

BAN: COVID-19 Response Emergency Assistance Project

ADB Project 54173-001| Loan 3918-BAN

ENVIRONMENTAL MANAGEMENT PLAN

Package

Package No. RAJ/ICU/ADB/W-01: Construction of Isolation unit & critical care unit/ICU at Rajshahi Medical Collage Hospital, Rajshahi. [Sub-head: Construction of 50 bed isolation unit at Rajshahi Medical Collage Hospital, Rajshahi]

Implementing Agency

Health Services Division (HSD)
Ministry of Health and Family Welfare

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Prepared by Health Services Division (HSD) of the Ministry of Health and Family Welfare for the Asian Development Bank.

The Environmental Management Plan is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

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I. PROJECT BACKGROUND

1. The COVID-19 pandemic in Bangladesh is part of the worldwide pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus-2 (SARS-COV-2). The virus was confirmed to have spread to Bangladesh in March 2020.
2. Under the project “COVID-19 Response Emergency Assistance Project” funded by Asian Development Bank (ADB), isolation and critical care unit will be established in the existing medical facilities. The respective medical authority will provide necessary support and supervision and the monitoring process will be done through Public Works Department (PWD).
3. There are some waste collection bins placed inside the hospital, but it is recommended to enhance the number and to use separate and labeled colored bins to store the medical wastes as well as to handle them with care and to dump in marked places through securing proper safety measures. No further acquisition of land is necessary, but several possible sources of environmental impacts shall be minimized by effective mitigation measures.
4. The Environmental Management Plan (EMP) is prepared for the contractor to provide guidance to manage the project consortium activities maintain the environmental compliances of Go Band ADB.

II. SUBPROJECT DESCRIPTION

6. In order to ensure modern medical services to the people of Greater Rajshahi region in the Northern part of Dhaka set up a medical college and hospital in Rajshahi. The foundation stone is laid. In the academic year 1958 medical college was started and 43 students were admitted in the first year of MBBS: Later, the government decided to suspend the activities of Rajshahi Medical College and set up a 530-bed hospital at the acquired site. Construction of a 530-bed hospital at the site began in 1963 and was completed in 1965.

7. As it is essential to transform this hospital into a medical college hospital for the clinical training of the students studying in this college, this hospital with 530 beds was renamed as “Rajshahi Medical College Hospital” without any infrastructural changes. The infrastructural development work of establishing a full-fledged Medical College Hospital has been completed and handed over on 24 July 2008. Later it was upgraded to 862 beds in 2012 respectively. This is one of the largest hospitals in the Rajshahi Division & only referral hospital (Level 3) in greater Rajshahi area serving health care services for about 60 million populations. The hospital is in the center of Rajshahi town and 280 kilometers North-West from capital city Dhaka.

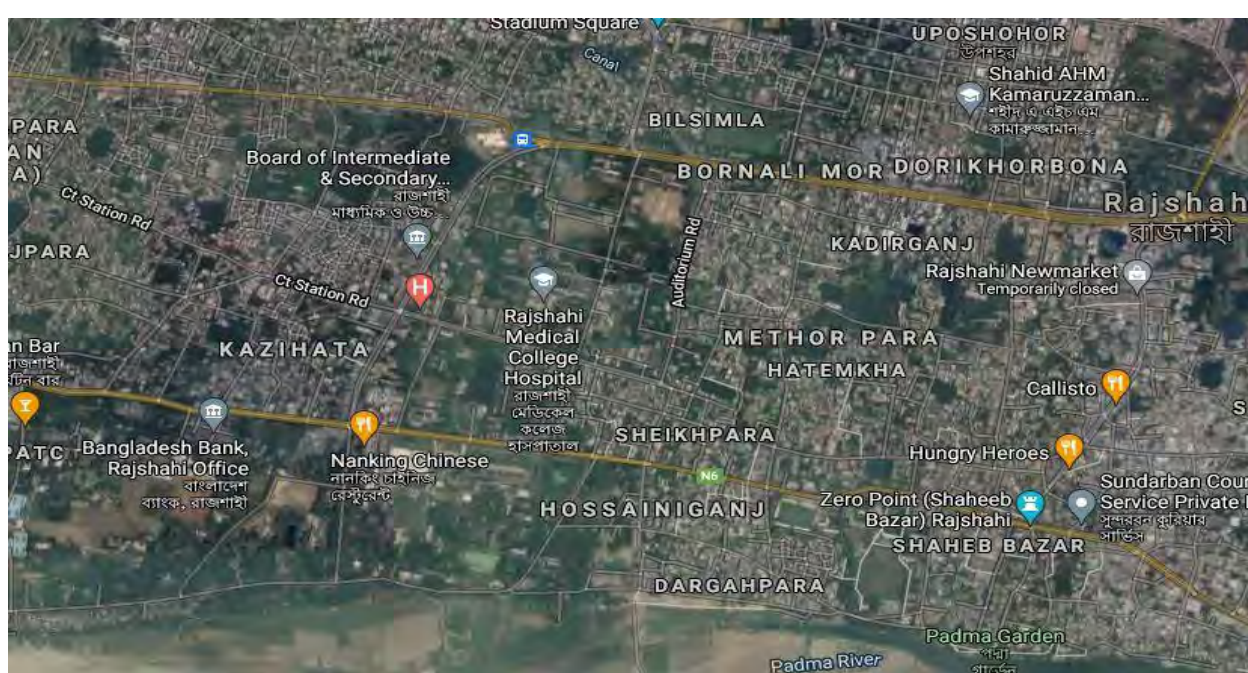


Figure II-1 : Rajshahi Medical College Hospital

8. Land area of the college campus is 90 acres. Now 800 students are enrolled of which 512 are female & 288 are male. College building area is about 30 acres and hospital building area are about 60 Acres. Total 30 departments are running in the College and Hospital. Two female hostels, two boys' hostel, two internee hostel, one Nurses Training Centre, One Nuclear Medicine Centre, One Morgue, Staff Quarters, Mosque and a playground are there in the campus

9. At the beginning of this hospital, there were only three departments Medicine, Surgery, Obs.&Gyna. Daily 750 to 850 patients remain admitted to this hospital. Admission turnover is 450-650 patients per day. Outdoor patient attendance 2000 to 2500. At present its 4 storied building accommodating all ward and departments of all subjects and specialties. But at this moment it is very much essential to have another building keeping provision to accommodate at least 1500 patient.

Table II-1: Existing Facilities of RMCH¹

| | |
|------------------------|---------------------------------------|
| Source of Electricity | National Grid |
| Source of water supply | Own piped supply |
| Toilet type | Sanitary |
| Toilet adequacy | Adequate with male and female privacy |

¹ http://facilityregistry.dghs.gov.bd/org_profile.php?org_code=10001560.

| | |
|-----------------------|---|
| Fuel source | Natural piped national gas |
| Autoclave System | Hospital's centralized autoclave system |
| Waste Disposal System | Hospital's own waste management (pit) |

10. There are some waste collection bins placed inside the hospital, but it is recommended to enhance the number and to use separate and labeled colored bins to store the medical wastes as well as to handle them with care and to dump in marked places through securing proper safety measures.

11. Rajshahi Medical College Hospital (RMCH) started conducting coronavirus test from 01 April 2020. The test lab was formally inaugurated at the Microbiology department on 01 April 2020. The treatment of the Coronavirus patient also started in the hospital and 12 physicians, and 18 Doctors have been trained in this regard.² Under this subproject, 50 Isolation Unit and 10 Bed ICU/CCU will be established in Rajshahi Medical College Hospital. This subproject includes civil construction works, Installation of 1000KVA substation, 500KVA generator, Air Cooler & Lift. Intended Completion Date is:180 days from the Commencement Date for Section-1: All civil, sanitary & water supply, gas connection and electro-mechanical works except Supply, Installation, Testing & Commissioning of Lift as mentioned in Section-2 below.270 days from the Commencement Date for Section-2: Supply, Installation, Testing & Commissioning of Lift (See items under Bill of Quantities for Lift) A small amount of waste materials will be produced during the construction period and medical wastes will be produced during the operation phase of the ICU. The handling procedures of these medical wastes along with other waste are included in Appendix 2.

