351.

Fireservices	- Chengalchoola Fire Station, Thampanoor- 0471-2333101, 0471-2320868 9447651100 - Thiruvananthapuram Southern Division, fire & Rescue Services, Manacaud - 0471-2571354.
24hours services	Accident and Emergency unit care-Harinamam, Maruthankuzhi ,9447342084.
Police	- Controlroom-0471- 2331843, 100 - Vizhinjam harbour-0471-232 8614 ,9497980036, - Citytraffic - 0471- 2558731, 0471- 2558732. - Traffic police helpline-0471-2331232. - Thampanoor Police Station Thiruvananthapuram, 0471-2326543. - Peroorkada Police Station-0471-2433243. - Police Circle Inspector Office Thiruvananthapuram-0471-2390223. - Museum Police Station, Nanthancodu-0471-2315096. - Railway police station,Thampanoor-0471-2331258.
Railways	- Information-139. - Pettah Railway station- 0471-2470181. - Varkala Railway station- 0471-2600022. - Railway alert-9846200100.
Roadways	- City Bus Station,Fort -0471-2463029. - Bus Station,Pappanamcode-0471-2491609. - Central Station,Thampanoor-0471-2323886. - Bus Station,Peroorkada-0471-2433683. - Highway alert-9846100100.
Watersupply	- Kerala Rural water supply and sanitation agency (Jalanidhi)- 9447133998. - Enquiries and Complaints -0471-2322674. - Water supply and drainage- 0471-2328992. - Drainage - Enquiries & Complaints-0471-2479502. - Emergency water supply enquiries and complaints,Vellayambalam-0471-2328992.

Environmental Management Plan



1.0 General

The likely adverse environmental impacts during the construction phase of the project will include the following: degradation of soil, landscape and soil erosion due to improper disposal of excavated materials and construction waste; spillage of oil and other substances during the construction; pollution of water resources and soil by construction run-offs; use of temporary construction sites (access roads, camps, machinery sites, storage facilities, etc); use of borrow pits; extraction of aggregate material, such as gravel, sand, granite; temporary air pollution related to increased truck traffic during the construction, release of dust from digging-loading works and heavy machinery operation; noise and vibration disturbances; safety hazards during implementation of construction works. The likely adverse environmental impacts during the operation phase include the following: safety hazards associated with improper operation; waste disposal issues associated with improper categorization and utilization/disposal of domestic and medical waste generated in the hospital.

The long-term positive socio-economic impacts of the operation of a new 338-bed Super specialty hospital at Thonakkal, Thiruvananthapuram on the other hand, are expected to be significant, since the project will provide reliable health care services centre on the basis of family medicine, upgraded hospital networks in the region, improved access to quality health care services provided to the population, in particular the most vulnerable groups, reduction of O&M costs; creation of new employment opportunities; overall improvement of the socio-economic situation and population welfare.

The project is not expected to have any significant or irreversible negative environmental impacts neither at the construction, nor at operation phases. Impacts of the construction phase will be typical for all medium scale construction activities, short-term and limited to the project sites. Control of dust and noise becomes crucial during construction phase. Impacts of the operation phase will be typical for the hospital where bio-medical waste management is the key environmental concern. There are no specially protected areas or threatened or endangered endemic species in the project area.

The management measures to mitigate the impacts during the construction & operation phase have been presented in the foregoing section. During both phases the management will

involve segregated collection, storage minimizing open/ground level dumping on/off-site reuse, recycle, treatment and final disposal. Most of the construction waste can be reused, recycled.

Air & Noise pollution are the adverse impacts mainly during construction phase. Dust-depressing measures will be done aimed at prevention of air pollution through watering of access roads and construction site. During construction, air pollution levels will be increased mostly by machine operations for earthwork. The main pollutants caused by these operations include exhaust gases emitted by machines and dust caused by the earthwork. Regular sprinkling of water during construction works will depress the dust, thus reducing impact on workers. Additional measures planned to maintain air quality include locating concrete mixing plant and stockpiles in isolated area, as well as confining working vehicles to designated routes only following the established schedule. Trucks loaded with loose construction materials (such as gravel, sand, soil, etc.) shall be covered to minimize dust emissions during transportation. Vehicles and machinery should be fitted with effective exhaust silencers and maintained in good and efficient working order. Machinery in intermittent use should be shut down or throttled down to a minimum when not in use.

