KINGDOM OF CAMBODIA

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MINISTRY OF HEALTH
Health Equity and Quality Improvement Project (H-EQIP)

ENVIRONMENTAL MANAGEMENT PLAN

FOR

CONSTRUCTION OF A NEW LABORATORY BUILDING

IN BATTAMBANG PROVICIAL HOSPITAL

November 2020

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1. PROJECT DESCRIPTION

The Royal Government of Cambodia (RGC) received fund from the International Development Association (IDA Credit No. 5813-KH; MDTF Grant No. TF0A3114) for the Cambodia Health Equity and Quality Improvement Project (H-EQIP). The objective of project is to improve access to quality health services for the targeted population groups with protection against impoverishment due to the cost of health services in the Kingdom of Cambodia, and to provide immediate and effective response in case of an eligible crisis or emergency. The project have 4 components namely Component 1: Strengthening Health Service Delivery, Component 2: Improving Financial Protection and Equity, Component 3: Ensuring Sustainable and Responsive Health Systems, and Component 4: Contingent Emergency Response Component (CERC).

CERC, with a provisional zero allocation, was to allow for the reallocation of financing in accordance with the IDA Immediate Response Mechanism to provide an immediate response to an eligible crisis or emergency, as needed. Upon the request from RGC, CERC was activated on March 27, 2020 and US$14 million was reallocated from other project component budget to finance the implementation of Cambodia National Action Plan for Responding to COVID-19. Action plan prepared to be financed when activating CERC includes supplies of laboratory equipment and reagents, medical equipment and consumables, renovation and construction of hospital laboratory buildings for testing and treating COVID-19.

Battambang Provincial Hospital is the regional representative of Ministry of Health that serves a broad public health mandate to improve health of the Cambodian in the region. In responding to COVID-19, MOH planned to upgrade the capacity of this hospital's laboratory to be a regional laboratory by equipping sophisticated laboratory equipment, i.e. a COBAS 6800 system and GeneExpert machines, and their associated equipment and consumables to be fully capable in testing COVID-19. As the design and specification of the construction of this regional laboratory has been prepared and the procurement for this construction has been underway, it is expected that the construction will begin in December 2020.

1.1 Description of Project Site

1.1.1 Battambang Provincial Hospital and Laboratories

The Battambang Provincial Hospital is the largest public hospital in Battambang province. It plays a vital role in providing health care for all people living in both rural and urban areas of

Battambang. The laboratories of this hospital play an important role in supporting the diagnosis and research. Since Battambang province is one of Cambodia's tourist zones and is a crossing point for tourists who travel between Thailand and Cambodia, the Ministry of Health is planning to upgrade this laboratory to be a regional laboratory biosafety level 2+ with full capacity for testing COVID-19 in the northwestern region of Cambodia.

The Operation Structure of Battambang Provincial Hospital

The hospital is managed by a director and two deputy directors. The director and deputy directors form the hospital management committee. Lower structure comprises different committees that work and manage specific hospital related areas such as management committee, hospital facility maintenance committee, financial management committee, and infection and prevention control committee. The hospital has four supported departments namely technical department, administration department, finance department, and planning and statistic department. The technical department is the largest department of the hospital.

The hospital's facility and maintenance committee responsible for monitoring and supervision the use and maintenance of facilities including laboratories. The laboratory biosafety and biosecurity team is part of the laboratory unit. This team works to ensure safety operation of laboratory. Infection prevention and control committee is responsible for management hospital waste and infection prevention control including laboratory waste. Figure 1 presents hospital organizational chart of hospital.

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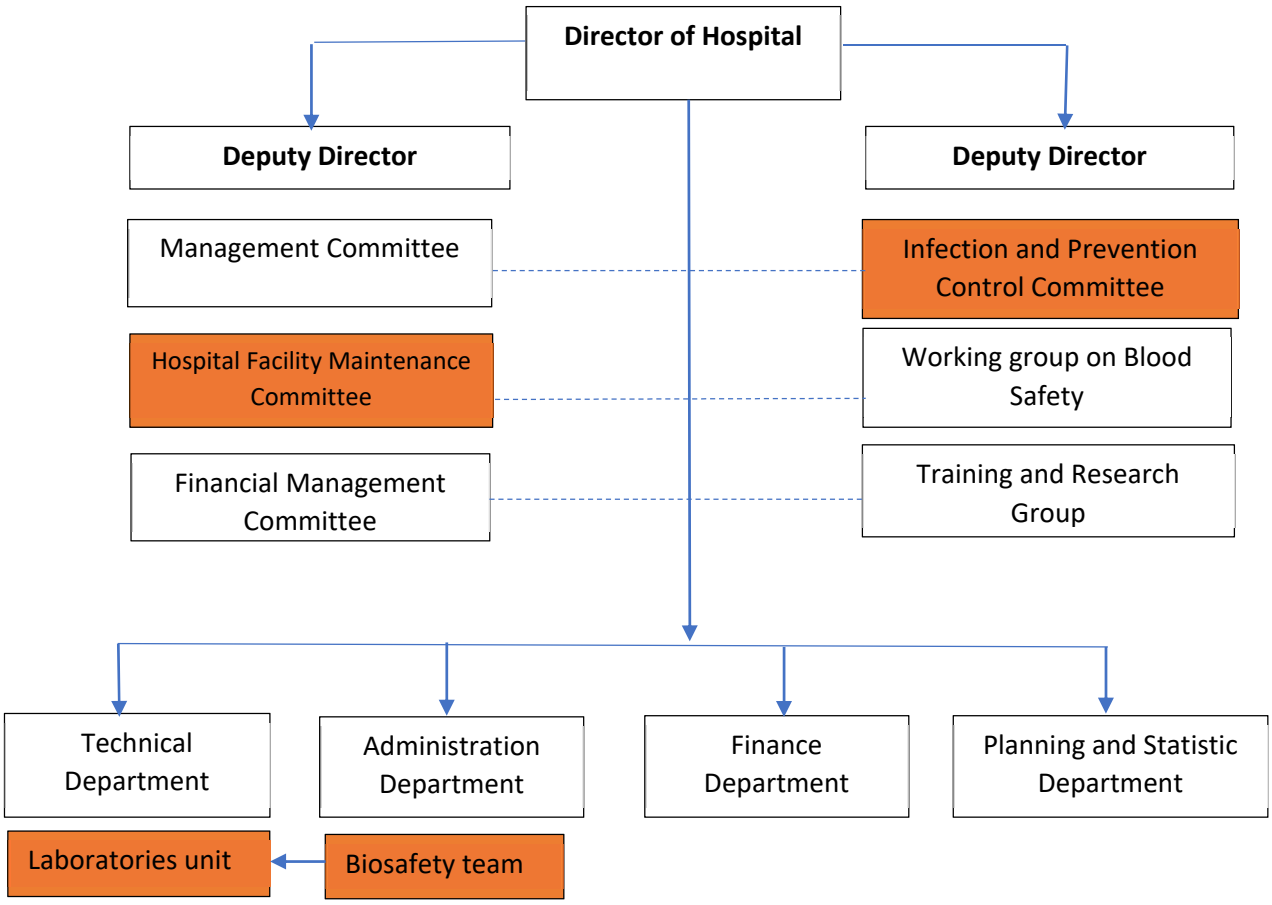
Figure 1: Organization Structure of Battambang Provincial Hospital



1.1.2 Human Resource

The Battambang provincial hospital has a total of 308 staff (147 female). This includes 73 medical doctors (14 female), 130 nurses (45 female), 12 pharmacists (6 female), 7 dentishs (1 female), 71 midwifes (71 female), and 14 laborators (7 female). 17 staff (4 medical doctors and 13 nurses) have been trained and have worked in the hospital intensive care unit (ICU).

The hospital laboratory unit consists of 20 staff. They are distributed into three laboratory groups namely general laboratory, micro loboratory, and TB laboratory. In addition, with the plan to upgrade the laboratories, the laboratory unit has requested to additionally recruit 9 staff: 4 staff for a new established molecule laboratory, 3 for general laboratory, and 2 for micro laboratory. Table 1 below presents the existing number of laboratory staff and the additional staff requested.

Table 1: existing laboratory staff and additional more staff request

No.	Laboratory	Type of staff			No. of staff requested	Qualification
		Govt. staff	Contract staff	Total		
1	Molecule laboratory	0	0	0	4	Laboratory skill
2	General laboratory	6	3	9	3	Laboratory skill
3	Micro laboratory	3	1	4	2	Laboratory skill
4	TB laboratoty	5	0	5	0	

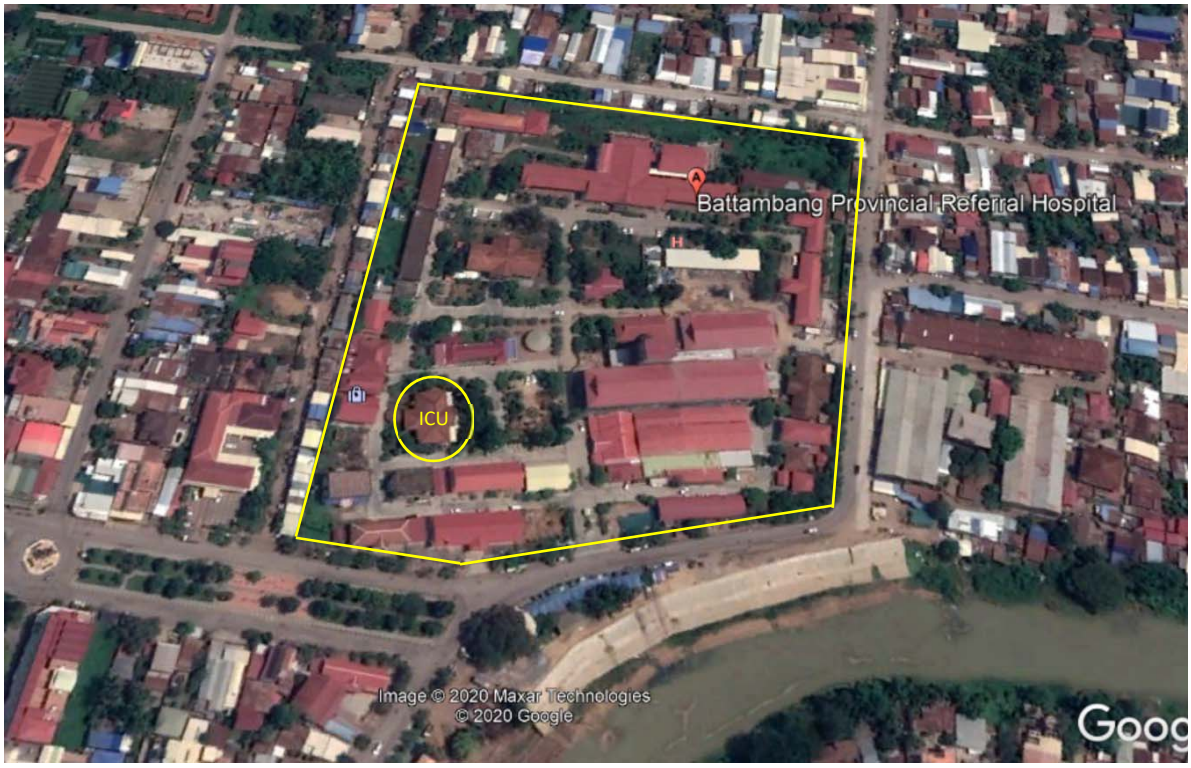
1.1.3 Location and Site Condition of Laboratories

The Battambang Provincial Hospital is located in a northen of Battambang city in Sangkat Chamkar Samraong. The size of the hospital is about 270m x 220m and its shape is roughly like a trapezoid. The hospital compound is flat and surrounded by fences. Its compound is scatterred with several general medicine buildings, ICU building, laboratory building, and administrative buildings. The ICU building is located at the right hand side after entry to the hospital and about 70 meters from the hospital main gate.

The existing ICU building is old and will be demolished for construction of the new Regional Laboratory. The existing ICU building is located between the existing laboratory building, Ophthalmology building, ENT building, Salle 4 (Student Dormitory) and Salle 5 (Afrims, an International NGO). Before using for ICU this building was used to be a handicraf workshop to produce artificial leg and arm of Provincial Deparment Social Affairs and Vetarant. This building is a sigle floor building with brick wall, wooden structure, and clay tile roof. No asbestos materials is used inside the building. Figure 2 presents the locations of Battambang Provincial Hospital and the new laboratory building (on the existing ICU building).

The Battambang Provincial Hospital is located closed to the Sangke River at its Southeastern side. A city street that connects city center to Chamkar Samrong is in between the hospital compus and river bank. However, there is no connection of hospital wastewater discharge into the River. Hospital infrastructure including stormwaster drainage and wastewater system have been improved in 2018 by a JICA Project on Improvement of Battambang Provincial Referral Hospital. Section of river bank close to the hospital is strongly stabilized by a strong concrete cover over the bank to protect bank collaspe and erosion.

Figure 2: Locations of Battambang Provincial Hospital and New Laboratory Building



1.1.3.1 The Ground Level and Drainage Status

The ground condition of Battambang Provincial Hospital is flat and its level is higher than the surrounding areas. The hospital drainage system is connected directly to the municipality's main drainage system. The hospital has prepared a good stormwater collection system. U drain was designed to collect stormwater from all sides and surrounding areas. Several manholes were constructed along the U drain to provide a convenient for maintenance.

1.1.3.2 Water Supply

Water supply in the hospital is provided by the Battambang Waterworks. The water pipe of the hospital is connected to the city public water system and is distributed to the elevated tanks before distributing to all hospital buildings. The water supply is adequate for hospital services. Its quality is good and meets the Cambodian water quality standards. Water supply system in Battambang city has been improved and upgraded under the JICA project in 2017-18.

1.1.3.3 Electric Power Supply

The hospital is connected to the Electricité Du Cambodge (EDC) electricity grid line (the power transformer capacity is 250Kva). The hospital also has 3 stand-by generators with the capacity of 32 Kva, 40 Kva and 80 Kva respectively. The stand-by generators cannot provide electricity supply to the whole hospital services if the EDC grid line experiences power failure. UPS protection for some equipment is only available in the laboratory rooms.

1.1.3.4 Wastewater Collection and Treatment

On site wastewater treatment facility is not available in laboratory. Wastewater treatment in laboratory is done manually at source. All wastewater collected from analyzer/testing machines, laboratory equipment, and from cleaning contaminated reuse laboratory materials have been collected separately at source and stored in transparent PVC containers of 1L, 2L, 5L, 10L, and 20L volumes for treatment (sterilization/disinfection) at source. The existing treatment/disinfection process is practiced manually with bleach solution[1]. Bleach is added into collected infectious wastewater at concentration of 0.5% and kept for a period of time depending on the level of infectious concentration. After bleach treatment/disinfection process, treated wastewater is poured into the sinks in the laboratories to discharge into wastewater pipe of the building and then to septic tank of laboratory building.

For new laboratory building, the design building does not include a design for onsite wastewater treatment facility. Wastewater treatment in this new laboratory will follow the process of existing laboratory. Septic tank that is designed in two chambers will be installed under the new laboratory building to collect wastewater from the building.

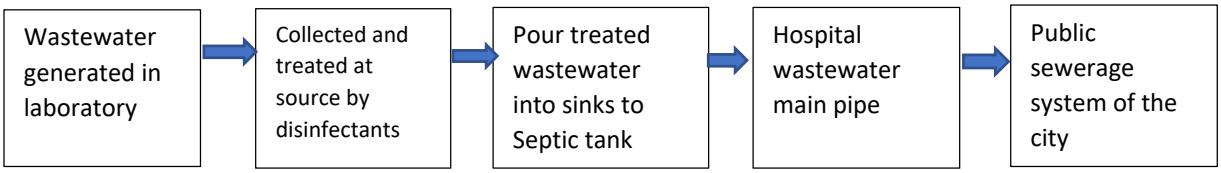
In terms of hospital wastewater management, wastewater generated in hospital buildings is flown into the septic tank of individual building and then to the main sewer of the hospital through an extended sewer. Main sewer of hospital is connected to public wastewater system of the city. Public wastewater sewer conveys wastewater that collected from Northwestern part of Western Sangke River side of the city center to Chamkar Samrong wastewater treatment plant.

No hospital wastewater is discharge to the Sangke River. In connection to this concern, site visit was conducted to discuss with concern people including hospital director and deputy director of department of environment, senior staff of provincial department of public work, and the residents who live near the Sangke River. The discussions and direct visit at the site confirmed that there is no connection between hospital wastewater and Sangke river. Please see Annex 8 for detail results on discussion these people.

[1] The treatment/disinfection through manual process by using bleach solution is acceptable for BSL2+ laboratory. WHO Laboratory Biosafety Manual, 3rd and 4th editions, state that contaminated liquid must be decontaminated before discharge into sanitary sewer. The contaminated liquid from laboratory can be treated with solution sodium hypochlorite (bleach).

Figure 3 presents a process of laboratory wastewater management of Battambang Provincial Hospital.

Figure 3: Flow chart of laboratory wastewater management



1.1.3.5 Solid Waste Collection and Treatment

a. **Laboratory waste management**

Battambang provincial hospital laboratories separate their generated wastes at source into two main types: general waste and laboratory wastes. The laboratory waste is separated into three difference groups: infectious waste, sharp waste, and chemical waste. Three types of separated bins with different colors and logos have been assigned for collecting and storing waste. They are green bin for general waste, red bin for chemical and radioactive waste, and yellow bin and box for infectious waste and sharp waste respectively.

Infectious waste and sharp waste are separated at source for prior disinfection in mini autoclave in lab room before collecting for final incineration in hospital incinerator. Infectious waste and sharp waste are put into the yellow waste bin and box that placed at the designated locations nearby the sources of generation. Then they are collected for disinfection/decontamination in autoclave prior to final incineration. When the quantity is cumulated to a proper amount, lab wastes are collected by lab staff to put in separated waste bins that placed at designated location outside lab building. Then wastes are removed every day by well-trained hospital waste collectors to store at the infectious waste storage facility nearby the incinerator waiting for incineration. This storage facility is a room next to incinerator designated for temporary storage of infectious wastes for incineration. Hospital incinerator operates two to three times per day, whenever the waste is accumulated enough amount at about 40-50kg to operate incinerator. In addition to infectious waste treatment, the hospital will sooner operate a new central autoclave facility that is located nearby the incinerator.

Contaminated reuse laboratory materials are sterilized in 0.5% bleach solution and then in mini autoclave for reuse. After completing the process of sterilization and decontamination, sterilized materials are validated with monitor spore ampoule to make sure that they are completely sterilized for reuse.

b. Hospital waste management

In terms of hospital waste management, hospital follows the guidelines on infection prevention and control for medical treatment and healthcare of the Ministry of Health. Waste management in hospital is managed by the infection prevention and control committee.

Hospital waste is categorized into four types include: (i) general waste (domestic waste); (ii) medical waste (health care waste, infectious waste and organic waste); (iii) sharp waste (sharp steel waste and ampoule glass waste); and (iv) chemical waste (pharmaceutical waste, acidic, radioactive, corrosive powder waste). These types of wastes are separated at source by separated bins that designed in different color and logos and placed at designated locations inside medial buildings and hospital compound. Green bin, yellow bin, and red bin are used to collect and store general waste, medical waste/sharp waste, and chemical waste respectively. Yellow and red bins are placed at medical rooms, medical wards to be used by medical staff only.

Waste bins have been emptied every day by well-trained waste collectors of hospital to store at the designated storage facilities. General waste, medical waste, infectious waste, and sharp waste are collected every day to store at the separated waste storage facilities located at the back of hospital near incinerator for daily incineration for medical/infectious/sharp wastes and for collection from city waste collection truck for general waste. Figure 4 presents waste separation and final disposal of waste Battambang provincial hospital waste.

For final waste treatment and disposal, hospital uses hospital incinerator to burn medical waste, infectious waste, and sharp waste. Hospital also contracted a waste collection service with the city waste collection company for collection and dispose of hospital general waste at the city dumpsite.

