

# Initial Environmental Examination

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Project Number: 55040-001  
September 2023

## Bangladesh: Dhaka Power System Expansion and Strengthening Project

### Appendices VII to XIII

Prepared by Ministry of Power, Energy and Mineral Resources for the Asian Development Bank.

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## **Appendix VII: Occupational Health and Safety Risk Assessment**



A hazard risk assessment is a critical examination of health and safety hazards at a construction site and operation and maintenance (O/M) work. Performing regular hazard risks assessments can help construction and O/M stakeholders comply with occupational health and safety (OHS) regulations. Hazard risks assessments can help OHS and technical teams implement corrective measures to protect workers from health and safety threats during construction and operation stages.

When referring to risk in relation to safety the common definition is “risk is the likelihood that a person may be harmed or suffers adverse health effects if exposed to a hazard.”

$$\text{Risk} = \text{Consequence} \times \text{Likelihood}$$

**Likelihood and Consequence**

Hazard Risks Assessment Codes (HRACs)<sup>1</sup> require assigning values for likelihood or probability of an outcome occurring and the consequence or severity of a potential outcome. Based on these assigned values, a matrix format is used to place the specific hazard within a specific location of the matrix. This location can then be used to determine an HRAC number for that hazard activity.

The Likelihood or probability Code is considered numerical (1 through 5). These are presented in **Table 1.1**.

**Table 1.1: Likelihood ratings**

Likelihood	Definition
Almost certain (5)	It will happen again and soon – recurring event (e.g. daily or weekly).
Likely (4)	It will reoccur, but not as an everyday event.
Moderate (3)	It may occur from time to time in the project.
Unlikely (2)	It is not expected to happen again in the foreseeable future.
Rare (1)	Unlikely that it is not expected to happen again in the project.

Next is the Consequence or severity Code, varies from 1 to 5 and is presented in **Table 1.2**.

**Table 1.2: Consequence ratings**

Consequence	Definition
Insignificant (1)	Injury or illness that resulted in first aid treatment or minimal effects that required no medical treatment, and the worker continued to work.
Minor (2)	Injury or ill health where the worker/person affected is absent or unfit to perform work (i.e. loss work time).
Moderate (3)	Injury or ill health related including bone fractures, a burn or penetrating injury to the eye, any injury or acute illness resulting in unconsciousness, requiring resuscitation or requiring admittance to hospital.
Major (4)	Single fatality or disability (e.g. amputations, loss of sight) resulted from work-related or community-related caused by the impact of the project
Catastrophic (5)	Multiple fatalities resulted from work-related or community-related caused by the impact of the project.

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<sup>1</sup> HRACs: The principle behind the Hazard Risks Assessment System and the assignment of Hazard Risks Assessment Codes (HRACs) is to identify and control workplace hazards

### Risks Assessment Matrix

The hazard risks level is presented in **Table 1.3**. This matrix helps OHS team to prioritize workplace hazards by identifying them as low, Moderate, High and Extreme.

**Table 1.3: Risk Level**

Risk Level	Definition	Legend
Low	Will involve the relevant supervisor to review the circumstances of the event and try to learn any lessons which will prevent future occurrences.	Low (1)
Moderate	Will involve an investigation by the relevant supervisor or line manager into the circumstances and determine the immediate, underlying and root causes of the adverse event, to try to prevent a recurrence and to learn any general lessons.	Moderate (2)
High	Will involve a more detailed investigation by site manager/supervisor/safety officer and look for the immediate causes, the underlying causes and the root causes by using available incident analysis methodologies	High (3)
Extreme	Will involve a team-based investigation, comprising site manager, supervisors, safety officer, worker representatives and external consultants/ specialists (if required). It will look at the immediate causes, the underlying causes and the root causes by using available incident analysis methodologies	Extreme (4)

Those hazards identified as extreme will require the most stringent controls available as well as immediate attention. They may even demand that such activities be cancelled from the Project. Specific workplace controls can be applied so that the associated hazards are more effectively controlled and therefore, result in a revised assessment category to a more acceptable level. Using the World Bank EHS Guidelines Risk Ranking Table (**Table 1.4**) provided below, the Site Manager/Supervisor/Safety Officer will assess the incident and risk rank to one of the four risk categories below:

**Table 1.4 Risk ranking table**

Consequences \ Likelihood	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Almost Certain (5)	Low	Moderate	Extreme	Extreme	Extreme
Likely (4)	Low	Moderate	High	Extreme	Extreme
Moderate (3)	Low	Moderate	High	Extreme	Extreme
Unlikely (2)	Low	Low	Moderate	High	Extreme
Rare (1)	Low	Low	Moderate	High	High

Source: "Incident Reporting and Investigation Guidelines" of South Asia Region published on 22<sup>nd</sup> June, 2022 by World Bank

### Summary of Assessed Hazard Risks

The project's potential risks and their significance have been assessed using the methodology described in Section 1.2.1 and 1.2.2. A summary of these risks and their significance along with the control measures are presented in Table 1.5.

Table 1.5: Summary of Risks, their Significance and Control Measures

Risk Assessment													
Index	Activity	Hazards	Reasons	Risk Ranking			Fatality Risk?	Protective Measures	Evaluation after choice of measures			Residual justification	Responsibility
				Likelihood	Consequence	Risk			Likelihood	Consequence	Risk		
<b>Mobilization and Site preparation</b>													
1.	Workforce mobilization/ Construction	<ul style="list-style-type: none"> <li>Bumping among workers due to Labor Influx</li> <li>Physical injuries</li> <li>SEA/SH and other GBV</li> </ul>	Lack of spaces among workers	3	2	Moderate	Not likely	<ul style="list-style-type: none"> <li>First Aid</li> <li>Worker Welfare Facilities</li> <li>Camp Management</li> <li>Plant Construction and Operation</li> <li>Prohibit religious or political discussion among the workers</li> <li>Provide trainings on labor code of conduct</li> </ul>	2	2	Low	Though enough precaution measures and training will be provided to the workers, still there might have some chaos among the workers	Site Supervisor
2.			Social confliction	3	3	High	No		2	2	Low		
3.			Different political and religious views	3	3	Extreme	Single / Multiple		2	3	Moderate		
4.			Lack of awareness	3	3	High	No		2	3	Moderate		
5.	Traffic movement	Knocked over or struck by or run over	Vehicle operations in the area and unauthorized entry	3	5	Extreme	Multiple	<ul style="list-style-type: none"> <li>Induction Process</li> <li>Personnel Competency and Training</li> <li>Check in Check out procedures</li> <li>Mobile Equipment</li> <li>Safe Driving.</li> <li>Traffic Interface Planning.</li> <li>Barricading and Signage.</li> <li>Equipment Inspection &amp; Maintenance.</li> </ul>	2	4	High	Largely administration controls. Likelihood reduced due to lower potential of multiple fatalities	Site Supervisor/ Security personnel
6.	Erection of electrical pole and other heavy structures	<ul style="list-style-type: none"> <li>Suppressed death</li> <li>Physical injuries</li> </ul>	<ul style="list-style-type: none"> <li>Machine failure</li> <li>Tear off the rope</li> <li>Falling object</li> </ul>	3	4	High	Single	<ul style="list-style-type: none"> <li>Working at Height</li> <li>Barricading and Signage</li> <li>Scaffold Erection</li> <li>Illumination</li> <li>Equipment Inspections and Maintenance</li> </ul>	2	2	Low	Due to the complexity of controls for working at heights Lapses still possible with the implementation of working at height controls. Could still result in fatality.	Site supervisor / OHS manager
7. Extreme	General	Pets in working area like dogs, goats	<ul style="list-style-type: none"> <li>Due to improper site fencing, lesser awareness in locals.</li> </ul>	3	2	Moderate	Not likely	<ul style="list-style-type: none"> <li>Barricading and Signage</li> <li>Safe Driving</li> </ul>	1	2	Low	No change to severity but lower likelihood.	Security / Site supervisor
8.		Entry of unauthorized personnel in working area	<ul style="list-style-type: none"> <li>Locals entering at site without authorization etc.</li> </ul>	3	3	High	Multiple	<ul style="list-style-type: none"> <li>Induction Process</li> <li>Personnel Competency and Training</li> <li>Check in Check out procedures</li> <li>Barricading and Signage</li> </ul>	2	3	Moderate	No change to severity but lower likelihood.	Security / Supervisor

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<b>Underground cable lying</b>													
9.	Trenching for underground cable	<ul style="list-style-type: none"> <li>Excavation close to electrical poles</li> <li>Trips, slips falling to the excavation</li> <li>Dust, Heat, noise and vibration</li> <li>Hit by a vehicle running along the road</li> </ul>	<ul style="list-style-type: none"> <li>Due to scattered cables</li> <li>Unprotected and uncovered excavated trench</li> <li>Muddy land at the work site</li> <li>Fugitive dust due to excavation work</li> <li>Traffic interference during work on/along the road</li> </ul>	4	3	High		<ul style="list-style-type: none"> <li>Personnel Competency and Training</li> <li>Plant Construction and Operation</li> <li>Barricading and Signage</li> <li>Equipment Inspection and Maintenance</li> <li>Traffic Interface Planning.</li> <li>Barricading and Signage.</li> <li>Trial pits made to establish services lines</li> <li>Safe access/egress to be provided(Ladder/Stair)</li> <li>PPE to be used (safety goggles, dust mask, ear plug)</li> <li>Sprinkling water regularly</li> </ul>	2	2	Low		
10.	Underground cable laying or Cable Installation	<ul style="list-style-type: none"> <li>Unauthorised work. electrocution, fire.</li> <li>Electric shock. Fire</li> <li>Electric shock from live circuit, shorting sparks, wrong connections, wrong item</li> <li>Electric shock. Property damage. Damage to test equipment</li> <li>Hit by a vehicle running along the road</li> </ul>	<ul style="list-style-type: none"> <li>Due to leakage in power line, machine and improper connections, scattered cables, inadequate maintenance (including cable wearing)</li> <li>Lack of proper training and skilled worker</li> <li>Indifferent attitude</li> <li>Traffic interference during work on/along the road</li> </ul>	3	4	Extreme		<ul style="list-style-type: none"> <li>Electrical Systems</li> <li>Equipment Inspection and Maintenance</li> <li>Traffic Interface Planning.</li> <li>Barricading and Signage.</li> <li>Use proper Personal Protective Equipment when using electric power tools e.g. face shields, rubber soled shoes</li> <li>Always switch off power and pull out the plug before changing parts on the tool or making some adjustments.</li> <li>Check with voltmeter that power is off. Switch off power on earth leakage.</li> <li>Encourage electric hazard spotting among employees such as cracked plug etc. and get them to report fault for remedial action.</li> </ul>	2	3	Moderate		
11.	Backfilling Using Hand tools	<ul style="list-style-type: none"> <li>Dust and extreme heat</li> </ul>	<ul style="list-style-type: none"> <li>Fugitive dust due to backfilling work</li> </ul>	4	3	High		<ul style="list-style-type: none"> <li>First Aid</li> <li>Worker Welfare Facilities</li> <li>Camp Management</li> </ul>	2	2	Low		



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		<ul style="list-style-type: none"> <li>Employees working too close to each other with hand tools</li> <li>Improper use of tools</li> <li>Hit by a vehicle running along the road</li> </ul>	<ul style="list-style-type: none"> <li>Struck by hand tool and other refilling tools</li> <li>Exposure of heat in a sunny day for a long time</li> <li>Traffic interference during work on/along the road</li> </ul>					<ul style="list-style-type: none"> <li>Plant Construction and Operation</li> <li>Traffic Interface Planning.</li> <li>Barricading and Signage.</li> <li>Personal Protective Equipment (PPE)</li> <li>Use the right tools for the right job</li> <li>Hand tools should check and provide proper sticker to ensure the safety of the workers</li> <li>Foreman to check if back fill procedure is being complied</li> </ul>					
<b>Biological Agent</b>													
12.	Site preparation / construction	Soil Fungus	<ul style="list-style-type: none"> <li>Breathing the fungus</li> <li>Lack of protective measures</li> </ul>	3	3	High	No	<ul style="list-style-type: none"> <li>First Aid</li> <li>Worker Welfare Facilities</li> <li>Camp Management</li> <li>Plant Construction and Operation</li> <li>Personal Protective Equipment (PPE)</li> </ul>	2	2	Low	Proper use of PPE can reduce the likelihood and consequences	OHS manager/ Site Supervisor
13.		Viruses including COVID-19 Corona virus	<ul style="list-style-type: none"> <li>Highly infectious</li> <li>Labour influx</li> <li>Lack of PPE</li> <li>Lack of emergency medical facilities</li> <li>Lack of spacious and Adequate accommodation</li> <li>Indifferent attitude about the severity of COVID-19</li> </ul>	4	4	Extreme	Single	<ul style="list-style-type: none"> <li>Worker Welfare Facilities</li> <li>Camp Management</li> <li>Personal Protective Equipment (PPE)</li> <li>Maintaining Social Distancing during gathering and intensive hand washing facilities.</li> <li>Thermal scanning during entrance in the project site</li> <li>Contractor will develop a grievance procedure in place</li> </ul>	2	4	High	Protective measures might reduce the likelihood but still the chance of fatalities or even death will be same	
14.		Bacteria and its group	Airborne, dirty environment, stagnant water, warm-water systems	3	2	Moderate	Not likely	<ul style="list-style-type: none"> <li>Worker Welfare Facilities</li> <li>Camp Management</li> <li>Personal Protective Equipment (PPE)</li> </ul>	2	2	Low	Proper use of PPE can reduce the risk	
15.		Attack by wild animals like snake, hornets etc.	<ul style="list-style-type: none"> <li>Lack of awareness</li> <li>Lack of safety measures</li> </ul>	2	4	High	Single	<ul style="list-style-type: none"> <li>Camp Management</li> <li>Personal Protective Equipment (PPE)</li> </ul>	1	3	Moderate	Protective measures and proper awareness will reduce this hazard mostly	
<b>Piling and Construction of substation and other civil works</b>													

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16.	Transport of material on access and public roads	Being struck or run over by moving machines, 3rd party accident from loose material	<ul style="list-style-type: none"> <li>Due to falling material from the dumpers during transportation when the dumpers are overloaded</li> <li>Driving at unsafe speed and not to conditions</li> <li>Fatigue</li> <li>Equipment failure</li> <li>Distraction</li> </ul>	4	5	Extreme	Single / Multiple	<ul style="list-style-type: none"> <li>Mobile Equipment.</li> <li>Barricading and Signage.</li> <li>Safe Driving.</li> <li>Material Haulage (Loading and Unloading).</li> <li>Traffic Interface Planning.</li> <li>Equipment Inspection &amp; Maintenance.</li> </ul>	2	4	Moderate	If an accident occurs, it may still result in multiple fatalities. None of these controls restricts a truck to only killing one person	OHS Manager, Foreman
17.		Unsecured loads	During transportation of mucking material filled to the point where it falls out of the truck	2	4	High	Multiple	<ul style="list-style-type: none"> <li>Mobile Equipment.</li> <li>Barricading and Signage.</li> <li>Safe Driving.</li> <li>Material Haulage.</li> <li>Traffic Interface Planning.</li> <li>Equipment Inspection &amp; Maintenance.</li> </ul>	1	4	Low	Assuming that the trucks are not overfilled, large material is unlikely to fall out of the truck.	Site supervisor, Foreman
18.		Machine failure	Due to poor maintenance and repair	3	4	Extreme	Multiple	<ul style="list-style-type: none"> <li>Safe Driving</li> <li>Equipment Inspection and Maintenance</li> </ul>	2	3	Moderate		Site engineer / OHS manager
19.		Lack of edge protection	<ul style="list-style-type: none"> <li>Land sliding</li> <li>Equipment failure</li> <li>Wet roads</li> <li>Fatigue</li> </ul>	3	3	High	Single / Multiple	<ul style="list-style-type: none"> <li>Mobile Equipment</li> <li>Barricading and Signage.</li> <li>Safe Driving.</li> <li>Traffic Interface Planning.</li> </ul>	2	2	Low	If an accident occurs, it may still result in the death of the driver. None of these controls will prevent a driver from driving off the edge but it will reduce the likelihood.	Site manager / Foreman
20.	Dewatering	Electric Shock/Electrocution	Due to leakage in power line, machine and improper connections, scattered cables, inadequate maintenance (including cable wearing)	3	4	12	Single (unlikely to be multiple)	<ul style="list-style-type: none"> <li>Electrical Systems</li> <li>Equipment Inspection &amp; Maintenance.</li> </ul>	2	4	8	Electric shock could still result in a fatality unless the voltage can be reduced.	Site engineer / OHS manager / Site supervisor