Operational phase generates bio-medical as well as wet & dry Municipal solid waste. Since the Project site is within a Panchayath area where local body owned/operated facilities dispose general waste is currently available, but to limited scale. Hence the Hospital Authorities have established own system for treatment of Municipal solid waste while Bio-medical will be sent to Common facility outside the premises.

The Recycling centre proposed for municipal solid waste is secondary collection & sorting area (300 sqm area will be set part for the same which will be partly covered to store recyclable fractions domestic hazardous , e-waste , used oil, grease etc without exposing to rain) The area will be paved with facility to drain to the drainage network. This area will have independent service access for collection/transportation vehicles without hindering the traffic in the main access to the premises.

The predicted environmental impact during both phases, suggested mitigation measures are summarized in **Table 01**.

Table 01. The predicted environmental impact during both phases and suggested mitigation measures

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
I.	Pre-Construction Phase					
1.	Land Acquisition	Land	As there is no land acquisition proposed for this project, there are no impacts envisaged.	No management measures needed.	Construction Contractor	Project Engg. department
		Water				
		Air				
		Noise				
		Biological				
		Socio-economic				
		Solid waste management				
2.	Soil Investigation – Bore hole	Land			Construction Contractor	Project Engg. department
		Water	Liquid/ mud contamination	Collect liquid mud in pits preventing flowing out.		
		Air	Temporary/low – air pollution due to dust /airborne litter	Screening the area , sprinkling water to minimise dust generation.		
		Noise	Noise due to drilling	Use well maintained drilling equipments.		
		Biological				
		Socio-economic				
		Solid waste management				
II.	Construction Phase					
II A.	Onsite Activities					

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
3.	Site Clearance	Land	Top soil gets compacted with the movement of vehicles, man and machineries.	Top soil needs to be stripped out and preserved in heaps under cover which is to be restored back to the areas proposed for green belt and landscaping.	Contractor	Project Engg. department
			Soil pollution can occur due to spillage of fuel/lubricants used in construction machineries and vehicles.	Proper maintenance of vehicles and construction machineries should be done. The construction machineries and vehicles should be inspected periodically for the detection of leaks and spillages. The maintenance and inspection of vehicles should be confined to designated paved areas only.		
			The activity increases the soil erosion probability of said area.	The site clearance should not be initiated during or prior to heavy monsoon season.		
		Water	If site clearance is done during rainy season, surface runoff will lead to contamination of water bodies.	The site clearance should not be initiated during or prior to heavy monsoon season. The construction should not be prolonged too much after site clearance.	Contractor	Project Engg. department
			Fuels/lubricants used in site can pollute water courses if it finds its	The construction machineries and vehicles should be inspected periodically for the detection of leaks and spillages.	Contractor	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			way to the water courses.	The maintenance and inspection of vehicles should be confined to designated paved areas only. The oily surface run off should be collected for treatment and disposed off.		
			Cleaning of construction machineries if carried out near the water courses, can lead to pollution of water courses.	Confined area which is situated away from the water bodies should be allotted for cleaning for construction machineries.		
		Air	Excavation and leveling leads to dust generation.	The site should be isolated by installing tall fabric fences to obstruct noise and dust.	Contractor	Project Engg. department
			Operation of excavator, loader, vehicles and crane leads to air emissions due to fossil fuel burning.	Pollution- under –check (PUC) should be made mandatory for all vehicles used for construction activities. Regular maintenance and inspection of the machineries should be conducted. The excavators, loaders, vehicles and cranes should be operated only well within the fenced area of the project site.		
			Movement of transport vehicles leads to dust generation.	Water should be sprinkled periodically to suppress the dust generation. Personnel masks should be provided to workers. The tyres of the transport vehicles		