1.1.3.6 Surrounding Natural Environment and Social Conditions

Battambang Provincial Hospital is located in a residential area of central Battambang city and is very close to the Sangkae River. It is surrounded by streets at its the northen, easten, and southen sidesof the hospital. The hospital is protected by fences with two main gates, one at the southand the other at the east. There are several informal houses next to the fences of hospital at the northen and westen sides of the hospital.

The hospital compound is scattered by several buildings making it difficult to move things around and to provide efficient services. Some hospital buildings are progresssively deteriorating due to old age as they were constructed since 1940s and 1960s. There are some big trees inside the hospital compound. There is no historical place, temple, or community spirit house located near the hospital compound.

The weather in Battambang city has changed. Annual precipitation is approximately 1,400 mm with 85% occurring in the wet season (May to November). Average annual temperature is around 32°C with maximum temperature exceeding 40°C during the hotest days in March or April.

1.2 Project Size and Main Activities

1.2.1 Sub-project Cost

The sub-project cost (i.e. construction of Battambang Provincial Hospital laboratories) is estimated at approximately US$443,496.89.

1.2.2 Main Activities

The main activities include the demolition of the existing ICU building and the construction of the new building with a single floor and a foundation capacity to support the expansion of the building up to 3 floors in the future. The demolition and construction are estimated to be completed within 6 months using labor input of around 25-30 workers. The main construction activities are described below:

Preliminary works: Installation of construction site safety protection fence, preparation of workers' camp, put project sign board, safety signs, access gate to the site, and soil backfilling.

Structural works: The new building will be constructed using reinforced concrete structure and brick wall. It will be constructed with the capacity to expand to two or three more floors in the future. During the initial stage, only one floor for laboratory purpose will be constructed. There will be installation of reinforced concrete piles to support the building load for further expansion of more floors to be constructed in the future. The building size is 15m x 29m with a total area floor of approximately 486m^2. There will be one canopy at the front, one at the right and one at the left sides of building. Other detailed construction and installation works are described below:

Civil works: Piling, reinforced concrete structure, masonry, steel structure, painting, tiling, ceiling, floor epoxy, doors, windows, hardware, and some other minor works.

Electrical works: Installation of main control and distribution boards, lighting, switches, sockets, air-conditions, exhausted fans, grounding system, and connection of power supply to the new building.

Plumbing works: Installation/construction of water supply pipe, wastewater pipe, stormwater pipe, sanitary fittings, pressure pump, water tank, gully trap, sewage manhole, waste manhole, septic tank, and soak pit.

Site works: Construction of walkways around the building, access road to the new building, site cleaning when the construction is completed.

Firefighting works: Installation of fire alarm system, smoke detector and fire extinguishers.

Other works: Installation of lightning strike protection system, laboratory equipment, benches, document shelves, and negative pressure room.

1.2.3 Provision of Laboratory Equipment

List of equipment for regional laboratory

No	Item description	Unit	Qty
1	Cobas 6800 with installation, calibration, training, warranty at the hospital	Unit	1
2	Reagents for Cobas 6800	Pack of 192 tests	54
3	Biosafety Cabinet: installation, training and warranty	Unit	2
4	Refrigerator 550L: installation, training and warranty	Unit	2
5	Freezer -20: installation, training and warranty	Unit	1
6	Freezer -80: installation, training and warranty	Unit	2
7	Pipettes automatic 0.1 to 10 ul	Pc	2
8	Pipettes automatic 5 to 50 ul	Pc	2
9	Pipettes automatic 2 to 200 ul	Pc	4
10	Pipettes automatic 100 to 1000 ul	Pc	4
11	Pipettes automatic 5 ul	Pc	2
12	Pipettes automatic 10 ul	Pc	2
13	Pipettes automatic 20 ul	Pc	2
14	Pipettes automatic 50 ul	Pc	2
15	Pipettes automatic 50 to 100 ul	Pc	4
16	Pipettes automatic 1 to 10 ul	Pc	2
17	Automate Hematology Analyzer: installation, training and warranty	Pc	1
18	Full Automated Coagulation Analyzer: installation, training and warranty	Pc	1
19	Centrifuge: installation, training and warranty	Pc	1
20	Microscopy: installation, training and warranty	Pc	1
21	Vortex Mixer: installation, training and warranty	Unit	3
22	Mini microcentrifuge: installation, training and warranty	Unit	2
23	Autoclave (50 - 75 liters): installation, training and warranty	Unit	1

24	Refrigerator microcentifuge: installation, training and warranty	Unit	1

2. POTENTIAL ENVIRONMENT IMPACTS

2.1 Potential Environmental and Social Impacts during Construction Phase

Potential environmental and social impacts during construction phase will mainly come from the demolition of the existing ICU building and the construction of the new laboratory building.

Without proper preparation for demolition and construction works and without well prepared preliminary work, the following may be neglected: life, safety measures and basic environmental hygiene facilities (hand washing facilities, toilets and waste disposal facility).

The demolition and construction activities may create noise, dust, and vibration. Noise and vibration may affect patients and hospital staff. Long time exposure to strong noise and vibration from breaking or hitting things like demolition and construction of building can cause several associated health problems such as mental problem, stress and anxiety, sleep disturbance, hearing loss, high blood pressure, which can be more serious for the patients. Strong sound and vibration may also create problem for nearby buildings as some of them are too old and are in deteriorated condition. Dust generation especially during demolition phase can cause health related problem such as respiratory, eye, and skin problems to workers, patients, and health staff who are present at or nearby the site.

The existing building does not have harmful materials like asbestos. However, demolition and construction activities may also cause occupational health and safety issues for hospital staff, patients, workers and visitors (e.g. collapse of walls, falling down part of ceilings, failure of installed construction equipment, scatter of debris, heating, inadequate ventilation, etc.) if occupation health and labor management procedure are not in place.

Construction waste may cause injury and aesthetic problem. Sharp pieces of broken concrete, broken steel, and broken glass can cut hand or leg of people if they are not properly managed. Piles of construction and demolition waste in hospital compound may result in scattering over the debris, litters and dust when there is a strong wind.

Wastes including solid waste and wastewater generated from the site will create health problems for worker themselves and visitors if they are not managed properly on site. Poor sanitation and hygiene can cause bad smell if wastes are not managed properly.

Improper control on transport of construction materials and waste such sand can result in sand scattering in the hospital when strong wind that can cause accidents. Big truck used to load, transport, and empty construction materials and wastes can cause accidents outside or inside the hospital,

especially at the main gate and inside the hospital where there usually crowded of people, if the drivers are not strictly controlled and informed to be careful when driving and parking the vehicles.

Improper management of labor influx and construction workers may cause community [2] disturbance (e.g., gender-based violence, sexual transmitted diseases, alcohol abuse strange behavior, alcohol abuse, noise, local security, local culture, other) including patients and hospital staff. Labors brought from outside may affect local culture and security if they are not properly managed. Use of child labor during construction activities would occur if contractor does not have a proper control or labor management procedure (LMP) in place.

2.2 Potential Environmental and Social Impacts during Installation and Pre-Operation Phase

This is a new established BSL2+ laboratory. The current laboratory staff have only been experienced with lower level laboratories, general laboratory, micro laboratory, and TB laboratory. Therefore, with this laboratory at higher level of BSL2+, potential environmental and social impacts may occur:

- With the presence of this new laboratory at BSL2+ level, which is equipped with new laboratory equipment and materials, there are potential risks of exposure by laboratory staff during operation if they are not identified and managed earlier at pre-operation stage.
- Inappropriate design of laboratory would create greater issues on biosafety, biosecurity, health safety issues for laboratory staff, workers, and community as a whole.
- Without prior and proper capacity building to laboratory staff, they may not be fully capable to operate this new laboratory in a safely and securely manner.
- Improper operation of the laboratory and use of materials/equipment would create potential exposure to health risks among laboratory staff, laboratory workers, visitors and the communities. For instance, inappropriate use of Biological Safety Cabinets (BSCs) would result in greater exposure of laboratory operators, laboratory environment, and laboratory materials to infectious aerosols and splashes when manipulating materials containing infectious agents, such as primary cultures, stocks and diagnostic specimens.

Through this subproject, Battambang Provincial Hospital Laboratories will be upgraded to be a regional laboratory through equipping higher standard laboratory equipment and machines, i.e. a COBAS 6800 system, supply of reagents, and their associated equipment for building Biosafety Level

[2] Community here includes hospital staff and patients

2+ (BSL2+) laboratory that is fully capable in testing COVID-19. However, the existing laboratory staff of this hospital is experiencing in operating lower level laboratories. Thus, operating this new laboratory would create some risks and impacts if it is not conducted risk assessment properly to identify any risks that might occur and manage risks to an acceptable level; and laboratory staff is not trained properly prior to operate this new laboratory.

The risk and impact would come from improper operating new machine and its reagent, improper operating Biosafety Cabinets (BSCs), improper control on agents/samples, and wastes, or inappropriate use of PPEs. This risk would be managed prior by conducting risk assessment. BSL2 laboratory, equipment, and facility design and construction is done with the broad spectrum of indigenous moderate-risk agents. With good microbiological techniques, these agents can be used safely and generated least potential for producing splashes or aerosols.

2.3 Potential Environmental Impacts during the Operation Phase

The project will enable Battambang Provincial Hospital laboratory with COVID-19 testing capacity by installing a PCR-COBAS 6800 machine as well as provision of basic health items and medical instruments (e.g., glove, glasses, laboratory suits) to protect laboratory staff from infectious agents, wastes, and injuries. Therefore, laboratory waste and relevant wastewater will be slightly increased.

Wastes generated in laboratories are mainly hazardous including sharp waste, infectious waste, pathological waste, pharmaceutical waste, cytotoxic waste, chemical waste, and radioactive waste. In epidemiology laboratory, hazardous wastes are mainly sharp waste, infectious waste, sample and testing waste (blood, stool, urine, body fluids), chemical waste, pathogenic waste, and small amount of pharmaceutical waste.

Pathogens in infectious waste and wastewater may enter the human body by a number of routes: through a puncture, abrasion, or cut in the skin; through the mucous membranes; by inhalation; and by ingestion. Sharps represent a double risk. They may not only cause physical injury but also infect these wounds if they are contaminated with pathogens. There is concern about infection with human immunodeficiency virus (HIV) and hepatitis B and C viruses, of which there is a strong evidence of transmission from injury by needles contaminated by human blood.

Inappropriate use and management of laboratory equipment, personnel protected equipment (PPE), and infectious agents in laboratory may results in greater exposure of laboratory staff to risk of injury, aerosol, and ventilation of the infectious agent into the environment.

All individuals who are exposed to laboratory wastes would be at risk if these wastes are not managed properly and carefully. These include those within laboratory establishment such as laboratory

staff, laboratory workers, waste collectors, and those outside these sources such as hospital health staff, patients and visitors. Hospital has put in place a standard operation procedure to mitigate the risk described in 3.3.

Laboratory waste is hazardous to the environment and people health and may create public sensitivity. Potential impacts of laboratory wastes to the environment and health are deemed to be site specific, manageable and for which mitigation measures can be readily designed. However, this impact can be managed by strict implementation of good practice on laboratory waste management, especially infectious and sharp wastes, in all steps including generation, segregation at sources, collection, treatment, handling, storage, and final disposal.

2.4 Potential Environmental and Occupational Health Impacts Associated with COVID-19

There is a possibility for infectious microorganisms to be introduced into the environment if they are not contained within the laboratory due to accidents/emergencies or weak compliance with the precaution measures for infection prevention and control. Improper collection of samples and testing for COVID19 and inappropriate laboratory biosafety could result in spreading of disease to laboratory staff, people in the hospital, or the population as a whole during the transportation of potentially affected samples.

The contamination of the laboratory and equipment may result from laboratory procedures: performing and handling of culture, specimens and chemicals. If the contamination is due to a highly infectious agents, it may cause severe human disease and presents a serious hazard to workers. Workers in healthcare facilities are particularly vulnerable to contagious agents such as COVID-19. Health care associated infections due to inadequate adherence to occupational health and safety standards can lead to illness and death among health and laboratory workers as well as spreading the disease into the communities.

The expected laboratory infectious/hazardous waste also includes wastes generated from COVID-19 samples. Laboratory wastes also include sharps, infectious agents, chemicals, and other hazardous materials used in laboratory testing. In summary, the laboratoty wastes from COVID-19 could cause a high environmental and social risk, if they are not properly handled, treated and disposed.

Wastes that may be generated from laboratories to be supported by this operation - the COVID-19 readiness and response - could include liquid contaminated waste (e.g., blood, other body fluids and contaminated body fluids) and infected materials (e.g., used water, laboratory solutions and reagents, and syringes). The majority of wastes from laboratories require special handling and awareness as they may pose infectious risk to health care workers who are in contact with or handle the wastes.

It is also important to ensure that sharps are properly disposed. Given that the medical waste generated by laboratories is a potential vector for the contagion, improper handling of medical waste runs the risk of further spread of the disease. Poor sanitation and improper management of wastewater related to COVID-19 diagnosis can transmit the diseases to the communities and pollute the environment. Without strict adherence of the infection prevention and control measures, laboratory staff and workers could be at high risk of COVID-19 virus transmission.

3. MITIGATION MEASURES

3.1 Measures to Mitigate Impacts during Construction Work (ESMMCW)

This section applies the Environmental and Social Mitigation Measures during Construction Work (ESMMCW)) to be performed by the contractor and construction workers. During civil works, the contractor and their workers shall be responsible to implement ESMMCW to mitigate environmental and social impacts (see Table 2). This ESMMCW shall be included in the contractor's contract. The contractor has the obligation to comply with ESMMCW when performing the contracted works in the hospital.

Table 2: Environmental and Social Mitigation Measures during Construction Work (ESMMCW)

Environmental and social issues	Mitigation measures	Responsibilities	Supervision and Monitoring
Without proper design for demolition and construction works and without well prepared preliminary work, life and safety measures and basic	To respond to these environmental and social issues/concerns and occupational health and safety of workers, the contractor shall follow these measures: • Before starting the demolition and construction activities, the contractor shall install temporary safety protection fences with proper height surrounding the construction site and put safety signs and construction sign boards. One main gate and another reserve gate should be established for accessing to the site;	Contractor	Facility management committee of hospital and assigned civil work supervision team

environmental hygiene facilities may be neglected.	• The contractor shall submit its statement/construction method and technology for the building demolition in the bidding document as an annex; • Identify appropriate locations and install hygiene and sanitation facilities including sinks for hand washing, toilets and bathrooms at appropriate locations inside the construction site. Make available of alcohol/hand gel and soaps; • Identify appropriate locations to place the garbage bins and set up schedule and responsible persons to collect and empty the bins; • Educate workers about how to use these hygiene, sanitation, and waste facilities properly; • Install proper size safer camp/accommodation for workers that provide enough room for worker to keep social space respond to Covid19. The Camp can be used by their workers as a safe place to have lunch and to rest when they are not well. • Provide the security guards to take care of the security in and around the construction site and to protect all construction workers/other parties who enter the construction site.		
Risk of accidents from moving big truck transport construction materials and wastes inside hospital.	• There is no choice in using hospital main gate for big truck to enter the hospital because another quiet gate at eastern side is far and blocked way by building, not easy to move by big truck. • Contractor shall strictly control moving of truck at the main gate and inside hospital compound through providing security guard to make traffic. •	Contractor and driver	Hospital management committee, hospital security guards

Dust, noise, ventilation and vibration generated from construction works	• The contractor is responsible for compliance with relevant national legislation with respect to ambient air quality, noise and vibration. • Prior to demolition of building, the contractor shall install safety net surrounding the demolished building to prevent scattering of debris and to reduce dust and noise. • The contractor shall prepare the measurement tool for noise and vibration test required by the project. The test should be conducted monthly. • The contractor shall ensure that the generation of dust, especially during demolition phase, is minimized and implement a dust control plan to maintain a safe working environment and minimize disturbance for hospital staff and patients. • The contractor shall implement dust suppression measures (e.g. water pathways, covering of construction material/debris stockpiles, etc.) as required. • The contractor shall use machinery instead of workforce for major demolition work. As this project is in a major hospital, the contractor shall select demolition and construction techniques that are safer with lesser noise and vibration generation for this project. For example, to prepare foundation of the new building, the contractor shall use pressure technique instead of hitting technique. • Construction materials such as pile of sand should be covered to prevent its scattering during strong wind. • Contractor shall require truck transport of construction materials or wastes to cover properly to avoid scatter along moving road and in hospital compound.	• Contractor	Facility management committee of hospital and assigned civil work supervision team

	• Drivers of trucks should be reminded very often about carefulness on driving and parking the truck. • Construction debris and used materials shall be covered to protect against wind and erosion and shall be properly secured during transportation to prevent scattering of soil, sand, materials, and dust. • The contractor shall check the air ventilation to ensure it is adequate during the demolition and construction works to reduce dust and to improve natural air flow in the rooms.		
Wastes generated from construction works	• Demolition waste shall be separated for purpose of reuse and recycling. Concrete and steel wastes shall be disposed only at the designated place approved by the hospital for reuse and recycling. Other minor wastes such as wooden and glass items should be collected by the city waste collection truck for final disposal at the city dump site. • Piles of debris from demolished building shall be removed shortly after they are generated. • The contractor shall ensure that on site latrine be properly operated and maintained to collect and dispose wastewater from those who do the works; • The contractor shall develop and follow a brief site-specific solid waste control procedures (storage, provision of bins, site clean-up, bin clean-out schedule, etc.) before commencement of any financed rehabilitation works; • The contractor shall use litter bins, containers and waste collection facilities at all places during works; • The contractor may store solid waste temporarily on site in a designated place prior to off-site transportation and disposal by the city waste collection company;	Contractor	Facility management committee of hospital and assigned civil work supervision team

	• The contractor shall dispose of wastes at the designated places identified and approved by the hospital. Open burning or burial of solid waste at the hospital premises are not allowed; • Recyclable materials such as wooden plates for trench works, steel, scaffolding material, site holding, packaging material, etc., shall be separated and collected on-site for reuse or recycle (sale); • When construction activities are completed, the contractor will carefully clean-up the site and remove all construction waste materials and dump them at the designated dumping site.		
Safety risks during works	• The contractor shall comply with all national and good practice regulations regarding workers' safety including ensuring that no child labor is employed for any construction works; • The contractor shall prepare and implement a simple action plan to cope with risk and emergency (e.g., fire, floods); • The contractor shall ensure that all of their contracted workers have a health insurance. • The contractor shall have or receive required training on occupational safety regulations and use of personal protective equipment; • The contractor shall provide safety measures as appropriate during works such as installation of fences, safety net, fire extinguishers, first aid kits, restricted access zones, warning signs, overhead protection against falling of debris, lighting system to protect workers and examinees against work risks; • The contractor shall provide training to workers and require them to sign a working code of conduct with appropriate disciplinary actions and penalties for	Contractor	Facility management committee of hospital and assigned civil work supervision team

	inappropriate behavior including gender-based violence and sexual harassment affecting their peers and community; • ; • Provide information and signage containing information of how grievances can be submitted; • The contractor shall install the ventilation system in the room if the air is found to be inadequate during construction activities; • • The contractor shall install the safety nets to protect people from debris sparking; • All visitors including hospital and laboratory staff shall be required to wear safety helmet and eye glasses during their site visit.		
Occupational health and safety issues	• The contractor shall prepare Occupational Health and Safety (OHS) management plans; • OHS trainings shall be provided by the contractor to the workers before starting the demolition and construction activities; • The contractor shall frequently conduct meetings with their workers and remind them on carefulness/safety adherence during their works; • The contractor shall ensure the presence of civil work supervisor at the site all the time. • The contractor shall conduct OHS monitoring at the construction site regularly and install on site monitoring equipment (e.g. safe camera, ventilated detector, heat detector, ...) as necessary. • The contractor shall ensure the availability of safety equipment (e.g. helmet, glasses, glove, boot, ...) • The contractor shall maintain statistical records of work-related injury and follow up on corrective	Contractor	Facility management committee of hospital and assigned civil work supervision team

	actions. This record shall be prepared on a white board in the construction site to inform all the related parties about the injury status.		
Community disturbance include GBV due to improper management of construction workers	• The contractor shall develop internal rules to manage construction workers' behaviors, and supervise their compliance; o Awareness raising about HIV/AIDs among workers and community shall be conducted by the contractor; • Place a gender-based violence (GBV) free zone signage at the construction site; • Contractor shall clearly separate toilets and bathrooms of men and women. • Contractor shall prepare code conduct for GBV and required construction staff to sign. • Contractor shall also include GBV in training provided to workers. • The contractor shall not allow workers to have a party or to use alcohol/beers in the construction site; • The contractor shall ensure that workers do not stay inside the hospital compound after working hours. • Night work shall be minimized • Contractor shall put in place Labor Management Procedure (LMP) as specified in section of MP and the prohibition the use of child labor	• contractor	• Facility management committee of hospital and assigned civil work supervision team
Health safety risk in exposing to hospital wastes	• The contractor shall develop internal rules to manage workers movement within the designated area inside the hospital; • The contractor shall know clearly about the designated locations for infectious waste storage in the hospital and shall inform their workers not to go closer to these locations;	Contractor	Facility management committee of hospital and assigned civil work supervision team