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Index	Activity	Hazards	Reasons	Risk Ranking			Fatality Risk?	Protective Measures	Evaluation after choice of measures			Residual justification	Responsibility
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21.		Slip, trip and fall	<ul style="list-style-type: none"> <li>• Due to scattered cables</li> <li>• Unprotected and uncovered excavated trench</li> <li>• Muddy land at the work site</li> <li>• Lack of proper drainage system</li> <li>• Tools and equipment left on the walkway</li> </ul>	5	2	Moderate	Unlikely	<ul style="list-style-type: none"> <li>• Cables must not be placed over walkways (for example use battery power tools, run the cables at a high level, tie loose cables together, or relocate them off the walking path). Where this is not possible, they must be fixed and appropriate protectors applied to reduce the risk of tripping or damage to the cable,</li> <li>• Establish drainage to move water away from walkways and avoid pooling.</li> <li>• Regular cleaning of the walkways from slush, mud.</li> <li>• Maintenance of water pipes, joint, no leakage.</li> <li>• Regular and routine cleanup of the work area removing trip hazards.</li> </ul>	3	2	Moderate	Unlikely to significantly reduce the likelihood. Slips, trips and falls are common in the construction industry	Site supervisor / OHS manager
22.	Scaffolding	<ul style="list-style-type: none"> <li>• Working at height</li> <li>• Open edges</li> <li>• Incomplete scaffolding or railings</li> <li>• Unguarded openings</li> <li>• Poorly stored or secured equipment</li> </ul>	<ul style="list-style-type: none"> <li>• During scaffold erection, dismantling and working on scaffold</li> <li>• Collapse of scaffold due to inadequate design, erection, overloading, adverse weather, vehicle collision, inadequate inspection</li> </ul>	3	4	Extreme	Single (multiple could occur but unlikely)	<ul style="list-style-type: none"> <li>• Working at Height</li> <li>• Barricading and Signage</li> <li>• Scaffold Erection</li> <li>• Illumination</li> <li>• Equipment Inspections and Maintenance</li> </ul>	2	2	Low	Due to the complexity of controls for working at heights Lapses still possible with the implementation of working at height controls. Could still result in fatality.	Site supervisor / OHS manager
23.		Falling material	Improper working platform, gaps in working platform, missing toe boards, missing safety nets or barricading of below working area, and throwing/dropping material during dismantling	3	4	Extreme	Single (multiple could occur but unlikely)	<ul style="list-style-type: none"> <li>• Working at Height</li> <li>• Barricading and Signage</li> <li>• Scaffold Erection</li> <li>• Illumination</li> <li>• Equipment Inspections and Maintenance</li> </ul>	2	2	Low	Due to the complexity of controls for working at heights Lapses still possible with the implementation of working at height controls. Could still result in fatality.	Site supervisor / OHS manager

Risk Assessment													
Index	Activity	Hazards	Reasons	Risk Ranking			Fatality Risk?	Protective Measures	Evaluation after choice of measures			Residual justification	Responsibility
				Likelihood	Consequence	Risk			Likelihood	Consequence	Risk		
24.	General working area	Slips, trips and falls,	Improper placement of material, poor housekeeping	5	2	Moderate	Unlikely	<ul style="list-style-type: none"> <li>Placement/stacking of all material away from the walkways, access ways.</li> <li>Housekeeping shall be done prior to commencement of work.</li> <li>Housekeeping of the site, cleaning of the working area.</li> <li>Design work areas to have minimal trip and slip hazards.</li> <li>Establish drainage to move water away from walkways and avoid pooling.</li> <li>Illuminate walkways.</li> <li>Maintain clear walkways (ensure the walkways are free of equipment, tools, construction debris and other materials).</li> <li>Barricading and Signage.</li> <li>Where work areas are unsafe due to uneven ground the work areas are to be graded.</li> <li>Use footwear that provides good slip resistance.</li> </ul>	3	2	Moderate	Unlikely to significantly reduce the likelihood. Slips, trips and falls are common in the construction industry	Site Supervisor / OHS manager
<b>Batching Plant Operations</b>													
1.	Aggregate batching system / Feeding	Pedestrian Loader interaction	<ul style="list-style-type: none"> <li>Hit by or struck by machine or bucket or material while feeding aggregate and sand with loader</li> <li>Distraction</li> <li>Fatigue</li> <li>Poor visibility</li> </ul>	3	4	Extreme	Single	<ul style="list-style-type: none"> <li>Barricading and Signage</li> <li>Mobile Equipment</li> <li>Safe Driving</li> <li>Material Haulage (Loading and Unloading)</li> <li>Traffic Interface Planning</li> <li>Illumination</li> <li>Plant Construction and Operation</li> </ul>	2	2	Low	Largely administration controls. Likelihood reduced due to lower potential of multiple fatalities	Site engineer
2.		Dust	<ul style="list-style-type: none"> <li>Dust due to Dry material and vehicle movements</li> <li>Inhaling the fine particles and other fugitive dust</li> </ul>	3	3	High	Single	<ul style="list-style-type: none"> <li>Hazardous Materials</li> <li>Plant Construction and Operation</li> </ul>	2	2	Low	Correct application of wetting and ventilation should lower the likelihood of this	OHS manager/ Site supervisor

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				Likelihood	Consequence	Risk			Likelihood	Consequence	Risk		
3.		Chemical hazards	Injury due to steel fibers and chemical contacts During feeding and physical contact	3	3	High	Unlikely	<ul style="list-style-type: none"> <li>Plant Construction and Operation</li> <li>Hazardous Materials</li> </ul>	2	2	Low	Potential still exists for terminal lung disease from inhaling silica or fibrous materials. In addition, the controls are focused on PPE.	Site engineer/OHS manager/supervisor
4.	Conveyor belts	Caught in between	working near conveyor belts with loose clothing and missing barricades	4	4	Extreme	Single	<ul style="list-style-type: none"> <li>Plant Construction and Operation</li> <li>Barricading and Signage</li> <li>Equipment Inspection and Maintenance</li> <li>Electrical Systems</li> </ul>	2	4	High	These controls reduce the likelihood but won't reduce the consequence	Site supervisor
5.	Mixer System	Struck by Caught in between	Caught in between or struck by while working /maintenance during operations	3	4	Extreme	Single	<ul style="list-style-type: none"> <li>Plant Construction and Operation</li> <li>Barricading and Signage</li> <li>Equipment Inspection and Maintenance</li> <li>Electrical Systems</li> </ul>	2	2	Low	These controls reduce the likelihood and the consequence	Site engineer
6.	Traffic movement	Knocked over or struck by or run over	Vehicle operations in the area and unauthorized entry	3	5	Extreme	Multiple	<ul style="list-style-type: none"> <li>Induction Process</li> <li>Personnel Competency and Training</li> <li>Check in Check out procedures</li> <li>Mobile Equipment</li> <li>Safe Driving.</li> <li>Traffic Interface Planning.</li> <li>Barricading and Signage.</li> <li>Equipment Inspection &amp; Maintenance.</li> </ul>	2	3	Moderate	Largely administration controls. Likelihood reduced due to lower potential of multiple fatalities	Site Supervisor/ Security personnel
7.		Unprotected edges	<ul style="list-style-type: none"> <li>Vehicles operations close to the unprotected edges</li> <li>Equipment failure</li> <li>Wet roads</li> <li>Speeding</li> <li>Falling material</li> <li>Inadequate visibility</li> <li>Blind spot</li> <li>Distraction</li> <li>Fatigue</li> </ul>	3	3	High	Multiple	<ul style="list-style-type: none"> <li>Mobile Equipment</li> <li>Barricading and Signage.</li> <li>Safe Driving.</li> <li>Traffic Interface Planning.</li> <li>Equipment Inspection &amp; Maintenance.</li> </ul>	2	2	Low	These controls reduce the likelihood and the consequence	OHS manager/ Site supervisor

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			<ul style="list-style-type: none"> <li>Equipment failure (e.g. brakes, steering)</li> </ul>										
8.	Maintenance operations	Caught in between Struck by Electrocuted	Maintenance work without any lock out and tag out process	2	4	High	Single (unlikely to be multiple)	<ul style="list-style-type: none"> <li>Electrical Systems</li> <li>Equipment Inspection &amp; Maintenance</li> </ul>	1	4	Low	Controls rely on behavior. Potential controls are not effectively put in place.	Site engineer
9.	Electrical Installations	Electric shock and electrocution	Due to current leakage if the RCCB/ELCB not/properly installed. Poor electrical installations and fittings	3	4	Extreme	Single (unlikely to be multiple)	<ul style="list-style-type: none"> <li>Electrical Systems</li> <li>Equipment Inspection &amp; Maintenance</li> </ul>	2	2	Low	Controls rely on behavior. Potential controls are not effectively put in place.	Site engineer / OHS manager
10.	General	Slip, trip and fall	<ul style="list-style-type: none"> <li>Improper placement of material</li> <li>Poor housekeeping</li> <li>Convenience</li> </ul>	5	2	Moderate	Unlikely	<ul style="list-style-type: none"> <li>Placement of all material away from the walkways, access ways, Housekeeping, cleaning of the site</li> <li>Design work areas to have minimal trip and slip hazards.</li> <li>Illuminate walkways.</li> <li>Housekeeping shall be done prior to commencement of work.</li> <li>Maintain clear walkways (ensure the walkways are free of equipment, tools, construction debris and other materials).</li> <li>Establish drainage to move water away from walkways and avoid pooling.</li> <li>Barricading and Signage.</li> <li>Where work areas are unsafe due to uneven ground the work areas are to be graded.</li> <li>Use footwear that provides good slip resistance.</li> </ul>	2	2	Low	Controls rely on behavior. Potential controls are not effectively put in place.	OHS manager/ Site supervisor

Risk Assessment														
Index	Activity	Hazards	Reasons	Risk Ranking			Fatality Risk?	Protective Measures	Evaluation after choice of measures			Residual justification	Responsibility	
				Likelihood	Consequence	Risk			Likelihood	Consequence	Risk			
11.		Work near water	Slips and trips Overbalance Bank collapse	2	3	Moderate	Single	<ul style="list-style-type: none"> <li>Working Near or Over Water</li> </ul>	1	4	Low	No change to severity but lower likelihood.	OHS manager/ Site supervisor	
Crushing Plant Operations														
1.	Hopper Feeding	Being knocked over Hit by or struck by Caught in between	<ul style="list-style-type: none"> <li>Feeding during excavator or loader, hit by or struck by machine or bucket or material.</li> <li>Distraction</li> <li>Fatigue</li> <li>Poor visibility</li> </ul>	2	4	High	Single	<ul style="list-style-type: none"> <li>Plant Construction and Operation</li> <li>Barricading and Signage</li> <li>Mobile Equipment</li> <li>Safe Driving</li> <li>Material Haulage (Loading and Unloading)</li> <li>Traffic Interface Planning</li> <li>Illumination</li> </ul>	1	4	Low	Largely administration controls. Likelihood reduced due to lower potential of multiple fatalities	Site Engineer And OHS Staff / Supervisor	
2.		Dust	Dry material		4	3	High	Not likely	<ul style="list-style-type: none"> <li>Ventilation</li> <li>Plant Construction and Operation</li> <li>Hazardous Materials</li> </ul>	2	2	Low	Correct application of wetting and ventilation should lower the likelihood of this	OHS Manager/Site supervisor
3.		Noise	Noise due to machine operations if not using ear plugs		3	3	High	No	<ul style="list-style-type: none"> <li>Equipment Inspection &amp; Maintenance.</li> <li>Plant Construction and Operation</li> </ul>	2	2	Low	Unlikely to drop the likelihood to "Possible" due to the typically poor implementation of noise controls	
4.	Jaw crushing and vibration feeder	Struck by Caught in between	Caught in between or struck by wheel rotation while working during operations	3	4	Extreme	Single	<ul style="list-style-type: none"> <li>Electrical Systems</li> <li>Plant Construction and Operation</li> <li>Barricading and Signage</li> <li>Equipment Inspection and Maintenance</li> </ul>	2	3	Moderate	These controls reduce the likelihood but won't reduce the consequence	Site Engineer And OHS Staff / Supervisor	
5.	Conveyor belts	Caught in between	Working near conveyor belts with loose clothing and missing barricades	2	4	High	Single	<ul style="list-style-type: none"> <li>Plant Construction and Operation</li> <li>Barricading and Signage</li> </ul>	1	4	Low	These controls reduce the likelihood but won't reduce the consequence	Site Engineer And OHS Staff / Supervisor	
6.	Vibration screens	Struck by	Rebounding stone or stone particles from screens	3	3	High	Unlikely	<ul style="list-style-type: none"> <li>Barricading and Signage</li> <li>Equipment Inspection and Maintenance</li> <li>Plant Construction and Operation</li> </ul>	1	3	Low	These controls reduce the likelihood but won't reduce the consequence		

Risk Assessment													
Index	Activity	Hazards	Reasons	Risk Ranking			Fatality Risk?	Protective Measures	Evaluation after choice of measures			Residual justification	Responsibility
				Likelihood	Consequence	Risk			Likelihood	Consequence	Risk		
7.		Dust	Dry material	2	3	Moderate	Single / Multiple	<ul style="list-style-type: none"> <li>Ventilation</li> <li>Plant Construction and Operation</li> <li>Hazardous Materials</li> </ul>	1	3	Low	Correct application of wetting and ventilation should lower the likelihood of this	OHS Manager/Site supervisor
8.		Noise	Noise due to machine operations if not using ear plugs	3	3	High	No	<ul style="list-style-type: none"> <li>Equipment Inspection &amp; Maintenance.</li> <li>Plant Construction and Operation</li> </ul>	2	2	Low	Unlikely to drop the likelihood to "Possible" due to the typically poor implementation of noise controls	
9.	Traffic movement	Knocked over or struck by	Vehicle operations in the area	3	5	Extreme	Multiple	<ul style="list-style-type: none"> <li>Excavation</li> <li>Barricading and Signage</li> <li>Mobile Equipment</li> <li>Safe Driving</li> <li>Material Haulage (Loading and Unloading)</li> <li>Traffic Interface Planning</li> <li>Illumination</li> <li>Plant Construction and Operation</li> </ul>	2	3	Moderate	Largely administration controls. Likelihood reduced due to lower potential of multiple fatalities	Site supervisor/ security personnel
10.		Unprotected road edges	Vehicle operations in the area	3	3	High	Multiple	<ul style="list-style-type: none"> <li>Barricading and Signage</li> <li>Mobile Equipment</li> <li>Safe Driving</li> <li>Material Haulage (Loading and Unloading)</li> <li>Traffic Interface Planning</li> <li>Illumination</li> </ul>	2	2	Low	Largely administration controls. Likelihood reduced due to lower potential of multiple fatalities	
11.	Maintenance operations	Caught in between Struck by	Maintenance work without any lock out and tag out process	2	4	High	Single	<ul style="list-style-type: none"> <li>Plant Construction and Operation</li> <li>Barricading and Signage</li> <li>Equipment Inspection and Maintenance</li> <li>Electrical Systems</li> </ul>	1	4	Low	These controls reduce the likelihood but won't reduce the consequence	OHS manager / Site supervisor
12.		Electrocuted	Poor electrical installations and Maintenance work without any lock out and tag out process	3	3	High	Single (unlikely to be multiple)	<ul style="list-style-type: none"> <li>Electrical Systems</li> <li>Equipment Inspection &amp; Maintenance</li> </ul>	2	2	Low	Controls rely on behavior. Potential controls are not effectively put in place.	