² The Daily Star, 01 April, 2020 "Coronavirus Test at RMCH Starts from 01st April".

III. BASELINE INFORMATION

12. **Climate:** The district bears a moderate and pleasant climate. The temperature, humidity and coldness of the district are not high. The summer season commences from April and continues up to the end of June. The rainy season comes at the end of June and stays up to September. The winter season starts from the middle of November and lasts up to the end of February. The minimum and maximum mean temperature during winter varies from 9c to 14.00 c. During summer the minimum and maximum mean temperature, vary from 25.50 c to 38.70 c. The rainfall is heavy during July to September. The annual rainfall of the district recorded in 2011 was 1862 millimeters. The level of humidity was about 77 % in April and about 88 % in July.³

13. **Water Quality.** The main cause for concern in drinking water is nitrate, which can interfere with the oxygen carrying capacity of the blood and can have serious implications for infants. Fortunately, nitrogen is not present in the ground water in this form at any significant level and at 0.4 and 0.2 mg l-1 is well below the Bangladesh and WHO standards of 10 and 50 mg l-1 respectively. Of the metals analyzed, iron, arsenic, chromium, lead and nickel were near or exceeded either the Bangladesh or WHO guideline values in one or more wells. The arsenic levels in the wells were close to the permissible limits for drinking water but did not exceed them. The chromium levels in the ground water sampled were double both the Bangladesh and WHO drinking water quality guidelines. Lead levels were very high at 10 times the Bangladesh guidelines and 50 times the WHO guidelines. The groundwater samples showed Coliform contamination, which means that they do not conform to the Bangladesh and WHO guidelines of 0 CFU/100 ml; however, they did not show any fecal contamination despite the fact that across Bangladesh 54 per cent of hand pumped tube wells were found to have fecal contamination⁴.

14. **Air Quality and Noise Level.** The city area is endowed with educational institutes, residential areas, hotels, community centers, restaurants, banks, pharmacies, office building, health clinics, etc. From the study it is seen that most of the places exceed the optimum maximum level of sound pollution ranged from 70-90 dB. It is also seen that the values of sound level at all hospitals (ranged from 65-80 dB), schools & colleges (ranged from 64-85 dB), and residential areas (ranged from 55-65 dB) exceeds the maximum permissible values. Four major cities, Rajshahi, Dhaka, Khulna and Chittagong, in Bangladesh have been suffering under severe impact of air pollution for many years particularly by particulate matter (PM). PM samples were collected within the period from September 2010 to July 2012 at four continuous air monitoring stations (CAMS) located at Farm Gate in Dhaka, Sapura in Rajshahi, Baira in Khulna and a TV station, Khulshi in Chittagong. PM sampling was performed using dichotomous samplers, collecting samples in two sizes: PM2.5 and PM2.5-10. Samples were collected on 37 mm Teflon filters. These filters were weighed for PM mass, analyzed for BC by transmissometer and elements by XRF. However, the mean concentrations in Rajshahi were higher than the other major cities. The highest PM2.5 concentration was found in Rajshahi, and this value was detected when transboundary pollutant transport was expected to be high⁵.

15. **Current situation of waste management:** The management of medical waste (MW) is of great importance due to its impact on human health and environment. The objectives of the study are to identify different types of wastes, its generation rate and assess the existing waste management in various HCEs. It was found that the surveyed HCEs generate a total of 1495 kg/day of MW; of which about 1328.6 kg/day (88.87%) are non-infectious and about 166.4 kg/day (11.13%) are infectious. The average waste generation rate for surveyed HCEs is 1.54 kg/bed/day or 0.30 kg/patient/day. It was found from the survey that there is no proper and systematic management of medical wastes. The study reveals that lack of awareness; financial support and willingness are responsible for improper

³http://baec.portal.gov.bd/sites/default/files/files/baec.portal.gov.bd/page/1f00cd0e_737d_4e2e_ab9f_08183800b7a2/NSA_Vol-23-Paper%204.pdf.

⁴<http://203.112.218.65:8008/WebTestApplication/userfiles/Image/District%20Statistics/Rajshahi.pdf>.

⁵https://www.researchgate.net/publication/330674469_Assessment_of_Sound_Level_at_Different_Locations_of_Rajshahi_City.

management of MW. So, the RCC and HCEs authorities should adopt appropriate policy regarding this issue and provide training program on relevant personnel who are engaged in medical waste management⁶.

⁶ <https://www.banqlajol.info/index.php/JESNR/article/view/22062>.

IV. ENVIRONMENTAL MANAGEMENT PLAN

16. Environmental Management Plan (EMP) is an instrument for implementing the mitigation plan for the proposed subproject. The plan provides guidance regarding environmental and social issues/parameters, location, frequency, and means of management and mitigation. The EMP specifies the means through which adverse environmental and social impact of the project associated with pre-construction, construction, and operational activities of the subproject are either avoided or mitigated.

17. The basic objective of the EMP is to manage the adverse impacts of proposed project interventions in a way that minimizes the adverse impact on the environment and people at the subproject sites. The specific objectives of the EMP are to –

- Identification of the environmental impacts and recommended mitigation and enhancement measures;
- Define the responsibilities of the subproject proponents in accordance with the project phases (pre-construction, construction and operation);
- Facilitate the implementation of the mitigation measures by providing the technical details of each project impact;
- Define a monitoring mechanism and identify monitoring parameters to ensure that all proposed mitigation measures are completely and effectively implemented;
- Providing a cost estimate for EMP implementation.

18. For civil works, the Contractor will be required to prepare a Site Specific EMP based on this EMP and submit to PIU for approval; carry out all of the monitoring and mitigation measures set forth in the approved SEMP. The SEMP will be implemented for impact management during subproject construction and operation.

19. **Implementation Arrangements:** MOHFW will be the executing agency (EA) while DGHS will be the implementation agency (IA). The project is expected to be completed by April 2023. A project implementation unit (PIU) will be set up in DGHS to provide the technical, administrative, and logistical support necessary for implementation. An inter-ministerial Project Steering Committee is to be constituted under the project of DGHS under the chairmanship of the Secretary, MOHFW, will provide guidance on policy directions and oversee the overall project implementation. The PIU will work directly with the government entity involved in each activity, such as but not limited to: (i) the COVID-19 Emergency Operation Center (EOC) in preparedness and response; (ii) the various coordination committees at Divisional, District, City Corporation and Upazila levels for civil works activities; and (iii) the Institute of Epidemiology, Disease Control and Research (IEDCR) and other relevant institutes under DGHS in contact tracing support and surveillance strengthening activities. The PIU will conduct regular monitoring and evaluation activities and hold quarterly reviews of progress against the indicators. For technical oversight and hands-on support to the PIU for ensuring environmental safeguards, an intermittent environmental specialist will be appointed throughout project implementation up to completion.

20. The contractor will designate their environmental staff who will be responsible in overseeing the implementation and compliance to the EMP during construction phase and maintain a record of complaint/grievance submitted at the project level through the contractor including any actions taken to address the issue. Contractors will also follow the guidelines for COVID-19 preparedness provided in Appendix 3.

21. **Grievance Redress Mechanism (GRM):** MOHFW will ensure that affected persons will have the chance to express their legitimate grievances or to file a complaint about the project by setting up a Grievance Redress Mechanism (GRM) as soon as the loan becomes effective. The GRM shall resolve complaints in a time-bound and transparent manner. The GRM process will be aligned with the process adopted by MOHFW, while ensuring compliance with the policy principles of ADB SPS 2009. Any cost related to the implementation of the GRM will be part of the administration cost borne by MOHFW.