	• The contractor shall provide a separate smoking area in the site while the rest of the areas are not allowed for smoking.		
Labor management procedure and the prohibition the use of child labor	• Labor law prohibits anyone under 18 years to be involved in hazardous work. Child labor or indentured labor is absolutely prohibited in the project. • The contractor shall ensure that all their workers at the construction site are over 18 years old. • Contractor shall strictly prohibit presence of children under 18 years old of age at the project site. This includes child/children of workers. • Contractor shall develop labor management procedure (LMP) and put in place this LMP before starting construction activities. The developed LMP of contractor shall include: (i) A review of national labor legislation; (ii) Types and number of workers; (iii) Time of labor requirements; (iv) Labor training schedule; (v) Assessment of key potential labor risks and actions to management labor risks in each stage of construction; and (vi) Workers' Grievance communication	Contractor	Facility management committee of hospital and assigned civil work supervision team
Working closely to COVID-19 testing and sample taking laboratories located inside Battambang	• The contractor shall develop internal rules to manage workers movement within the designated area inside the hospital to prevent them from being closer to other people who are present in the hospital; • The contractor shall review and incorporate interim guideline on COVID-19 prevention in the	Contractor	Facility management committee of hospital and assigned civil work

Provincial Hospital coupled with workers poor living condition may facilitate COVID-19 transmission for them and other people.	construction/civil works project. For the details of this guideline, please see Annex 9. The contractor shall comply with COVID-19 prevention measures as follows: o Consider ways to minimize/control movement in and out of the construction sites; o The contractor shall ask workers to minimize their movement and be in direct contact with other people from outside; o Follow the procedures to confirm that workers are fit for work before they start working and pay special attention to workers who have underlying health conditions or who may be otherwise at risk; o Check and record temperatures of workers and other people entering the construction sites or ask for self-reporting before entering the sites; o Provide daily briefing to workers prior to commencing their works, focusing on COVID-19 specific prevention including cough etiquette, hand hygiene and distancing measures; o Request workers to self-monitor for possible symptoms (fever, cough, etc.) and to report to their supervisors if they have symptoms or are feeling unwell; o Prevent workers from an affected area or prevent workers who was in contact with an infected person from entering the construction sites for 14 days (with an insurance in place to ensure that they can receive their salary, as per the Labor Management Plan);		supervision team

	o Prevent sick workers from entering the construction sites, refer them to local health facilities if necessary, or request them to quarantine at home for 14 days (with an insurance in place to ensure that they can receive their salary, as per the LMP); o Develop a contingency plan with arrangements for accommodation, care and treatment for: ▪ Workers who are self-isolating; ▪ Workers who display symptoms; o Provide adequate water, food and supplies; o Provide workers with PPEs; o Provide workers with accommodation that meets or exceeds IFC/EBRD worker accommodation requirements (e.g. in terms of floor type, proximity/number of workers, number of 'hot bedding', drinking water, washing facility, bathroom facility, etc.), which is in good state, clean and hygienic to minimize the spread of infection; o Washing stations should be provided throughout the site, together with the supply of clean water, liquid soap and paper towels (for hand drying), and waste bins (for used paper towels) that are regularly emptied. Washing stations should be provided wherever there is a toilet, canteen, accommodation, waste storage areas, stores, and communal facilities. Where washing stations cannot be provided (for example at remote locations), alcohol-based hand rub should be provided;		

	○ Enhanced cleaning arrangements should be put in place, to include regular and deep cleaning using disinfectant of catering facilities/canteens/food/ drink facilities, latrines/toilets/showers, communal areas, including door handles, floors and all surfaces that are touched regularly (ensure that cleaning staff have adequate PPE when cleaning consultation rooms and facilities used to treat infected patients); ○ Communication materials on COVID-19 prevention and control should be displayed in the workplaces; ○ Ensure that contracted workers have medical insurance, covering treatment of COVID-19. • All these measures shall be incorporated or attached as a supported document to the contract to make sure that the contractor is aware of all these requirements.		

3.2 Measures to Mitigate Impacts during the Design of Laboratory and Installation of Laboratory Equipment

There will be some biosafety and biosecurity measures to be incorporated in the design and installation of this new laboratory. The design follows the Medical Laboratory Biosafety Guidelines. It will include the primary and secondary barrier concept to prevent and protect laboratory staff, laboratory workers, and visitors from contacting and contaminating with infectious agent, used hazardous materials and wastes generated from the laboratory. Laboratory staff shall be consulted to ensure that they are happy, feel safe, and ensure that their concern have been incorporated in the design operation of the new laboratory. Measures to be included in the design of this new BSL2+ laboratory are presented below.

3.2.1 Risk Assessment

This is a new established BSL2+ laboratory building, thus conducting risk assessment prior to operation would be necessary to evaluate the potential exposure to or release of a biological agent and wastes and determine/prioritize risks to be mitigated. The objective of the risk assessment is to determine the risks associated with laboratory procedures. It also allows the management to determine the relative risk level of different activities performed in the laboratory, which can be used to make decision on risk mitigation/elimination. The risks and the vulnerabilities in the current biosecurity program will be identified and mitigated/eliminated to ensure that biosecurity risks are reduced to an acceptable level. This risk assessment will be conducted during pre-operation phase after completing the installation of PCR machine and other supporting laboratory equipment. Biosafety and biosecurity team of NIPH should be requested for performing this risk assessment during the installation and pre-testing of the new BSL2+ laboratory. This five-step processes will be adopted for this biosafety risk assessment:

1- Identify hazardous agents and perform an initial assessment of risk;
2- Identify hazardous laboratory procedures;
3- Determine the appropriate biosafety level and select additional precautions indicated by the risk assessment;
4- Evaluate the proficiencies of staff regarding safe practices and the integrity of safety equipment; and
5- Review the risk assessment with a biosafety professional, subject matter expert, and the biosafety committee.

According to Medical Laboratory Biosafety Guidelines, risks from BSL2+ laboratory should match with risk group 2 classification: moderate individual risk, and low community risk. Annex 2.1 presents SOP for Risk Assessment and Risk Level of laboratory, procedure for risk assessment to determine the risk

associated with laboratory procedures and risk management. However, the existing SOP for Risk Assessment shall be upgraded to a suitable level for the new BSL2+ laboratory.

3.2.2 Design to Comply with BSL2+ Physical Facility

A BSL2+ must comply with the following conditions:

- BSL2+ laboratories are often used to study, diagnose, and test pathogens in risk group 2.
- There is a system for collection and treatment of wastewater. The treatment of wastewater from a laboratory shall meet the national standard before being discharged into public wastewater system.
- There must be signage of biological hazard on the entrance of the testing area.
- The laboratory doors shall be closed all the time when tests are being conducted.

3.2.3 Design to Include Primary Barrier: Safety Equipment

- Safety equipment includes BSCs, enclosed containers, and other engineering controls designed to minimize exposure to hazardous biological materials.
- Safety equipment includes items for personal protective equipment (PPE), such as gloves, coats, gowns, shoe covers, boots, respirators, face shields, face protection, and safety glasses or goggles.
- Other devices such as hand washing sinks and waste decontamination facilities will be made available to reduce potential environmental contamination.
- Segregate bio-hazardous waste from other types of waste prior to its disposal. Infectious waste containers serve as primary barriers to protect the worker and to minimize the chance of environmental contamination. This container shall be placed at the appropriate location inside the laboratory room to avoid access and contact from the public.

3.2.4 Design Incorporated Safety Secondary Barrier: Facility Design and Construction

- The design of the construction works contributes to the protection of laboratory workers, provides a barrier to protect persons outside the laboratory, and protects persons in the community from infectious agents that may be accidentally released from the laboratory.
- These barriers include separation of the laboratory work area from public access, availability of a decontamination facility (e.g. autoclave) and hand washing facilities.
- Prevent risk of infection by infectious aerosols that are released into the environment; the design features should include special ventilation system to prevent the above risk.

3.2.5 Design to Comply with Physical Security

- Control and monitoring of access to the building, premises, laboratories, and biological material storage areas to prevent unauthorized access to and removal of bio-hazardous materials.

- Limit access to authorized and designated employees based on the need to enter sensitive areas. The methods for limiting access include door locking or having a key card system in place.

3.2.6 Design to Include Management of Personnel, Inventory, and Accountability

- Identify roles and responsibilities of employees who handle, use, store and transport dangerous pathogens and/or other important assets.
- Establish material accountability procedures to track the inventory, storage, use, transfer and destruction of dangerous biological materials and assets when they are no longer needed.

3.2.7 Conduct Capacity Need Assessment

- Conduct capacity need assessment of the existing laboratory biosafety and biosecurity team and operators by assessing their existing capacity and identifying their capacity gaps to effectively supervise and operate BSL2+ laboratory. This capacity need assessment shall be guided or conducted by NIPH laboratory team.
- Design and provide proper capacity building for laboratory biosafety and biosecurity team and laboratory staff based on the capacity gaps identified in the capacity need assessment. This capacity building program shall be provided by biosafety, biosecurity, and laboratory team of NIPH.

3.2.8 Upgrade Laboratory SOPs

- The existing SOPs of Battambang Provincial Hospital's laboratories were developed to fit with the operation of the existing general laboratory, microbiology laboratory, and TB laboratory. These SOPs will need to be updated to meet the standard requirements of the new BSL2+ laboratory. The existing list of SOPs is lacking of some SOPs required for the new BSL2+ laboratory. The detailed list and status are described in section 5.1.
- In the meantime, Battambang Provincial Hospital's laboratories should consult with NIPH regarding SOPs used by NIPH for BSL2+ laboratory.
- Battambang Provincial Hospital's laboratories should upgrade their existing SOPs and develop additional SOPs for the new BSL2+ level laboratory. In doing so, Battambang Provincial Hospital's laboratory team shall closely consult with NIPH team.

3.3 Measures to Mitigate Impacts from Laboratory Operations

Measures to mitigate the impacts during laboratory operation include procedures for laboratory biosafety and procedures for laboratory waste management. Standard Operation Procedures (SOPs) of laboratories will serve as standard guideline for operating this new laboratory. Thus, Battambang Provincial

Hospital's laboratories shall conduct assessment on their existing SOPs to find out whether they comply with the standards required for this BSL2+ laboratory. If not, the assessment should identify the gaps of the existing SOPs that need to be upgraded to meet the standards required for BSL2+ laboratory.

3.3.1 Procedures for Laboratory Biosafety

3.3.1.1 Procedure for the use of personal protective equipment

PPE needs are identified, made available, used and appropriately maintained within the facility.

Laboratory clothes: clothing is a barrier to minimize the risk of exposure to aerosols, splashes and accidental inoculation. The clothing and equipment selected depend on the nature of the work performed and shall be based on the risk assessment. Laboratory coat and protective clothing shall be worn when working in the laboratory and removed before leaving the laboratory. Reuse laboratory coat shall be washed in laundry machine by adding bleach for decontamination.

Laboratory coats, gowns, coveralls, aprons: Laboratory coats should preferably be fully buttoned. Long-sleeved, back opening gowns or coveralls give better protection than laboratory coats and are preferred in microbiology laboratories and when working at Biological Safety Cabinets (BSCs). Aprons may be worn over laboratory coats or gowns when necessary to give further protection against spillage of chemicals or biological materials such as blood or culture fluids. Aprons should also be worn during washing of contaminated materials and over laboratory coats which are not fully buttoned. Laundering services need to be provided at/near the facility. Laboratory coats, gowns, coveralls or aprons should not be worn outside the laboratory areas.

Goggles, safety spectacles, face shields: The choice of equipment to protect the eyes and face from splashes and impacting objects will depend on the activity performed. Safety glasses do not provide adequate splash protection even when side shields are worn with them. Goggles for splash and impact protection should be worn over normal prescription eye glasses and contact lenses (which do not provide protection against biological or chemical hazards). Face shields (visors) are made of shatterproof plastic, fit over the face and are held in place by head straps or caps. Goggles, safety glasses or face shield should not be worn outside the laboratory areas.

Respirators: Respiratory protection may be used when carrying out high-hazardous procedures (e.g. cleaning up a spill of infectious material). The choice of respirator will depend on the type of hazard(s). To achieve optimal protection, respirators should be individually fitted to the operator's face and tested before use. Fully self- contained respirators with an integral air supply provide full protection. Respirators should not be worn outside the laboratory areas.

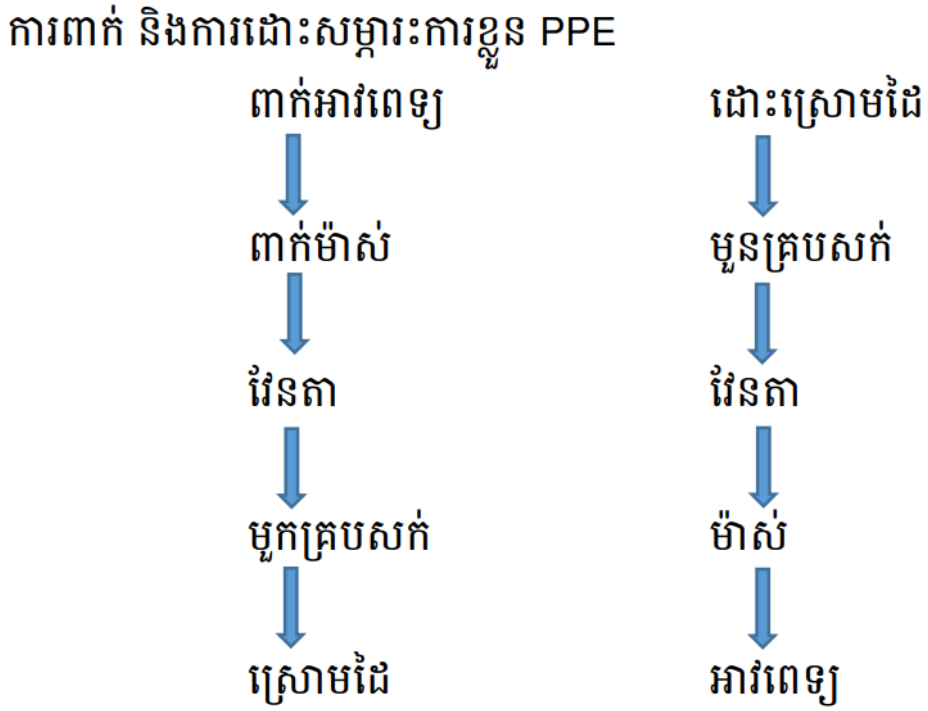
Gloves: Disposable microbiologically approved latex, vinyl or nitrile surgical-type gloves should be used for general laboratory work, and for handling infectious agents, blood and body fluids. Gloves should be removed and hands should be thoroughly washed after handling infectious materials, working in a BSC

and before leaving the laboratory. Used disposable gloves should be discarded with infected laboratory waste. Disposable gloves should not be decontaminated or reused. Gloves should not be worn outside the laboratory areas.

Shoes: Shoe covers or dedicated shoes should be worn where appropriate. All personnel entering areas where infectious materials and/or animals are housed or manipulated should wear boots, shoe covers, or other protective footwear to prevent cross contamination and should only wear them in the restricted laboratory areas.

Figure 3 presents the required PPEs for laboratory staff to be taken on and off in BSL2 laboratory. Hands shall be washed with soap or alcohol after removal of the protective clothing. The instruction for proper use of PPEs in BSL2 laboratory is detailed in SOP for Personal Protective Equipment Use in Annex 2.3 of this document.

Figure 3: PPEs used in Battambang Provincial Hospital's laboratory: take on (left) and take off (right)



Source: NIPH (2017a)

3.3.1.2 Procedure for operation of laboratory safety cabinet

Biological Safety Cabinets (BSCs) are designed to protect the laboratory operators, the laboratory environment and working materials from exposure to infectious aerosols and splashes that may be generated when manipulating materials containing infectious agents. BSCs also protect the environment in the laboratory. Properly used of BSCs is highly effective in reducing laboratory-acquired infections and cross-

contaminations of cultures due to aerosol exposures. Selection of BSC Class 2 is reasonable for the BSL2+ laboratory.

Locating BSCs in the laboratory

BSCs should be situated in a location remote from traffic and potentially disturbing air currents. A clearance of 30–35 cm above the cabinet is required to provide accurate air velocity measurement across the exhaust filter and to allow convenient exhaust filter change.

The existing SOPs of Battambang Provincial Hospital's laboratories do not have the SOP on BSC operation and maintenance. Thus, the hospital laboratories shall develop and put in place the detailed procedure for BSC operation and maintenance prior to operation of the new BSL2+ laboratory.

3.3.1.3 Procedure for operation of autoclave

Autoclaves are used to decontaminate contaminated reuse laboratory materials, infectious wastes and sharp wastes prior to disposal. Battambang Provincial Hospital's laboratories do not have SOP for autoclave operation and maintenance. Thus, the hospital laboratories shall develop and put in place this SOP prior to operation of the new BSL2+ laboratory.

3.3.1.4 Procedures for decontamination, disinfection and sterilization

Battambang Provincial Hospital will establish and maintain procedures to ensure that appropriate methods for sterilization, disinfection, antisepsis and decontamination are chosen and implemented effectively. Whether preparing an injection site on a patient's skin, or an infectious material for disposal or cleaning up a spill, it is of the utmost importance that the materials be treated properly:

- Sterilization is the use of a physical or chemical procedure to destroy all microbial life, including highly resistant bacterial endospores.
- Disinfection is the elimination of virtually all pathogenic microorganisms on inanimate objects with the exception of large numbers of bacterial endospores, reducing the level of microbial contamination to an acceptable safety level.
- A decontamination procedure can range from sterilization to simple cleaning with soap and water. Sterilization, disinfection and antisepsis are all forms of decontamination.

Bleach, a fast-acting oxidant, is broad-spectrum chemical germicide. It is important to note that bleach is highly alkaline and can be corrosive to metal. Household bleach (original concentration 5% or 6%) should be prepared to the proper concentration and discard daily after use.

Battambang Provincial Hospital's laboratories SOP on waste disposal management is partly covered disinfection, decontamination of infectious wastes through autoclave and incineration. However, this

specific SOP on decontamination, disinfection, and sterilization of wastes and contaminated materials shall be prepared separately and put in place prior to operation of the new BSL2+ laboratory.

3.3.1.5 Procedure for packaging, transportation, receipt and process of samples

Ensure that procedures for safe and secure transportation of cultures, specimens, samples and contaminated or potentially contaminated materials are established and maintained in accordance with legal requirements for the transportation of dangerous goods. Policy on transportation of materials includes accountability measures for the movement of materials within an institution. Annex 2.4 and Annex 2.5 present SOP for Specimens Packaging and Transportation and SOP for Sample Reception and Processing respectively.

The triple packaging system

The triple packaging system is the safest packaging system to transport infectious agents/materials. It consists of three layers: a leakproof primary receptacle, a leakproof secondary packaging and a sturdy outer packaging. The primary receptacle is wrapped in enough absorbent material to absorb all fluid in case of breakage or leakage. The secondary receptacle is used to enclose and protect the primary receptacle(s). Several wrapped primary receptacles may be placed in a single secondary receptacle.