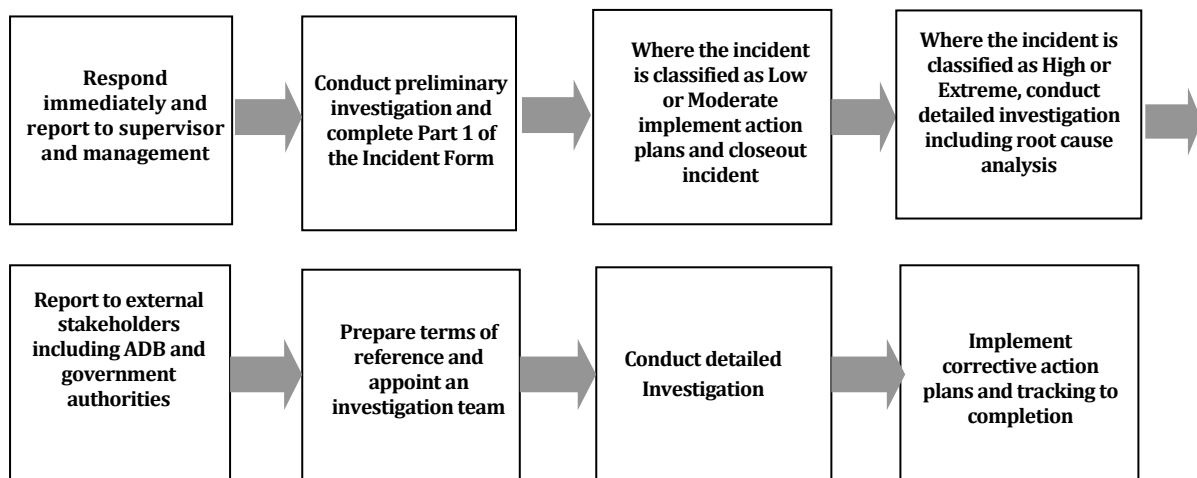
Risk Assessment													
Index	Activity	Hazards	Reasons	Risk Ranking			Fatality Risk?	Protective Measures	Evaluation after choice of measures			Residual justification	Responsibility
				Likelihood	Consequence	Risk			Likelihood	Consequence	Risk		
13.	Electrical Installations	Electric shock and electrocution	Due to current leakage if the RCCB/ELCB not/properly installed. Poor electrical installations and fittings	3	4	Extreme	Single	<ul style="list-style-type: none"> <li>Electrical Systems</li> <li>Equipment Inspection &amp; Maintenance</li> </ul>	2	2	Low	Controls rely on behavior. Potential controls are not effectively put in place.	Site Engineer
14.	General	Personal injury	Improper placement of material, poor housekeeping	5	2	Moderate	Unlikely	<ul style="list-style-type: none"> <li>Placement of all material away from the walkways, access ways, Housekeeping, cleaning of the site</li> <li>Design work areas to have minimal trip and slip hazards.</li> <li>Housekeeping shall be done prior to commencement of work.</li> <li>Water Management</li> <li>Barricading and Signage.</li> <li>Personal Protective Equipment.</li> </ul>	4	2	Moderate	Controls rely on behavior. Potential controls are not effectively put in place.	OHS manager
15.		Near water or low land area	Open edges Slips and trips Land sliding Distractions	3	3	Moderate	Single	<ul style="list-style-type: none"> <li>Working Near or Over Water</li> <li>Water Management</li> <li>Barricading and Signage.</li> <li>Personal Protective Equipment</li> </ul>	1	3	Low	No change to severity but lower likelihood.	OHS manager/ Site supervisor
16.		Pets in working area like dogs, goats	Due to improper site fencing, lesser awareness in locals	3	2	Moderate	Multiple	<ul style="list-style-type: none"> <li>Barricading and Signage</li> <li>Safe Driving</li> </ul>	1	2	Low		Security / Site supervisor
Natural Hazards													
17.	Work during extreme weather	Extreme Heat Exposure	Working under direct sunlight for a long time	4	3	High	Single	<ul style="list-style-type: none"> <li>Severe Weather</li> <li>Worker Welfare Facilities</li> <li>Emergency Response Plan</li> <li>First Aid</li> <li>Training on heat stroke should be conducted among the workers.</li> </ul>	2	3	Moderate	Control measures can reduce the likelihood but not reduce the consequences	OHS manager/ Site Supervisor
18.		Extreme Rain, Flood and Near or over water	<ul style="list-style-type: none"> <li>Natural</li> <li>Working under direct rain</li> <li>Working near water</li> </ul>	3	3	High	Single / Multiple	<ul style="list-style-type: none"> <li>Severe Weather</li> <li>Working Near or Over Water</li> <li>Emergency Response Plan</li> <li>First Aid</li> </ul>	2	3	Moderate	Although humans can do little or nothing to protect the incidence or intensity of most natural phenomena but the control measures can reduce the likelihood of the consequences	

Risk Assessment													
Index	Activity	Hazards	Reasons	Risk Ranking			Fatality Risk?	Protective Measures	Evaluation after choice of measures			Residual justification	Responsibility
				Likelihood	Consequence	Risk			Likelihood	Consequence	Risk		
19.		Storm and thunderstorm	Natural	3	5	Extreme	Single / Multiple	<ul style="list-style-type: none"> <li>• Emergency Response Plan</li> <li>• Severe Weather</li> <li>• First Aid</li> </ul>	2	4	Moderate	Control measures can reduce the likelihood but not reduce the consequences	
Ergonomic Issues													
20.	Construction activities	Physical disorder	<ul style="list-style-type: none"> <li>• Sedentary work</li> <li>• Heaving lifting</li> <li>• Push or pull</li> <li>• Awkward or prolonged postures</li> <li>• Repetitive activities</li> <li>• Overhead work</li> </ul>	4	4	Extreme	Not Likely	<ul style="list-style-type: none"> <li>• Training needs to be provided to use the right tool in a right way</li> <li>• Lifting capable weight in a right direction</li> <li>• Take break if there is any repeated works like hammering.</li> <li>• Switch the hand periodically</li> </ul>	2	2	Low	Likelihood and consequences would be reduce by proper implementation of measures and training	OHS Staff/ Supervisor

## Incident Reporting and Investigation Process

This section has prepared based on the report named “**Incident Reporting and Investigation Guidelines**” of South Asia Region published on 22<sup>nd</sup> June, 2022 by World Bank.

All incidents and illnesses must be reported to site supervisor after which investigation shall commence and recorded so that appropriate corrective actions shall be implemented to prevent any re-occurrence and report findings shall be forwarded to management for review. Reporting requirements shall include notification of incident, investigation report, and monthly report. Notification of Incident form shall be developed which shall be filled and submitted to OHS officer or site supervisor for investigation. The PIU is ultimately responsible for all incidents that occur in the project and is required to ensure that all contractors and sub-contractors will comply with the incident reporting and investigation process (Fig: 1.2) guideline by the World Bank.



**Figure 1.1: Simplified Incident Reporting & Investigation Process**

### ***Incident Reporting***

- All incidents must be reported:
- All incidents must be immediately notified to the supervisor.
- The supervisor should notify their area manager or site manager.
- All incidents should be reported using the Project Incident Form.
- Incident Notification section to be completed by the Supervisor/ Safety Officer by the end of the shift when the incident occurred in.
- Incident Notification to be sent to the Resident Engineer/ Project Director within 24 hours after the incident.

### ***External Notification of Incident***

Notifiable incidents should be communicated to the ADB, relevant local government/ regulatory department and other stakeholders when required by the project senior management such as the Resident Engineer or Project Director as soon as is reasonably practicable to do so. The project should review incident reporting per country legal requirements as there may be a time requirement for reporting serious injury (fatality), major structural failure/ collapse (building, tower, crane, hoist, construction support system or excavation), or major release of a hazardous substance to the environment.

### ***Investigation process***

The following process should be considered as a guide for conducting investigations:

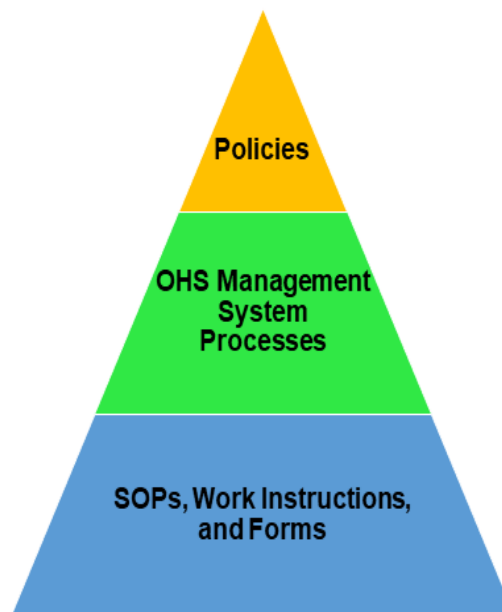
- Inspect the location;
- Gather and record physical evidence including detailed description of the incident;
- Interview witnesses;
- Identify any health and safety breaches that may have contributed to the incident;
- Review relevant documents such as procedures and records;
- Attempt to resolve any conflicts in the evidence;
- Identify missing information;
- Perform data and root cause analysis;
- Identify remedial actions; and
- Prepare an Investigation Report.

### ***Investigation Report Preparation***

Concentrate on the facts and find out “who, what, where, when, why and how”. After obtaining necessary information, the incident investigation report should be completed (Final Incident Report) a copy of which shall be sent to client representative Project Manager or resident engineer. Client or borrower will be responsible to send the copy of the investigation report to ADB in the prescribed format provided by World Bank. All the reporting format can be found in Source: “Incident Reporting and Investigation Guidelines” of South Asia Region published on 22<sup>nd</sup> June, 2022 by World Bank.

### **OHS Plan Documents Structure**

Figure 1.2 Presents the document hierarchy of the OHS Plan.



**Figure 1.2: Document hierarchy of the OHS Plan**

## ***Policies***

Contractor's operating policies are the highest-level document. They provide with direction when the Contractor operates in different geographies of the world. These are based on the Contractor's senior management commitments and they guide in day-to-day operations.

### ***Human Rights Policy***

Contractor's human rights policy should have focus on the responsibility to respect human rights and play a positive role among the workers and staffs who will be directly and indirectly involved in this project interventions and also in the communities where the project will be implemented. To this end, Contractor should commit to respecting human rights as set out in the United Nations Universal Declaration of Human Rights and the International Labour Organization (ILO) Declaration on Fundamental Principles and Rights at Work, as well as adhere to the United Nations Guiding Principles on Business and Human Rights, the Voluntary Principles on Security and Human Rights, ADB Safeguard Policy Statement (SPS) and the World Bank Environmental and Social Standards (ESS2): Labor and Working Conditions.

The Contractor must continually assess the human rights context of their activities, including impacts that they may cause and those to which they may contribute or be directly linked. This determines the prevention, mitigation and control measures required, including using leverage from their business relationships.

The Contractor should recognize, respect and abide by all project workers, community worker, and employment laws and expect their subcontractors and other third-party companies to meet the same standards. No child or forced labor is allowed under the project/program – by the contractors or subcontractors or primary suppliers. These include prohibitions on child labor, forced labor and discriminatory behavior.

The Contractor should value and respect the traditions and the culture of the many different communities in the project area where they do business.

The Contractor should believe their business activities contribute to the economic well-being and quality of life. The Contractor should recognize the effect that their activities may have on local communities, and they value and strive to engage in a meaningful way with the communities where they do business to help ensure that they positively contribute to the welfare of the local communities.

The Contractor should endeavor to conduct business with communities who share their values and business principles.

### ***Contractor's Health and Safety Policy***

**Safety and Environmental Sustainability is not a choice, it's a lifestyle.** The Contractor should support a safe work environment and ensuring the safety of all employees and the clients. They should recognize Safety as a Core Value of their business. The Contractor will be responsible for the compliance of OHS/CHS including the compliance for their respective sub-contractors.

**Everyone has a role to play.** The Contractor's Occupational Health and Safety Plan should be built on best practices and industry leading safety management systems. To be successful, such a plan must start with proper attitudes toward injury and illness prevention on the part of all employees. It also requires cooperation on all Health and Safety matters, not only between management and employees, but also between each employee and his or her co-workers.

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**Recognize the responsibilities of Health, Safety and Environment**

- The Contractor accepts responsibility in leading the Health and Safety program and for its effectiveness and improvement.
- Supervisors, Officers, and Managers should be responsible for developing the positive attitudes towards Health and Safety in themselves and those they supervise. And for ensuring that all activities are performed with the utmost regard for the Safety and Health of those involved.
- Employees are responsible for wholehearted, genuine cooperation with all aspects of the health and safety program.
- Provide education to participating personnel, thus enabling them to understand and share in the responsibility for monitoring and protecting the environment.
- Maintain an effective reporting and communication system, and develop a project action plan commensurate with company standards and regulatory/client requirements.
- The Contractor should make responsible decisions and should believe in environmental sustainability by applying the core values and upholding the code of conduct. They should protect their employees, the public and the environment.

***Alcohol and Drug Policy***

The use of alcohol and illegal drugs shall be strictly forbidden on all project sites. All project workers on the project shall comply with the following:

- No project worker shall distribute, possess, consume, or use alcohol or illegal drugs on the work site or in any vehicle or any other equipment.
- No project worker shall report to work or be at work under the influence of any drug, or substance that may cause impairment and/or will affect their ability to work safely.
- No project worker shall misuse prescribed or non-prescribed drugs while at work. If a project worker is taking a prescribed or non-prescribed drug for which there is a potential unsafe side effect, he has an obligation to report such potential to the supervisor.
- Management reserves the right to conduct searches of premises and worksites where there are reasonable grounds to conclude there is or has been use or possession of substances prohibited under this Policy.
- Any person taking medication that can affect or restrict their ability to do their job safely must advise and must discuss with his/her direct supervisor.
- Smoking at work places should be banned except in designated smoking areas which are equipped with the smoking signs and trash cans, and possession of lighters and matches should be prohibited before entering at work areas
- Management at their discretion may conduct 'Reasonable Cause Suspicion Testing' if there are evident reasons to believe that the person in question is impaired.
- Management may also conduct Post Incident Alcohol & Drug testing to rule out if this may be a contributory factor in the incident.

***Business Conduct and Ethics Code***

The Contractor's Business Conduct and Ethics Code should be built on the core values and highlights the principles that guide their business conduct. Use it for guidance about their ethical standards and where to take worker's questions or concerns

## **Ethical decision making**

Ethical decision making is essential to the success of the Contractor. Some decisions are obvious and easy to make; others are not. By asking questions below can help to make the right ethical decisions.

Four yes answers are required to qualify an action as ethical.

1. Is it legal?
2. Is it consistent with company policies? If the proposed action does not comply with company policy, you should not do it.
3. Is it in the best interests of my co-workers, the company, and the community?
4. If it were made public, would I be comfortable?

If the answer to any of these questions is "No": STOP. If you're not sure: speak to the Project Manager.