Grievances filed and resolved will be thoroughly documented and included in the monitoring reports submitted to ADB.

22. Complainants or affected persons can seek redress to their complaints in three levels: Level 1: The complaint will be resolved at the activity level through the Site Engineer or Representative by the Contractor within one to two working days and advise the Complainant accordingly. Level 2: The GRM Focal Person will assist the complainant in elevating the complaint to the PIU. The PIU will address the grievance within 7 days through continuous interactions with the complainant to answer queries and resolve the complaint. Level 3: In the event the complainant is not satisfied with the decision after the GRM, the Complainant can access the ADB's Accountability Mechanism (ADB's Office of Special Project Facility or Office of Compliance Review).

Table IV-1: Environmental Management Plan for Isolation Unit and ICU/CCU at RMCH

| IEC | Potential Impact | Mitigation Measures | Monitoring Method | | Responsibility | |
|---|---|--|---|---|----------------|---------------------------------------|
| | | | Method of Collecting and Reporting Data | Location and Frequency | Implementation | Supervision |
| CONSTRUCTION PHASE | | | | | | |
| Waste Management for Construction and COVID Waste | <ul style="list-style-type: none"> Soil, water and air pollution from the improper management of wastes and excess materials from the construction sites. The discarded PPE has posed serious health hazards and can spread the contagion among cleaners and walkers. | <ul style="list-style-type: none"> Develop a waste management plan including COVID waste by the help of the environmental consultant and later to update the plan, if required. Use of colored bins (like yellow) and to put medical wastes in 2-3 layered plastic bag. These wastes need to disinfectant first using chlorine or any other germicides and then safely transport them through marked vehicles in a marked place. Waste segregation, packaging, collection, storage disposal, and transport will be conducted in compliance with GOB, ADB and WHO COVID-19 Guidelines. Train on correct use and disposal of PPEs and check that they understand. Construction wastes (such as piece of rod, wood, bamboo, tin sheet, brick etc.) shall be kept in designated area and sprayed water mist to reduce the dust. Use PPE for staff handling any hazardous materials seepage of hazardous chemicals in case of any accidental spills. Do not burn/throw in any wastes to the waterbodies/drains. The PIU will audit any off-site waste disposal required on a monthly basis and institute any remedial measures required to ensure compliance. | <ul style="list-style-type: none"> Record of waste type and quantity and the disposal method | Construction camp and work sites during construction period | Contractor | PIU and Environmental Consultant (ES) |
| Management of Workers Facility | <ul style="list-style-type: none"> Lack of proper facilities such as water supply and sanitation facilities may pose health hazards to workers. | <ul style="list-style-type: none"> Ensure sufficient stock of soap, sanitizer, washing facility and safe water at work site. Also provision of an appropriate number of toilets and hand-washing points. At the entrance of the worksite every personnel must wash their hands for 20 second with maintaining a distance of at least 6ft from each other. Check the availability of medical kits at the site on weekly basis. Preparation of daily routine checkup including temperature screenings of the workers and staff. | <ul style="list-style-type: none"> Visual inspection & consultation with worker; Health checkup record. | Construction camp site during construction period | Contractor | PIU and ES |
| Drinking Water Quality | <ul style="list-style-type: none"> Groundwater at shallow depths may be contaminated with arsenic and other parameters and hence not suitable for drinking purposes. | <ul style="list-style-type: none"> Provide the drinking water that meets national standards. Select aquifers for drinking water free from arsenic and other contaminants. Tube wells will be installed with due regard for surface environment, protection of groundwater from surface contaminants, and protection of aquifer cross contamination. Sanitary waste should be adequately disposed-off to avoid groundwater contamination. | <ul style="list-style-type: none"> Record of water-borne diseases | Regular monitoring the drinking water source during construction period | Contractor | PIU and ES |
| Drainage Congestion | <ul style="list-style-type: none"> Waterlogging due to improper management of drainage for rainwater/liquid waste or wastewater. | <ul style="list-style-type: none"> Regularly inspect and maintain all drains to assess and alleviate any drainage congestion problem. Stockpile materials away from drainage lines. Reconstruct internal road-side drains immediately if damaged by any activities. | <ul style="list-style-type: none"> Visual inspection & consultation with hospital staff and visitors. | In the project area during construction period | Contractor | PIU and ES |
| Dust/Air Quality Management | <ul style="list-style-type: none"> Dust generation from construction sites, material stockpiles specially earth material stockpiles and access roads is a nuisance in the | <ul style="list-style-type: none"> During pneumatic drilling/wall destruction dust shall be suppressed by ongoing water spraying and/or installing dust screen enclosures at site. Water spraying the material stockpiles and access roads when and as required basis to minimize the potential for environmental nuisance due to dust. Increase the | <ul style="list-style-type: none"> Visual inspection & consultation with hospital staff, doctors, patients and their relatives | On the worksite Weekly monitoring during | Contractor | PIU and ES |

| IEC | Potential Impact | Mitigation Measures | Monitoring Method | | Responsibility | |
|--------------------------------------|---|---|--|---|----------------|-------------|
| | | | Method of Collecting and Reporting Data | Location and Frequency | Implementation | Supervision |
| | environment and can be a health hazard. | watering frequency during periods of high risk (especially during the dry period and high winds). <ul style="list-style-type: none"> • Cover haul vehicles carrying dusty materials moving outside the construction site. • Fit machinery/vehicles with appropriate exhaust systems and emission control devices. | | construction period | | |
| Noise and Vibration Management | <ul style="list-style-type: none"> • Noise may have an impact on workers, patients, hospital staffs, local residents etc. | <ul style="list-style-type: none"> • Appropriately site all noise generating activities to avoid noise pollution to workers, patients, hospital staffs, local residents etc. • Install temporary noise barriers by screen, tin, wood around generators to reduce noise levels. • Employ best available work practices on-site to minimize occupational noise levels. Use ear plugs in noisy areas of the construction activities. • Maintain all equipment in order to keep it in good working order in accordance with manufactures maintenance procedures. | <ul style="list-style-type: none"> • Visual inspection & consultation with hospital staff, doctors, patients and their relatives | On the worksite Weekly monitoring during construction period | Contractor | PIU and ES |
| Occupational Health and Safety (OHS) | <ul style="list-style-type: none"> • Construction works may pose health and safety risks to construction workers that may cause severe injuries and deaths. • Lack of first aid and health care facilities in the immediate vicinity. • Health risk of construction workers due to COVID-19. | <ul style="list-style-type: none"> • Develop and implement an Occupational Health and Safety Plan to ensure competent and consistent attention to worker health and safety throughout the construction phase. • Prepare the health and safety guidance for COVID-19 at work sites and get approval from PMU, and strictly follow the guidance at worksite; • Any worker showing symptoms of respiratory illness (fever, cold or cough) and has potentially been exposed to COVID-19 should be immediately removed from the site and tested for the virus at SSMCH; • Workers involved for any short renovation activities at isolation area for COVID-19 will have WHO certified PPE and subsequently dispose the PPE in designated areas. • Provide PPE to workers such as safety shoes, safety helmets, face masks, hand gloves, protective clothing, goggles, full face eye shields, and ear plugs and monitor to maintain them. • Ensure hand washing and other sanitary stations are always supplied with clean water, soap, and disinfectant; • Provide safety measures as appropriate during works such first aid kits, restricted access zones, warning signs, overhead protection against falling debris, lighting system to protect community, hospital staff and patients against construction risks. • Simple poster/signage in Bangla explaining entry procedures, wearing masks and wash hands before entering/leaving. • Emergency preparedness and response procedures and equipment (warning signs, fire extinguishers, fire exit etc.). • Train all construction workers in OHS matters, and on the specific hazards of their work and maintain a register of the person present during the training. • Grievance Redress mechanism (GRM) developed to readdress complaints raised by community, health staff, patients and their relatives. | <ul style="list-style-type: none"> • Visual inspection & consultation with hospital staff, doctors, patients and their relatives • Record of accidents • Obtain record of training • Provision of regular temperature check, using disinfectants and also provision of time-to-time hand wash are required to limit the COVID-19 pandemic. | Contractor' site office and work site during construction | Contractor | PIU and ES |