Figure 4: Triple package system

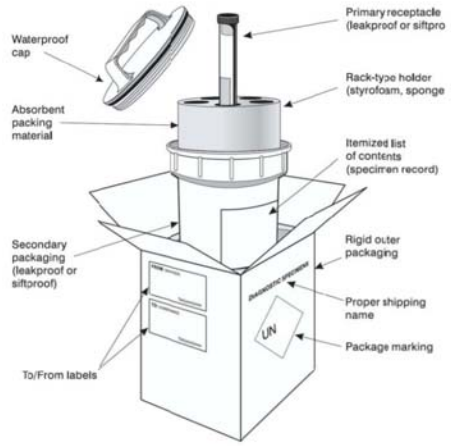


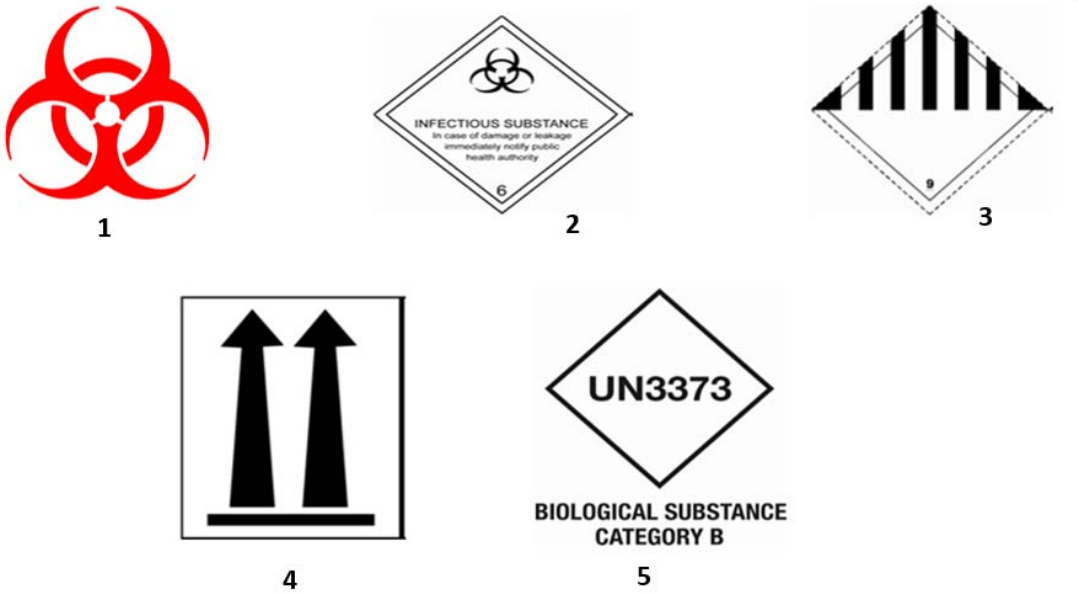
Figure 1. Example of triple packaging system.

However, the existing SOP- Safety of Specimens Packaging and Transportation shall be upgraded by the laboratory unit to a suitable level for the new BSL2+ laboratory. Thus, this SOP should be upgraded prior to operation of this new laboratory.

Label on packaging

The below labels describe the infectious substances required to appropriately place on the package for transportation.

Figure 5: Labels of infectious substances required to place on package for transportation



1 2 3 4 5

1- Biohazard sign: infectious materials, infectious wastes;
2- Hazard label for Category A infectious substances and for genetically modified microorganisms and organisms that meet the definition of an infectious substance;
3- Hazard label for certain noninfectious genetically modified microorganisms and organisms (UN 3245) and for carbon dioxide, solid (dry ice) (UN 1845); substances packed in dry ice (see section on Refrigerants) shall bear this label in addition to the primary risk label (e.g. the label shown in Figure 3 for Category A infectious substances;
4- Orientation label to indicate position of closures on the primary receptacles; for the air transport of quantities of liquid infectious substances in Category A that exceed 50 ml per primary receptacle, this label shall be affixed to two opposite sides of the package with the arrows pointing in the right direction, in addition to the label shown in Figure
5- UN 3373, are human or animal materials that are being transported only for the purpose of diagnosis or investigation.

3.3.2 Procedures for Laboratory Waste Management

Battambang Provincial Hospital's laboratory will strictly implement waste management plan and standard operation procedure for waste management, which will follow good practice standards on how to properly manage laboratory wastes. Good practice standards on laboratory waste management, especially infectious and sharp wastes, will be strictly followed. They include generation, segregation at sources, collection, treatment, handling, storage, and final disposal. Below are procedures for laboratory waste management at Battambang Provincial Hospital's laboratories.

3.3.2.1 Procedure for waste segregation, collection and preliminary treatment in laboratories

Battambang Provincial Hospital's laboratories will implement SOPs for waste management, disposal of chemical waste, disposal and decontamination of sharp wastes, disinfection solution and sterilization including minimization, segregation, storage, transport, treatment and final disposal of solid laboratory wastes. The procedures for laboratory waste management are detailed in SOP for Waste Management and Disposal in Annex 2.6. In addition, please see details on healthcare waste management procedure and infection prevention and control measures in Annex 5 and Annex 6 respectively.

Table 3 mentions mitigation measures and methods to minimize impacts from laboratory generated wastes.

Table 3: Laboratory and Infectious Waste Management

Environmental issue	Mitigation measures	Responsibilities	Supervision and Monitoring

Individual risk associated with exposure to laboratory wastes, infectious wastes and sharp wastes.	- Strictly apply good practices on laboratory waste management, especially infectious and sharp waste management. - Apply SOPs on waste management such as waste segregation, collection, treatment, handling, storage, and disposal; waste decontamination, disinfection, and sterilization. - Strictly control the practices of wastewater treatment at source through regular monitoring of compliance with good practices and to ensure that treated wastewater meet the standard of laboratory wastewater safe disposable into the public wastewater system.	Battambang Provincial Hospital	Biosafety and biosecurity team and IPC committee
Solid medical laboratory wastes, especially sharp wastes and infectious wastes, generated from laboratory.	Battambang Provincial Hospital will apply SOPs on waste management including disposal of chemical wastes, disposal and decontamination of sharp wastes, disinfection, and sterilization including minimization, segregation, storage, transportation, treatment and final disposal of solid laboratory wastes. **Segregation of laboratory wastes** • All type of wastes will be segregated at source. • Separated waste containers/bags are clearly designated by color with appropriate logos according to the type of wastes: black container/bag for general waste, yellow container/bag for infectious wastes (i.e. pathological waste, blood, body fluids), double yellow container/bag for high risk infectious wastes, red container/bag for sharp wastes, and brown container/bag for chemical and pharmaceutical wastes. • The waste containers are put at the most appropriate places closer to the sources of generation. • Training is provided to ensure that laboratory staff and workers are well understood on how to segregate wastes. **Labeling**	Battambang Provincial Hospital	Biosafety and biosecurity team and IPC committee

	• All waste containers are placed at the source of generation and should be clearly marked with biohazard symbol. • The date when the waste is first generated is written on the waste container with appropriate label for storage. • Laboratory wastes requiring autoclaving or other equivalent treatment will be labelled accordingly. **Storage of laboratory wastes** • Different laboratory wastes will be stored separately in standard storage equipment. • Storage time of laboratory wastes will not exceed 48 hours. • Storage room or place and storage equipment will be cleaned and disinfected at least once a week. • Specific areas will be identified for the initial storage in the laboratory rooms, near the source of waste generation. • Central storage facility for infectious wastes is separated from general waste storage areas and be away from public access. • Waste for sanitary landfill and/or for incineration are stored separately in the central storage area. **Transportation of laboratory wastes** • Waste containers from initial storage area will be emptied regularly. • Manual handling of waste bags will be minimized. • Dedicated wheeled containers, trolleys or carts should be used to transport the waste containers to central storage area. • Transport vehicles shall be reserved only for the transportation of laboratory and healthcare wastes.		

	• Wheeled containers, trolleys or carts should be cleaned and disinfected regularly and immediately after spillage or contamination. **Central storage facility for laboratory wastes** • Central storage facility should be locked and should be accessible only by authorized persons. • It should be well ventilated with sufficient light. • It should be located on a well-drained, impervious hard-standing area, provided with wash down and disinfection facilities. • It should have sufficient storage capacity. • The existing central storage infectious waste facility of the hospital should be improved its condition by replacing better structure, strong concrete wall and proper access door. **Treatment of laboratory wastes** • Infectious waste will be autoclaved wherever possible before disposal. • Non-autoclave infectious waste will be disinfected by using bleach solution, lime solution, calcium oxide or other chemical disinfectants. • Needle cutter will be used to remove needles from syringes. • Defanged syringes should be disinfected with 2% chlorine solution in order to be recycled. **Autoclave:** is used for the treatment of highly infectious wastes, such as microbial cultures or sharp wastes. **Standard incinerator:** Two-chambered incinerators with proper temperature and sufficient chimney height should be used. The temperature must be at least 850C to ensure minimal emission of toxic gases at the primary chamber. However, smoke from incinerator shall be well managed		

	to minimize it impacts on residents stay nearby the incinerator. **Chemical disinfection:** 0.5% chlorine solution, 5% sodium hypochlorite, 30% hydrogen peroxide, bleaching powder, lime solution, calcium oxide or other chemical disinfectants can be used for non-autoclavable infectious wastes. **Sanitary landfill:** Sanitary landfill is close to the working areas where wastes are generated providing easy access for waste disposal. Landfill site should be at least 50 meters away from the water sources. **Encapsulation and energization:** It is usually used as a disposal method for pharmaceutical wastes and incinerated ash of heavy metals.		
Occupational Health issues among laboratory staff	Occupational health and safety training program will be developed and provided to laboratory staff on aspects linked to laboratory waste management and infection control. This training program can be offered by biosafety and biosecurity team of Battambang Provincial Hospital.	Battambang Provincial Hospital	Biosafety and biosecurity team and IPC committee

3.3.2.2 Biohazardous waste handling and disposal

Hazardous waste poses high risks to the laboratory staff, the general public, and the environment if not handled properly. Therefore, all staff involved with waste handling and disposal should be aware of the potential risks, be trained to mitigate the risks, and receive appropriate tools (e.g. PPEs, waste collection containers, signage, etc.) to safely handle the wastes.

All infectious waste generated from a laboratory should be decontaminated prior to disposal. Decontamination as close as possible to the point or source of generation fosters safer waste handling and minimizes the chance of staff inadvertently coming in contact with infectious materials.

3.3.2.3 Procedure/method for chemical waste treatment and disposal

Incineration is useful for disposal of laboratory wastes, with or without prior decontamination. Proper incineration requires an efficient temperature control and a secondary burning chamber. There are some concerns regarding the possible negative environmental effects of the existing or the proposed incinerators.

SOP for Waste Management and Disposal of Battambang Provincial Hospital's laboratories is more general for laboratory infectious wastes. But chemical wastes disposal shall be guided by a specific SOP on Disposal of Chemical Waste. Thus, the hospital laboratories shall prepare and put in place this SOP prior to operation of the new BSL2+ laboratory.

3.3.2.4 Wastewater collection and treatment

Wastewater generated from laboratory facilities will be disposed of according to the reference guidelines for healthcare and laboratory facilities and WHO's guidelines for safe management of waste from healthcare and laboratory activities. Battambang Provincial Hospital's laboratories do not have onsite wastewater treatment facility. All wastewater generated from laboratory facilities/machines and from cleansing/sterilizing of reuse laboratory materials will be collected at source for treatment before discharge to public wastewater. Bleach solution/powder will be used as disinfectant for treating collected wastewater. Concentration and volume of bleach solution used depend on the level of contaminated wastewater and its volume. Battambang Provincial Hospital's laboratories SOP on waste management disposal is partly covered disinfection, decontamination of infectious wastes through autoclave and incineration. However, a specific SOP on disinfection solution and sterilization of wastes including wastewater shall be developed and put in place prior to operation of the new BSL2+ laboratory.

3.3.3 Procedures for Safety

3.3.3.1 Detecting system monitoring

Install detective devices such as fire alarm, automatic smoke detectors, and automatic door access. The SOP for detecting system monitoring is not available at Battambang Provincial Hospital's laboratories. Thus, biosafety and biosecurity team shall develop and put in place this SOP prior to operation of the new laboratory.

3.3.3.2 Emergency evacuation plan

Identify evacuation routes and maps designed in response to emergency situation such as in case of fire, natural disasters, and chemical spills. Battambang Provincial Hospital's laboratories do not have SOP for emergency evaluation plan. Thus, the hospital laboratories shall develop and put in place this SOP prior to operation of this new laboratory. However, Battambang Provincial Hospital's laboratories have SOP on biological and chemical spill management, as in annex 2.7, to manage emergency event from spilling of chemical or biological substances/agents.

Potential impacts during operation phase will be well managed since risk assessment will be conducted in all procedures related to laboratory testing. Biosafety cabinet class 2 will be used to minimize the potential impacts on laboratory staff and the environment. BSL2+ room will be used to perform testing on sample which has high pathogenic risk. In addition, biosafety team will conduct routine monitoring and supervision in the laboratories. All molecular staff who will work in the new laboratory facilities have been

well trained and passed the staff competency assessment. All technical, management, and biosafety and biosecurity procedures are available for all staff to use in their relevant stations.

3.4 Public Consultation

The subproject is located in major hospital of province that have hundred staff and thousand patients. Demolition and construction of new building inside hospital may create some environmental and social risks and concerns for people in hospital (hospital staff and patients) through its generation noise, dust, vibration, construction waste, social disturbance of construction workers if mitigation measures are not properly designed and acceptable by them.

Public consultation with hospital staff and patients have been conducted to gather their ideas/concerns and to consult on proposed mitigation measures. In regarding concern on connection of hospital wastewater and Sangke river, villagers at downstream closer to hospital were accessed to consult. Due to big constraint of COVID-19, this public consultation was alternatively conducted through individual discussion with 2 medical staff, 2 laboratory staff, 2 patients in hospital, and 2 villagers.

Discussion topic included: (i) concerns from the construction of this new laboratory (ii) appropriateness of proposed mitigation measures and (iii) appropriateness of the design GRM for this subproject. Results of public consultations found that hospital staff concern about noise, dust, scatter of debris during demolition and construction. Presences of workers in hospital, waste generation, hygiene, sanitation, and mobility of construction trucks is also another group of concerns. However, these concerns have already identified in section 2 on risks and impacts of subproject in this EMP. And in responding to these concerns, the proposed mitigation measures in this EMP also discussed and they believed that these design mitigation measures are enough to address their concerns and can manage risks and impacts, effectively. Hospital staff and patients also believed that the design GRM for this subproject is appropriate and applicable.

Regarding water quality of Sangke River, villagers believed that water quality now is not good as it was in 1980-1990s. At present, villagers don't use river water directly for their daily livelihood. they are all connected to clean water supply of Battambang city. Villagers reported that there is no connection of hospital wastewater system to river since they don't see wastewater outlet from hospital to river now. In addition, there is a strong concrete structure to stabilize river bank at section near hospital. For more detail on results of public consultation, please see Annex 8.

4. MONITORING, SUPERVISION AND REPORTING

This section describes procedures and tools to monitor and supervise the implementation of mitigation measures and the compliance with environmental and safety standards/guidelines.

4.1 During the Construction of the New Laboratory Building

During the construction of the new BSL2+ laboratory facilities, the Hospital Facility Management Committee will be responsible for the day-to-day supervision of the implementation of the contractor on mitigation measures as specified in the Environmental and Social Mitigation Measures during Construction Work (ESMMCW).

The civil work supervision team consists of civil work engineers who will provide direct supervision and monitoring of the contractor's compliance with CEMP/ ESMMCW during their regular site supervision and report on the civil work progress reports on the regular basis. Preventive Medicine Department (PMD) will supervise implementation of the EMP in line with the monitoring schedule of the Project operational plan. In addition, MOH also nominated the hospital management committee who are at the side construction site to monitor the contractor's compliance with CEMP/ ESMMCW routinely to report the key issue on compliance with CEMP/ ESMMCW to the civil work supervision team on time.

4.2 During the Operation of the New BSL2+ Laboratory

The laboratory biosafety and biosecurity team and IPC committee shall be assigned to routinely monitor and supervise the biosafety and biosecurity. In performing in monitoring and supervision, the teams will routinely monitor lab operation and lab operators at least once a week and periodically conduct the biosafety and biosecurity internal audit once a month by using international standard checklist to identify any nonconformity (or potential nonconformity) to the standards which may cause other potential risks, particularly on the environment and human. The audit will provide objective evidences for management committee to make an efficient and effective preventive measure to minimize or stop those identified potential risks. The result of monitoring and supervision of the biosafety and biosecurity team and IPC committee should be incorporated in the quarterly and semester monitoring report on laboratory operation prepared by the laboratory operators.

5. IMPLEMENTATION OF EMP

5.1 Implementation Arrangement

This Environmental Management Plan (EMP) is prepared in response to the Environmental and Social Safeguard requirements under H-EQIP project, specifically on the construction and design of Battambang Provincial Hospital's laboratories. It lists down potential environmental and social impacts that would occur during the construction and operation phases of the laboratory and proposes measures to mitigate the identified risks and impacts to an acceptable standard. PMD and Battambang Provincial Hospital facility managing committee shall ensure the implementation of mitigation measures at all phases including construction and operation phases. Biosafety and biosecurity team of hospital's laboratory unit and

infection prevention and control (IPC) committee will perform routing monitoring and supervision of the laboratory at least once a week during the installation and operation. Laboratory chief and laboratory staff will involve in the implementation of measures dealing with daily operation, especially with wastes and personnel safety measures. Laboratory unit will be responsible also in developing missing SOPs and upgrading existing SOPs to an acceptable level to serve the operation of the new BSL2+ laboratory as indicated in table 4 below. The contractor is responsible for implementing ESMMCW during the construction period and ensure that workers are aware of the internal rules and health safety measures and strictly follow the occupational and health safety measures and the contractor's internal rules during their work in the hospital.

Table 4: List of SOPs to be Developed and Upgraded by Laboratory Unit

List of SOPs required before the operation of the new laboratory	Availability	Next Step
Master list of SOPs of Battambang Provincial Hospital laboratories	Yes	Update
Risk Management	Yes	SBF
PPE done and doff	Yes	Upgrade
Specimen reception and processing	Yes	SBF
Safety of specimen packaging and transportation	Yes	SBF
Waste management and disposal	Yes	Upgrade
Laboratory risk assessment	Yes	Upgrade
Biological safety cabinet operation and maintenance	No	Develop
Autoclave operation and maintenance	No	Develop
Detection system monitoring	No	Develop
Emergency Evacuation Plan	No	Develop
Disposal and decontamination of sharp wastes	Refer to SOP on WMD	
Disinfection solutions and sterilization	No	Develop
Disposal of chemical waste	No	Develop

Note: SBF: Should Be Fine, WMD: Waste Management and Disposal

5.2 Budget for Implementation of EMP

For the implementation of EMP, a budget needs to be allocated for mitigation measures. Budget to cover the contractor's compliance with EMP and ESMMCW shall be included in the bidding budget by the MOH. The hospital facility management committee and the laboratory biosafety/biosecurity team are responsible of the monitoring and supervising the implementation of mitigation measures. They will not require any budget as they are located within the hospital compound. However, the budget from the project management will finance the civil works supervision team. During the operation, the budget for laboratory equipment, laboratory materials, and PPEs shall be covered by the project budget.