## ***OHS Management System Processes***

OHS Management System Process forms a framework of the Contractor OHS management plan (OHS Plan) and these are Contractor's second-tier documents after policies. The Contractor should develop the following OHS Management System Processes based on the project design, site requirements, review the layout plan, Nature of construction activities etc.:

<i>Induction Process</i>	<i>Critical Risk Protocols</i>
<i>Job Hazard Analysis</i>	<i>Personal Protective Equipment (PPE)</i>
<i>Meetings</i>	<i>Incident Investigation</i>
<i>Personnel Competency and Training</i>	<i>Measurement - Leading and Lagging Indicators</i>
<i>Short Service Worker Program (with tools for assessment)</i>	<i>OHS Compliance Audit</i>
<i>Reward and Recognition</i>	<i>Inspections</i>
<i>Disciplinary Process</i>	<i>Personal Risk Assessment</i>
<i>Permit to Work Process</i>	<i>Risk Management</i>
<i>Work Observation Process</i>	<i>Document Control</i>

## ***Standard Operating Procedures (SOP), Work Instructions and Forms***

Standard Operating Procedures and Work Instructions are mostly technical in nature and are third-tier documents in overall risk management approach. Forms and checklists provide support for implementing the controls mentioned in these SOPs. The following SOPs should be developed by the project contractors based on project specific risk assessment matrix and be part of the OHS Plan:

Work at Height	Traffic Interface Planning
Excavation	Severe Weather
Mobile Equipment	Lifting and Hoisting
Barricading and signs	Scaffold Erection
Cell Phone Use	Working Near or Over Water
Safe Driving	Illumination Ground Support
Material Haulage (Loading and Unloading)	Water Management

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Ventilation	Project Worker Welfare Facilities
Fire	Camp Management
Electrical Systems	Emergency Response Plan
Hazardous Material Management	Visitor orientation and escorting on site
Equipment Inspection & Maintenance	Contractor Security Management
First Aid	

The specific direction of the Contractor is shown through the health and safety policy and the responses to Contractual/applicable laws, regulations, guidelines, and standards as above. These considerations together assist Contractor's continuing contention to provide/develop/apply and review OHS provision and its consistent application at site.

### **Roles and Responsibilities**

These roles and responsibilities give a holistic understanding pertaining for the implementation of the OHS Plan which comprises multiple processes and SOPs. However, each process and SOP may also have additional specific requirements pertaining to a specific role.

#### ***Contractor Project Manager***

- Overall accountability for the development, implementation, and maintenance of the OHS Plan.
- Accountable for allocation of sufficient resources for the execution of the plan.
- Ensure that empowered and competent personnel are available for the execution of this plan
- Make sure that Sr. Leadership (all directors, Construction Managers and other line management personnel) are fully aware of their responsibilities as per the Processes and SOPs of the OHS Plan.
- Demonstrate visible leadership, walk to talk behavior to reinforce the implementation of the OHS Plan
- Attend monthly OHS Committee/Progress Review Meeting and monitor the performance through leading and lagging indicators.
- Discourage achievement of operational results at the cost of safety violations
- Develop a conducive culture where Personnel are authorized to \*STOP unsafe work without fear of retribution
- Develop a culture where it is safe to speak up and provide the time, people and resources to respond to OHS concerns identified by their workers.
- Ensure that Work Observation program is utilized, and all incidents are fully investigated
- Review Executive Summary of incidents, ensure that Root Causes are being identified and resources are provided for the closure of Preventive and Corrective Actions
- Encourage reward and recognition where personnel demonstrate safe behavior or identify hazards and fairly apply disciplinary process when personnel cut short.

*\*ILO COP 2.2.12. Where there is an imminent danger to the safety of workers, the employer should take immediate steps to stop the operation.*



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**Contractor OHS Experts**

- Be a Subject Matter Expert of the OHS Plan. Provide training and awareness regarding the implementation of the OHS Plan that includes multiple Processes and SOPs
- To be familiar with all local, national, and international laws that are applicable to Operations.
- Convene and raise concern in the monthly OHS Committee/Progress Review meeting regarding implementation of controls stipulated in the OHS Plan.
- Provide training to staffs on the OHS Plan. Conduct regular sessions for all project team members to inculcate the requirements of the OHS Plan.
- To report to the Contractor's Management Team on implementation progress, monthly KPIs.
- To ensure that sufficient training and induction of all personnel is being provided and maintained.
- To ensure that visit induction is given to all visitors before they are allowed to visit the site.
- To develop the OHS awareness of all personnel employed on the project and ensures their participation in all aspects of the health and OHS program
- Provide guidance for the purchase of personal protective equipment
- Regular inspection of construction safety and security as per PR09: Work Observation Process
- Provide guidance to employees regarding their emergency response responsibilities.
- Decide whether a potential rescue service or team is adequately trained and equipped to perform permit space rescues of the kind needed at the facility and whether such rescuers can respond in a timely manner, and organize drills
- Establish and maintain a professional relationship with subcontractor representatives.
- Establish an audit system that measures the effectiveness of the OHS Plan
- Review of OHS management plan annually.

**Contractor Supervisors**

- They allocate tasks and check that the project workers are implementing OHS requirements to standard. They provide feedback and guidance on OHS implementation.
- Ensure that the controls stipulated in PTW (Permit to Work) are implemented and STOP the work when critical controls are missing or compromised
- Discuss Job Hazard Analysis (JHA) and conduct effective Tool Box Talk with all project workers. Ask questions to ensure that they have a good understanding.
- Ensure that all new employees receive training as per PR01: Induction Process and PR05: Short Service Worker Process
- Conduct worksite observations, discuss safety concerns with project workers
- Develop a culture where it is safe to speak up and provide the time, people and resources to respond to OHS concerns identified by their workers. They are also responsible for escalating issues that can't be resolved by the project workers or at the supervision level to OHS Team or senior management.
- Responsible for making an incident scene safe and secure and for ensuring that hazards, near misses and incidents are entered into the reporting system.
- Ensure all project workers use appropriate PPEs and train them how to use PPEs.

### **Workers**

- Conduct Personal Risk Assessment Take 5 (Stop, Look, Assess, Control, and Monitor) and do not proceed to work if unsafe to do.
- Use authority to STOP work if observe an unsafe work by fellow worker.
- Report hazards and at-risk behavior as and help the Contractor management to develop a conducive safety culture.
- Use PPE as provided.
- Conduct a visual inspection of equipment in the beginning of the operation and ensure that equipment is de-energized before working on a piece of equipment.
- Ensuring that they wear appropriate PPE for the activity that they undertake.
- Be aware and mindful of hazards related to any work activity; do not undertake a job or task if physically or mentally not fit.
- Seek clarification for uncertainty relating to a task with the Supervisor.
- Do not undertake a job if not competent to do so.
- Raise improvement opportunities.
- Report near misses and actual incidents immediately to the supervisor

## **Appendix VIII: Community Health and Safety Risk Assessment**



## Likelihood and Consequence

Hazards and Risk Assessment Codes (HRACs) require assigning values for likelihood or probability of an outcome occurring and the consequence or severity of a potential outcome. Based on these assigned values, a matrix is used to place the specific hazard within a specific location of the matrix. This location can then be used to determine an HRAC number for that hazard activity.

The Likelihood or probability Code is considered numerical (1 through 5). These are presented in Table 1.1.

**Table 1.1: Likelihood ratings**

Likelihood	Definition
Almost certain (5)	It will happen again and soon – recurring event (e.g., daily or weekly).
Likely (4)	It will reoccur, but not as an everyday event.
Moderate (3)	It may occur from time to time in the project.
Unlikely (2)	It is not expected to happen again in the foreseeable future.
Rare (1)	Unlikely that it is not expected to happen again in the project.

Next is the Consequence or severity Code, varies from 1 to 5 and is presented in Table 1.2.

**Table 1.2: Consequence ratings**

Consequence	Definition
Insignificant (1)	Injury or illness that resulted in first aid treatment or minimal effects that required no medical treatment, and the worker continued to work.
Minor (2)	Injury or ill health where the worker/person affected is absent or unfit to perform work (i.e. loss work time).
Moderate (3)	Injury or ill health related including bone fractures, a burn or penetrating injury to the eye, any injury or acute illness resulting in unconsciousness, requiring resuscitation or requiring admittance to hospital.
Major (4)	Single fatality or disability (e.g. amputations, loss of sight) resulted from work-related or community-related caused by the impact of the project
Catastrophic (5)	Multiple fatalities resulted from work-related or community-related caused by the impact of the project.

## Risk Level

The hazard risks level is presented in Table 1.3. This matrix helps OHS team to prioritize workplace hazards by identifying them as low, Moderate, High and Extreme.

**Table 1.3: Risk Level**

Risk Level	Definition	Legend
Low	Will involve the relevant supervisor to review the circumstances of the event and try to learn any lessons which will prevent future occurrences.	Low
Moderate	Will involve an investigation by the relevant supervisor or line manager into the circumstances and determine the immediate, underlying and root causes of the adverse event, to try to prevent a recurrence and to learn any general lessons.	Moderate
High	Will involve a more detailed investigation by site manager/supervisor/safety officer and look for the immediate causes, the underlying causes and the root causes by using available incident analysis methodologies	High

Risk Level	Definition	Legend
Extreme	Will involve a team-based investigation, comprising site manager, supervisors, safety officer, worker representatives and external consultants/ specialists (if required). It will look at the immediate causes, the underlying causes and the root causes by using available incident analysis methodologies	Extreme

### Risk Ranking

Those hazards identified as extreme will require the most stringent controls available as well as immediate attention. They may even demand that such activities be cancelled from the Project. Specific workplace controls can be applied so that the associated hazards are more effectively controlled and therefore, result in a revised assessment category to a more acceptable level. Using the World Bank EHS Guidelines Risk Ranking Table (Table 1.4) provided below, this has been used to assess the incident and risk rank to one of the four risk categories below:

**Table 1.4: Risk Ranking Table**

Consequence Likelihood	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Almost Certain (5)	Low	Moderate	Extreme	Extreme	Extreme
Likely (4)	Low	Moderate	High	Extreme	Extreme
Moderate (3)	Low	Moderate	High	Extreme	Extreme
Unlikely (2)	Low	Low	Moderate	High	Extreme
Rare (1)	Low	Low	Moderate	High	High

Source: "Incident Reporting and Investigation Guidelines" of South Asia Region published on 22<sup>nd</sup> June, 2022 by World Bank

**Table 1.5: Summary of the Community Health and Safety Impacts and Risk**

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
Faulty Route Design of underground cable laying	Faulty design of underground cable installation through the highly populated area may lead unexpected chaos among the community.	3	3	High	<ul style="list-style-type: none"> <li>• Extensive and judgmental survey<sup>1</sup> should be conducted before implementation.</li> <li>• Ensure the design comply with national and international standards.</li> <li>• Verify the design with a checking engineer.</li> <li>• Identify critical and risky activities and develop emergency response plans (ERP)</li> </ul>	2	1	Low	Contractor
Working in the cave of the trench	Land sliding while excavating the trench may cause physical injuries and even death.	2	4	High	<ul style="list-style-type: none"> <li>• Excavating work should be scheduled during non-rainy season to avoid land slide and try to complete the work within the short time frame.</li> <li>• Fence the excavating area</li> </ul>	1	2	Low	Contractor

<sup>1</sup> Surveyor's own existing knowledge or his professional judgment.

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
					<ul style="list-style-type: none"> <li>Avoid keeping heavy equipment at the edge of excavated area.</li> <li>Proper protective equipment should be used</li> </ul>				
Uncovered excavated trench	Uncovered trench may cause falling the community people during the off-work time	4	2	Moderate	<ul style="list-style-type: none"> <li>Unfinished work must be demarcated and properly fenced.</li> <li>Develop a communication protocol to inform the community of any possible consequences during the excavation of the trench.</li> </ul>	2	2	Low	Contractor
Disruption of power supply	Implementation of power extension work may have restrained the power supply to the community.	4	4	Extreme	<ul style="list-style-type: none"> <li>Community people should be notified before the work commenced</li> <li>Authority should announce among the respective community on the previous day about the power disruption if require.</li> </ul>	4	2	Moderate	Contractor
Bribery	Contractor or project personnel may tempt the community people to provide power connection in exchange of money	3	3	High	<ul style="list-style-type: none"> <li>DESCO should make aware the Community people about this hazard</li> <li>Public consultation meeting can be arranged to disseminate the right information about the power connection</li> </ul>	2	1	Low	Contractor



Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
					<ul style="list-style-type: none"> <li>Train and aware the project related staff about the punishment of bribery</li> </ul>				
Vulnerable health services	Breaches of medical ethics, including the potential for direct and indirect discrimination of, and violence against, affected persons, specific communities and subpopulations	3	2	Moderate	Collaborate with local governments and communities to develop or share in third party health data collection and reporting. Contractor will set clear expectations and protocols for the management of medical data to prevent access to, and disclosure of medical data to, non-medical personnel.	2	1	Low	Contractor
	Lack of continued services, especially to the most vulnerable communities	2	2	Low	The health services program will use environmental, social, economic and health data to continually track and evaluate the changing vulnerability of communities within the area of influence so that action can be focused on the most vulnerable communities at any given time.	2	1	Low	Contractor
	Stress on the public healthcare services	4	2	Moderate	The Contractor will engage sufficient number of registered medical doctor and establish health center for its workforces and work with local government to identify any necessary follow-up actions if health status is negatively affected	2	1	Low	Contractor

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
					by the Project in areas of influence. Possible actions may include supporting provision of affordable health services, including mobile health outreach clinics within the areas of influence.				
Spread of Communicable Disease (Tuberculosis (TB), COVID-19)	Increased workforce (Local and migrated) and crowded accommodation camp may spread these diseases to the community	4	4	Extreme	<ul style="list-style-type: none"> <li>Medical screening and proof of vaccination are needed prior to the employment</li> <li>The Contractor conduct induction training or workshop for all workforce and introduce the basics of these diseases, how they transmit and the preventive measures against them.</li> <li>Contractor can organize vaccination program in the camp for the non-vaccinated workforce</li> <li>Any positive cases should be dealt diligently and treated in designated hospital. After emergency care treatment should be continued at worker's home with the family to maintain isolation, the Contractor will bear the cost of treatment.</li> </ul>	2	2	Low	Contractor
	COVID-19 and other similar infections can spread by the	4	4	Extreme	Follow all precautions listed above. Working site and labor camp should	3	2	Moderate	Contractor

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
	project workers to the community				strictly maintain COVID-19 protocol, if the cases are widespread. Follow all COVID-19 protocol (washing hands, wear mask, maintain 6 feet distance etc.)				
Vector- borne diseases <ul style="list-style-type: none"> <li>• Malaria</li> <li>• Chikungunya</li> <li>• Dengue</li> <li>• Lymphatic filariasis</li> </ul>	Stagnant water and poor sanitation conditions can spread vector-borne diseases Increased burden of disease in workforce, results in increased demand on Project health services and reduce productivity.	5	4	Extreme	The Contractor will develop program to limit bodies of stagnant water, spray insecticides, develop support in nearby communities, and create community awareness. The Contractor will encourage good sanitation practices, and the use of mosquito nets throughout the area of influence. Provide information for training of workers in Chikungunya and Dengue awareness so they can take knowledge back to communities. Develop educational materials regarding vector-borne disease transmission to the communities Evaluate supporting the community health authorities with lymphatic filariasis eradication programs to ensure adequate coverage of target areas with community directed treatment programs	2	2	Low	Contractor

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
Increased incidence of water related disease and food-borne illness	There are potential linkages between health and health impact pathways (e.g., number of bodies of stagnant water, number of people with access to improved sanitation facilities), which is crucial for water related disease and food-borne illness.	3	3	High	<ul style="list-style-type: none"> <li>Support the development of improved sanitation and improved water facilities.</li> <li>Organize focus group discussions with local government, existing communities and in-migrants to help knowledge exchange and establish common expectations for sanitary conditions in the areas of influence.</li> <li>Disseminate information on the linkages between improved water sources, sanitation conditions and human health, and on good hygiene practices, will promote use of the improved facilities and minimize the increased incidence of water related disease and food-borne illness in the areas of influence.</li> </ul>	2	2	Low	Contractor
Vaccine preventable diseases <ul style="list-style-type: none"> <li>Measles</li> <li>Mumps</li> <li>Rubella</li> </ul>	<ul style="list-style-type: none"> <li>Potential increase in outbreaks in the community related to population influx or the introduction of personnel who are not immunized</li> </ul>	3	3	High	Ensure and implement pre-employment medical checkup for the workforce	2	2	Low	Contractor
	<ul style="list-style-type: none"> <li>Increased burden of disease in community will</li> </ul>	3	2	Moderate	Implement infectious disease outbreak management program for	2	1	Low	Contractor