| IEC | Potential Impact | Mitigation Measures | Monitoring Method | | Responsibility | |
|--|---|---|--|--|----------------|-------------|
| | | | Method of Collecting and Reporting Data | Location and Frequency | Implementation | Supervision |
| Site Reinstatement | <ul style="list-style-type: none"> • Damage due to debris, spoils, excess construction materials. | <ul style="list-style-type: none"> • Remove all spoils wreckage, rubbish, or temporary structures from the construction and camp sites; • All affected structures rehabilitated. | <ul style="list-style-type: none"> • Visual inspection & consultation with local people | At the end of construction period | Contractor | PIU and ES |
| OPERATION PHASE | | | | | | |
| COVID Waste Management | <ul style="list-style-type: none"> • COVID waste has posed serious health hazards and can spread the contagion among hospital staff, waste handlers and the community. | <ul style="list-style-type: none"> • Prepare medical waste management plan that will cover the waste generated from the response to the COVID-19 infection. The plan will follow ADB's guidance note on managing medical waste during COVID-19 pandemic as well as any other government regulations. • All medical waste produced during the care of COVID-19 patients must be considered as infectious waste and should be segregated and collected safely in designated colored coded containers. • Use of colored bins (like yellow) and to put Covid wastes in 2-3 layered plastic bag. These wastes need to disinfectant first using chlorine or any other germicides and then safely transport them through marked vehicles in a marked place. • Waste segregation, packaging, collection, storage disposal, and transport will be conducted in compliance with WHO COVID-19 Guidelines. • Train the staffs on color coding and handling of infectious Covid wastes. | <ul style="list-style-type: none"> • Visual inspection and consultation with hospital staff and cleaners. • Record of waste type and quantity and the disposal method. | Hospital area especially in COVID ward during operation period | RMCH | DGHS |
| Medical Waste Management | <ul style="list-style-type: none"> • Poor management of medical waste exposes healthcare workers, waste handlers and the community to infections, toxic effects and injuries. • Soil, water and air pollution from the improper management of wastes generated from the facility. | <ul style="list-style-type: none"> • Provision of color coded, covered receptacles in strategic positions of the facility for separate categories of waste and regular cleaning of waste bins. Labels showing the type of waste that should be disposed of in each container should be placed near to the bins to guide staff and reinforce good habits. • Medical wastes generated in the hospital will be treated by in-house facility and then these treated wastes will be disposed of as per a pre-determined SOP in accordance with international good practices. Transport the medical waste with covered vehicle. The records of waste disposal will be maintained as proof for proper management as designed. • Ensure necessary PPE (gown, gloves, face mask, goggles or face shield, gumboots) is provided to all staffs, as required and ensure them to wear PPE when handling and disposing waste according to national and WHO guideline. • Do not burn the wastes openly or throw in to waterbodies or do not dispose on soil. • Audit for any off-site waste disposal will be required on a monthly basis and institute any remedial measures required to ensure compliance. | <ul style="list-style-type: none"> • Visual inspection and consultation with hospital staff and cleaners. • Record of waste type and quantity and the disposal method. | Hospital area during operation period | RMCH | DGHS |
| Occupational Health and Safety including COVID H&S | <ul style="list-style-type: none"> • Needle-sticks, surgical cuts, and other injuries posing transmission risk of blood-borne diseases such as COVID-19, Hepatitis C, HIV-AIDS, etc. • Dermatitis and allergic reactions due to workplace exposures. | <ul style="list-style-type: none"> • Prepare a health and safety guidance for COVID-19 and strictly follow the guidance at the facility. • Refer to IFC EHS Guidelines for Healthcare Facilities (2007) and relevant national guidelines and protocols. • Implement suitable safety standards for all workers and facility visitors. • Mandatory use of personal protective equipment and safety gears, where required. • Arrangements for safe drinking water and sanitation facilities. | <ul style="list-style-type: none"> • Regular inspection and testing of all safety features and hazard control measures and personal protective features | Hospital area during operation period | RMCH | DGHS |

| IEC | Potential Impact | Mitigation Measures | Monitoring Method | | Responsibility | |
|---------------------------------------|---|---|---|---|----------------|-------------|
| | | | Method of Collecting and Reporting Data | Location and Frequency | Implementation | Supervision |
| | | <ul style="list-style-type: none"> • Provide regular OHS training to healthcare workers. • Provide incentives to staff and create a work-life balance in work schedule. | | | | |
| Hazards due to Substation | <ul style="list-style-type: none"> • Noise and vibration may have an impact on hospital staff, doctors, patients and their relatives; • Accidental spillage of oil and toxic coolants that would contaminate land and water. • Risk of fire and electrocution hazards from substation. | <ul style="list-style-type: none"> • Have provision to use canopy to absorb 0.7 dB to 0.8dB of noise. • Periodic maintenance of equipment such as transformers and capacitors to minimize noise generation. • Provision of oil-water separator and oil containment structure. • Substation room will be entry restricted and security staff assigned to prevent unauthorized public access. Place warning signs at substation room. • Ensure firefighting arrangement such as fire extinguishers, fire alarms etc. in the substation site. • Use of PPE, proper training, awareness, keeping safe distance from hazardous points, maintaining safety of high switchyard and cable gallery. | <ul style="list-style-type: none"> • Regular inspection and testing of all safety features and hazard control measures and personal protective features. | Substation room during operation period | RMCH | DGHS |
| Accidental Releases of Gas and Fluids | <ul style="list-style-type: none"> • Leakage of infectious or hazardous substances may pose serious health hazards and can spread the contagion among hospital staff and patients, cleaners etc. | <ul style="list-style-type: none"> • Develop an Emergency Response Plan and follow strictly during emergency incident. • Emergency preparedness and response procedures and equipment (warning signs, fire extinguishers, fire exit etc.). • Wear disposable gloves and, if aerosols are formed, glasses and a respirator for particles. • Cover the contaminated area with a disinfectant in a concentric way, starting at the edge and progressing towards the center of the contamination. • Avoid spraying or pouring the disinfectant from above, which can cause aerosols. • Mop up, and dispose of all waste and contaminated material in the appropriate container (infectious waste). • Conduct monthly safety audit of facility to identify fire risks, electrocution hazards and other unsafe conditions, and assess adequacy of fire extinguishers and first aid provisions. | <ul style="list-style-type: none"> • Record of regular inspection. | Hospital area during operation period | RMCH | DGHS |

23. **EMP Budget:** The contractor should develop a site-specific Occupational Health and Safety Plan following ADB COVID-19 guidelines to ensure competent and consistent attention to worker health and safety throughout the construction phase and it is also suggested to maintain a medical waste management plan for the operation period. The possible mitigation measures of handling medical waste have also been suggested in the EMP. The EMP budget would also include the training cost. The contractor will arrange training for associated personnel and workers during construction phase. These training sessions will include knowledge on the environmental management system, health and safety, emergency response, etc. The EMP implementation cost for RMCH has been calculated and given in Table IV-2.