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
				have to be washed before leaving the construction site. The material transport vehicles should be adequately covered.		
			Operation of DG set in construction site results in air emissions.	The DG should be operated only on stand by mode. Periodic emission test should be conducted. The stack height of the DG set has to be in conformance with the CPCB guidelines. .		
		Noise	Operation of tree cutter, excavator, loader,DG, crane and transporting vehicles lead to increased ambient noise level.	Diesel generator should have noise control measures to meet the noise standards set by Central Pollution Control Board (75 dB(A) at 1 m from the enclosure surface for generators with integral acoustic enclosure. Acoustic enclosure for generators without integral acoustic enclosure shall be designed for minimum 25 dB(A) insertion loss or for meeting the ambient noise standards, whichever is on the higher side at 0.5 m from the enclosure). Workers shall not be exposed to sound of more than 85 – 90 dB(A) for more than eight hours a day and shall be provided with ear plugs. Noise quality monitoring shall be conducted as per Environmental	Contractor	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
				Monitoring Plan to detect noise pollution. Noise level of vehicles used for construction activities should meet the noise standards set by Central Pollution Control Board (maximum 80 dB(A)) Construction contract shall clearly specify the use of equipment emitting noise of not greater than 90 dB (A) for the eight hour operation shift.		
		Biological	Site clearance leads to loss of terrestrial and aquatic flora and fauna. The impact could be severe if protected or endangered species are affected.	Compensatory plantation has to be carried out with thrice the number of trees to be cut for proposed project. No protected or endangered species are reported in the project area.	Contractor	Project Engg. department
		Socio-economic	Labour involved in the site clearance is exposed to dust and increased ambient noise level.	Water should be sprinkled periodically to suppress the dust generation. Personal protective equipments such as ear plugs, helmets, goggles, gloves, boots etc. should be made mandatory for the construction workers. Other provisions to ensure worker's safety shall be followed as per rules in force.	Contractor	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			Safety risk includes the attack of venomous species, or injuries due to glass pieces, metals or any other sharp materials.	Personal protective equipments such as ear plugs, helmets, goggles, gloves, boots etc. should be made mandatory for the construction workers. Trained personnel for first aid should be available at site. First aid kit at site and on-call accident support agreement with an approved hospital should be made.		
			Immediate surroundings of the project site and the transport route for the project purpose experiences nuisance due to dust emissions and increased ambient noise level. The magnitude of impact increases if the construction works are extended to night hours including the use of flood light.	Noisy construction shall be stopped between 10:00 pm and 6:00 am. Flood lights would be properly shaded without affecting the surrounding		
		Solid waste management	Site clearance generates waste including pieces of trees, rags such as	The construction waste should be disposed off properly by the construction contractor.	Contractor	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			paper/glass etc, which were present in site.			
		Risk/ Hazard	Occupational health and safety impacts for workers.	Provisions to ensure worker's safety shall be followed as per the rules in force.	Contractor	Project Engg. department
4.	Excavation	Land	Loss of topsoil	Top soil conservation measures should be adopted.	Contractor	Project Engg. department
		Water	Surface runoff of the excavated earth will lead to partial or completely filling of water bodies and also to enhance the turbidity of water to unacceptable levels for the intended uses and also to the loss of aquatic flora and fauna.	Excavated earth should be stored properly and re used for levelling and filling. The surplus earth should be stored in such a way that the surface run off from the construction site will not lead to near by water courses.	Contractor	Project Engg. department
		Air	Excavation work	Water should be sprinkled periodically to suppress the dust generation.	Contractor	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			especially along the loose soil areas releases large amount of dust.	The construction area should be temporarily fenced to avoid dispersion of dust from the same area.		
			Operation of fossil fueled vehicles and machineries will lead to emissions due to fossil fuel burning.	Pollution- under –check (PUC) should be made mandatory for all vehicles used for construction activities. Stack height of Generator and emission level of vehicles and machineries should meet the relevant SPCB guidelines. Fuel adulteration should not be permitted for any construction machineries.		
			Levelling of site, loading and unloading of excavated earth releases significant amount of dust	Water should be sprinkled periodically to suppress the dust generation. Compound wall constructed around the site will control dispersion of dust to a considerable extend.		
		Noise	Operation of heavy duty machineries such as excavators, loaders and frequent uses of transit vehicles such as lorry, tractor etc leads to increased ambient noise level in	Workers shall not be exposed to sound of more than 85 – 90 DB(A) for more than eight hours a day and shall be provided with ear plugs. Noise quality monitoring shall be conducted as per Environmental Monitoring Plan to detect noise pollution. Noise level of vehicles used for construction activities should meet the	Contractor	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			project area.	noise standards set by Central Pollution Control Board (maximum 80 dB(A)). Construction contract shall clearly specify the use of equipment emitting noise of not greater than 90 dB (A) for the eight hour operation shift.		
		Biological	No impact.	-		
		Solid waste management	Debris and the extra excavated earth.	The waste materials will have to be properly disposed off to authorised dumping areas. Proper disposal measures of debris and excavated earth has to be undertaken by the contractor.	Contractor	Project Engg. department
		Risk/Hazard	Occupational health and safety impacts for workers.	Provisions to ensure worker's safety shall be followed as per the rule in force.	Contractor	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
Building Construction for various units						
5	Foundations, columns, joinery works,	Land	Top soil gets compacted with the movement of vehicles, man and machineries.	Top soil conservation measures should be adopted.	Contractor	Project Engg. department
			Soil pollution can occur due to spillage of fuel/lubricants used in construction machineries.	Machinery and equipments are maintained and refilled in such a fashion that fuel spillage does not contaminate the soil. Soil quality monitoring shall be conducted as per Environmental Monitoring Plan to ascertain level of contamination. Maintenance should be carried out on impervious platforms with spill collection provisions and oil traps. All spills shall be disposed off as desired and the site shall be fully cleaned before handing over.		
			Soil pollution can occur along raw material storage area, concrete mixing area and along the transit points and construction sites due to spillage.	The materials would be stored properly and all transit should be without spillage and in vehicles under cover.		