5.3 Grievance Redress Mechanism

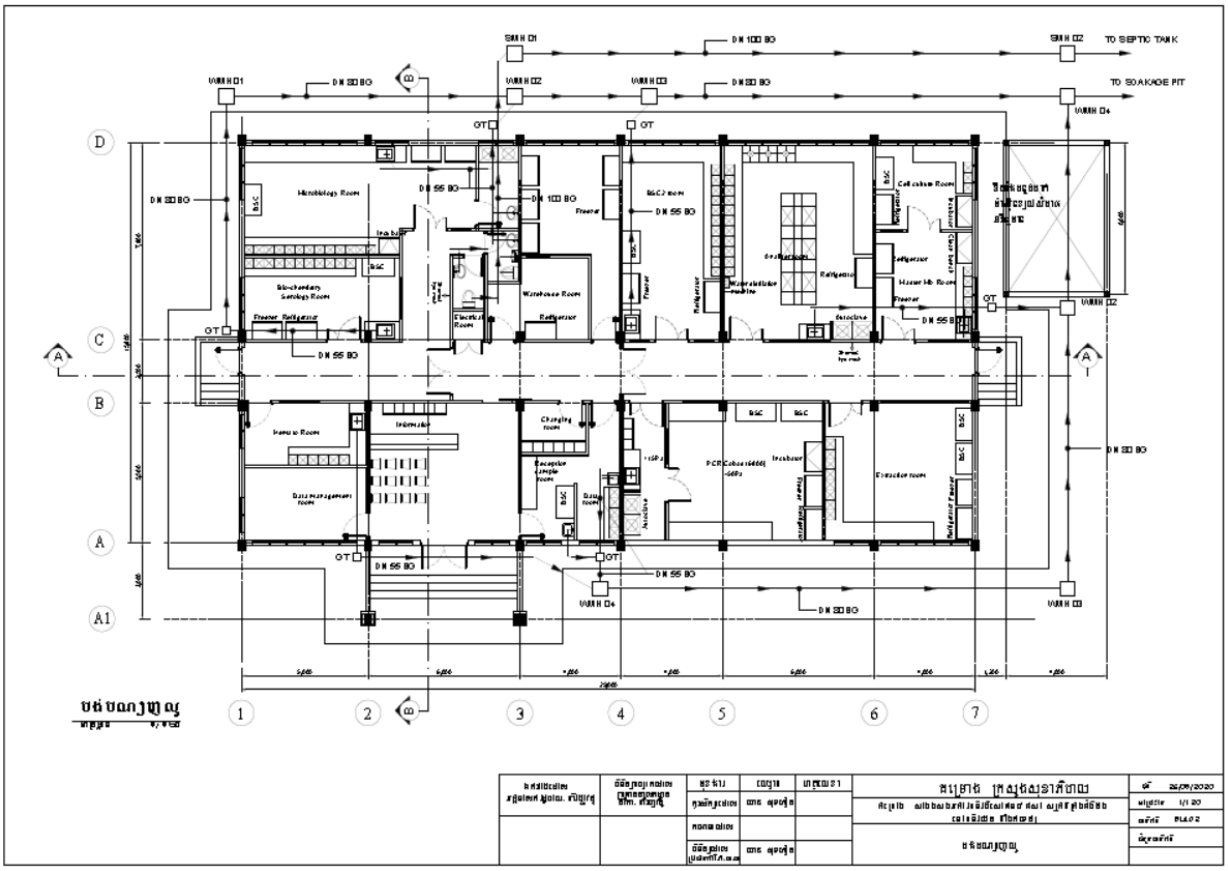
A grievance redress mechanism (GRM) needs to be established by the MOH within the context/scope of this subproject. This GRM is established to address any complaints that may occur during the subproject implementation. If someone finds out that the project creates negative impact on the community, individual, or environment, s/he can raise a respective grievance and submit a complaint to the Grievance Redress Committee for solution. The GRM has 3 steps.

- Step 1: The complainant discusses respective grievance with the Battambang Provincial Hospital's Director;
- Step 2: If the complainant is not satisfied with the solution offered, s/he can raise the grievance to the Grievance Redress Focal Person (GRFP) of Province;
- Step 3: If the complainant is not satisfied with the solution offered, s/he can raise the grievance to the Project Director (PD) at MOH;
- Next step: If one of parties is not satisfied with the solution made by the PD, they can go further step for a legal recourse.

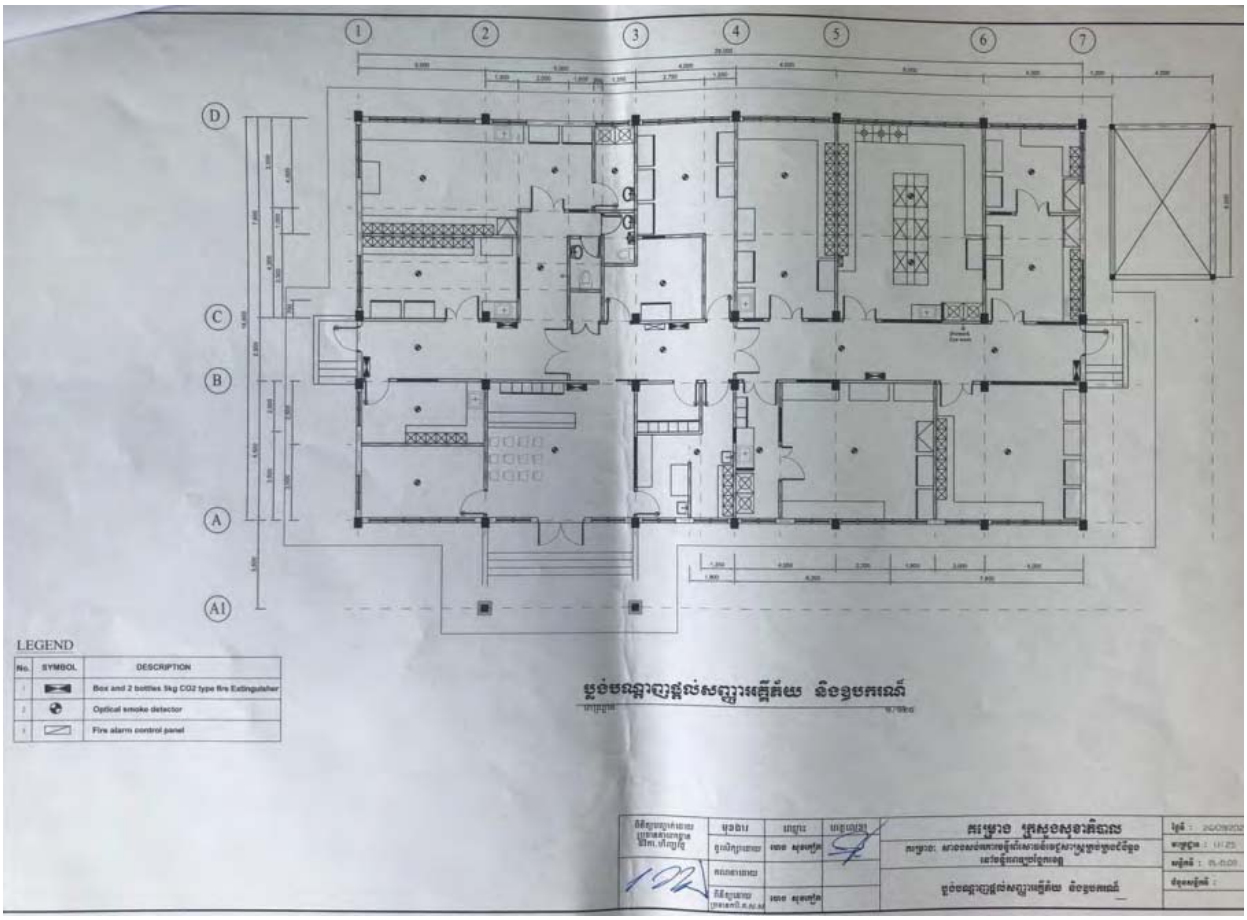
Step 1, 2 and 3 have no cost to the complainant. Please see detail GRM for this subproject please refer to Annex 7.

ANNEXES

Annex 1a: Drawing design of new building



Annex 1b: Drawing design for fire detecting system of building



ANNEX 2: SOPs of Battambang Provincial Hospital Laboratories

Annex 2.1: SOP for Risk Assessment and Risk LevelAnnex 2.2: SOP for Risk Management

Annex 2.3: SOP for Personal Protective Equipment Use

Annex 2.4: SOP for Specimen Packaging and Transportation

Annex 2.5: SOP for Sample Reception and Processing

Annex 2.6: SOP for Waste Management and Disposal

Annex 2.7: SOP for Biological and Chemical Spill Management

ANNEX 3: Checklist For Environmental and Social Safeguards Supervision for Construction of Laboratory in Battambang Provincial Hospital

Objectives:

To supervise/monitor status of ESMMCW implementation and social safeguards implementation during construction of Battambang Provincial Hospital's laboratory building

To suggest time-bound corrective actions for activities which create adverse impacts on the environment and people

Location:	Battambang Provincial Hospital
Person involved:	
Name of other Institution/ Organization involved:	
Filled out by:	
Date:	
Summary of the finding:	

	Question on Environmental- Social Safeguards Implementation	**Yes**	**No**	**Comments/ Information (Propose Time-bound corrective actions if No)**
1.	Unexploded Ordnances' (UXO, landmines, unexploded remnants of remnants etc.) at the construction sites.			
2	Chemicals, sanitary wastewater, spoil waste oil and concrete agitator washings is not deposited in the watercourses.			
3.	No Asbestos based materials are used in the construction			
4.	Asbestos product such as roofing sheets, old structure to be demolished are not stored in the health facilities compound.			
5.	If Asbestos products such as roofing sheets are found on site, or present in old structures that are to be demolished, they must be removed carefully from site, if possible, without breaking. The Asbestos is to be wetted to prevent dust and if any cutting or abrading is necessary, then the material must be kept wet during working to prevent dust.			

6.	The contractor protects sites of known antiquity by placing barriers and fencing to prevent access or damage to the site			
7.	The construction materials/ equipment is stored on site in the property constructed area, in good working condition and do not produce excessive noise			
8.	The demolition activities do not generate visible airborne dust			
9.	The site potable drinking water for construction workers is provided			
10.	The privy facilities available for construction workers are constructed and operational at the sites. The privy is located more than 30 meters of any existing water supply wells/surface water body			
11.	Noise disturbance of patients, HFs staff, residents or surrounded area due to prolong construction			
12.	Request for obtaining an agreement for disposal of construction waste			
13.	Proper location of construction site/camp			
14.	Availability of proper storage for fuel, oil and construction materials			
15.	Proper maintenance of construction machinery and equipment (prevent leakage of fuel, oil, lubricants, etc.)			
16.	Availability of temporary storage areas for excavated and demolished materials and construction wastes within health facility			
17.	Timely removal of excavated and demolished materials and construction waste from the temporary storage areas to planned and agreed places			
18.	Use covered trucks for transportation of construction materials and waste			
19.	Clean the surrounding area from dust by water sprinkling in construction zone (when necessary)			
20.	Clean/ wash tires of vehicles before they get to dwellings and/or drive on highways (when necessary)			
21.	Implementation of works at the established time (e.g. work during daytime 06.00 to 18.00)			
22.	Ensure proper safety of workers at the construction site (e.g. wearing construction helmet or other protective materials)			
23.	Installation of warning signs/safety signs in construction site, worker camps and access roads			
24.	Ensure proper sanitary/ hygienic conditions for workers at the construction site			

25.	Restoration of the area of construction sites and camps when the construction works are over			
26.	Replanting/planting of finished work areas			
27.	The construction site is properly fencing/ proper use of net construction			
28.	Having enough warning signs at danger areas (e.g. construction site, holes, construction wastes storage areas, etc.)			
29.	Electrical equipment and wires are in good conditions and properly kept (no damage, cuts, found in the wire, put it above the ground when it is flooded), proper Personal Protective Equipment (PPE) provided for works expose to electrical hazard. Prohibit works that involve electrical hazard to be carried out during raining or on a wet floor.			
30.	Ensure appropriate and respectful behavior of workers towards individuals in and around the construction area and the surrounding communities (ex. sexual harassment etc.).			
31.	During the construction/ground breaking, etc. in the event of unanticipated discovery of cultural or historical artifacts (human remain, antiquity, sacred artifact etc.).			
32.	Before/during working at height place, the arrangement of scaffoldings, supports, platforms, ladders and handrails to be provided, and using of safety belt be applied.			
33.	Conducting of monthly safety training to the construction workers to each site by the supervision engineers, and always training when the new construction workers recruited to work at sites.			
34.	There is no employment of children under eighteen years old at the construction site.			
Note: (Other issues found related to the social and environmental issues found at the construction sites).				

ANNEX 4: Environmental and Social Screening Checklist of Subproject

Health Equity and Quality Improvement Project (H-EQIP)

CHECKLIST FORM

for Environmental and Social Screening

This checklist form is developed as a screening tool to screen the environmental and social risks and impacts of upgrading provincial laboratories of Battambang Hospital. This tool is used by the Department of Preventive Medicine (DPM) to make prior environmental and social screening before starting activities of upgrading laboratory in Battambang Hospital.

This checklist form contains of 4 parts. Part 1 is key information about subproject; part 2 provides brief description on subproject/related activities; part 3 is environmental and social checklist; and part 4 is conclusion and rating level of environmental and social risks.

I. General information

Name of subproject	Health and Equity and Quality Improvement Project (H-EQIP)
Location of subproject	Battambang Provincial Hospital
Proponent of subproject	Laboratory Construction
Investment estimation	xxx
Start and completion dates	xxx

II. Subproject information

Briefly describe subproject/related activities to be done under subproject

Brief subproject: upgrade Battambang Provincial Hospital Laboratory to be regional laboratory and fully capable to test COVID-19. Construction (if any): Demolition of existing ICU building and reconstruct new building Renovation (if any): upgrade Provision of equipment: PCR-COBAS 6800 and supported equipment and materials Others:

III. Environmental and Social Checklist

Please answer all questions in table below, "No" means subproject is not applicable to the question, and "Yes" means subproject is applicable to the question.

If answer is no, please provide remark is applicable

If answer is yes, please provide some details about what to do, how to do, and when to do the activities and provide remarks if applicable.

Questions	Answer		Some details if yes, please provide some detail about what to do, how to do, and when to do?	Remarks (information to be noted)
	Yes	No		
Does the subproject involve civil works including new construction or expansion or rehabilitation of existing health building/facility?	Yes		Demolition of existing ICU building and reconstruction new building for new laboratory.	
Does the subproject involve upgrading/ renovation of health facilities including laboratories equipment and machine	Yes		New examiner machine, COBAS 6800 with full capable to run for COVID-19 testing	
Does the subproject involve improving waste management facilities?		No		Septic tank will be installed for collecting wastewater from new lab building
Does the subproject involve major digging soil, pit?		No		Shallow digging for preparing foundation of new building. Pressing technique will be used for preparing this foundation.
Is the subproject associated with any external waste management facilities such as a sanitary landfill, incinerator, or wastewater treatment plant for healthcare waste disposal?	Yes	No	Yes, for general waste to be collected by city waste collection company truck to dispose at city dumpsite.	No, for infectious, sharp, and chemical wastes use internal facilities of hospital such as incinerator and central autoclave (sooner to operate).
Does the subproject involve land acquisition and/or restrictions on land use?		No		The subproject is in existing public hospital, land owned by the Hospital.
Is there sound regulatory framework, institutional capacity in place for healthcare facility infection control and healthcare waste management?	Yes		The Hospital has an IPC committee and the SOPs and guidelines related to healthcare facility infection control and healthcare waste management.	
Is the subproject located within or in the vicinity of any ecologically sensitive areas, natural protected sites, or cultural heritage sites?		No		The subproject is in existing public hospital in city.
Does the subproject involve activities that have potential to cause any		No		The subproject is in existing public hospital in city.

significant loss or degradation of critical natural habitats whether directly or indirectly, or activities that could adversely affect forest and forest health?				
Will the subproject and related activities involve the use or potential air pollution?		No		No, except dust generated from demolition of building
Will the subproject and related activities involve the use or potential water pollution?		No		The Hospital has wastewater and drainage system connected to the public drainage system. There is no possible connection of wastewater discharge from hospital to river nearby. Each building has a septic tank that connect to main sewer of hospital.
Does the subproject involve transboundary transportation of specimen, samples, infectious and hazardous materials?		No		This new upgraded laboratory will serve in testing COVID-19 in Northwestern region of Cambodia only.
Is the subproject involve generation of hazardous waste?	Yes		Waste generated in laboratory contains of infectious, sharps, and chemical wastes.	
Does the subproject involve acquisition of assets to hold patients (including yet-to-confirm cases for medical observation or isolation purpose)?		No		It is laboratory project, it involve testing on samples only The hospital has 4 isolation rooms.
Does the subproject involve in activities that will result in the involuntary taking of land, relocation of households, loss of assets or access to assets that leads to loss of income sources or other means of livelihoods, and interference with households' use of land and livelihoods?		No		The subproject is in existing public hospital in city.
Does the subproject involve use of goods and equipment on lands abandoned due to social tension / conflict, or the ownership of the land is disputed or cannot be ascertained?		No		The subproject is in existing public hospital in city.
Does the subproject involve uses of goods and equipment involving forced labor, child labor, or other harmful or exploitative forms of labor?		No		All these are prohibited.
Does the subproject involve recruitment of workforce including direct, contracted,	Yes		Demolition and construction work will be done by	

primary supply, and/or community workers?			contractor with group of workers. The Hospital has announced to recruit 4 more staffs to support operation this new Laboratory.	
Does the subproject involve use of security personnel during construction and/or operation of healthcare facilities?	Yes		It would require to use the security guard to prevent any accident from moving of construction trucks inside hospital.	
Does the subproject use goods and equipment for military or paramilitary purposes;		No		It is not related.
Are there any vulnerable groups present in the subproject area and are likely to be affected by the proposed subproject negatively or positively?		No		No vulnerable groups present in/around the Hospital area.
Is there any indigenous people presence near the site and benefits from the subproject?		No		No indigenous people present in/around the Hospital area.
Is there any uses of goods and equipment for activities that would affect indigenous peoples, unless due consultation and broad support has been documented and confirmed prior to the commencement of the activities?		No		No indigenous people present in/around the Hospital area.
Does the project area present considerable Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) risk?		No		The workers won't allow to stay in the construction site at night and the Contractor shall comply with the EMP in all activities.

IV. Conclusions

1. Proposed E&S Risk Ratings: ☐ High ☐ Substantial ☐ Moderate ☐ Low.

Please provide Justifications: ……. Possible risk and impacts on water pollution, air pollution, noise pollution, health related impacts, social disturbance during construction would be low at level of controllable and manageable. .....

2. Proposed E&S Instruments: ……Environmental Management Plan (EMP)……

Person who complete checklist: Position: ……Civil Engineer Consultant of WB……

Date of completion check: 18 October 2020…

Tel: ..077 880 008.....

email: .....

Annex 5: HEALTHCARE WASTE MANAGEMENT PROCEDURE

While approximately 80% of the wastes generated in a HCF are general waste, the remaining 20% comprise wastes that contain harmful microorganisms which can infect hospital patients, HCFs staff and the general public, as well as sharp objects and hazardous substances that can result in injuries, poisoning and pollution.

Categorization of healthcare wastes

Healthcare waste is broadly categorized into two main groups, namely medical wastes and general wastes.

1. General wastes or household waste

• Any waste that are solid or semi-solids generated from HCFs that are non-toxic and non-hazardous and are not contaminated with medical wastes. These are the food wastes, paper, plastics, textiles, non-toxic metals, glass and garden wastes.

• In the event that general wastes are contaminated or mixed with any medical wastes, the general wastes shall be classified as medical wastes and managed accordingly.

2. Medical wastes

• Any waste which consists completely or partly of human or animal tissue, blood or other body fluids, excretions, drugs or other pharmaceutical products, swabs or dressings, syringes, needles or other sharps instruments, … all wastes that are hazardous or can cause infection to any person coming into contact with it.

• Any other wastes generated from healthcare activities which may be hazardous or toxic.

• The categories of medical wastes are:

1) Infectious wastes
2) Pathological wastes
3) Sharps wastes
4) Pharmaceutical wastes
5) Genotoxic wastes
6) Chemical wastes
7) Wastes with high content of heavy metals
8) Pressurized containers
9) Radioactive wastes

Proper healthcare waste management includes (1) waste segregation, (2) collection and handling, (3) stock in a safe temporary storage, (4) safe treatment and disposal.