Table IV-2 : Cost Estimation for EMP Implementation

| Mitigation and Monitoring Items | Unit | Cost/Unit | Total Unit | Total Cost |
|--|---------|-----------|------------|-------------|
| 1. Workers Health and Safety: | | | | |
| Safety Vest | Nos. | 70 | 270 | 18900 |
| Helmet | Nos. | 70 | 350.00 | 24500 |
| safety shoes | Nos. | 70 | 430.00 | 30100 |
| safety Goggles | Nos. | 70 | 280.00 | 19600 |
| Hand Sanitizer (5 Liter) | Nos. | 20.00 | 2600.00 | 52000 |
| One-time Face Mask | Nos. | 30.00 | 500.00 | 15000 |
| Thermometer for measuring Body temperature | Nos. | 3 | 1000 | 3000 |
| Fire Extinguisher | Nos. | 10 | 1299 | 12990 |
| Megaphone | Nos. | 2 | 2700 | 5400 |
| Handheld Loudspeaker | | | | |
| First Aid Box | Nos. | 2 | 2500 | 5000 |
| Torch Light | Nos. | 5 | 1090 | 5450 |
| Sub-total excluding over-head & profit = | | | | 1,91,940 |
| Sub-total Including over-head & profit = | | | | 2,17,851.9 |
| Add VAT with adjustment factor (VAT-7.5% & Factor-1.08108) | | | | 17,663.43 |
| Total for item 1 including over-head, profit and VAT = | | | | 2,35,515.33 |
| 2. Engineers Health and Safety: | | | | |
| Safety Vest | Nos. | 15 | 270 | 4050 |
| Helmet | Nos. | 15 | 1140.00 | 17100 |
| safety shoes | Nos. | 15 | 2000.00 | 30000 |
| safety Goggles | Nos. | 15 | 2100.00 | 31500 |
| Hand Sanitizer (5 Liter) | Nos. | 2.00 | 2600.00 | 5200 |
| One-time Face Mask | Nos. | 5.00 | 500.00 | 2500 |
| Thermometer for measuring Body temperature | Nos. | 2 | 1000 | 2000 |
| First Aid Box | Nos. | 2 | 2500 | 5000 |
| Torch Light | Nos. | 2 | 1090 | 2180 |
| Sub-total excluding over-head & profit = | | | | 99,530 |
| Sub-total Including over-head & profit = | | | | 1,12,966.55 |
| Add VAT with adjustment factor (VAT-7.5% & Factor-1.08108) | | | | 9,159.33 |
| Total for item 2 including over-head, profit and VAT = | | | | 1,22,125.88 |
| 3. Training on Occupational Health & Safety, and COVID-19 Safety Protocol | | | | |
| Train on correct use and disposal of personal protective equipment (PPE). | Nos. | 3 | 20000 | 60000 |
| Leaflet/poster for awareness among the workers, staffs and nearby communities | Nos. | 1000 | 5.00 | 5000 |
| Sub-total excluding over-head & profit = | | | | 65000 |
| Sub-total Including over-head & profit = | | | | 73775 |
| Add VAT with adjustment factor (VAT-7.5% & Factor-1.08108) | | | | 5981.75 |
| Total for item 3 including over-head, profit and VAT = | | | | 79756.75 |
| 4. Water, Sanitation and Waste Disposal Management | | | | |
| Supply of waste bins/pots for different wastes. | Nos. | 50 | 2400 | 120000 |
| Cost for Drinking water | Nos. | 15000 | 2 | 30000 |
| Cost for Sanitation facilities (hand tube well, latrine, etc.) | Lumpsum | 35000 | 1 | 35000 |

| Mitigation and Monitoring Items | Unit | Cost/Unit | Total Unit | Total Cost |
|--|------|-----------|------------|------------|
| Cost for Signboard (1 m x 1.5m) | Nos. | 5000 | 5 | 25000 |
| Sub-total excluding over-head & profit = | | | | 210000 |
| Sub-total Including over-head & profit = | | | | 238350 |
| Add VAT with adjustment factor (VAT-7.5% & Factor-1.08108) | | | | 19325.65 |
| Total for item 4 including over-head, profit and VAT = | | | | 257675.65 |
| Grand Total = | | | | 695073.61 |
| Note: Considering Over-head 3.5%, Profit - 10%, VAT 7.5% | | | | |

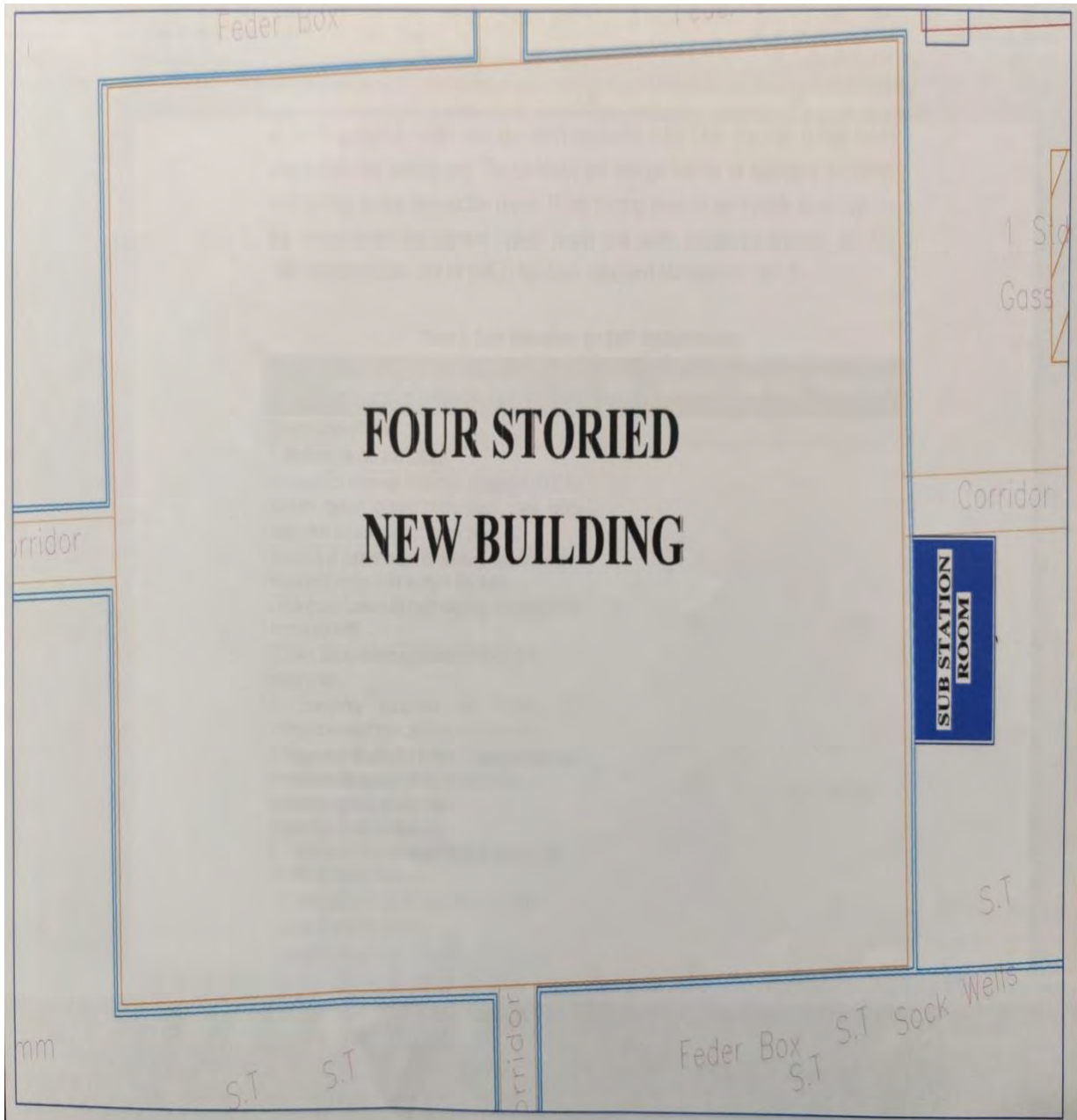
24. **Monitoring and Reporting:** The PIU of the project, under DGHS, will monitor the progress of EMPs implementation and the compliance performance of their contractors. The PIU will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome.