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
		Water	Contamination of water course with construction materials are possible if the construction is near to water courses or the surface runoff of the construction site reaches the water course.	Proper covering to be given to water bodies inside the location. Construction during heavy rainy days should be avoided. No construction yard should be set up near water courses. Surface run off should be allowed for detention within the yard so as to avoid reaching the water courses.		
		Air	Use of DG set in the construction site can lead to air pollutants emission.	The DG should be operated on stand by mode. Periodic emission test should be conducted. The stack height of the DG set has to be adequate. Stack height and emission level of hot mix plant and diesel generator should meet the relevant SPCB.	Contractor	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
		Noise	Operation of transport vehicles and construction machineries especially concrete transfer pump, Jack hammer, vibrator etc. Leads to increased ambient noise level.	Noise quality monitoring shall be conducted as per Environmental Monitoring Plan to detect noise pollution. Noise level of vehicles used for construction activities should meet the noise standards set by Central Pollution Control Board (maximum 80 dB(A)). Construction contract shall clearly specify the use of equipment emitting noise of not greater than 90 dB (A) for the eight hour operation shift. The tools deployed for vibration will have optimal power rating confined to daytime. The vibrators would be mounted on vibration damping mountings recommended for machines.	Contactors	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			Noise pollution due to wood cutting, planing machine, drilling machine, welding machine, gas cutter / electrical cutter etc. during joinery works.	As only fitting needs to be done at site, noise will be minimum. The work has to be done within the noise barrier zone.		
		Biological	Terrestrial / aquatic flora and fauna in the immediate surroundings of project location affected if the soil / water is severely contaminated with construction materials/chemicals used.	As the construction is confined within the compound wall, possibility of contamination of water body is less. Green belt should be planted prior to construction activities with indigenous species having canopy to so as to avoid dispersion of pollutants to the immediate surroundings.	Contractor	Project Engg. department
		Socio-economic	The immediate surroundings of the project location and transport routes experiences increased traffic,	Material transit should be confined during non peak hours and haul roads should be though roads having less traffic. All material transit should be made under cover without chances of dust dispersion.	Contractor	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			dust and noise levels due to transfer of construction machineries /labour force.			
		Solid waste generation	Waste concrete and slurry would be generated as waste. Waste materials will be generated as part of plastering works. If false ceiling is done, waste pieces of thermocol, gypsum, PVC etc. will be generated as waste materials.	The waste concrete removed has to be disposed off by the contractor.	Contractor	Project Engg. department
6.	Setting up and Operation of Labour Camp	Land	Soil contamination could be resulted in due to dumping of solid waste generated from construction camp in soil.	A preinspection of the site could be conducted by the Concessionaire. Facilities for the disposal of waste in proper manner shall be arranged by the respective contractor.	Contractor	Project Engg. department
		Water	The water bodies within / near by the	A preinspection of the site could be conducted by the Concessionaire.	Contractor	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			camp premises could be contaminated with increased number of access with unhygienic withdrawal practices.	Toilets, sewage collection system and septic tanks provided in labour camp should be properly maintained. Proper waste disposal facility to be provided at site		
			If solid waste is stored/dumped near water courses, there are chances for the water bodies to get contaminated with the leachate.		Contractor	Project Engg. department
			Practices such as dumping of domestic waste in watercourses leads to contamination.			
			Excessive consumption of water to meet the requirements of large workforce from the common resources can affect down end users.		Contractor	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			Cleaning of construction machineries in the construction camp will result in waste water. Discharge of waste water to the water resources can have negative impacts on water quality.		Contractor	Project Engg. department
		Air	Air emission will be resulted if domestic waste is burned especially, plastic, rags etc.	A preinspection of the site could be conducted by the Concessionaire. Waste bins should be provided for waste collection and safe disposal. LPG should be provided for cooking.	Contractor	Project Engg. department
		Socio-economic	Social security issues are of special concern where large number of construction workers resides. The issues on theft, use of drugs etc are quite common within the workers and also with the local inhabitants.	The labour force shall be properly registered with Police.	Contractor	Project Engg. department