1. **Organize waste segregation:**

All HCFs shall organize waste segregation at sources. Each type of waste should be contained in designated, color coded and labelled bags and containers. These are:

- green bin: general waste or household waste
- yellow bin: infectious waste, main part of the medical waste
- brown bin: chemical and pharmaceutical wastes, wastes with high content of heavy metals
- red bin: genotoxic waste, radioactive waste
- black bin: pressurized containers

Waste Category	Colour of Container & Markings	Proposed Symbol
Infectious waste	Yellow, marked black	
Pathological wastes	Yellow, marked red	
Sharps "safety-box"	Yellow, marked "SHARPS"	
Chemical & pharmaceutical waste	Brown, marked "HAZARDOUS"	
Wastes with high content of heavy metals	Brown, marked with the specific heavy metal content and "HAZARDOUS"	
Genotoxic waste	Red, marked "CYTOTOXIC"	
Radioactive waste	Red	
Pressurized containers	Black	
General waste	Green	

2. Handling

Staff should handle medical waste as little as possible before storage and disposal. The more waste is handled, the greater the chance for accidents.

Special care must be taken when handling used needles and other sharps, which pose the greatest risk of accidental injury and infection.

Emptying waste containers

Waste containers that are too full also present greater opportunities for accidents. Waste should be removed from operating theatres, procedure rooms, and sluice rooms before the containers become completely full. At the very least, these containers should be emptied once a day. Dispose of sharps containers when they are 3/4 full. (When sharps-disposal containers become too full, people may push sharps into the container, causing injury.)

Staff should wear utility gloves, heavy duty apron and boots when collecting waste.

Do not collect medical waste from patient-care areas by emptying it into open carts or wheelbarrows, as this may lead to spills and contamination of the surroundings, may encourage scavenging of waste, and may increase the risk of injury to staff, patients, and visitors.

Handle medical waste as little as possible.

Never put your hands into a container that holds medical waste.

3. Stock in a safe temporary storage

Following segregation, medical wastes should be placed in a designated, safe (locked) and temporary storage at HCFs. Different health care waste should be streamed separately in standard storage equipment. Storage time of infectious waste should not exceed 48 hours. Anatomical waste should be buried or disposed daily.

The central storage area must be:

- Located separately from the general waste storage areas.
- Should be clearly identifiable.
- Away from food preparation, public access and egress route.
- Arranged to store waste for landfill and waste for incineration waste separately.
- Well ventilated and well lit.
- Located on well drained, impervious hard-standing.
- Provided facilities for washing down and disinfection.

4. Treatment and disposal of medical waste

General wastes can be removed to the regular community waste-disposal (land field). Infectious waste can be treated by the following methods:

Incineration. Two-chambered incinerators with proper temperature, required chimney heights should be used. The temperature must be at least of 800'C to ensure minimal emission of toxic gases

at the primary chamber. Appropriate location and high chimney (higher than nearby roofs) are required. Pressured gas containers, radioactive wastes, radiographic wastes, halogenated plastics like PVC, mercury, cadmium and ampoules of heavy metals should never be incinerated. Several provinces in Cambodia have installed two-chambered incinerators for medical waste treatment in the centralized model. Health centers and district hospitals are recommended to transport sharp waste to these incinerators for treatment.

Single-chamber, drum and brick incinerators cannot meet the best available technology requirements of the Stockholm Convention on Persistent Organic Pollutants, of which Cambodia is signatory. Emissions of toxic and persistent organic pollutants (dioxin, furans, etc.) from these small-scale incinerators may result in human exposure at levels associated with adverse health risks. The project will not finance new small-scale onsite incinerator. If existing on-site incinerators are used, mitigation measures will be taken to control emissions to air in line with WBG EHS for healthcare facilities and WHO's guidelines for safe management of waste generated from healthcare activities. The good practices as follow:

- Waste reduction and segregation to minimize quantities of waste to be incinerated;
- Siting incinerators away from patient wards, residential areas or where food is grown;
- A clearly described method of operation to achieve the desired combustion conditions and emissions; for example, appropriate start-up and cool-down procedures, achievement and maintenance of a minimum temperature before waste is burned, use of appropriate loading/charging rates (both fuel and waste) to maintain appropriate temperatures, proper disposal of ash and equipment to safeguard workers;
- Periodic maintenance to replace or repair defective components;
- Improved training for operators and improved management including the availability of an operating and maintenance manual, visible management oversight, and regular maintenance schedules.

Autoclave. Autoclave used to decontaminate infectious waste is required for laboratory (Level BS2+ and BSL3). They are available in some laboratories in Cambodia. All laboratory equipment, materials and fluids must be decontaminated in the autoclave, before being discharged out of the laboratory.

Sharp pit and Placenta pit: Placenta and small anatomical waste should be disposed to placenta pit and sharp waste should be disposed to sharp pit where there is no effective incineration.

Secured landfill. This is the minimal approach to sharp waste disposal, which should be used only in remote and underdeveloped areas. Even in difficult circumstance, the health facility should establish the following basic principles:

- Locates the burial site away from the groundwater supply sources
- Restrict access to the disposal site by unauthorized persons
- Line the burial site with a material of low permeability, such as clay, dung and river silt, if available, to prevent pollution of shallow groundwater and nearby wells.
- Bury sharp waste and infectious waste only
- Each layer of waste should be covered by a layer of soil to prevent odors, rodents and insects.

5. Waste water collection and treatment

a. Overall requirements

Health and environmental workers should always wear heavy utility gloves and shoes when handling or transporting liquid medical waste of any kind. When carrying or disposing of liquid medical waste, they should be careful to avoid splashing the waste on yourself, others, or on the floor and other surfaces.

Carefully pour liquid waste down a sink, drain, flushable toilet, or latrine. If this is not possible, bury it in a pit along with solid medical waste. Moderate quantities of mild liquid or semi-liquid pharmaceuticals such as solutions containing vitamins, cough syrups, intravenous solutions, eye drops (but not antibiotics or cytotoxic drugs), may be diluted in a large flow of water and discharged into municipal sewers. Pharmaceutical wastes shall not be disposed of into slow-moving or stagnant water. Pharmaceutical wastes shall not be disposed of into slow-moving or stagnant water.

All facilities should have appropriate drainage. If the facility does not link to a treated municipal water drainage system, then all drainage should be treated locally. This includes appropriate septic and filtration systems. Highly infectious waste should be disinfected by proper disinfectants or autoclaved before they are disposed of either by incineration or non-incineration processes. Unless there is an adequate waste-water treatment plant, blood should be disinfected before discharged to a sewer.

b. Management of faecal waste and wastewater in COVID-19 outbreak

There is no evidence that the COVID-19 virus has been transmitted via sewerage systems with or without wastewater treatment. Further, there is no evidence that sewage or wastewater treatment workers contracted the severe acute respiratory syndrome (SARS), which is caused by another type of coronavirus that caused a large outbreak of acute respiratory illness in 2003. As part of an integrated public health policy, wastewater carried in sewerage systems should be treated in well-designed and well-managed centralized wastewater treatment works. Each stage of treatment (as well as retention time and dilution) results in a further reduction of the potential risk. A waste stabilization pond (an oxidation pond or lagoon) is generally considered a practical and simple wastewater treatment technology particularly well suited to destroying pathogens, as relatively long retention times (20 days or longer) combined with sunlight, elevated pH levels, biological activity, and other factors serve to accelerate pathogen destruction. A final disinfection step may be considered if existing wastewater treatment plants are not optimized to remove viruses. Best practices for protecting the health of workers at sanitation treatment facilities should be followed. Workers should wear appropriate personal protective equipment (PPE), which includes protective outerwear, gloves, boots, goggles or a face shield, and a mask; they should perform hand hygiene frequently; and they should avoid touching eyes, nose, and mouth with unwashed hands.

- *Sanitation and plumbing*

People with suspected or confirmed COVID-19 disease should be provided with their own flush toilet or latrine that has a door that closes to separate it from the patient's room. Flush toilets should operate properly and have functioning drain traps. When possible, the toilet should be flushed with the lid down to prevent droplet splatter and aerosol clouds. If it is not possible to provide separate toilets, the toilet should be cleaned and disinfected at least twice daily by a trained cleaner wearing

PPE (gown, gloves, boots, mask, and a face shield or goggles). Further, and consistent with existing guidance, staff and health care workers should have toilet facilities that are separate from those used by all patients.

WHO recommends the use of standard, well-maintained plumbing, such as sealed bathroom drains, and backflow valves on sprayers and faucets to prevent aerosolized faecal matter from entering the plumbing or ventilation system, together with standard wastewater treatment.21 Faulty plumbing and a poorly designed air ventilation system were implicated as contributing factors to the spread of the aerosolized SARS coronavirus in a high-rise apartment building in Hong Kong in 2003.22 Similar concerns have been raised about the spread of the COVID-19 virus from faulty toilets in high-rise apartment buildings.23 If health care facilities are connected to sewers, a risk assessment should be conducted to confirm that wastewater is contained within the system (that is, the system does not leak) before its arrival at a functioning treatment or disposal site, or both. Risks pertaining to the adequacy of the collection system or to treatment and disposal methods should be assessed following a safety planning approach,24 with critical control points prioritized for mitigation.

- *Toilets and the handling of faeces*

It is critical to conduct hand hygiene when there is suspected or direct contact with faeces (if hands are dirty, then soap and water are preferred to the use of an alcohol-based hand rub). If the patient is unable to use a latrine, excreta should be collected in either a diaper or a clean bedpan and immediately and carefully disposed of into a separate toilet or latrine used only by suspected or confirmed cases of COVID-19. In all health care settings, including those with suspected or confirmed COVID-19 cases, faeces must be treated as a biohazard and handled as little as possible. Anyone handling faeces should follow WHO contact and droplet precautions and use PPE to prevent exposure, including long-sleeved gowns, gloves, boots, masks, and goggles or a face shield. If diapers are used, they should be disposed of as infectious waste as they would be in all situations. Workers should be properly trained in how to put on, use, and remove PPE so that these protective barriers are not breached.25 If PPE is not available or the supply is limited, hand hygiene should be regularly practiced, and workers should keep at least 1 m distance from any suspected or confirmed cases.

If a bedpan is used, after disposing of excreta from it, the bedpan should be cleaned with a neutral detergent and water, disinfected with a 0.5% chlorine solution, and then rinsed with clean water; the rinse water should be disposed of in a drain or a toilet or latrine. Other effective disinfectants include commercially available quaternary ammonium compounds, such as cetylpyridinium chloride, used according to manufacturer's instructions, and peracetic or peroxyacetic acid at concentrations of 500–2000 mg/L.

Chlorine is ineffective for disinfecting media containing large amounts of solid and dissolved organic matter. Therefore, there is limited benefit to adding chlorine solution to fresh excreta and it is possible that this may introduce risks associated with splashing.

- *Safely disposing of greywater or water from washing PPE, surfaces and floors.*

Current WHO recommendations are to clean utility gloves or heavy duty, reusable plastic aprons with soap and water and then decontaminate them with 0.5% sodium hypochlorite solution after each use. Single-use gloves (nitrile or latex) and gowns should be discarded after each use and not reused; hand hygiene should be performed after PPE is removed. If greywater includes disinfectant

used in prior cleaning, it does not need to be chlorinated or treated again. However, it is important that such water is disposed of in drains connected to a septic system or sewer or in a soakaway pit. If greywater is disposed of in a soakaway pit, the pit should be fenced off within the health facility grounds to prevent tampering and to avoid possible exposure in the case of overflow.

ANNEX-6:INFECTION PREVENTION AND CONTROL MEASURES: TRANSMISSION BASED PRECAUTIONS

While standards precautions are applied for all patients, depending on the risks assessment (e.g. splash of fluids on body, face…) and performed procedures (e.g. withdrawing blood…), transmission-based (additional) precautions are applied depending on the route of transmission of the pathogen, in addition to standard precautions.

Additional precautions are a set of procedures whose goal is to prevent communication of infectious disease transmitted in a certain manner.

There are three types of additional precautions:

1. Contact precautions
2. Droplet precautions
3. Airborne precautions

They may be combined for diseases that have multiple routes of transmission e.g. avian influenza (droplet and contact precautions are required).

For all type of isolation precautions:

- Implement all standard precautions.
- Place patient in a single room or in a room with another patient infected by the same pathogen - also called cohorting room.

In a cohort room, keep at least 1 meter distance between patient beds.

- Put a sign with the type of precautions (e.g. contact, droplet and/or airborne) and what PPE staff, visitors need to wear.
- Always limit the movement and transport of the patient from the room (e.g. use mobile X-Ray, where available, instead of transporting patient to X-Ray room)

If transportation is necessary, apply standard precautions to minimize the risk of transmission.

- Avoid crowed area (with other patients, to avoid NI), when transporting patients.
- Use dedicated patient care equipment (one equipment for one isolated patient); if not possible clean and disinfect item between patients.

7A. CONTACT PRECAUTIONS

Requirements	Contact Precautions
Single Room	Yes, or Cohort with patient with same pathogen in consultation with infection prevention and control focal point.
Negative Pressure	No
Hand Hygiene	Yes Hand cleaning with soap and water or AHR
PPE for staff/ visitor	
Gloves	Yes, If there is direct contact with the patient or their environment Rubber gloves, when cleaning, disinfecting
Gown/Apron	Yes, If there is direct contact with the patient or their environment.
Mask	Standard Precautions Use to protect face if splash or aerosol likely
Protective eyewear	Standard Precautions Use to protect eyes if splash likely to be generated
Rubber boots	Standard precautions When risk of infected liquid on the foot, walking where contaminated floor
Patient Equipment	Designated equipment (1 equipment/ 1 patient) Or if not possible clean and disinfect before to use to the next patient. To avoid infection of other patients (nosocomial infection) via contaminated equipment.
Transport of Patients (inside and outside of hospital)	• limit transport, only when necessary • Notify the area receiving patient. • choice un-crowed way to transport patient inside of hospital • transport staff need to wear PPE for contact precautions • PPE for patient: ◦ Put a drape on top of the patient (to avoid risk of contamination of the environment during the transport)

	◦ If patient has also respiratory symptoms, patient should wear surgical mask during the transport • Clean and disinfect transport material or vehicle
After leaving the isolation room	• when transferring patient from outside to isolation unit, use the dedicated entrance for infectious patient, if available • Take off PPE in the ante-room (if ante-room is not available, in the dedicated area – e.g. corridor) and perform hand hygiene
Room Cleaning	• Refer to **Annex 15** and Hospital Cleaning Procedure • Cleaner staff wear PPE for contact precaution plus rubber gloves, rubber boots and impermeable apron • May require additional cleaning with a disinfectant solution depending on the pathogen.
Remarks	• Everyone entering in the isolation room or unit, need to record their name and contact in the logbook. • Patient Medical Records/document, pen, mobile phone… must not be taken into the room. • Put a sign contact precaution room.

CONTACT PRECAUTIONS

Staff, Visitors, Family, must report to nursing desk before entering

Staff, Visitors, Family, must

- Perform hand washing before entering and when leaving
- Wear disposable gloves and gown/ apron before enter
- Leave patient care equipment, food in the room and inform unit staff
- When leaving the isolation room, take off PPE (in anteroom or designated area) and
- Perform hand hygiene

7B. DROPLET PRECAUTIONS

Requirements	Droplet Precautions
Single Room	Yes or Cohort with patient with same pathogen (in consultation with infection control professional, or infectious diseases physician). It is recommended that single patient rooms be fitted with ensuite facilities. In the advent of no ensuite facilities, a toilet and bathroom should be dedicated for individual or cohort patient use.
Negative Pressure*	No
Hand Hygiene	Yes Hand cleaning with soap and water or water-free alcohol based skin cleanser.
PPE for staff/ visitor	
Gloves	Standard Precautions Use to protect for anticipated contact with blood and body substances.
Gown/Apron	Standard Precautions Use to protect where soiling or splashing are likely.
Mask	Yes Surgical Mask Take off mask after leaving patients room.
Protective Eyewear	Yes
Handling of Equipment	Standard Precautions Avoid contaminating environmental surfaces and equip-ment with used gloves.
Transport of Patients	• Respiratory hygiene for coughing and sneezing patients suspected of having an infectious respiratory illness. • Surgical mask for patient when they leave the room.

	• Patients on oxygen therapy must be changed to nasal prongs and have a surgical mask over the top of the nasal prongs for transport (if medical condition allows). • Advise transport staff of level of precautions to be maintained (droplet precautions). • Notify area receiving the patient. • Clean and disinfect transport material or vehicle.
Alert	• When cohorting patients, they require minimum of one metre of patient separation. • Visitors to patient room must wear a surgical mask and protective eyewear (if unable to maintain 1 meter distance) and perform hand hygiene. • Patient Medical Records must not be taken into the room. • Signage of room.
Room Cleaning	• Refer to **Annex 15** and Hospital Cleaning Procedure • May require additional cleaning with a disinfectant agent depending on organism. • Consult with infection control professional.

DROPLET PRECAUTIONS

Staff, Visitors, Family must report to nursing desk before entering

Staff, Visitors, Family must

- Perform hand washing before entering and before leaving the room
- Wear at least surgical mask and eyes protection when entering room
- Leave patient care equipment in the room and inform unit staff
- When leaving the isolation room, take off PPE (in anteroom or designated area)
- Perform hand washing

7C. AIRBORNE PRECAUTIONS

Requirements	Airborne Precautions
Single Room	**Yes** Door closed It is recommended that single patient rooms be fitted with ensuite facilities. If no en-suite facilities, a toilet and bathroom should be dedicated for individual patient use.
Negative Pressure*	**Yes**, if available otherwise single room with door closed and window open
Hand Hygiene	**Yes** Hand cleaning with soap and water or water-free alcohol based skin cleanser
PPE for staff/ visitor	
Gloves	Standard Precautions Use to protect for anticipated contact with blood and body substances
Gown/Apron	Standard Precautions Use to protect where soiling or splashing are likely
Mask	**Yes**, N95 or P2 Mask (perform fit check each time a mask is worn to ensure it fits the face firmly with no gaps between the mask and the wearers face according to manufacturer instructions prior to entering room) Take off mask after leaving patient room
Protective eyewear	Standard Precautions Use to protect eyes if splash likely or where aerosol may be generated
Handling of Equipment	Standard Precautions Avoid contaminating environmental surfaces and equipment with used gloves
Transport of Patients	• Surgical mask for patient when they leave the room • Patients on oxygen therapy must be changed to nasal prongs and have a surgical mask over the top of the nasal prongs for transport (if medical condition allows). • Advise transport staff of level of precautions to be maintained (airborne).

	• Respiratory hygiene for coughing and sneezing patients suspected of having an infectious respiratory illness. • Notify area receiving patient. • Clean and disinfect transport material or vehicle.
Alert	• Respiratory hygiene for coughing patients • Visitors to patient room must also wear P2 or N95 mask and perform hand hygiene • Signage of room indicating precautions to be applied • Patient Medical Records must not be taken into the room.
Room Cleaning	• Refer to Annex 15 and Hospital Cleaning Procedure. • May require additional cleaning with a disinfectant agent depending on the organism. • Consult with infection control professional.

AIRBORNE PRECAUTIONS

Staff, Visitors, Family, must report to nursing desk before entering

Staff, Visitors, Family must

- Perform hand washing before entering
- Wear particulate respirator (N95) before enter
- Leave patient care equipment in the room and inform unit staff
- When leaving the isolation room, take off PPE (in anteroom or designated area) and
- Perform hand washing

Ministry of Health

H-EQIP Health Equity and Quality Improvement Project (H-EQIP)

Grievance Redress Mechanism of Battambang Provincial Hospital Laboratory Upgrading Subproject

This Grievance Redress Mechanism (GRM) is established to provide a mechanism for addressing grievances and concerns of individual or community from implementation of a subproject on construction of upgrading laboratory of Battambang Provincial Hospital. This mechanism will respond to all types of grievances and concerns derive from implementation of subproject activities. This GRM will be made aware to public, hospital staff, and patient will disclose on MOH's website as well as display on public information board of hospitals. Hospital director will be focal person of subproject to respond to grievance or concern if any.