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
<ul style="list-style-type: none"> <li>Chicken pox</li> <li>Pneumonia</li> <li>Influenza</li> <li>Typhoid</li> </ul>	Increase the demand on local community health services				workers to reduce potential outbreaks to the local communities				
	<ul style="list-style-type: none"> <li>Diminished quality of health care and treatment for local communities as existing, limited capacity is overwhelmed</li> </ul>	3	2	Moderate	<ul style="list-style-type: none"> <li>Require active vaccinations program to workforce as necessary if possible</li> <li>Develop educational materials regarding communicable diseases transmission to the communities</li> </ul>	2	2	Low	Contractor
Sexually transmitted diseases and substance use	<ul style="list-style-type: none"> <li>The influx of people may bring communicable diseases to the project area, including sexually transmitted diseases (STDs), or the incoming workers may be exposed to diseases to which they have low resistance.</li> <li>Workers with health concerns relating to substance abuse, mental issues or STDs may not wish to visit the project's medical facility and instead go anonymously to local medical providers, thereby placing further stress on local resources.</li> </ul>	3	3	High	<ul style="list-style-type: none"> <li>Establish the construction camps at a distance away from the local community, if possible. If this is not possible due to densely populated project area, strict protocols and restriction should be imposed for interaction with local communities in order to prevent such type of STDs from labor influx.</li> <li>Camp area should be well protected where the access of the local outsider will be strictly prohibited.</li> <li>Engagement of skilled trainers to raise awareness and provide trainings among project workers about the STDs risks, consequences, prevention, positive behavioral approach to the</li> </ul>	2	2	Low	Contractor

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
					community etc. It may also be important to raise awareness of the risks among community members and local health authorities and inform them about available grievance mechanisms. <ul style="list-style-type: none"> <li>Arrange and support local organizations and/or government initiatives on community STDs education, prevention, and treatment programs.</li> </ul>				
Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH)	<ul style="list-style-type: none"> <li>Large influx of workers, particularly in dense populated communities, may increase the likelihood of exploitive and coercive sexual relations with community members, particularly minors in exchange for goods or money.</li> <li>Close proximity without appropriate supervisory and preventative measures may increase the risk of sexual exploitation by project workers of female domestic workers and vendors</li> <li>Community girls and women may be tempted by the</li> </ul>	4	3	High	<ul style="list-style-type: none"> <li>Contractor shall be responsible to develop a Community Environmental and Social Management Plan (C-ESMP where EA/SH Prevention and Response Action Plan will be clearly mentioned</li> <li>The ESMP should include a sample of the Code of Conduct (CoC) that will be used in the project will include provisions for addressing SEA and SH risks and also the prohibitions against any illegal sexual activity with anyone</li> <li>Establish workers' camps separated from local communities with strict protocols for interaction</li> </ul>	3	2	Moderate	Contractor

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
	project staff to get a good job in exchange of sexual relationship.				<p>with local communities in order to avoid project impacts from labor influx.</p> <ul style="list-style-type: none"> <li>Extensive training for Awareness raising strategy which describes how workers and local communities will be sensitized to SEA and SH risks, and the worker's responsibilities under the CoC</li> </ul>				
Emergency events and lack of preparedness and response	Internal and external emergencies may occur which require preparedness by the project authorities and a response procedure commensurate to the level of emergency situation	3	4	High	<ul style="list-style-type: none"> <li>Develop an emergency preparedness and response plan (EPRP) to contain emergencies at the project site level</li> <li>The Contractor will work with local authorities to coordinate with the national emergency response network in the areas of influence and to ensure implementation of the project specific emergencies and make arrangements with external emergency services (Fire, ambulance, etc.), if the resources available with the Contractor is not sufficient to contain the emergency.</li> <li>Conduct capacity building and train local communities as needed to make sure the</li> </ul>	2	2	Low	Contractor

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
					communities know what to do during an emergency.				
Use of security forces (e.g., police, Ansar, or private security personnel)	Project will engage security forces to ensure human security of project-affected communities and project workers and assets. There are potential risks that could arise from the use or presence of security personnel to protect the project or related aspects of the use of security personnel	3	3	High	<ul style="list-style-type: none"> <li>The operations and selection of the Project's security personnel will be guided by the relevant provisions of ESS 2 (Labor conditions) and ESS4 (Community Health, Safety and Security) which is adopted by World Bank</li> <li>Adoption/compliance with the World Bank Group's Good Practice Notes on Assessing and Managing the Risks and Impacts of the Use of Security Personnel and a project/contract specific Code of Conduct for the security personnel.</li> <li>The Contractor will carry out a continuous risk assessment of the security arrangements in place, monitor its security personnel, and identify any necessary corrective or preventive actions for continuing security operations.</li> <li>Security will be provided in a manner that does not jeopardize the community's safety and security, or the client's relationship with the community.</li> </ul>	2	2	Low	Contractor



Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
					<ul style="list-style-type: none"> <li>Security arrangements will follow the principle of proportionality, respect for human rights, and good international practice.</li> </ul>				
Lack of awareness on health and safety	Awareness on Community Health and Disease Prevention may arise from the interaction of project workers with local communities	4	3	High	<p>Community health and disease prevention awareness campaigns will be applied consistently throughout the Project duration and will include awareness of:</p> <ul style="list-style-type: none"> <li>Linkages between improved water sources, sanitation conditions</li> <li>Common water related disease and food borne illness</li> <li>Good hygiene practices</li> </ul>	3	2	Moderate	Contractor
Traffic and road accident	<ul style="list-style-type: none"> <li>Lack of Traffic and Road Safety Awareness</li> <li>Use of the community road</li> <li>Careless driving and goods deployment to the project site through the crowded area.</li> </ul>	4	4	Extreme	<ul style="list-style-type: none"> <li>Engage community consultations and monitoring and management plans to prevent potential negative impacts resulting from poor traffic and road safety culture.</li> <li>Ensure continuous monitoring of traffic and pedestrian Interface in the project area.</li> <li>Promote traffic safety awareness in communities in the</li> </ul>	2	3	Moderate	Contractor

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
				High	Direct Area of Influence and along the transportation route. <ul style="list-style-type: none"> <li>Driving by the side of schools and colleges should be avoided. If can't be avoided speed limit should be maintained in these roads.</li> </ul>			Low	
Management and safety of hazardous materials	Improper Hazardous Materials Management and lack of Safety Awareness	2	3	Moderate	<ul style="list-style-type: none"> <li>Ensure hazardous materials management safety communications to communities' close proximity of the project to deter workers, their families and others from collecting, reusing, recycling or reselling Project waste (e.g.; diesel, cement concrete etc.).</li> <li>Communications will include examples of hazardous materials used in Project construction, operation and rehabilitation, the risks to human health, and appropriate methods of use and disposal.</li> </ul>	2	2	Low	Contractor
Behavioral segmentation of the Security personnel	Misuse of Security Personnel	3	3	High	<ul style="list-style-type: none"> <li>Engage with communities about the project's impacts on community safety and security, create awareness concerning the Code of Conduct commitment and project grievance mechanism, as</li> </ul>	1	2	Low	Contractor

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
					<p>outlined in the Stakeholder Engagement Plan (SEP) and SEA/SH Action Plan of the ESIA.</p> <ul style="list-style-type: none"> <li>• Ensure that Security staff coordinate regularly with other departments, such as Community Relations and Human Resources.</li> <li>• Community Relations Officer of the Contractor will share information with communities about security arrangements, the Contractor's security policies, and the expected conduct of security personnel.</li> <li>• Arrange dialogue with communities about security issues to identify potential risks and local concerns, and can serve as an early warning system.</li> </ul>				
	Lack of Positive Lifestyles concept	3	2	Moderate	<p>Encourage culturally appropriate positive lifestyle choices in an effort to:</p> <ul style="list-style-type: none"> <li>• Establish good financial management choices with the compensation payment.</li> <li>• Deter an increase in alcohol use, substance abuse and tobacco use.</li> </ul>	2	2	Low	Contractor

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
					<ul style="list-style-type: none"> <li>Avoid violence against women, including sexual harassment, sexual exploitation and abuse.</li> <li>Avoid ethnic- or religious-based violence.</li> </ul> Conduct awareness campaigns within the workplace and at religious institutions (e.g., mosque), local governments, schools, and health clinics.				
Poor quality Management Systems to maintain safety of Services	The Construction may pose safety risks on community health and safety, for example, risks associated with: <ol style="list-style-type: none"> <li>Infrastructure construction and heavy equipment movement, such as, struck by moving vehicle.</li> <li>Trench construction hazard, such as land sliding, buried, slip, trip and falling communities people due to careless management.</li> <li>Water and sanitation services, such as contaminated water or spread of disease.</li> </ol>	4	4	Extreme	<ul style="list-style-type: none"> <li>The Contractor will establish and implement appropriate quality management systems to anticipate and minimize risks and impacts.</li> <li>The Contractor will apply hierarchy of controls, such as, eliminate/ substitute, and engineering control of hazards and if hazards are low risk, then introduce administrative controls and as a final resort provide appropriate personal protective equipment.</li> </ul>	2	3	Moderate	Contractor

Hazards	Reasons	Risk Ranking			Control Measures	Evaluation after measures			Responsibility
		Likelihood	Consequence.	Risk		Likelihood	Consequence	Risk	
	<p>d) Electricity supply, which may result in electric shock from electrical cabinets or cables.</p> <p>e) Service providers, which may use their service for the purpose of financial, sexual, or other exploitation, particularly of vulnerable groups such as women, children, and the elderly.</p>								
Potential Risks and Impacts on Ecosystem Services	The project's direct impacts on ecosystem services may result in adverse health and safety risks to and impacts on affected communities. With respect to ESS4, ecosystem services are limited to provisioning and regulating services as defined in ESS1.	2	3	Moderate	<ul style="list-style-type: none"> <li>Contractor will identify the project's potential risks and impacts on ecosystem services that may be exacerbated by climate change.</li> <li>Adverse impacts will be avoided, and if they are unavoidable, the Contractor will implement appropriate mitigation measures.</li> </ul>	2	2	Low	Contractor

## **Community Health and Safety Management Framework**

### *Traffic Management Including Accident*

Traffic, particularly the movement of heavy vehicles and other equipment carrier during peak hours in the construction phase of a project may cause huge road traffic in the highly populated area like Mirpur, Kalshi and Airport Area, which may face the deterioration of standard living condition of those city dwellers. School or college going students may face an unfavourable environment for their study and attending into their classes. Fatal injuries even death may be happened due to traffic congestion and unsafe driving of the project vehicles and other public transportations. Project authorities should plan to reduce such type of risks (e.g., by re-routing traffic, adjusting the timing of traffic movements and training staff and/or contractors) and work collaboratively with the Project Affected Communities to develop an appropriate Traffic Management Plan.

### *Accidental risks during overhead line installation and maintenance*

Contractor and DESCO should be cautious while the overhead line maintenance and installation works will be performed in a densely populated area. Hanging equipment, ladder, crane, work at height etc. may pose different types of risks including fatal, minor and near miss accidents and incidents. Near miss incidents should be recorded for the future awareness. Proper protective equipment, working schedule and demarcation of the working site can reduce the hazard significantly.

### *Health Services Program*

The health services program will enhance and monitor effective change in access to health, and any linkage to health status in general and in terms of the area of influence and specific communities and sub-populations (e.g., women, girls, children, in-migrants, visible minorities) within the project area. The health services program will use environmental, social, economic and health data to continually track and evaluate the changing vulnerability of communities within the area of influence so that action can be focused on the most vulnerable communities at any given time.

The Contractor will work with local government to identify any necessary follow-up actions if health status is negatively affected by the Project in the areas of influence. Possible follow up actions may include supporting provision of affordable health services, including mobile health outreach clinics within the areas of influence.

### *Disease Prevention Program*

The Disease Prevention Program will focus on methods to reduce of community exposure of water related disease. The program will be delivered through the active mitigation measures (e.g., limiting bodies of stagnant water) and community awareness. The program will be informed by health monitoring e.g., dengue exposure.

### *Chikungunya and Dengue*

Chikungunya, dengue and other vector borne disease reduction campaigns will be applied consistently throughout the Project period and will include awareness of linkages between stagnant water and dengue, including through poor sanitation conditions. Open water sources are created and/or enlarged, as a result of construction activities and storage of plant, materials and equipment, with the potential for increased mosquito breeding sites. Increased burden of disease in workforce, results in increased demand on Project health services and reduce productivity.

Perform a baseline entomological study to define the most predominant vector species in the Project area, as well as determining the susceptibility of mosquitoes to the different classes of insecticides. The Contractor will encourage good sanitation practices, and the use of mosquito nets throughout the area of influence. The Contractor will support development of local knowledge and on the exposure pathways and determinants of exposure in vulnerable communities. The Health Services Program will inform the Disease Prevention Program of the most vulnerable communities (with highest dengue incidence) for prioritized action. Provide information for training of workers in Chikungunya and Dengue awareness so they can take knowledge back to communities. Actions and lessons learned in the areas of influence will regularly inform Occupational Health and Safety training.

#### *Sanitation and Water Supply*

The Contractor will support the development of improved sanitation and improved water facilities. Existing drinking water supply must be monitored by the contractor so that the over-use of water by the project workers and project interventions will not make scarcity of the drinking water for the local community. Extraction of the ground water for project purposes must be prohibited. Through stakeholder engagement, the Contractor will encourage people to construct, adopt and properly use improved sanitation and water facilities. Focus groups with local government, existing communities and in-migrants may be implemented to help knowledge exchange and establish common expectations for sanitary conditions in the areas of influence.

The facilitation and dissemination of information on the linkages between improved water sources, sanitation conditions and human health, and on good hygiene practices, will promote use of the improved facilities and minimize the increased incidence of water related disease and food-borne illness in the areas of influence.

On-going monitoring of health and health impact pathways (e.g., number of bodies of stagnant water, number of people with access to improved sanitation facilities) will be implemented by the Contractor with regular feedback to those affected.

#### *Sexually Transmitted Diseases*

Stakeholder engagement activities will include culturally specific and gender specific awareness education about incidence of sexually transmitted diseases in the areas of influence, information on pathways of exposure, and any local evidence to aid acceptance of this information and dispel current myths about causes of HIV/AIDS. The Contractor will assist communities in developing education materials such as those using anecdotal epidemiology that would aid increasing acceptance of evidence-based research and facts regarding HIV/AIDS.

#### **Subcontractor Integrity Program**

The Contractor will be clear about its expectations of subcontractors during all phases. The Contractor will continually monitor and evaluate companies' performance, including performing spot checks on-site, to ensure that the expected level of safety culture is being adhered to. The subcontractor integrity program will be far reaching and include, but not be limited to the performance regarding the following:

- General traffic safety;
- Hazardous materials management;
- Community health and safety;
- Occupational health and safety; and
- Adherence to construction standards stated in the general and specific conditions of the main contract.

## **Emergency Preparedness and Response Planning**

The Contractor will develop an emergency preparedness and response plan (EPRP) to combat emergencies. The Contractor will work with local authorities to strengthen the national emergency response network in the areas of influence and to ensure implementation of the project specific emergencies and make arrangements with external emergency services (e.g., Fire-fighting, ambulance, etc.), if the resources available with the Contractor is not sufficient to contain the emergency.

If an external emergency arises not due to the Project but something where collaboration from the Contractor is needed for both human resources and emergency equipment, contractor can extend collaboration to work with local authorities and communities. The Contractor will develop procedures in the EPRP on actions that need to be taken, when an external emergency event is triggered. The Emergency Response Plan prepared by the contractor will cover both project-specific and emergencies in the communities. The Contractor will conduct capacity building and train local communities as needed to make sure the communities know what to do during an emergency. The Contractor will work with local authorities to make sure they are aware of it and if needed strengthen the emergency response network to be able to coordinate with the Project.