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			Local inhabitants exerted serious security issues especially when outstation workers different from the culture and language are stationed within their local area due to cultural differences.	The labour force shall be properly registered with Police.	Contractor	Project Engg. department
		Solid waste management	Domestic waste will be generated from the construction workers settlements.	A preinspection of the site could be conducted by the Concessionaire. Periodical maintenance of waste handling space should be undertaken. Provision of separate waste bins for bio-degradable, non-degradable and domestic hazardous waste should be provided. Disposal of collected waste in nearest approved landfill site or identified debris disposal site should be undertaken.	Contractor	Project Engg. department
II	Operational Phase					
	Land		Risk of soil contamination from the careless disposal of hospital waste.	A well managed waste disposal scheme in accordance with Bio-medical waste Management rule will be adopted as per Annexure X of Form IA.	Hospital Administration	EMP cell

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			Risk of heavy metal contamination.	Replacing mercury containing thermometers. Regular monitoring of the soil will be conducted to detect the soil contamination (once in a year). Once contamination is detected removal of the contaminated soil and the separation of the metal contaminants by mechanical means will be adopted.		
			Risk of radioactive waste contamination on soil.	Radio active wastes are carefully treated as per the management proposed in Annexure X of Form IA.		
	Water		Suspended solids emitted from increased influx of people and vehicle may reach waterbodies and pollute them.	Vehicles with specified emission standard will be allowed in the plot except in the emergency cases. Pollution suppressing vegetation will be promoted within the campus.	Hospital Administration	EMP cell
			Risk of Water contamination from the careless disposal of Biomedical waste	A well managed waste disposal scheme in accordance with Bio-medical waste Management rule will be adopted.		