Someone/individual and community who involved directly or indirectly with implementation of this subproject including hospital staff, patients, and surrounding people nearby the site of subproject believed that subproject activity is generating a detrimental impact or being affected by subproject activities; s/he (complainant) can raise a grievance and make a complaint to the grievance redress focal person (presented in Table 1 below) for addressing. The mechanism will be applied during both civil work/upgrading phase and operation phase of subprojects and ensured that all complaints/concerns from affected persons or communities are addressed and proposed corrective action plan/solutions being implemented, and complainant being inform of the outcome. A complaint to this GRM can be made through complainant make a directly inform the complaint to GRM focal person, Hospital Director through phone call, telegram, complaint box. All complaints or concerns are recorded in grievance logbook by hospital director. GRM process has 2 steps as:

Step 1: direct discussion between complainant and hospital director. Complainant makes a direct inform the complaint (in verbal or writing) to hospital director through phone call, telegram, email, complaint box, or submit directly to the hospital director. Upon the receipt complaint, hospital director shall review issues caused the complaint and seek solution to complainant within 7 working days from the day of complaint received. Upon given solution by Hospital director; if complainant is satisfied, the grievance is solved and closure agreement is signed with corrective action plan; and if not satisfied, complainant will continue to step 2.

Step 2: with unsatisfaction on solution in step 1, complainant can escalate the grievance to Grievance Redress Focal Person (GRFP) of province. Complainant fills complaint form and submit to GRFP. Upon complaint received, GRFP will acknowledge the receipt of complaint within 3 working days after the day of complaint received. Then GRFP will seek for resolution from hospital director within 10 working days from the day of complaint acknowledged. GRFP reviews issues caused complaints and solution proposed in step 1 and then discussed with hospital director to have a better

resolution. Upon the resolution given from GRFP; if complainant is satisfied, the grievance is solved and closure agreement is signed with corrective action plan; and if not, complainant will continue to step 3.

Step 3: with unsatisfaction on solution in step 2, GRFP will escalate the complaint to Project Director (PD) at MOH through submitting filled complaint form of complainant. Upon complaint received, Project Director will seek for a resolution within 15 working days from the day of complaint received. PD reviews grievance and resolutions made in step 1 and step 2 and seek for another better resolution. Upon the resolution given from project director; if complainant is satisfied, the grievance is solved and closure agreement is signed with corrective action plan; and if not, complainant can file the grievance to justice system.

In responding to complainant satisfaction with proposed solution, the implementation of corrective action plan and the outcome will be recorded in the GRM logbook. Upon the agreement on solution made and implementation of corrective action plan, if the complainant is not satisfied s/he still has the right to reactivate and continue the complaint to next steps or appeal to the ordinary courts as last resort.

Figure 1: Grievance Redress Mechanism of Battambang Provincial Hospital Laboratory Upgrading Subproject Project Flow Chart

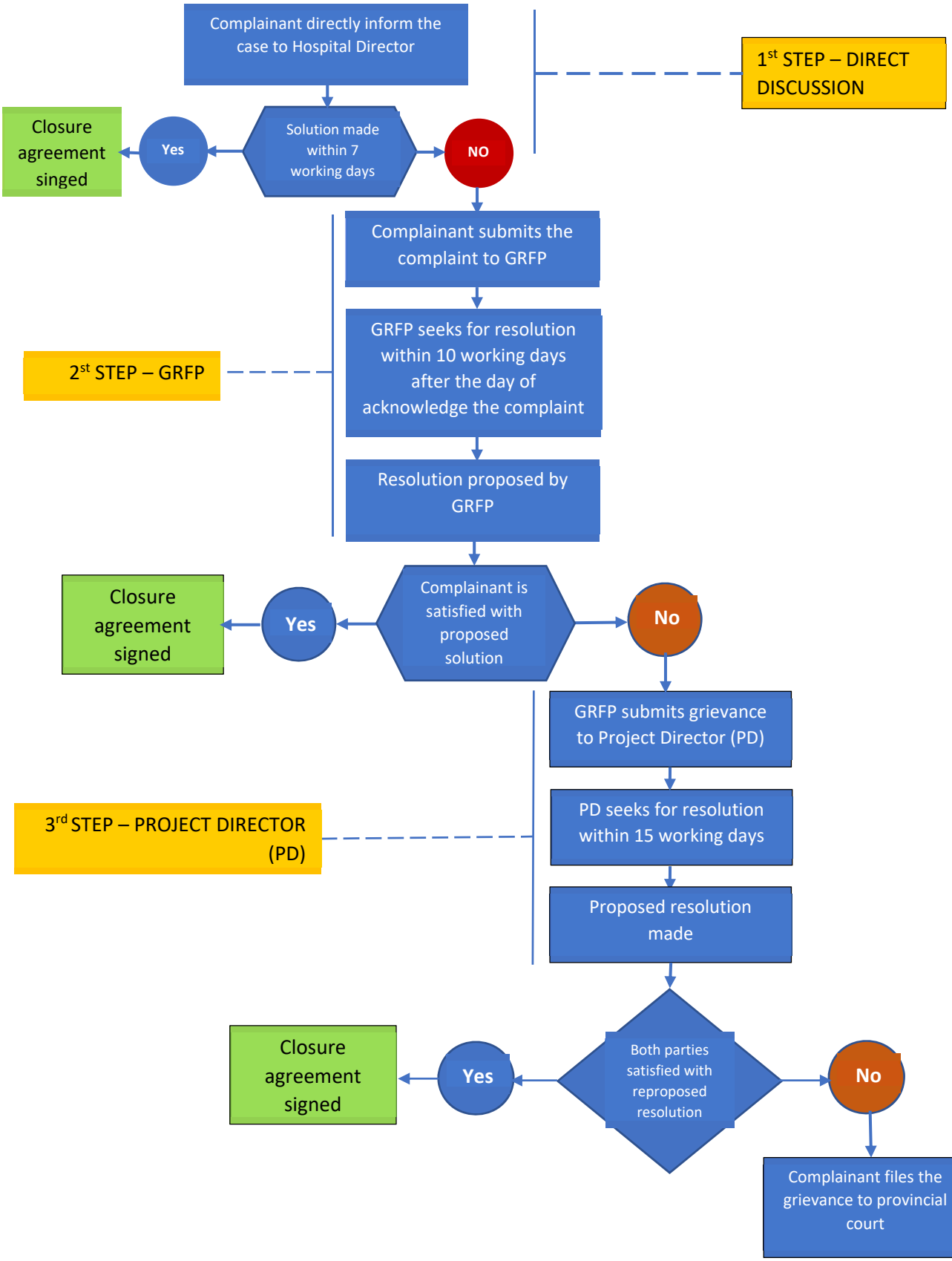


Table 1: List of Contact of Hospital Director and Grievance Redress Focal Person

No.	Subproject location	Name of assigned grievance address focal person	Position	Phone	Telegram
1	Battambang Provincial Hospital	Dr. Kak Seila	Hospital Director	012 833 261	012 833 261
2	Grievance Redress Focal Person (GRFP)	??	??	??	??

ពាក្យបណ្តឹង

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តើអ្នកចង់បានដំណោះស្រាយទៅនឹងបញ្ហានេះ យ៉ាងដូចម្តេច ៖ .....

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ហត្ថលេខា

ANNEX 8: Results of Key Informant Discussion and Public Consultation

(Battambang Provincial Hospital)

1. Consultation inside Hospital

Discussion topic	**Lab staff (2 lab staff)**	**Hospital staff (2 staff)**	**Patients (2 patients)**	**People at River (2villagers)**
Concerns	• For construction, location of construction site is so close to existing laboratory building thus, there would be some concerns on noise, dust, and scatter of debris. • Presences of workers and waste generation, sanitation, and hygiene are also the concerns. • No problem about risks and impacts from this new lab, since there will risk assessment to be conducted before the operation, thus any risks can be reduced and managed prior the operation. • There will be upgrading capacity of lab staff for operating this new lab, using new machine, equipment, and materials.	• There will be some concerns on noise, dust, and scatter of debris to cause injure to people and damage cars. • Sanitation, hygiene, and wastes generation of workers should be strictly managed. • Worker's behavior is also a concern if they are not managed properly. • Moving construction trucks inside hospital would cause accident since there always crowded at the main gate and inside hospital.	• Moving patients from ICU building to another building • Contractor need to prepare carefully during demolition and construction especially control of noise and dust control during demolition of building. • Noise can suffer patients, especially for high blood pressure and serious heart disease patients.	• Quality of river is not good especially in dry season. River is getting shallow with floating some garbage from upstream. • No directly use river water for household. All households access city water supply. • No connection of hospital wastewater to river now. No wastewater outlet from hospital is recognized now. • There is a strong concrete structure to stabilize river bank at section near hospital.
Mitigation measures				
Mitigation measures	• These mitigation measures are	• These mitigation measures are	These measures are good and	

during demolition: dust, noise, vibration, waste	good enough to respond concerns. • However, ensure good implementation of these measures. • Contractor should use most appropriate demolition technique that generate soft sound and less dust. • Ensure safety net to be installed properly during demolition and construction.	good and respond well to concerns. • However, ensure good implementation of these measures. • Contractor should use most appropriate demolition technique and consider time.	can manage problems well.	
Mitigation measures during construction: social: workers, behaviors, and GBVs	• These mitigation measures are good enough. • No further comments on these measures. • However, ensure good implementation of these measures.	• These mitigation measures are good and respond well to concerns. • No further comments on these measures. • However, ensure good implementation of these measures.	These measures are good and can manage problem well.	
Mitigation measures waste management, hygiene, and sanitation	• These mitigation measures are good enough. • No further comments on these measures. • However, ensure good implementation of these measures.	• These mitigation measures are good and respond well to concerns. • No further comments on these measures. • However, ensure good implementation of these measures.	These measures are good and can manage problem well.	

Mitigation measures against truck transportation and accident	• These mitigation measures are good enough. • No further comments on these measures. • However, ensure good implementation of these measures.	• These mitigation measures are good and respond well to concerns. • No further comments on these measures. • However, ensure good implementation of these measures.	These measures are good and can manage problem well.	
Laboratory installation: design, risk assessment,	• These mitigation measures are good enough. • No further comments on these measures. • Propose staff training for safe operating this new laboratory.			
Laboratory operation:	• These mitigation measures are good enough. • No further comments on these measures. • Propose staff training for safe operating this new laboratory.			
Grievance Redress Mechanism for the subproject				
	• The design GRM for this subproject is appropriate and applicable.	• The design GRM for this subproject is appropriate and applicable.	• The design GRM for this subproject is appropriate.	

2. Discussions with Deputy Director of Environmental Department of Battambang

Current river water quality: Water quality of Sangke river at its section in Battambang City has been tested by the MOE laboratory once a month. Water samples have collected at different locations of the river in city from upstream to downstream. The quality of water is varied between

dry season and rainy season. River was almost dry up in hot dry season and was full of water in rainy season with fast current flow of water from upstream to downstream of Battambang City and then to Tonle Sap lake. There used to have some direct and indirect discharges of wastewater into river before. However, those point sources had been controlled and connected to public sewer of city under the wastewater improvement project of JICA in 2017. Table below presents result of water quality testing of Sangke River in June 2018 at three locations, Kandeng Pagoda, Leap Pagoda, and Chamkar Samroeung.

ប្រភពសំណាក/Sample Source : **នាយកដ្ឋានគ្រប់គ្រងគុណភាពទឹក**
ថ្ងៃ ខែ ឆ្នាំទទួលសំណាក/Date: June 21, 2018
ប្រភេទសំណាក./Type of Sample: **ទឹកស្ទឹងសង្កែ I. វត្តកណ្តឹង, II. វត្តលៀប III. ចំការសំរោង** ក្រុងបាត់ដំបង **ខេត្តបាត់ដំបង**

លរ No	**ប៉ារ៉ាម៉ែត្រ** Parameter	**ខ្នាត** Unit	**លទ្ធផល** Result			**ស្តង់ដារ** Standard	**វិធីសាស្ត្រវិភាគ** Reference Method
			I	II	III		
1	pH	-	7.30	7.10	7.38	6.5-8.5	Method pH meter
2	Total Suspended Solid(TSS)	mg/L	42.00	94.00	33.00	25-100	Method 2540 D
3	Biochemical Oxygen	mg/L	1.00	7.20	22.50	1.0-10	Method 5210 B
4	Chemical Oxygen Demand	mg/L	8.00	23.00	54.00	<8.0(MRC)	Method 5220.B
5	Chromium Hexavalent (Cr^{+6})	mg/L	ND	ND	ND	<0.05	Method Spectrometry
6	Total Nitrogen (TN)	mg/L	4.92	4.92	4.92	1.0-06	Method JIS K 0102
7	Total Phosphorus (TP)	mg/L	2.04	2.04	2.04	0.005-0.05	Method JIS K 0102

សំគាល់៖ ការយកសំណាក ការរក្សារទុក និងការដឹកជញ្ជូនសំណាកមកមន្ទីពិសោធន៍ នាយកដ្ឋានគ្រប់គ្រងគុណភាពទឹកជាអ្នកអនុវត្ត ។

ចេញអោយនៅ ថ្ងៃទី ខែ ឆ្នាំ២០១៨ ចេញអោយនៅថ្ងៃទី ខែ ឆ្នាំ២០១៨

បានឃើញនៅថ្ងៃទី ខែ ឆ្នាំ២០១៨ **ប្រធានមន្ទីពិសោធន៍** **អ្នកវិភាគ**

អគ្គនាយក: Date of Issue: Analyzer
Was seen on date: Director
Director General

Is there any connection between hospital wastewater and river? Wastewater and stormwater generated from hospital are collected by hospital wastewater sewer and stormwater drainage that connected to public sewer system of city that convey to wastewater to treat at Chamkar Samroeung treatment plant. There is no connection of hospital wastewater discharge into river now. In 2019, a strong enforce concrete structure has been constructed to stabilize river bank at section near hospital.

Is septic tank suitable for treatment wastewater? Septic tank is used to capture rotten debris, collect sludge and sediment in wastewater to prevent blocking of sewage system from sludge and sediment. Good septic tank can be built in three chambers/blocks to collect and condense sludge and sedimentation. Septic tank is not suitable to use as wastewater treatment facility at laboratories. However, it is fine if wastewater generated is properly treated prior discharging to septic tank.

3. Discussion with Provincial Department of Public Work

Is there any connection between hospital wastewater and river? Wastewater and stormwater generated from hospital are discharged into to public sewage system. Public sewer transport wastewater to treat at Chamkar Samroeung treatment plant. There is no connection of hospital wastewater discharge into river now. In 2019, a strong enforce concrete structure has been constructed to stabilize river bank at section near hospital. In short future, with an ADB project, city will separate domestic wastewater sewer from stormwater drainage to improve effectiveness of treatment plan, especially in rainy season.

ANNEX 9: ESF/Safeguards Interim Note: Covid-19 Considerations in Construction/Civil Works Projects

ESF/SAFEGUARDS INTERIM NOTE: COVID-19 CONSIDERATIONS IN CONSTRUCTION/CIVIL WORKS PROJECTS

This note was issued on April 7, 2020 and includes links to the latest guidance as of this date (e.g. from WHO). Given the COVID-19 situation is rapidly evolving, when using this note it is important to check whether any updates to these external resources have been issued.

1. INTRODUCTION

The COVID-19 pandemic presents Governments with unprecedented challenges. Addressing COVID-19 related issues in both existing and new operations starts with recognizing that this is not business as usual and that circumstances require a highly adaptive responsive management design to avoid, minimize and manage what may be a rapidly evolving situation. In many cases, we will ask Borrowers to use reasonable efforts in the circumstances, recognizing that what may be possible today may be different next week (both positively, because more supplies and guidance may be available, and negatively, because the spread of the virus may have accelerated).

This interim note is intended to provide guidance to teams on how to support Borrowers in addressing key issues associated with COVID-19, and consolidates the advice that has already been provided over the past month. As such, it should be used in place of other guidance that has been provided to date. This note will be developed as the global situation and the Bank's learning (and that of others) develops. This is not a time when 'one size fits all'. More than ever, teams will need to work with Borrowers and projects to understand the activities being carried out and the risks that these activities may entail. Support will be needed in designing mitigation measures that are implementable in the context of the project. These measures will need to take into account capacity of the Government agencies, availability of supplies and the practical challenges of operations on-the-ground, including stakeholder engagement, supervision and monitoring. In many circumstances, communication itself may be challenging, where face-to-face meetings are restricted or prohibited, and where IT solutions are limited or unreliable.

This note emphasizes the importance of careful scenario planning, clear procedures and protocols, management systems, effective communication and coordination, and the need for high levels of responsiveness in a changing environment. It recommends assessing the current situation of the project, putting in place mitigation measures to avoid or minimize the chance of infection, and planning what to do if either project workers become infected or the work force includes workers from proximate communities affected by COVID-19. In many projects, measures to avoid or minimize will need to be implemented at the same time as dealing with sick workers and relations with the community, some of whom may also be ill or concerned about infection. Borrowers should understand the obligations that contractors have under their existing contracts (see Section 3), require contractors to put in place appropriate organizational structures (see Section 4) and develop procedures to address different aspects of COVID-19 (see Section 5).

2. CHALLENGES WITH CONSTRUCTION/CIVIL WORKS

Projects involving construction/civil works frequently involve a large work force, together with suppliers and supporting functions and services. The work force may comprise workers from international, national, regional, and local labor markets. They may need to live in on-site accommodation, lodge within communities close to work sites or return to their homes after work. There may be different contractors

permanently present on site, carrying out different activities, each with their own dedicated workers. Supply chains may involve international, regional and national suppliers facilitating the regular flow of goods and services to the project (including supplies essential to the project such as fuel, food, and water). As such there will also be regular flow of parties entering and exiting the site; support services, such as catering, cleaning services, equipment, material and supply deliveries, and specialist sub-contractors, brought in to deliver specific elements of the works.

Given the complexity and the concentrated number of workers, the potential for the spread of infectious disease in projects involving construction is extremely serious, as are the implications of such a spread. Projects may experience large numbers of the work force becoming ill, which will strain the project's health facilities, have implications for local emergency and health services and may jeopardize the progress of the construction work and the schedule of the project. Such impacts will be exacerbated where a work force is large and/or the project is in remote or under-serviced areas. In such circumstances, relationships with the community can be strained or difficult and conflict can arise, particularly if people feel they are being exposed to disease by the project or are having to compete for scarce resources. The project must also exercise appropriate precautions against introducing the infection to local communities.

3. DOES THE CONSTRUCTION CONTRACT COVER THIS SITUATION?

Given the unprecedented nature of the COVID-19 pandemic, it is unlikely that the existing construction/civil works contracts will cover all the things that a prudent contractor will need to do. Nevertheless, the first place for a Borrower to start is with the contract, determining what a contractor's existing obligations are, and how these relate to the current situation.