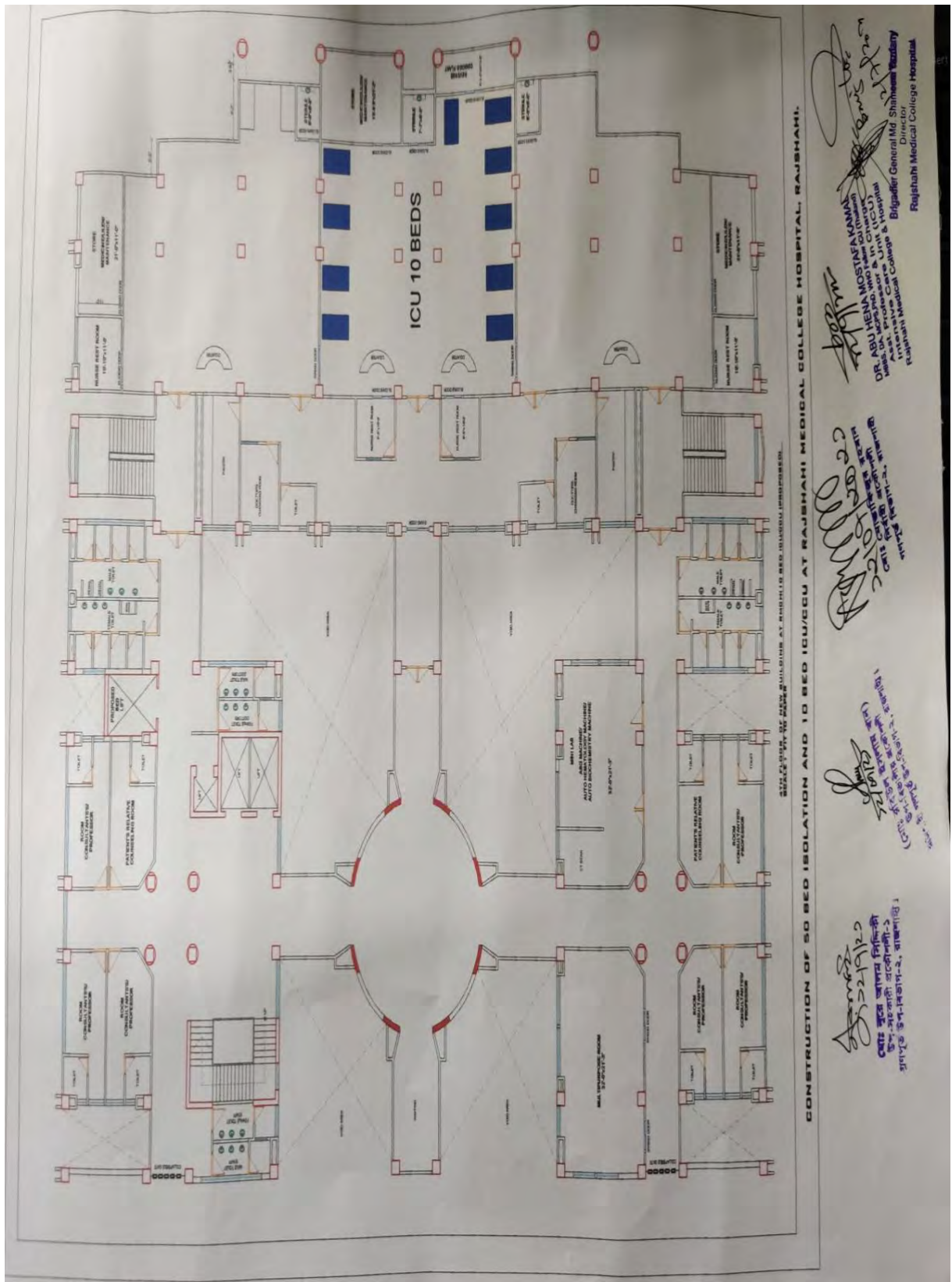
25. The PIU will be responsible in preparing the environmental monitoring reports to be submitted to ADB semi-annually during project implementation. An environmental consultant will be provided by the ADB to provide technical support to the PIU of the Project in ensuring compliance to ADB requirements and in preparing the environmental monitoring reports.

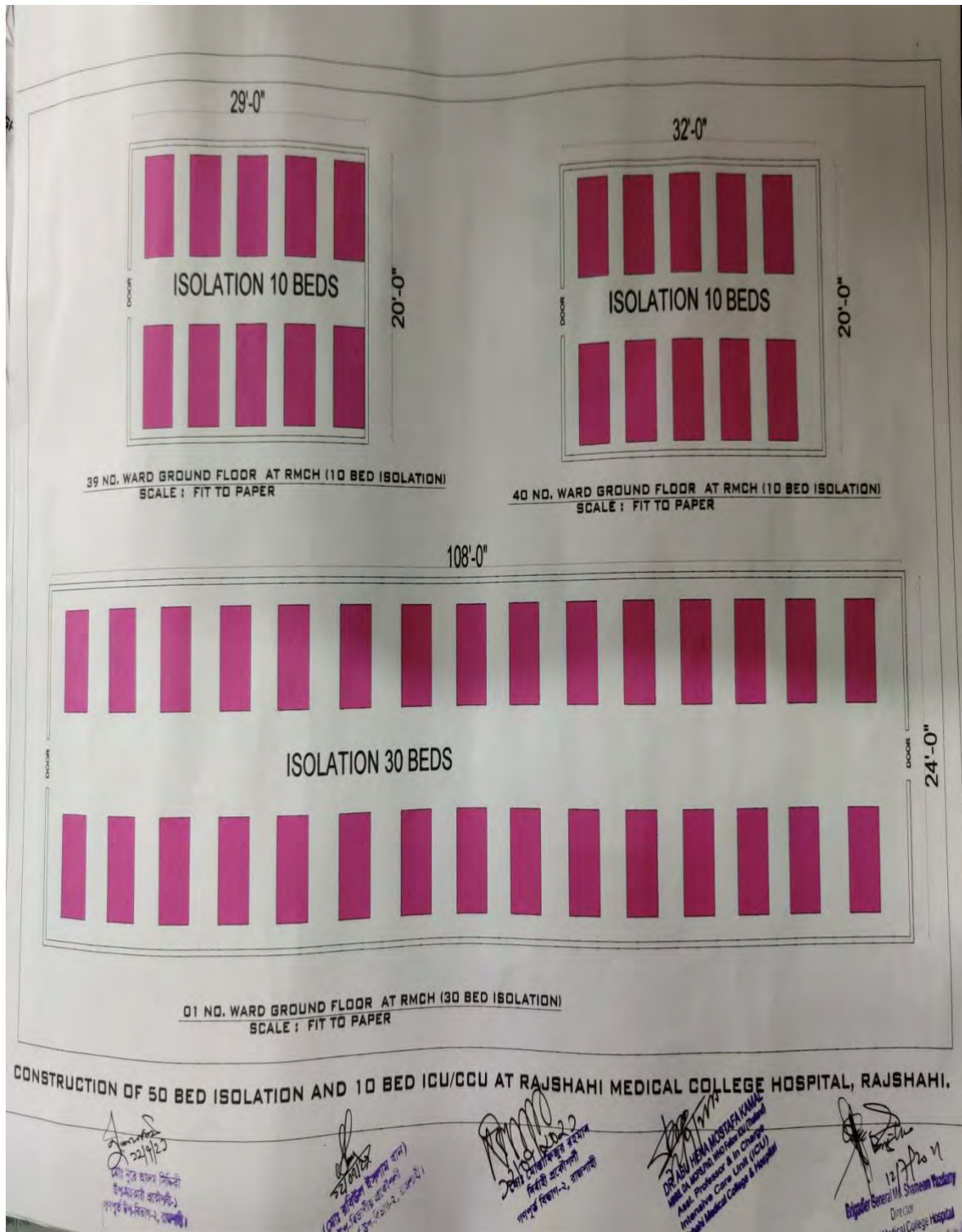
26. ADB will review the project performance based on the commitments by HSD, MOHFW as agreed in the legal documents. Monitoring and supervising of environmental safeguards will be integrated into the project performance management system of ADB. The review of project performance will be conducted by ADB until the project completion report is completed. ADB will carry out the following monitoring actions to supervise project implementation:

- Conduct periodic site visits for projects with adverse environmental impacts;
- review the environmental monitoring reports submitted by MOHFW to ensure that adverse impacts and risks are mitigated as planned and as agreed with ADB;
- work with MOHFW and DGHS to rectify, to the extent possible, any failure to comply with their environmental commitments in the Loan Agreement, and exercise remedies to re-establish compliance as appropriate; and
- Prepare a project completion report that assesses whether the objective and desired outcomes of the project have been achieved.

APPENDIX-1: LAYOUT PLAN OF SUBPROJECT COMPONENTS







APPENDIX-2: SAMPLE MEDICAL WASTE MANAGEMENT PLAN

OBJECTIVE

Medical Waste which is also referred as clinical waste has to be handled and disposed in a proper manner to eliminate the possibility of injury or infection and safeguarding the environment as a whole. The impacts associated with improper Medical Waste Management (MWM) can damage the environment and affect public health directly and indirectly.

Medical wastes contain both general wastes (app. 75-80%) and infectious wastes (app. 20-25 percent). Medical Waste constitutes a public health hazard, if not managed properly. Although majority of the medical waste is no more dangerous than household/municipal waste, the hazardous waste, if exposed to the people or environment in an untreated form, pose various kinds of danger.

The main objective of the Medical Waste Management Plan (MWMP) is to organize disposal of all wastes generated during construction in an environmentally acceptable manner specially consider the following:

- Health hazards of the project personnel as well as community people should not be occurred;
- Manage the wastes in such a way that environment (specially air, water, surrounding environment etc.) will not be polluted;
- Odor means bad smell should not be generated;
- Always friendly environment at the construction sites and construction camps;
- Any waste should not be disposed into the river and any water bodies to avoid water pollution;
- Any waste should not be burnt

STRATEGIES FOR MEDICAL WASTE MANAGEMENT

The major components of medical waste management include:

- Proper waste collection and segregation at source – use of standardized color-coded bins for different wastes;
- Waste streams - general, contaminated, cytotoxic/pharmaceuticals, body parts;
- Storage and transport - cold storage for contaminated waste and body parts, transport in safe and leak proof containers;
- Waste treatment – sterilization of contaminated waste (steam autoclave), incineration of cytotoxics, pharmaceuticals and body parts in incinerator meeting relevant standards and statues.

To perform a Medical Waste Management, several stages, need to be followed.

Stage 1: Collecting & Segregating

The biomedical waste has to be collected in containers that are resilient and strong from breakage during the handling process. Do not place sharps, used needles, syringes, or other contaminated tools in common waste disposal or recycle bin because the entire waste will be infectious by doing so. The segregation also needs to be performed between the liquid and solid biomedical waste products. Categorizing the medical waste with correct segregation to isolate and manage each waste in the proper way. For this purpose, the segregations come in colored waste containers, label coding and plastic bags. The simplest way to identify the different types of waste is to collect the various types of waste in separate containers or plastic bags that are color-coded and/or marked with a symbol.



Stage 2: Storing & Transporting

Specific requirements for storage facilities, such as a secure area that is inaccessible to the general public, as well as separated it from areas for food consumption. The storage facilities also have to be accompanied with refrigerator or freezer unit that can be used with medical waste if necessary. Some facilities even provided special vehicles and protective devices to dispose, handling or transport the biomedical waste products. Remember to observe and keep maintaining the protective devices periodically so it won't be a source of transmitting the infections. Further recommendations should be followed by the ancillary workers in charge of waste collection:

- Wastes should be collected daily or as frequently as required and transported to the designated central treatment site.
- No bags should be removed unless they are labeled with their point of production (hospital and ward or department) and contents.
- The bags or containers should be replaced immediately with new ones of the same type.
- Special packaging requirements for off-site transport in general, the waste should be packaged according to the recommendations provided in sealed bags or containers to prevent spilling during handling and transportation. The bags or containers should be appropriately robust for their content (puncture-proof for sharps, for example, or resistant to aggressive chemicals). Bags and containers must be closed whenever they are two-thirds full. Never pile bags or empty them; grasp them from the top (never hold them against the body) and wear gloves.
- All waste bags or containers should be labeled with basic information on their content and on the waste producer. This information may be written directly on the bag or container or on preprinted labels, securely attached. For health care wastes, the following additional information should be marked on the label: waste category, date of collection, place in hospital where produced (e.g., ward), and waste destination.

Stage 3: Treatment of Medical Waste

Incineration at high temperatures (over 1000°C) is one of the few technologies with which all types of health-care waste can be treated properly and it has the advantage of significantly reducing the volume and weight of the wastes treated. There are simple incinerator models for treating small quantities of medical waste. Some are available on the market, and others have to be built with local materials on the spot according to relatively simple plans. These incinerators consist essentially of one or two combustion chambers (the primary and secondary chambers) and a discharge chimney. The combustion and air-borne emission control system is simple. If infectious medical waste is treated in small single-chamber or dual-chamber incinerators on site, fractions of waste such as drugs, chemicals, halogenated materials or wastes with high heavy metal content (such as batteries, broken thermometers, etc.) must not be treated in this type of facility.

Autoclaving is a thermal process at low temperatures where waste is subjected to pressurized saturated steam for a sufficient length of time to be disinfected (60 minutes at 121°C and 1 bar). Where prions (which cause Creutzfeldt- Jakob's disease) are present, a cycle of 60 minutes at 134°C is recommended, since they are exceptionally resistant. Efficiency tests (biological or thermal) must in any case be carried out regularly. Autoclaving is environmentally safe but, in most cases, it requires electricity, which is why in some regions it is not always suitable for treating wastes small autoclaves are frequently used for sterilizing medical equipment, but the models used for treating healthcare wastes can involve relatively complex and expensive plants (with internal mixing, shredding and drying systems) requiring meticulous design, proper sorting and a high level of operating support and maintenance. Furthermore, the effluents must be disposed of carefully and properly monitored. And lastly, large autoclaves may require a boiler that generates several types of emissions, which have to be monitored. Once wastes have been processed in an autoclave, they are no longer infectious materials: they can be landfilled with municipal refuse. Autoclaving is often used for pre-treating highly infectious waste before it is transported outside the hospital. This thermal process needs electricity and high installation cost.

Microwaving is another emerging technology to treat biohazardous waste, including material from healthcare facilities. Use of radiation to heat materials and destroy pathogens, can be combined with shredding to make material safe for disposal without modification. In microwave systems, disinfection occurs through the action of moisture and low heat. Microwave units usually operate at a frequency of 2450 MHz and the energy generates hot water and steam. It can be installed indoor with solid floor and require large electricity supply. It has the advantage of significantly reducing the volume and weight of the wastes treated up to 60-80% where autoclave can reduce to 50%.