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			Impacts associated with liquid effluents (storm water, sewage).	Waste water generated from the hospital activities will be connected to STP as per the sewage line plan in Conceptual drawing. Storm water will be managed with well connected drain layout as shown in conceptual plan DWG 12.		
	Air		Air quality deterioration can take place by open burning of the Hospital wastes.	Open burning of the Hospital waste particularly if it contains plastics/polyethylene will be strictly banned since it produces dioxins in addition to other toxic gases.	Hospital Administration	EMP cell
			Emission of pollutants from vehicular movements and DG sets and negligible emissions from sewage and solid waste handling and disposal.	A strong vegetation belt which involve evergreen trees and pollution suppressing plants will be maintained in the plot in order to minimise the air pollution from the pollutant emissions. DG sets comply with MoEF norms of emissions will be used. Vehicles with pollution under control certificate may be allowed to ply.		

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			Incineration of infectious waste can also pollute the air. Particular concern are dioxins which are produced by burning of the plastic and polyethylene products.	Incinerator will be located by considering both wind direction and altitude of the land so as to reduce airpollution rate. Incinerators specifically designed for hospital waste will be used. Properly trained staff operate the incinerators according to standard operating procedures. Appropriately high (more than 1200°C) temperature is achieved in the incinerator to avoid dioxin discharge. The flue gases are properly treated (e.g. with the help of waterscrubbers) before their release to the atmosphere.		
			DG sets will create noise pollution.	DG sets will be provided with acoustics enclosure. DG sets will be palced in acoustically treated room.	Hospital Administration	EMP cell
	Noise		Noise will be generated due to influx of people including staffs, students and public.	Noise regulation standard will be set in the place.	Hospital Administration	EMP cell

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
	Socio-economic		Risk of infection for the public living in the vicinity of hospitals.	Waste management committee keep the waste storage area protected and out of the reach of persons other than on waste management duty. Biomedical waste management will be adopted as per Annexure X of form IA and transportation of bio-medical waste for final disposal through authorised operator should be ensured.	Hospital Administration	EMP cell
			Injuries from sharp wastes will lead to infection to all categories of hospital personnel especially waste handler.	Seggregate collection of the waste in designated containers. Puncture proof containers for sharps will be adopted. Waste handlers will be provided with protective gear to wear.	Hospital Administration	EMP cell

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			Infections in patients from poor infection control practices and poor waste management	Waste handlers will be provided with protective gear. The entire buildings will be kept clean on regular basis by appointing specific workers. Waste management committee keep the waste storage area protected and out of the reach of persons other than on waste management duty. Biomedical waste management will be adopted as per Annexure IX and transportation of bio-medical waste for final disposal through authorised operator should be ensured.	Hospital Administration	EMP cell

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			Risk associated with hazardous chemicals, drugs and rays to persons handling wastes at all levels.	Waste handlers will insist to wear protective gear for ensuring minimum handling. Waste storage containers will be kept closed ensuring minimum exposure to prevent contamination of air. Waste will be strictly transported in closed vehicles. The storage area of the waste especially hazardous waste will be kept protected and out of the reach of persons other than those on waste management duty. Transportation of hazardous waste will be strictly avoided along corridors/pathways used by patients, visitors /staff trolleys after sealing the containers to prevent en-route spill /contamination. The entire waste management of the medical college will be monitored by a waste management cell which involves hospital officials.	Hospital Administration	EMP cell

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
	Risk Hazard		Fire	Fire hazard management explained in Form I A will be adopted.	Hospital Administration	EMP cell
			Radioactive material and waste handling	The walls of x-ray rooms are lead-lined to reduce theradiation exposure to those areas on the other side of the wall. X-ray facilities are designed around the equipment and the source of radiation usually remains within a well-defined area in the room. Radiation doses to workersare monitored using personal dosimeters.	Hospital Administration	EMP cell
			Flooding of the area due to the over flowing of the water strip flowing at the western side of plot (which is a valley),incase of episodic rainfall events.	Culvert at the northern end of the water strip will be doubled in order to sustain the valley to the original flow capacity.	Hospital Administration	EMP cell

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Implementing Agency	Monitoring Agency
			Since the proposed plot is a sloped area chance for landslide is detected incase of episodic rainfall events.	Slope stability of the soil will be adopted.	Hospital Administration	EMP cell