The following aspects of the Emergency Preparedness and Response Plan will be jointly addressed by the Contractor, the community and government representatives:

- Definition of information and notification chain(s) within government/regulatory agencies (who needs to be informed, who has which responsibility and access to/control over resources), following notification of the authorities by the Contractor that an emergency situation has occurred;
- Evacuation procedures for the local affected population;
- Awareness of operations and their risks and preparedness to respond (e.g., sufficient capacity of beds in local hospital);
- Preparedness of state/community emergency response teams (fire brigade) and awareness of risks and potential emergency scenarios, availability of PPE adequate for specific risks such as respirators, full-body harness etc.;
- Knowledge of site plan by ambulance teams (fastest access to critical points such as embankment, explosive storage);
- Training requirements of key people (police, hospitals and local health centers) and alignment of their training plans with the Contractor training plans;
- Commitment to coordinated emergency drills between the Contractor and police, fire fighters, national disaster management authority, etc., and aligned plans for drills; and
- Nomination of community representatives in the preparation of the external plan, and in the planning of and participation in, drills.
- Designated coordinator for EPRP implementation and
- Measures for restoration and cleanup of the environment following any major accident.

## **Community Health and Safety Awareness Program**

### *Awareness on Community Health and Disease Prevention*

Where an assessment identifies risks, for example communicable diseases, which may arise from the interaction of project workers with local communities, the EIA for the project will describe such risks and measures to address them. Such measures can include, more generally, the use of skilled trainers to raise awareness among project workers of the risks, expected behaviours, and consequences of violations, communicated through training, and publicized codes of conduct. It is also important to



raise awareness of the risks among community members and local health authorities and inform them about available grievance mechanisms. In addition, the Contractor will create awareness of linkages between stagnant water and dengue, including through poor sanitation conditions in the communities' close proximity to the Project. Provide information for training of community representatives in Chikungunya and Dengue awareness so they can take the knowledge back to their respective communities.

Community health and disease prevention awareness campaigns will be applied consistently throughout the Project duration and will include awareness of:

- Linkages between improved water sources, sanitation conditions and human health;
- Common water related disease and food borne illness rates in the areas of influence;
- Good hygiene practices;
- Benefits to properly using the improved facilities; and
- Evidence of improvement in target communities to encourage adoption in other communities.

#### *Traffic and Road Safety Awareness*

Stakeholder engagement activities, a good communication strategy, as well as monitoring and management plans will help the Contractor prevent potential negative impacts resulting from a poor in-country safety culture. These actions include the following:

- Clear expectations regarding road safety culture, road safety behavior and road safety training, provided to workers and contractors;
- On-going monitoring of traffic and Pedestrian Interface in the project area (e.g., near misses, reports from communities, reports from project traffic) with regular feedback to those affected; and
- Knowledge transfer to workers and affected communities regarding road user awareness with advice on strategies for interacting with project traffic.

In addition, the Contractor will promote traffic safety awareness in communities in the Direct Area of Influence and along the transportation route.

#### *Waste and Hazardous Materials Management and Safety Awareness*

The Contractor will provide hazardous materials management safety communications to communities in the areas of influence to deter workers, their families and others from collecting, reusing, recycling or reselling Project waste. Communications will include examples of hazardous materials used in Project construction, operation and rehabilitation, the risks to human health, and appropriate methods of use and disposal.

Solid waste as well as the electrical waste collection process and offsite disposal system should be outlined and demarcated accordingly after discussion with the local stakeholder of nearby community. Proper and effective drainage system should be developed before starting of civil and mechanical construction and waste must be collected in a sump for treatment.

### *Use of Security Personnel*

The Contractor will engage with communities about the project's impacts on community safety and security, create awareness concerning the Code of Conduct commitment and project grievance mechanism and disclosure of the project possible outcome including the impacts through the public consultation meeting.

The Contractor will avoid internal operational silos by ensuring that their Security staff coordinate regularly with other departments, such as Community Relations and Human Resources. Through its Community Relations function, the Contractor will share information with communities about security arrangements, the Contractor's security policies, and the expected conduct of security personnel. Dialogue with communities about security issues can also help the Contractor to identify potential risks and local concerns, and can serve as an early warning system.

Community members will be informed through the awareness program, where to go with complaints about the conduct of security personnel. Can they lodge such complaints through the company's general community grievance mechanism or is there one specifically for security concerns- or even an alternative complaint mechanism (for example, as part of the local justice system)? The Contractor will maintain a clear process and communicate it. The awareness will also provide information on the community members' ability to make complaints without fear of intimidation or reprisal.

Gender considerations are also important, as women often have different experiences and interactions with security personnel. For example, the potential for sexual harassment or sexual violence against women can increase from an expanded presence of private or public security forces in a project area. The Contractor should consider to consult and create awareness separately for the women group, which may offer important perspectives and may help the Contractor to identify a fuller range of potential risks and community concerns. At the same time, security personnel's awareness of and respect for culturally specific gender issues may help the local population accept their presence. The Contractor might consider to recruit female security guards to improve cultural acceptance and reducing tensions, particularly in situations where there are frequent interactions between guards and women from the community.

### *Positive Lifestyles Program*

Through the Community Development Plan, the Contractor will encourage culturally appropriate positive lifestyle choices in an effort to:

- Establish good financial management choices;
- Deter an increase in alcohol use, substance abuse and tobacco use;
- Avoid violence against women, including sexual violence;
- Avoid ethnic- or religious- based violence;
- Adopt good hygiene practices and sanitation; and
- Reduce the potential for STDs.

Awareness campaigns may be conducted within the workplace and at religious institutions, local governments, schools, and health clinics.

### *SEA/SH awareness program*

Apart from the reasons of this hazard indicated in the Risk matrix (Table 10.2), other examples of Sexual Exploitation & Abuse (SEA)/Sexual Harassment (SH) need to be considered but are not limited to:

- A project worker tells women in the community that he can get them jobs related to the work site (cooking and cleaning) in exchange for sex
- A worker that is connecting electricity input to households says that he can connect women headed households to the grid in exchange for sex.
- A project worker gets drunk after being paid and rapes a local woman.
- A project worker denies passage of a woman through the site that he is working on unless she performs a sexual favor.
- A manager tells a woman applying for a job that he will only hire her if she has sex with him.
- Male staff comment on female staffs' appearances (both positive and negative) and sexual desirability.
- When a female staff member complains about comments male staff are making about her appearance, they say she is "asking for it" because of how she dresses.
- A male staff may touch female staff members' buttocks whether in project or in community when she passes her destination.
- School or college girls might get seduced or tempted by the project staff by offering gifts or other financial benefits

To protect and prevent community SEA/SH Strengthen community engagement and awareness-raising is essential. Critical awareness activities need to be conducted which will include training and awareness-raising sessions with women, girls, boys and men in communities of concern as well as with other stakeholders (including implementing and operational partners, government officials, civil society organizations, and companies in the private sector). To prevent SEA effectively, all staff and project workers must make sure that project Persons of Concern (PoC) are aware of their rights and entitlements. On the other hand, PoC from contractor and project management side should know that they are entitled to assistance that they should never be expected to provide any form of sexual favour, and that demands for such favours are strictly prohibited. Community and project victims should also know how and where to report SEA incidents safely and confidentially when they occur. As part of prevention, trainings and information campaigns should be put in place for all project personnel and PoC. Training and information campaigns may include the distribution of information sheets, posters and videos, or community meetings, focus group discussions, etc.

Beside that the project will include a general Code of Conduct (CoC) as well as a Labor Code of Conduct, covering the Gender-Based Violence (GBV)/SEA/SH related risks for the contractors, sub-contractors, and laborers who will be employed under the project.

### **Other Measures to Manage CHS Risks**

#### *Safety of Services by maintaining quality Management Systems*

The Contractor will establish and implement appropriate quality management systems to anticipate and minimize risks and impacts. Projects may provide many kinds of services to communities, such as those relating to education and health, social security and social protection, transport, and utilities, such as electricity and gas, water and sanitation, and waste disposal. Management systems that address the safety of such services are important because without adequate protection measures the provision of such services can present dangers for communities. Such systems address the community health and safety risks posed by project services, for example, risks associated with:

- a) Infrastructure construction and heavy equipment movement, such as, struck by moving vehicle;
- b) Erection of steel pole for the overhead electricity distribution may cause the minor to fatal injuries.
- c) Slip, trip and fall injuries due to wet road and uncovered excavated trench.
- d) Waste disposal, such as toxicity, waste dump collapse, or air pollution;
- e) Quarries or excavation works, such as rock falls or hazardous equipment;
- f) Water and sanitation services, such as contaminated water or spread of disease;
- g) Electricity supply, which may result in electric shock from electrical cabinets or cables;
- h) Service providers, which may use their service for the purpose of financial, sexual, or other exploitation, particularly of vulnerable groups such as women, children, and the elderly.

In such circumstances, the Contractor will apply hierarchy of controls, such as, eliminate/substitute, and engineering control of hazards and if hazards are low risk, then introduce administrative controls and as a final resort provide appropriate personal protective equipment.

### **Potential Risks and Impacts on Ecosystem Services**

The project's direct impacts on ecosystem services may result in adverse health and safety risks to and impacts on affected communities. Where appropriate and feasible, the Contractor will identify the project's potential risks and impacts on ecosystem services that may be exacerbated by the project interventions. Adverse impacts will be avoided, and if they are unavoidable, the Contractor will implement appropriate mitigation measures.

Ecosystem services are the benefits that people derive from ecosystems. The provisioning services that ecosystems provide include the products people obtain from the ecosystems, such as food, freshwater, timbers, fibres, and medicinal plants. Regulating services of ecosystems are the benefits people obtain from the regulation of ecosystem processes, such as surface water purification, carbon storage and sequestration, climate regulation, and protection from natural hazards.

### **Training and Competency**

The Contractor will ensure that personnel responsible for the execution of tasks and requirements in this Plan are competent based on education, training, and experience.

Training to be provided to workers who may be exposed to hazards (health, safety or security) associated with Project activities. The training and increase in Project worker awareness associated with health, hygiene and sanitation, communicable disease, sexually transmitted infection (STI) and HIV/AIDS education campaigns are a key component in minimizing health risks to the community posed by activities of the Project.

Training will include, but not be limited to:

- Voluntary Principles for Security and Human Rights training for all Project security guards and security management, including the appropriate use of force and protection of human rights;
- STI and HIV/AIDS prevention and awareness training for all workforces;
- Driver training to improve driver and vehicle safety, as well as systems for monitoring and enforcement;
- Road and traffic safety awareness for school children and the community leaders;
- Sanitation and nutrition awareness and education for all workforces, with a focus on messages which can be taken home to families to encourage good sanitation and nutrition practices in rural settings;

- Respiratory illness and infectious disease management, including TB;
- Vector-borne disease awareness including Chikungunya and Dengue;
- Speed restrictions in populated areas, safe driving in rural areas, safe driving in dusty environments, defensive driving and basic first aid;
- Guidance for all workforces with potential occupational exposures and prevention to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2);
- Benefits of vaccinations and disease prevention; and
- Adverse impacts of Drug and Alcohol usage.

## **Monitoring and Maintenance**

### *Confidentiality Requirements*

The Contractor will ensure health data are handled to an international standard of medical ethics. Health data is confidential to the individual and health professionals only. the Contractor will assure that data is stripped of all personal identifiers before dissemination to other (non-medical) company employees or external bodies, reducing the potential for any internal or external discrimination of employees or community members. Sample size and relative risk of personal identification will need to be taken into account before combined health data is published internally and externally. The Contractor understands that confidentiality of health data overrides any need to demonstrate vulnerability in a population, sub-population or individual.

## **Appendix IX: Environmental Mitigation Plan**



**Part 1 – General Mitigation**

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
<b>Detailed Design and Pre-Construction Phase</b>								
Compliance with national laws and regulations and SPS 2009 requirements	Environmental and social impacts/risks of construction and O&M phase -- lack of management of detailed design, construction and O&M leading to environmental degradation, H&S risks for construction and O&M workers as well the local community	<ul style="list-style-type: none"> <li>- DESCO and contractor to comply with national laws and regulations including those set out in the IEE in addition to international good practice e.g., IFC EHS General Guidelines (April 2007) and the EHS Guidelines for Electric Power Transmission and Distribution (April 2007) and the mitigation set out within this table.</li> <li>- Any conditions of the national ECC (<b>Appendix I</b>) to be complied with by DESCO and contractor throughout the project duration.</li> <li>- DESCO and contractor to comply with the definite version of the EMP which is the version disclosed on ADB’s website. This includes any measures in an updated IEE</li> </ul>	<ul style="list-style-type: none"> <li>- No breaches of national regulations and/or international good practice guidelines.</li> <li>- No breaches of EMP by DESCO, contractor, subcontractors or other third parties with prompt corrective</li> </ul>	Upon loan effectiveness for DESCO (prior to contract award in case of advance contracting or third-party works) and contract award for contractor then throughout project implementation	√	√	√	DESCO and Contract Cost

<sup>1</sup> DESCO to implement EMP requirements as well as supervising and monitoring the contractor’s implementation of measures delegated to them, including reviewing and approving detailed designs, CESMPs/H&S Plans and subplans, and other documentation, reporting compliance in EMRs for submission to ADB.

<sup>2</sup> CSC to support DESCO in EMP implementation, supervision, and monitoring of the contractors, the reviewing and approving of documentation, and reporting.