Stage 4: Disposal of Medical Waste

Disposal in a sanitary landfill or waste burial pit: The disposal of untreated health-care waste in an uncontrolled dump is not recommended and must only be used as a last resort. It can be disposed of in a sanitary landfill, subject to certain precautions: it is important that health-care waste be covered rapidly. One technique is to dig a trench down to the level where old municipal refuse (over three months old) has been buried and to immediately bury health-care waste that is discarded at this level under a 2-metre layer of fresh municipal refuse. The following are the essential factors that must be taken into consideration in the design and use of a sanitary landfill

- access must be restricted and controlled;
- competent staff must be available;
- the discarding areas must be planned;
- the bottom of the landfill must be waterproofed;
- the water table must be more than 2 meters below the bottom of the landfill;
- there must be no drinking water sources or wells in the vicinity of the site;
- chemicals must not be disposed of on these sites;
- the waste must be covered daily and vectors (insects, rodents, etc.) must be controlled;
- the landfill must be equipped with a final cover to prevent rainwater infiltration; leachates must be collected and treated.

Purpose-built burial pit could also be used, preferably on the hospital site. Ideally, the pit should be lined with low permeability material such as clay to prevent the pollution of shallow groundwater and should be fenced in so as to prevent scavenger access. Health-care wastes must be buried immediately under a layer of soil after each unloading operation. It is suggested that lime be spread on the waste for added health protection (in the event of an epidemic, for example) or to eliminate odor. The pit should be sealed once it has been filled.

Disposal of liquid wastes in the sewage: There are two recommended ways to handle medical waste fluids: i. Collect fluids in a leak proof container, and solidified for autoclave treatment; ii. Thermally (autoclave) fluids then they be disposed into the sanitary sewer system. An extra precaution should be performed before pouring treated fluids in sewer because they may clog and leak.

Spill contingency plan: Surfaces contaminated with spilled or leaked biomedical waste must be decontaminated with a solution of industrial strength detergent to remove visible soil before being disinfected by one of the following methods:

- Steam for a minimum of 30 seconds.
- Rinse for at least three (03) minutes with a hypochlorite solution containing 100 parts per million (ppm) available free chlorine (note: one tablespoon per two (02) gallons of water is approximately 100 ppm available free chlorine), or rinse for at least three (3) minutes with an iodine solution containing 25 ppm available iodine.
- Use a chemical germicide that is registered by the Environmental Protection Agency (EPA) as a hospital disinfectant, following recommended dilutions and directions. Liquid waste created by these chemical disinfecting operations shall be disposed of into the sanitary sewage system.
- Employees cleaning spills of biomedical waste must wear appropriate personal protective equipment such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks and eye protection. Spills should be reported to the respective Health and Safety Officer.

APPENDIX-3: COVID HEALTH AND SAFETY PLAN FOR THE CONSTRUCTION WORK

The contractors shall at all times be responsible to take all reasonable precautions to maintain the health and safety of personnel and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. However, a COVID-19 Health and Safety Advisory Guidance for Construction Workforce prepared by ADB, which may be further updated as the COVID-19 situation evolves by the contractor and get approval from the PIU. The guidance includes the protocols on the following:

A. Prerequisites for Reopening Worksite: Plan to open/reopen worksite at limited scale (i.e. only essential works at worksite). Map essential/unavoidable works that must be attended at this moment. Identify and engage essential labor force initially. Increase labor force step by step as necessary. Do not engage labor until: i. Conduct risk assessment of worksite and prepare plan as per H&S guideline; ii. Avoid labor intensive works as much as possible; iii. Ensure all to use the Personal Protective Equipment (PPE) as appropriate; iv. Engage health and safety supervisor to implement COVID-19 guideline; v. Engage health worker for daily temperature check and record for workers; vi. Ensure all equipment and vehicles used are routinely disinfected; vii. Provide thermometer, soap, sanitizer, disinfectant, PPE at worksite/camp; viii. Place adequate washbasins, disinfectant tub, dispenser for sanitizer; ix. Engage contractor’s EHS staff or assign an existing staff to handle COVID-19 in case if detected; x. Post enough COVID-19 awareness posters throughout the worksites; and xi. Maintain COVID-19 weekly monitoring and reporting mechanism at worksite; including any necessary actions to be taken.

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| Locate the closest medical facility equipped with COVID -19 and contact them. | Place washbasins and disinfectant tub for shoes. | Assign a staff or EHS professional to oversee implementation of COVID-19 EHS manual. | Place COVID-19 signed covered trash bin for disposal of used PPEs. | Supply soap and sanitizer to labor and staff before and after the shift for disinfection. |

B. Worksite Entrance Protocol: Everyone entering the worksite must wear a mask, gloves and hard shoes. Strictly follow and implement the EHS manual at worksite. The entrance of the worksite/camp site every personnel must wash their hands for 20 second with maintaining a distance of at least 1m (3ft) from each other.

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| Everyone entering the worksite must wear a mask and gloves. | Maintain physical distance of minimum 1m (3ft) during worksite entry queue. | Display hand washing protocol at entrance. All personnel wash their hands with soap for 20 seconds before, during and after work. | Spray bottom of shoes of every personnel entering worksite/ campsite with disinfectant. Disinfect all vehicles entering the site. | Check body temperature of all at the time of reporting to site. If temperature is > 37°C send to the designated medical facility. |

C. Worksite Management Protocol: A designated EHS and medical person should stay all time during work. The EHS/Medical person should also monitor campsite. He/she will be in charge of ensuring physical distances (minimum 1m) among workers, disinfecting surfaces that are commonly used and investigate worker’s/site personnel health and safety.



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| <p>Ensure physical distance 1m (3ft) all the time at work. Ensure rotated schedule for break to minimize gathering.</p> | <p>Frequently clean and disinfect highly used tools, machineries, and surfaces (e.g. tables, toilets) by workers. Use designated trash bin to dispose used PPEs.</p> | <p>Mandatory morning briefing on COVID awareness at site maintaining physical distance. Display COVID-19 related awareness message in Bangla.</p> | <p>Use alcohol-based wipe to clean tools, equipment, vehicle before and after use.</p> | <p>Discourage gathering at site. Discourage unnecessary entrance and exit at site.</p> |

D. Camp Management Protocol:

1. Provide soap, sanitizer, washing facility and safe water at the workers' dwelling. Encourage frequent hand washing.
2. Ensure separate covered waste bin for disposal of used PPEs.
3. Protect against heat, cold, damp, noise, fire, and disease-carrying animals.
4. Maintain good housekeeping and social distancing in kitchens, meal rooms, canteens.
5. Ensure personal distance at least 1m (3ft) during lunch, dinner and prayer.
6. Ensure ample ventilation at the camp.



E. Work at Site Awareness: Train workers on how to properly put on, use/wear, and take off protective clothing and equipment. The on-site EHS/Medical person should be in-charge of these trainings. These trainings must maintain the WHO's social distancing protocol. Make these trainings mandatory at worksites. Provide 10-15 minutes of a workday for such 'training and encouragement' activities.

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| <p>Inform the designated ESH/Medical personnel immediately if any person starts showing the symptoms of COVID-19.</p> | <p>Encourage respiratory etiquette, including covering coughs and sneezes. Don't touch nose/eye/mouth if not washed recently, do not spit.</p> | <p>Encourage the workers at camp to go out for supplies not more than once a week. Prepare posters for awareness in Bangla. Place awareness raising posters at worksite & camp.</p> | <p>Shorten toolbox meetings. Initiate remote meeting protocol to avoid physical contact.</p> | <p>Stay informed. Get news from WHO and Government news outlets. <u>Ask your EA.</u> <u>Ask ADB.</u></p> |

Contractor should develop a preparedness and response plan by following the ADB guideline to prevent COVID-19 infection in the workplace. The preparedness plan will be submitted to PMU for approval. In addition to the ADB guideline, the government's Technical Guidance for Social and Institutional Containment and Prevention of Pandemic COVID-19 Infection issued on 11 May 2020 has also to be complied with.