2.0 ENVIRONMENTAL MONITORING PLAN

With proper implementation of the various mitigation measures as proposed in EMP, the environmental setting of the project area could be developed in a sustainable manner. It is required that the critical environmental attributes which are indicative of environmental performance of the project should be periodically monitored and analyzed during the construction and operation stages of the project. Environmental Monitoring Plan (EMP) for each of the environmental components specifies the technical aspects of monitoring like locations of monitoring; frequency of monitoring and duration, sampling method, parameters to be monitored, and standards to be monitored in analyzing. The monitoring plan also specifies the applicable standards, and implementation and supervising responsibilities. The environmental monitoring plan is presented in **Table 02.**

Table 02.Environmental Monitoring Plan

Air Quality Monitoring	
Project stage	Construction and operation stages
Parameter	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO
Sampling Method	High volume air sampler to be located 50 m from the source of pollution in the downwind direction. Method specified by CPCB for analysis shall be followed.
Standards	Revised National Ambient Air Quality (NAAQ) Standards set by CPCB
Frequency	Once in every season for three seasons (except monsoon) per year for every year of construction
Duration	Continuous 24 hours / or for 1 full working day
Locations	One location within the project location during construction phase with 3 locations outside the periphery along the predominant wind direction and 1 at upstream of predominant wind direction both during construction and operation phase.
Measures	Wherever air pollution parameters increase above specified standards, additional measures as decided by the engineer shall be adopted.
Implementation	Contractor through approved monitoring agencies.
Supervision	Hospital administration.
Water quality Monitoring	
Project stage	Construction stage
Parameter	pH, BOD, COD, TDS, Pb, Oil & Grease, Detergents and Faecal Coliforms for Surface water. pH, TDS, Total hardness, Sulphate, Chloride, Fe, and Pb for groundwater.
Sampling Method	Grab sample collected from source and analysis as per standard methods for examination of water and waste water.
Standards	Indian standards for Inland Surface Water (IS; 2296, 1982) and for Drinking water (IS; 10500,1991)
Frequency	Twice a year (pre monsoon and post monsoon seasons) during the

	entire construction period
Duration	One-time grab sampling
Location	N 08°38'37.44";E 076°51'06.367". Description -well water east boundary residence and canal water.
Measures	At locations of increased water pollution towards down stream, all inflow channels shall be checked for pollution loads and channel delivering higher pollution loads shall be terminated from disposal into the water source.
Implementation	Contractor through approved monitoring agencies.
Supervision	Hospital administration
Noise Level Monitoring	
Project stage	Construction and operation stages.
Parameter	Noise level on dB (A) scale.
Sampling Method	Measure equivalent noise levels using an integrated noise level meter kept at a distance of 15m from edge of the pavement.
Standards	Noise Pollution (Regulation and Control) Rules, 2000.
Frequency	Once in every seasons (except monsoon) for each year of construction.
Duration	Reading to be taken at 15 seconds interval for 15 minutes every hour for 24 hours and then average will be taken.
Location	Eastern boundary, Residential area(North East), 2 locations near project site, old National Highway.
Measures	Incase of noise levels causing disturbance to the sensitive receptors, management measures as suggested in the EMP shall be carried out.
Implementation	Contractor through approved monitoring agencies.
Supervision	Hospital administration.
Soil Quality Monitoring	
Project stage	Construction.
Parameter	Monitoring of Pb, SAR and Oil & Grease.
Sampling Method	Sample of soil collected to be acidified and analyzed using absorption spectrophotometer.
Standards	Threshold for each contaminant set by IRIS database of USEPA until national standards are promulgated.
Frequency	During the pre monsoon and post monsoon seasons in each year for the entire construction period.
Duration	One-time grab sampling.
Location	Project site proposed for super speciality hospital.
Measures	At location of increased pollution levels, source shall be identified and shall be diverted from future disposal.
Implementation	Contractor through approved monitoring agencies.
Supervision	Hospital administration.