<sup>3</sup> Contractor to implement the measures delegated to them for the duration of their contract period, pre-construction measures are to be completed before the commencement of works and then to implement requirements throughout construction works reporting to DESCO monthly on the status of EMP implementation



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>following design or any updates in response to unanticipated impacts. Contractors will be responsible for implementing and budgeting for all measures required.</p> <ul style="list-style-type: none"> <li>- If there is any conflict between the measures set out in this EMP and the national ECC the most stringent provision is precedent.</li> <li>- Contractors will have in place corporate environment, health and safety policies and corporate environment, health, and safety management system certifications, such as, ISO 14001 for environment, ISO 45001 for health and safety, or equivalent.</li> <li>- Contractors will not engage in any activities described on the ADB Prohibited Investment Activities List in Appendix 5 of ADB's SPS (2009)</li> </ul>	<p>action taken if required.</p> <ul style="list-style-type: none"> <li>- Status of EMP compliance documented in EMRs</li> </ul>					
Securing national environmental clearance and other permissions		<ul style="list-style-type: none"> <li>- DESCO to renew ECC informing DOE of any changes in scope and design since it was issued and ensure that all other required national permissions are secured and renewed as needed before the commencement of related works.</li> <li>- Contractor at request of DESCO to obtain permissions as part of their scope of works; and to obtain those permissions which by</li> </ul>	<p>All ECC and other permits, licenses, and clearances are obtained prior to commencement of related work. Copies of these will be included in the EMR for the</p>	<p>Upon loan effectiveness for DESCO (prior to contract award in case of advance contracting or third-party works) and contract award for</p>	√	√	√	DESCO (Contract cost if requested by DESCO or to be obtained by default)

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>default the Contractor is responsible to obtain.</p> <ul style="list-style-type: none"> <li>- Contractor to report to DESCO any tree cutting required that was not originally planned in the IEE and DESCO to obtain any tree cutting permit required from Forest Department prior to cutting of trees.</li> <li>- Avoidance of tree cutting in the bird nesting season.</li> </ul>	period in which they were obtained.	contractor then throughout project implementation				by the contractor)
Procurement of contractors for demolition and construction work and goods supply		<ul style="list-style-type: none"> <li>- DESCO to ensure the EMP is incorporated in the bidding documents and the final (definitive) EMP cleared by ADB is incorporated into the contract documents for demolition and construction works prior to contract award, any updates to it will be incorporated as a contract variation. This includes any site-specific EMP included in an updated IEE following detailed design or any updates in response to unanticipated impacts.</li> <li>- DESCO to ensure that the requirement to comply with the final (definitive) EMP as well as pertinent EHS requirements form an integral and binding part of the contract, including appropriate incentives and/or penalties for (non-) compliance related to EHS management.</li> </ul>	<ul style="list-style-type: none"> <li>- Final EMP to be included in bidding and contract documents for demolition and construction works.</li> <li>- Relevant clauses in the contract document for works and goods supply contracts.</li> <li>- Copy of EMP related contract extracts will be</li> </ul>	Prior to issue of bidding documents and contract award	√	√	NA	DESCO

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
			attached to EMR for the period in which the contract was awarded.					
Detailed design and updates to IEE		<ul style="list-style-type: none"> <li>- Contractors to ensure that detailed designs reflect the requirements of the IEE/EMP and international engineering best practice/good EHS practice including site-specific measures where these are required with regards to biodiversity and physical cultural resources as well as other sensitive receptors.</li> <li>- During detailed design contractors to ensure national seismic design requirements are followed especially for buildings and pole foundations; building and structural designs are to be checked for seismic safety by design team and an independent expert separate to design team, to confirm international good practice seismic design standards are met.</li> </ul>	<ul style="list-style-type: none"> <li>- Detailed Design cleared and approved reflects EMP and CRA requirements.</li> <li>- ADB informed of any unanticipated impacts identified at any point during project implementation.</li> <li>- IEE updated as required to reflect detailed design and any unanticipated impacts and reviewed and cleared by ADB</li> </ul>	Prior to detailed design approval and for implementation during construction	√	√	√	DESCO and Contract Cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<ul style="list-style-type: none"> <li>- During detailed design climate change adaptation measures per ADB CRA 2023<sup>4</sup> need to be incorporated by the contractors</li> <li>- Contractor's detailed designs will be reviewed by DESCO's PIU with support of CSC to confirm that all measures required by this EMP have been adequately incorporated in them and that they reflect international engineering best practice/good EHS practice before they are approved.</li> <li>- Prior to the approval of detailed designs DESCO will consult ADB regarding the need to update the IEE. If required, the IEE will be updated for clearance and disclosure by ADB before approval of the detailed designs and the start of related works including site establishment. Contractor to support DESCO in respect of any update to the IEE following detailed design.</li> <li>- If other changes in project scope or design occur during project implementation, or if</li> </ul>	prior to the start of related works.					

<sup>4</sup> For this project a Climate Risk Assessment (CRA) was carried out that sets out adaptation measures which need to be considered in detailed design to improve resilience to heavy rainfall, cyclones, temperature, and floods. Measures incorporated include using XLPE conductors which are weather and heat resistant in place of bare conductors, adding stays to major and minor angle points, temperature devices on transformers, etc. Full details of measures required are detailed in the CRA, 2023 disclosed on ADB website as part of RRP supplementary documents.

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>any unanticipated impacts are identified, contractor to inform DESCO who are to immediately inform ADB of change to determine the need to update the IEE.</p> <ul style="list-style-type: none"> <li>- Use of any asbestos containing materials is prohibited.</li> <li>- Use of PCB based oil for transformers/transformer oil is prohibited.</li> <li>- Use of chlorofluorocarbons (CFCs) and halon-based substances are prohibited.</li> </ul>						
Construction EHS management planning during pre-construction and location of temporary construction facilities		<ul style="list-style-type: none"> <li>- Contractor to develop site-specific Construction Environmental and Social Management Plans (CESMPs) and H&amp;S Plans including all subplans as required by the EMP to be approved by DESCO with support of CSC incorporating the requirements of (i) this Environmental Mitigation Plan, (ii) the ECPs (see <b>Appendix X</b>), (iii) the conditions of National Environmental Clearance (iv) international engineering best practice/good EHS practices e.g., IFC EHS guidelines including the Construction and Demolition section and ILO Code of Practice, and (v) site-specific measures where these are required with regards to biodiversity and physical cultural resources as well as other sensitive</li> </ul>	<ul style="list-style-type: none"> <li>- CESMPs/H&amp;S Plans and all subplans cleared and approved before work are reflective of Project EMP requirements to minimize impacts and risks on EHS during subsequent stages of the project. Copies and any updates</li> </ul>	Prior to mobilization and site establishment and for implementation during construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>receptors. These will be living documents, to be updated as required and re-approved by DESCO as construction proceeds, if construction methods or site conditions change, in response to an accident, incident, near miss etc.</p> <ul style="list-style-type: none"> <li>- Construction is to only be undertaken on DESCO-owned land and no temporary or permanent relocation to be undertaken unless the resettlement plan is followed.</li> <li>- Contractor to seek to locate all temporary construction facilities required including laydown and storage areas within the boundaries of DESCO land (new or existing substations) except for overnight accommodation for workers that could be provided in existing properties off-site. If other public or private land is required for temporary construction facilities due to lack of space within DESCO land, land use to be negotiated with private landowner, submit land ownership papers and copy of agreement for temporary land use with a photographic record of pre-project condition. Drainage must be installed at all temporary facility locations to avoid waterlogging.</li> </ul>	to these plans are to be attached to EMR during the period in which DESCO approved them.					

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<ul style="list-style-type: none"> <li>- Noisy and dusty facilities or those that may generate sediment laden runoff or wastewater (e.g., concrete batching plant, asphalt plant, refueling areas, labor camps, maintenance yards, storage areas) must be sited at least 500m from residential property and outside biodiversity sites and away from any physical cultural resources; pollution prevention equipment must be installed on such facilities. Laydown and storage areas that are not potential pollution sources may be located a minimum of 50m distant, but these must be outside dense habitation, not block accesses or road users. No land requiring extensive landfill or levelling will be used, there will be no clearance of trees/vegetation on land to be used by the contractor. Photographic record of land condition to be undertaken before any works to establish temporary facilities.</li> <li>- Design of sanitation and welfare facilities at construction sites and labor camps/overnight accommodation to conform to IFC EHS general guidelines, ILO's guidance on worker accommodation and national regulations and to be</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>approved by DESCO.<sup>5</sup> Contractors to provide all basic requirements; individual beds and beddings, individual lockers, mosquito nets, artificial lights, natural lights, windows and ventilation, fans, emergency exits, firefighting equipment, kitchen and dining halls, mobile charging points, toilets and washing facilities, potable drinking water, recreational space etc.</p> <p>– Contractors will determine if they source canned drinking water from an existing commercial supplier (as the preferred option) or provide their own source of treated water for workers; all drinking water provided is to be regularly tested and confirmed to meet drinking water standards. For sources other than canned drinking water undertake baseline water quality sampling per EMoP (<b>Appendix XII</b>) to confirm source suitability and, if necessary, provide additional water treatment facilities during construction to</p>						

<sup>5</sup> Indoor toilets (one per six staff) with hand washing facilities and if overnight accommodation private bathing area, showers or baths, all connected to existing sewage system or septic tank with soak away; Shaded rest area that is accessible and can accommodate the number of workers on site; Indoor food preparation and separate clean eating area, provision of sufficient fuel supply for cooking other than wood; Enclosed garbage bins for disposal of waste, as burning of waste will be prohibited, and; Potability testing before work commencement, a drinking water supply that meets drinking water standards to be provided etc.



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>facilitate safe drinking water supplies. If contractors use existing or install their own borewell for construction water supply permissions will be obtained from authorities together with agreement of local communities before abstraction.</p> <ul style="list-style-type: none"> <li>- Contractors will use locally sourced materials as far as practical to reduce transportation, but all raw materials will be sourced only from existing licensed sources e.g., aggregates from quarries or borrow areas which hold ECC with submission to DESCO of all necessary documents such as records of materials used and source with copies of ECC.</li> <li>- Contractors to provide adequate facilities for the collection, separation, and storage of construction waste (including from labor camps/overnight accommodation) on-site and safe transportation for composting or recycling or disposal through reputable, legitimate, licensed third parties with all waste transfer records retained. Leaving or disposing of construction waste by burying it on-site or disposing of it at unlicensed waste management facilities is strictly prohibited. Unsanitary open dumps are not to be used by the contractor or their third</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		parties; for this reason, Dhaka municipalities must not be relied upon by the Contractor for the disposal of waste. Burning of waste is also to be strictly prohibited.						
Consideration of H&S through detailed design and construction H&S management planning during pre-construction		<ul style="list-style-type: none"> <li>- Contractors to undertake facilitated H&amp;S risk assessment with DESCO through a workshop attended by PIU/CSC during the detailed design (and at other key stages) so it can inform both the detailed design and pre-construction preparations, considering both occupational and community H&amp;S risks resulting from subsequent stages of the project. Facilitated workshop will involve the design and construction team of the contractors and DESCO O&amp;M staff.</li> <li>- Informed by the outcome develop a H&amp;S Plan to avoid, minimize and mitigate occupational H&amp;S risks. DESCO will be required to approve the H&amp;S Plan and then ensure their own staff on-site follow it when on site.</li> <li>- Contractors will set up an accident reporting system for any health and safety incidents (near miss, minor, lost time, fatal) involving workers or community to be reported to DESCO within 24 hours of</li> </ul>	CESMPs/H&S Plans and all subplans cleared and approved before work are reflective of EMP requirements to minimize impacts and risks on EHS during subsequent stages of the project. Copies and any updates to be attached to EMR during the period in which they are approved by DESCO.	Prior to mobilization and site establishment and for implementation during construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>occurrence with a response plan detailing the incident and how its reoccurrence will be avoided. DESCO to then report any lost time or fatal incidents to ADB within 48 hours. Record of all incidents and response taken should include date, time, details of incident, treatment given and outcome, and lessons learnt for the future. Contractors will ensure all workers are covered by medical/accident insurance to pay out in the event of a disability or fatality. Contractor's insurance includes a community liability clause for payment of compensation in case of any accidents because of construction.</p> <p>– Emergency contact number and details for medical, fire, etc. are to be displayed in all construction sites.</p>						
Environmental safeguards staffing and employment of construction workers; environment safeguards training and	Environmental and social impacts of construction phase -- lack of EHS management capabilities on DESCO and Contractor's part,	<p>– DESCO to establish ESU and appoint CSC as set out in the EMP institutional arrangements. ESU manager will be delegated authority under the contract to be able to halt construction works if any EHS issues arise.</p> <p>– Contractor to recruit EHS team under an Environmental, Social and Health and Safety (ESHS) Manager and enough E&amp;S</p>	<p>– ESU was established with suitably qualified staff with PIU supported by CSC.</p> <p>– Contractor equipped with</p>	Upon loan effectiveness for DESCO (prior to contract award in case of advance contracting) and contract award for contractor and then throughout	√	√	√	DESCO and contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
awareness raising activities	leading to environmental degradation, H&S risks for construction workers as well the local community.	<p>Supervisors and H&amp;S Stewards as set out in the EMP institutional arrangements for onsite supervision and monitoring of environment safeguards implementation daily for the duration of works. Subcontractors to be required to appoint an EHS representative for each construction site.</p> <ul style="list-style-type: none"> <li>- CVs of the contractors EHS team plus team structure to be submitted to DESCO in bid document or immediately on contract award for approval before mobilization. List of staff and copies of CVs to be reflected in the first monthly progress report to DESCO. Any updates to be reflected in the succeeding progress reports.</li> <li>- Maintain administrative procedures for recruitment. No illegal forced or child labor to be employed in construction with the minimum age for employment on the construction site to be 18 given hazardous nature of works involved - no persons under 18 to be employed. Working hours to be in accordance with Bangladesh labor laws to minimize H&amp;S risks.</li> <li>- Contractors must not discriminate and must proactively encourage the</li> </ul>	<p>approved EHS team prior to mobilization.</p> <ul style="list-style-type: none"> <li>- EHS staffing details for period to be included in EMR.</li> <li>- No breach of Bangladesh labor laws and labor management sub-plan under the CESMPs.</li> <li>- Breakdown of construction worker profiles, plus verifiable proof of age and wage documentation for every worker, insurance certificates and labor related</li> </ul>	project implementation				

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>employment of suitably skilled women on the project.</p> <ul style="list-style-type: none"> <li>- Contractors must proactively encourage local employment for unskilled roles whilst ensuring suitably qualified and experienced workers for skilled roles; local labor can be used for manual and office work, but precedence must be given to ensuring that all workers are appropriately skilled given the hazardous nature of construction works. Contractors are to provide construction skill enhancement training to local communities to enhance the skill of local people and help avoid conflict, if skilled workers not locally available.</li> <li>- Contractors to ensure the provision medical/accident insurance for all workers (formal and informal) for the duration of their contracts and 14 days sick leave for all construction workers.</li> <li>- DESCO to prepare a detailed training plan elaborating how training and awareness raising activities required by EMP will be conducted and with the support of CSC conduct required training sessions on EMP implementation and GRM operationalization for all those with</li> </ul>	<p>permissions are maintained by the contractor throughout the project.</p> <ul style="list-style-type: none"> <li>- No incidents/ community complaints related to impacts from influx of workers.</li> <li>- Detailed training plan reflecting EMP requirements developed.</li> <li>- Records of all training activities are retained. Training undertaken will be documented and reported in EMRs including photos and</li> </ul>					

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>management responsibilities to clarify requirements, roles and responsibilities, record keeping and reporting at each stage of the project. Contractor to ensure all members of contractor's EHS team, design team, and construction management team attend trainings.</p> <ul style="list-style-type: none"> <li>- Contractor to prepare a detailed training plan upon contract award elaborating how training and awareness raising activities required by EMP will be conducted.</li> <li>- Prior to the start of and then throughout construction contractor to conduct training for construction management and provide all workers and visitors onsite, irrespective of them being formally or informally employed by contractor, subcontractor or third-party with an EHS induction before being allowed on-site including dos and don'ts in relation to construction site, temporary workers camps, local communities, forests, protected areas, etc. Contractor to ensure topics covered by training and induction will include but not be limited to good housekeeping at all times; environmentally sound waste</li> </ul>	<p>records of participants (including gender breakdown)</p> <ul style="list-style-type: none"> <li>- Trainings and awareness raising delivered in accordance with the training plan.</li> <li>- Contractors and construction workers fully aware of their responsibilities under the EMP through training</li> </ul>					

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>management practices; hygiene and communicable disease prevention including COVID-19 and HIV/AIDS; sexual exploitation, abuse and harassment prevention; culturally acceptable practices.</p> <ul style="list-style-type: none"> <li>- Contractor to prepare with guidance of health experts HIV/AIDS/COVID-19 information video/brochures/leaflets for distribution to all workers during induction, covering factual health issues as well as behaviour change issues (e.g., social distancing for COVID-19) around the transmission and infection of HIV/AIDS/COVID-19 and other communicable diseases.</li> <li>- Contractor to prepare with guidance of labor experts a worker Code of Conduct and information video/brochure/leaflet for distribution to all workers during induction addressing culturally acceptable practices etc.</li> </ul>						
Establishment of a functioning Grievance Redress Mechanism	Unresolved community grievances and increased conflict due to lack of operational	<ul style="list-style-type: none"> <li>- DESCO to set up and operationalize a GRM for local community and workers as set out in the IEE, identifying GRM focals and GRC and ensuring all the members are trained on the process.</li> </ul>	<ul style="list-style-type: none"> <li>- GRM as per IEE operationalized, affected persons aware of its existence and are actively</li> </ul>	Upon loan effectiveness for DESCO (prior to contract award in case of advance contracting) and	√	√	√	DESCO and contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
	Grievance Redress Mechanism (GRM)	<ul style="list-style-type: none"> <li>- Contractor's EHS team too operationalize the informal site level GRM per the IEE, and support DESCO in resolving and addressing grievances entering the formal GRM, keep record of all grievances registered, status, time taken for redressal and outcomes, etc. Nominate a GRM Focal Point for each construction site who will keep affected persons and local communities informed of the status of work and be readily available onsite to receive, document and deal with grievances at site level.</li> <li>- DESCO and contractor to ensure GRM as well as the GRM process and means to submit a grievance is communicated verbally to the community (especially those within 500m of SS and 50m of power line/cable works)<sup>6</sup> before commencement of works. Information on GRM to be disseminated through community meetings, one-on-one consultations, posters, leaflets, brochures, SMS, or sign boards in prominent areas. Contractor to provide notice boards at all substations, construction site offices and active work</li> </ul>	<ul style="list-style-type: none"> <li>using GRM to raise their grievances.</li> <li>- 100% of grievances received are recorded and resolved in a timely manner as per GRM process; no unresolved grievances.</li> <li>- Records to be kept of all grievances received and their resolution for reporting per the IEE.</li> <li>- Details of GRM being operation, including photos of awareness</li> </ul>	contract award for contractor				

<sup>6</sup> 500m from substations and 50m of ROW is the project area of influence that was adopted for the EIA.