The obligations on health and safety will depend on what kind of contract exists (between the Borrower and the main contractor; between the main contractors and the sub-contractors). It will differ if the Borrower used the World Bank's standard procurement documents (SPDs) or used national bidding documents. If a FIDIC document has been used, there will be general provisions relating to health and safety. For example, the standard FIDIC, Conditions of Contract for Construction (Second Edition 2017), which contains no 'ESF enhancements', states (in the General Conditions, clause 6.7) that the Contractor will be required:

- to take all necessary precautions to maintain the health and safety of the Contractor's Personnel
- to appoint a health and safety officer at site, who will have the authority to issue directives for the purpose of maintaining the health and safety of all personnel authorized to enter and or work on the site and to take protective measures to prevent accidents
- to ensure, in collaboration with local health authorities, that medical staff, first aid facilities, sick bay, ambulance services and any other medical services specified are available at all times at the site and at any accommodation
- to ensure suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics

These requirements have been enhanced through the introduction of the ESF into the SPDs (edition dated July 2019). The general FIDIC clause referred to above has been strengthened to reflect the requirements of the ESF. Beyond FIDIC's general requirements discussed above, the Bank's Particular Conditions include a number of relevant requirements on the Contractor, including:

- to provide health and safety training for Contractor's Personnel (which include project workers and all personnel that the Contractor uses on site, including staff and other employees of the Contractor and Subcontractors and any other personnel assisting the Contractor in carrying out project activities)
- to put in place workplace processes for Contractor's Personnel to report work situations that are not safe or healthy
- gives Contractor's Personnel the right to report work situations which they believe are not safe or healthy, and to remove themselves from a work situation which they have a reasonable justification to believe presents an imminent and serious danger to their life or health (with no reprisal for reporting or removing themselves)
- requires measures to be in place to avoid or minimize the spread of diseases including measures to avoid or minimize the transmission of communicable diseases that may be associated with the influx of temporary or permanent contract-related labor
- to provide an easily accessible grievance mechanism to raise workplace concerns

Where the contract form used is FIDIC, the Borrower (as the Employer) will be represented by the Engineer (also referred to in this note as the Supervising Engineer). The Engineer will be authorized to exercise authority specified in or necessarily implied from the construction contract. In such cases, the Engineer (through its staff on site) will be the interface between the PIU and the Contractor. It is important therefore to understand the scope of the Engineer's responsibilities. It is also important to recognize that in the case of infectious diseases such as COVID-19, project management – through the Contractor/subcontractor hierarchy – is only as effective as the weakest link. A thorough review of management procedures/plans as they will be implemented through the entire contractor hierarchy is important. Existing contracts provide the outline of this structure; they form the basis for the Borrower to understand how proposed mitigation measures will be designed and how adaptive management will be implemented, and to start a conversation with the Contractor on measures to address COVID-19 in the project.

4. WHAT PLANNING SHOULD THE BORROWER BE DOING?

Task teams should work with Borrowers (PIUs) to confirm that projects (i) are taking adequate precautions to prevent or minimize an outbreak of COVID-19, and (ii) have identified what to do in the event of an outbreak. Suggestions on how to do this are set out below:

- The PIU, either directly or through the Supervising Engineer, should request details in writing from the main Contractor of the measures being taken to address the risks. As stated in Section 3, the construction contract should include health and safety requirements, and these can be used as the basis for identification of, and requirements to implement, COVID-19 specific measures. The measures may be presented as a contingency plan, as an extension of the existing project emergency and preparedness plan or as standalone procedures. The measures may be reflected in revisions to the project's health and safety manual. This request should be made in writing (following any relevant procedure set out in the contract between the Borrower and the contractor).

- In making the request, it may be helpful for the PIU to specify the areas that should be covered. This should include the items set out in Section 5 below and take into account current and relevant

guidance provided by national authorities, WHO and other organizations. See the list of references in the Annex to this note.

- The PIU should require the Contractor to convene regular meetings with the project health and safety specialists and medical staff (and where appropriate the local health authorities), and to take their advice in designing and implementing the agreed measures.

- Where possible, a senior person should be identified as a focal point to deal with COVID-19 issues. This can be a work supervisor or a health and safety specialist. This person can be responsible for coordinating preparation of the site and making sure that the measures taken are communicated to the workers, those entering the site and the local community. It is also advisable to designate at least one back-up person, in case the focal point becomes ill; that person should be aware of the arrangements that are in place.

- On sites where there are a number of contractors and therefore (in effect) different work forces, the request should emphasize the importance of coordination and communication between the different parties. Where necessary, the PIU should request the main contractor to put in place a protocol for regular meetings of the different contractors, requiring each to appoint a designated staff member (with back up) to attend such meetings. If meetings cannot be held in person, they should be conducted using whatever IT is available. The effectiveness of mitigation measures will depend on the weakest implementation, and therefore it is important that all contractors and sub-contractors understand the risks and the procedure to be followed.

- The PIU, either directly or through the Supervising Engineer, may provide support to projects in identifying appropriate mitigation measures, particularly where these will involve interface with local services, in particular health and emergency services. In many cases, the PIU can play a valuable role in connecting project representatives with local Government agencies, and helping coordinate a strategic response, which takes into account the availability of resources. To be most effective, projects should consult and coordinate with relevant Government agencies and other projects in the vicinity.

- Workers should be encouraged to use the existing project grievance mechanism to report concerns relating to COVID-19, preparations being made by the project to address COVID-19 related issues, how procedures are being implemented, and concerns about the health of their co-workers and other staff.

5. WHAT SHOULD THE CONTRACTOR COVER?

The Contractor should identify measures to address the COVID-19 situation. What will be possible will depend on the context of the project: the location, existing project resources, availability of supplies, capacity of local emergency/health services, the extent to which the virus already exist in the area. A systematic approach to planning, recognizing the challenges associated with rapidly changing circumstances, will help the project put in place the best measures possible to address the situation. As discussed above, measures to address COVID-19 may be presented in different ways (as a contingency plan, as an extension of the existing project emergency and preparedness plan or as standalone procedures). PIUs and contractors should refer to guidance issued by relevant authorities, both national

and international (e.g. WHO), which is regularly updated (see sample References and links provided in the Annex).

Addressing COVID-19 at a project site goes beyond occupational health and safety, and is a broader project issue which will require the involvement of different members of a project management team. In many cases, the most effective approach will be to establish procedures to address the issues, and then to ensure that these procedures are implemented systematically. Where appropriate given the project context, a designated team should be established to address COVID-19 issues, including PIU representatives, the Supervising Engineer, management (e.g. the project manager) of the contractor and sub-contractors, security, and medical and OHS professionals. Procedures should be clear and straightforward, improved as necessary, and supervised and monitored by the COVID-19 focal point(s). Procedures should be documented, distributed to all contractors, and discussed at regular meetings to facilitate adaptive management. The issues set out below include a number that represent expected good workplace management but are especially pertinent in preparing the project response to COVID-19.

(a) ASSESSING WORKFORCE CHARACTERISTICS

Many construction sites will have a mix of workers e.g. workers from the local communities; workers from a different part of the country; workers from another country. Workers will be employed under different terms and conditions and be accommodated in different ways. Assessing these different aspects of the workforce will help in identifying appropriate mitigation measures:

- The Contractor should prepare a detailed profile of the project work force, key work activities, schedule for carrying out such activities, different durations of contract and rotations (e.g. 4 weeks on, 4 weeks off).
- This should include a breakdown of workers who reside at home (i.e. workers from the community), workers who lodge within the local community and workers in on-site accommodation. Where possible, it should also identify workers that may be more at risk from COVID-19, those with underlying health issues or who may be otherwise at risk.
- Consideration should be given to ways in which to minimize movement in and out of site. This could include lengthening the term of existing contracts, to avoid workers returning home to affected areas, or returning to site from affected areas.
- Workers accommodated on site should be required to minimize contact with people near the site, and in certain cases be prohibited from leaving the site for the duration of their contract, so that contact with local communities is avoided.
- Consideration should be given to requiring workers lodging in the local community to move to site accommodation (subject to availability) where they would be subject to the same restrictions.
- Workers from local communities, who return home daily, weekly or monthly, will be more difficult to manage. They should be subject to health checks at entry to the site (as set out above) and at some point, circumstances may make it necessary to require them to either use accommodation on site or not to come to work.

(b) ENTRY/EXIT TO THE WORK SITE AND CHECKS ON COMMENCEMENT OF WORK

Entry/exit to the work site should be controlled and documented for both workers and other parties, including support staff and suppliers. Possible measures may include:

- Establishing a system for controlling entry/exit to the site, securing the boundaries of the site, and establishing designating entry/exit points (if they do not already exist). Entry/exit to the site should be documented.
- Training security staff on the (enhanced) system that has been put in place for securing the site and controlling entry and exit, the behaviors required of them in enforcing such system and any COVID - 19 specific considerations.
- Training staff who will be monitoring entry to the site, providing them with the resources they need to document entry of workers, conducting temperature checks and recording details of any worker that is denied entry.
- Confirming that workers are fit for work before they enter the site or start work. While procedures should already be in place for this, special attention should be paid to workers with underlying health issues or who may be otherwise at risk. Consideration should be given to demobilization of staff with underlying health issues.
- Checking and recording temperatures of workers and other people entering the site or requiring self-reporting prior to or on entering the site.
- Providing daily briefings to workers prior to commencing work, focusing on COVID-19 specific considerations including cough etiquette, hand hygiene and distancing measures, using demonstrations and participatory methods.
- During the daily briefings, reminding workers to self-monitor for possible symptoms (fever, cough) and to report to their supervisor or the COVID-19 focal point if they have symptoms or are feeling unwell.
- Preventing a worker from an affected area or who has been in contact with an infected person from returning to the site for 14 days or (if that is not possible) isolating such worker for 14 days.
- Preventing a sick worker from entering the site, referring them to local health facilities if necessary or requiring them to isolate at home for 14 days.

(c) GENERAL HYGIENE

Requirements on general hygiene should be communicated and monitored, to include:

- Training workers and staff on site on the signs and symptoms of COVID-19, how it is spread, how to protect themselves (including regular handwashing and social distancing) and what to do if they or other people have symptoms (for further information see WHO COVID-19 advice for the public).
- Placing posters and signs around the site, with images and text in local languages.
- Ensuring handwashing facilities supplied with soap, disposable paper towels and closed waste bins exist at key places throughout site, including at entrances/exits to work areas; where there is a toilet, canteen or food distribution, or provision of drinking water; in worker accommodation; at waste stations; at stores; and in common spaces. Where handwashing facilities do not exist or are not adequate, arrangements should be made to set them up. Alcohol based sanitizer (if available, 60-95% alcohol) can also be used.
- Review worker accommodations, and assess them in light of the requirements set out in IFC/EBRD guidance on Workers' Accommodation: processes and standards, which provides valuable guidance as to good practice for accommodation.
- Setting aside part of worker accommodation for precautionary self-quarantine as well as more formal isolation of staff who may be infected (see paragraph (f)).

- At some point, it may be necessary to review the overall project schedule, to assess the extent to which it needs to be adjusted (or work stopped completely) to reflect prudent work practices, potential exposure of both workers and the community and availability of supplies, taking into account Government advice and instructions.

(f) PROJECT MEDICAL SERVICES

Consider whether existing project medical services are adequate, taking into account existing infrastructure (size of clinic/medical post, number of beds, isolation facilities), medical staff, equipment and supplies, procedures and training. Where these are not adequate, consider upgrading services where possible, including:

- Expanding medical infrastructure and preparing areas where patients can be isolated. Guidance on setting up isolation facilities is set out in WHO interim guidance on considerations for quarantine of individuals in the context of containment for COVID-19). Isolation facilities should be located away from worker accommodation and ongoing work activities. Where possible, workers should be provided with a single well-ventilated room (open windows and door). Where this is not possible, isolation facilities should allow at least 1 meter between workers in the same room, separating workers with curtains, if possible. Sick workers should limit their movements, avoiding common areas and facilities and not be allowed visitors until they have been clear of symptoms for 14 days. If they need to use common areas and facilities (e.g. kitchens or canteens), they should only do so when unaffected workers are not present and the area/facilities should be cleaned prior to and after such use.
- Training medical staff, which should include current WHO advice on COVID-19 and recommendations on the specifics of COVID-19. Where COVID-19 infection is suspected, medical providers on site should follow WHO interim guidance on infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected.
- Training medical staff in testing, if testing is available.
- Assessing the current stock of equipment, supplies and medicines on site, and obtaining additional stock, where required and possible. This could include medical PPE, such as gowns, aprons, medical masks, gloves, and eye protection. Refer to WHO guidance as to what is advised (for further information see WHO interim guidance on rational use of personal protective equipment (PPE) for COVID-19).
- If PPE items are unavailable due to world-wide shortages, medical staff on the project should agree on alternatives and try to procure them. Alternatives that may commonly be found on constructions sites include dust masks, construction gloves and eye goggles. While these items are not recommended, they should be used as a last resort if no medical PPE is available.
- Ventilators will not normally be available on work sites, and in any event, intubation should only be conducted by experienced medical staff. If a worker is extremely ill and unable to breathe properly on his or her own, they should be referred immediately to the local hospital (see (g) below).
- Review existing methods for dealing with medical waste, including systems for storage and disposal (for further information see WHO interim guidance on water, sanitation and waste management for COVID-19, and WHO guidance on safe management of wastes from health-care activities).

(g) LOCAL MEDICAL AND OTHER SERVICES

Given the limited scope of project medical services, the project may need to refer sick workers to local medical services. Preparation for this includes:

- Obtaining information as to the resources and capacity of local medical services (e.g. number of beds, availability of trained staff and essential supplies).
- Conducting preliminary discussions with specific medical facilities, to agree what should be done in the event of ill workers needing to be referred.
- Considering ways in which the project may be able to support local medical services in preparing for members of the community becoming ill, recognizing that the elderly or those with pre-existing medical conditions require additional support to access appropriate treatment if they become ill.
- Clarifying the way in which an ill worker will be transported to the medical facility, and checking availability of such transportation.
- Establishing an agreed protocol for communications with local emergency/medical services.
- Agreeing with the local medical services/specific medical facilities the scope of services to be provided, the procedure for in-take of patients and (where relevant) any costs or payments that may be involved.
- A procedure should also be prepared so that project management knows what to do in the unfortunate event that a worker ill with COVID-19 dies. While normal project procedures will continue to apply, COVID-19 may raise other issues because of the infectious nature of the disease. The project should liaise with the relevant local authorities to coordinate what should be done, including any reporting or other requirements under national law.

(h) INSTANCES OR SPREAD OF THE VIRUS

WHO provides detailed advice on what should be done to treat a person who becomes sick or displays symptoms that could be associated with the COVID-19 virus (for further information see WHO interim guidance on infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected). The project should set out risk-based procedures to be followed, with differentiated approaches based on case severity (mild, moderate, severe, critical) and risk factors (such as age, hypertension, diabetes) (for further information see WHO interim guidance on operational considerations for case management of COVID-19 in health facility and community). These may include the following:

- If a worker has symptoms of COVID-19 (e.g. fever, dry cough, fatigue) the worker should be removed immediately from work activities and isolated on site.
- If testing is available on site, the worker should be tested on site. If a test is not available at site, the worker should be transported to the local health facilities to be tested (if testing is available).
- If the test is positive for COVID-19 or no testing is available, the worker should continue to be isolated. This will either be at the work site or at home. If at home, the worker should be transported to their home in transportation provided by the project.
- Extensive cleaning procedures with high-alcohol content disinfectant should be undertaken in the area where the worker was present, prior to any further work being undertaken in that area. Tools used by the worker should be cleaned using disinfectant and PPE disposed of.
- Co-workers (i.e. workers with whom the sick worker was in close contact) should be required to stop work, and be required to quarantine themselves for 14 days, even if they have no symptoms.

- Family and other close contacts of the worker should be required to quarantine themselves for 14 days, even if they have no symptoms.
- If a case of COVID-19 is confirmed in a worker on the site, visitors should be restricted from entering the site and worker groups should be isolated from each other as much as possible.
- If workers live at home and has a family member who has a confirmed or suspected case of COVID-19, the worker should quarantine themselves and not be allowed on the project site for 14 days, even if they have no symptoms.
- Workers should continue to be paid throughout periods of illness, isolation or quarantine, or if they are required to stop work, in accordance with national law.
- Medical care (whether on site or in a local hospital or clinic) required by a worker should be paid for by the employer.

(i) CONTINUITY OF SUPPLIES AND PROJECT ACTIVITIES

Where COVID-19 occurs, either in the project site or the community, access to the project site may be restricted, and movement of supplies may be affected.

- Identify back-up individuals, in case key people within the project management team (PIU, Supervising Engineer, Contractor, sub-contractors) become ill, and communicate who these are so that people are aware of the arrangements that have been put in place.
- Document procedures, so that people know what they are, and are not reliant on one person's knowledge.
- Understand the supply chain for necessary supplies of energy, water, food, medical supplies and cleaning equipment, consider how it could be impacted, and what alternatives are available. Early pro-active review of international, regional and national supply chains, especially for those supplies that are critical for the project, is important (e.g. fuel, food, medical, cleaning and other essential supplies). Planning for a 1-2 month interruption of critical goods may be appropriate for projects in more remote areas.
- Place orders for/procure critical supplies. If not available, consider alternatives (where feasible).
- Consider existing security arrangements, and whether these will be adequate in the event of interruption to normal project operations.
- Consider at what point it may become necessary for the project to significantly reduce activities or to stop work completely, and what should be done to prepare for this, and to re-start work when it becomes possible or feasible.

(j) TRAINING AND COMMUNICATION WITH WORKERS

Workers need to be provided with regular opportunities to understand their situation, and how they can best protect themselves, their families and the community. They should be made aware of the procedures that have been put in place by the project, and their own responsibilities in implementing them.

- It is important to be aware that in communities close to the site and amongst workers without access to project management, social media is likely to be a major source of information. This raises the importance of regular information and engagement with workers (e.g. through training, town halls, tool boxes) that emphasizes what management is doing to deal with the risks of COVID-19. Allaying fear is an important aspect of work force peace of mind and business continuity. Workers should be given an opportunity to ask questions, express their concerns, and make suggestions.

- Training of workers should be conducted regularly, as discussed in the sections above, providing workers with a clear understanding of how they are expected to behave and carry out their work duties.
- Training should address issues of discrimination or prejudice if a worker becomes ill and provide an understanding of the trajectory of the virus, where workers return to work.
- Training should cover all issues that would normally be required on the work site, including use of safety procedures, use of construction PPE, occupational health and safety issues, and code of conduct, taking into account that work practices may have been adjusted.
- Communications should be clear, based on fact and designed to be easily understood by workers, for example by displaying posters on handwashing and social distancing, and what to do if a worker displays symptoms.

(k) COMMUNICATION AND CONTACT WITH THE COMMUNITY

Relations with the community should be carefully managed, with a focus on measures that are being implemented to safeguard both workers and the community. The community may be concerned about the presence of non-local workers, or the risks posed to the community by local workers presence on the project site. The project should set out risk-based procedures to be followed , which may reflect WHO guidance (for further information see WHO Risk Communication and Community Engagement (RCCE) Action Plan Guidance COVID-19 Preparedness and Response). The following good practice should be considered:

- Communications should be clear, regular, based on fact and designed to be easily understood by community members.
- Communications should utilize available means. In most cases, face-to-face meetings with the community or community representatives will not be possible. Other forms of communication should be used; posters, pamphlets, radio, text message, electronic meetings. The means used should take into account the ability of different members of the community to access them, to make sure that communication reaches these groups.
- The community should be made aware of procedures put in place at site to address issues related to COVID-19. This should include all measures being implemented to limit or prohibit contact between workers and the community. These need to be communicated clearly, as some measures will have financial implications for the community (e.g. if workers are paying for lodging or using local facilities). The community should be made aware of the procedure for entry/exit to the site, the training being given to workers and the procedure that will be followed by the project if a worker becomes sick.
- If project representatives, contractors or workers are interacting with the community, they should practice social distancing and follow other COVID-19 guidance issued by relevant authorities, both national and international (e.g. WHO).

6. EMERGENCY POWERS AND LEGISLATION

Many Borrowers are enacting emergency legislation. The scope of such legislation, and the way it interacts with other legal requirements, will vary from country to country. Such legislation can cover a range of issues, for example:

- Declaring a public health emergency

- Authorizing the use of police or military in certain activities (e.g. enforcing curfews or restrictions on movement)
- Ordering certain categories of employees to work longer hours, not to take holiday or not to leave their job (e.g. health workers)
- Ordering non-essential workers to stay at home, for reduced pay or compulsory holiday

Except in exceptional circumstances (after referral to the World Bank's Operations Environmental and Social Review Committee (OESRC)), projects will need to follow emergency legislation to the extent that these are mandatory or advisable. It is important that the Borrower understands how mandatory requirements of the legislation will impact the project. Teams should require Borrowers (and in turn, Borrowers should request Contractors) to consider how the emergency legislation will impact the obligations of the Borrower set out in the legal agreement and the obligations set out in the construction contracts. Where the legislation requires a material departure from existing contractual obligations, this should be documented, setting out the relevant provisions.