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>sites including highly visible details of the GRM including the name, designation, contact numbers including phone/SMS/What's App, address of both the DESCO and contractor's GRM focal persons plus the timeline and process of redressal together with a suggestion box that is regularly checked for any grievances received.</p> <ul style="list-style-type: none"> <li>- GRM will be available to all workers for receiving and handling complaints about unfair treatment or unsafe living or working conditions, ensuring no coercion nor reprisal. Construction workers will be given access to register any grievances with the contractors or direct access to the DESCO GRM Focal.</li> <li>- Contractor to carry out awareness raising among workers on the GRM at the start of employment onsite, including details on how to submit a grievance, process, and timeframes including disseminating GRM contact details on noticeboards and placing suggestion boxes at construction site offices and at employer provided staff accommodation.</li> </ul>	<p>raising activities to be submitted in EMR.</p> <ul style="list-style-type: none"> <li>- Details of all grievances received and resolved during the period to be reported in EMR.</li> </ul>					

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<ul style="list-style-type: none"> <li>DESCO and contractor to encourage affected persons to use the GRM but also clarify that the GRM can run in parallel with legal redress. DESCO and Contractor to inform about ADB's Accountability Mechanism as the last resort.</li> </ul>						
Meaningful consultations, information disclosure and community awareness raising activities	Unresolved community grievances regarding disruption and disturbance and increased conflict due to lack of communication with the local community regarding project impacts and risks	<ul style="list-style-type: none"> <li>DESCO to prepare a detailed stakeholder engagement plan for meaningful consultation with the local community especially those in 500m of substations and 50m of power line/cable works) before commencement of works.</li> <li>No work will start on site until DESCO has locally disclosed the IEE on their website with executive summary translated into Bangla and placed hard copies at construction site offices. Copies of the executive summary in Bangla will be printed in Bengali and disseminated through community meetings, one-on-one consultations, or sign boards in prominent areas. Hard copies and translation to Bangla of the full IEE are to be provided by DESCO upon request by affected persons. If an IEE update is required, it will be similarly disclosed as will findings of EMRs.</li> </ul>	<ul style="list-style-type: none"> <li>Stakeholder engagement plan prepared, and IEE is locally disclosed and accessible to affected persons.</li> <li>Details of all consultations and awareness raising activities undertaken by DESCO and contractor documented and reported in EMRs including photos and records of participants</li> </ul>	Upon loan effectiveness for DESCO (prior to contract award in case of advance contracting) and contract award for contractor and then throughout project implementation	√	√	√	DESCO and contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<ul style="list-style-type: none"> <li>- Contractor to consult with and seek agreement of landowners and local communities within 500m on proposed locations for any temporary labor camps, site offices, storage areas, areas for waste management, etc.</li> <li>- Contractor to consult with and seek agreement of local communities to temporarily use any community resources (e.g., water supplies) during construction to identify any potential conflict, if additional demand may place stress on community resources plan for alternative sourcing for these resources for project needs.</li> <li>- Contractor to consult with local communities and other concerned stakeholders including local government officials and public utilities as well as the local police and municipalities during design in order that any concerns raised can be reflected in the choice of SS site layout, route alignment and construction method, contractor to continue liaising in construction.</li> <li>- Contractor to communicate at least four weeks (one month) prior to the commencement of works advance notice to</li> </ul>	<p>(including gender breakdown).</p> <ul style="list-style-type: none"> <li>- Local communities and other concerned stakeholders kept informed throughout project implementation, and aware of construction, providing with awareness raising etc.</li> </ul>					

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>local communities. This is to be done verbally through local government offices and community meetings, one-on-one consultations, posters, leaflets, brochures, SMS, or sign boards in prominent areas about the agreed schedule of and details of the planned construction works including its anticipated impacts, such as traffic disruption (road closures, diversions, including notices/signs on either end and marking of the diversion routes) to help manage any disruption and disturbance to and potential conflicts with local communities. Contractor to continue with consultations with affected persons who will be most impacted (in 500m of substations and 50m of power line/cable ROWs) on at least a weekly basis to keep them fully informed of the nature of works and schedule. They will be specifically notified about the commencement of works and any high dust or noise activities (especially demolition, earthwork and piling work)</p> <p>- Contractor to undertake construction safety community awareness raising activities in local affected communities within 500m of</p>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>new substations and 50m of power lines/cable routes, especially with schools.</p> <ul style="list-style-type: none"> <li>- Contractor to undertake electrical safety community awareness raising activities in local affected communities within 500m of new substations and 50m of power lines/cable routes, and especially with schools, awareness raising activities to be repeated on completion of construction; to include electrocution risks, EMF, corona noise, etc.</li> <li>- Community awareness by DESCO will use distribution of posters, leaflets, and safety booklets to all households in Bangla within 500m of the substations and 50m from power line/cable routes in addition to face-to-face awareness raising by the contractor. These posters and safety booklets will also be available to pick up within substations, local DESCO offices etc.</li> <li>- Contractors to distribute leaflets/pamphlets/posters to the local community covering (i) health awareness including HIV/AIDS/Covid-19 and other communicable diseases, and (ii) the conduct of construction workers that can be expected.</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
<b>Construction Phase</b>								
Onsite construction activities in general including works for temporary facilities	Environmental and social impacts of construction phase -- lack of management of construction leading to environmental degradation, H&S risks for construction workers as well the local community.	<ul style="list-style-type: none"> <li>- Contractor to comply with EMP including ECOP and the approved CSEMP/H&amp;S Plan along with the IFC EHS Guidelines and ILO Code of Practice during construction.</li> <li>- DESCO to undertake at least monthly supervision visits as well as periodic "spot check" site visits to all contract packages whilst directing supervision efforts towards the most environmentally sensitive components of the project.</li> <li>- Contractor to ensure each active construction site has an EHS Supervisor with responsibility for ensuring EMP implementation on their site with enough H&amp;S Stewards per the EMP institutional arrangements.</li> <li>- Contractor's EHS team will oversee EMP implementation and provide guidance on corrective actions. The contractor through the EHS team will document activities and compliance with EHS and conditions onsite through photos and written records.</li> <li>- The contractor will comply with any corrective action plan required and cover the costs where corrective action is required due to noncompliance on behalf of</li> </ul>	<ul style="list-style-type: none"> <li>- No breaches of national regulations and/or international good practice guidelines.</li> <li>- No breaches of EMP by DESCO, contractor, subcontractors or other third parties with prompt corrective action taken if required</li> <li>- Compliance with EMP documented in Contractor's monthly progress reports</li> <li>- Status of EMP compliance</li> </ul>	Throughout construction	√	√	√	DESCO and contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>the contractor, its subcontractors or third parties.</p> <ul style="list-style-type: none"> <li>Contractors will ensure all their subcontractors and third parties, irrespective of being formally or informally employed by them, also comply with the EMP and any updates to it, as well as their own CESMP/H&amp;S Plan and that this responsibility is cascaded down any chain involved. Provisions will be incorporated into all sub-contracts to ensure compliance with the EMP and CESMP/H&amp;S Plan at all tiers; all will be given a copy of the IEE/EMP and CESMP/H&amp;S Plan.</li> <li>Contractors will put in place appropriate incentives and/or penalties for (non-) compliance by subcontractors and workers related to the use of PPE, prohibition on firewood, fishing by workers etc.</li> </ul>	documented in EMRs					
Environment safeguards training and awareness raising activities	Environmental and social impacts of construction phase -- lack of EHS management capabilities on DESCO and	<ul style="list-style-type: none"> <li>Contractors to ensure workers with a specific role have, before been allocated the task, attended specialized health and safety trainings related that role e.g., health and safety stewards, first aiders, fire safety officers, as well as ensuring workers have received task-specific trainings for working</li> </ul>	<ul style="list-style-type: none"> <li>Records of all training activities are retained. Training undertaken will be documented and reported in</li> </ul>	Throughout construction at least weekly basis	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
	Contractor's part, leading to environmental degradation, H&S risks for construction workers as well the local community	<p>at height, demolition, working with electricity, etc.</p> <ul style="list-style-type: none"> <li>- Only allow suitably trained and qualified workers to work on electrical equipment and at height, these workers must have training record of attending suitable training course on electrical safety and working at height and be provided with and wear the appropriate PPE for their role. Untrained workers must not be permitted to work with either live electricity or at height.</li> <li>- During construction site and activity specific risk assessments to be undertaken prior to the commencement of related work to identify the hazards present and applicable measures to be followed.</li> <li>- Contractor to undertake regular, compulsory awareness raising activities for all workers related to the EMP, including short monthly EHS refresher sessions, daily toolbox talks and posting of information at construction site offices, labor camps, and all work sites etc.</li> <li>- Contractors to conduct regular emergency preparedness and response drills involving all workers irrespective of them being</li> </ul>	<p>EMRs including photos and records of participants (including gender breakdown)</p> <ul style="list-style-type: none"> <li>- Trainings and awareness raising delivered in accordance with the training plan.</li> <li>- Contractors and construction workers fully aware of their responsibilities under the EMP through training</li> </ul>					



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>formally or informally employed by contractor, subcontractor or third-party to prepare them in case of an environmental or health and safety incident including fire, spillage, natural disaster, disease outbreak, etc.</p> <ul style="list-style-type: none"> <li>- Emergency preparedness and response training for construction management will include modules on first aid and fire safety including training on how to use first aid and firefighting equipment provided on-site.</li> <li>- All construction workers to be made aware of the chance-find procedure and types of finds to be reported.</li> <li>- Driver training to include advice on behaviour to reduce the potential for disturbance, including use of horn, loud radios with windows open, switching engines off when not in use, strictly observing speed limits and not accelerating or braking aggressively.</li> </ul>						
Construction workers	Upholding of the labour rights of construction workers to maintain H&S	- Contractor to allow collective bargaining and ensure that national labor law and ILO core labor standards are upheld. All workers receive at least the minimum wage as defined by national legislation and	No breach of Bangladesh labor law or labor management sub-	Throughout construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		additional work hours are adequately compensated. Workers operate within legal working hours; no more than 60 hours per week. All overtime hours are voluntary; coercion, threats or penalties are not used to pressure the workers into overtime.	plan under the CESMPs.					
Site clearance and earthworks including works for temporary facilities	Impacts to soil and vegetation cover, loss of biodiversity habitat and disturbance to flora and fauna	<ul style="list-style-type: none"> <li>- Ensure clear demarcation of the working area and avoid encroachment outside the agreed impact area. Implement careful construction practices to avoid damage to trees. Vehicle movements to be restricted to demarcated working areas to reduce unnecessary impacts to adjacent land.</li> <li>- Demarcation of trees to be avoided and retained. Only marked trees are to be felled after joint verification with PIU and approval of tree list. In case tree cutting is required, secure the necessary permit from the Forest Department and schedule tree cutting/trimming outside the bird breeding season with all trees checked by an ecologist for nesting birds and other fauna prior to being cut. Similarly, any burrows will be checked for fauna by an ecologist before any earthworks commence.</li> <li>- Record all trees removed during construction, compensation paid, and</li> </ul>	<ul style="list-style-type: none"> <li>- EMP/CSEMP requirements successfully implemented as determined through regular site checks, photographic record etc.</li> <li>- No outstanding grievances related to impacts on biodiversity etc.</li> </ul>	Throughout construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>replacements planted (including location, species, size, and economic value) and monitor their current health and survival status, for up to 1.5 years following plantation. Use of herbicides or burning to clear vegetation is strictly prohibited. Cut/trimmed trees and other vegetation trimmings will be immediately removed from the site. No dumping of cut vegetation onto agricultural fields.</p> <ul style="list-style-type: none"> <li>- Minimize removal of existing vegetation and topsoil. Excavated spoil to be reused as a landscaping material. Topsoil disturbed will be separately stored and used to restore exposed surfaces which will be promptly revegetated with native species including areas used for temporary construction facilities. If topsoil is stored for more than six months, the stacks will be monitored for anaerobic conditions and manual aeration will be undertaken if they develop. Topsoil storage areas will be protected from vehicle movements to avoid soil compaction.</li> <li>- Carry out works during the dry season outside the urban area to minimize soil erosion and sedimentation and in wet conditions, minimize the use of heavy</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>machinery. Consideration of the temporary use of removable steel plates to protect soil and its vegetation cover.</p> <ul style="list-style-type: none"> <li>- Strict prohibition of cutting of fuelwood or timber for cooking and heating by the construction workers. Contractor to provide alternative fuel source (e.g., kerosene/LPG) which will be stored safely.</li> <li>- Trainings will be provided to workers on identification of threatened species, dos and don'ts regarding chance encounter with wild animals (especially those species that can be dangerous to man like snakes, etc.) and wildlife rescue protocols; contacts for any wildlife rescue will be displayed in the contraction office</li> <li>- Construction activities to be scheduled to avoid high rainfall periods when drainage may become congested and result in flood, drainage connectivity and the natural flow of waterbodies must not be obstructed or diverted to another direction</li> </ul>						
Transportation, use of construction plant, demolition and	Impacts due to dust and vehicle emissions on air quality	- Construction equipment and vehicles to meet national emission standards including for air and noise.	- EMP/CSEMP requirements successfully implemented as determined	Throughout construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
earthworks including works for temporary facilities	Impacts due to construction noise	<ul style="list-style-type: none"> <li>- Avoid the use of diesel- or petrol-powered and use mains electricity or battery-powered equipment where practicable.</li> <li>- Belching of black smoke prohibited, use diesel fuel that has a low sulfur content, less than 0.1%.</li> <li>- Use low noise generating equipment e.g., less than 55dBA sound pressure level at 1m.</li> <li>- The use of horns in areas where sensitive receptors are located (houses, schools, clinics, mosques, etc.) will be prohibited.</li> <li>- Regularly check and maintain construction equipment and vehicles to keep them in good working condition as per the manufacturer's specifications to meet emission standards. Record all maintenance works undertaken.</li> <li>- Vehicles shall not be left running idle for more than 5 minutes.</li> <li>- Regular sprinkling of water to be undertaken for dust suppression at the construction site (excavations, earthen or otherwise dusty access roads, and material stockpiles). (i.e. 3 times per day but more often if needed during traffic movements, earthwork, dry or windy conditions) but</li> </ul>	<ul style="list-style-type: none"> <li>through regular site checks, photographic record etc.</li> <li>- No exceedance of air quality or noise levels (<b>Appendix XI</b>) or increase in baseline air or noise pollution levels where they are already exceeded.</li> <li>- No outstanding grievances related to impacts from dust, air and noise pollution.</li> </ul>					

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>avoid overwatering as it can make for muddy conditions.</p> <ul style="list-style-type: none"> <li>- Stockpiles of spoils and other dust generating materials to be kept to a minimum. Cover stockpiles with tarpaulin. Locate stockpiles as far away as possible from residential property to avoid inconvenience from fugitive dust and from waterbodies to minimize pollution. Ensure they are enclosed by a solid fence or equivalent to avoid windblown dust and sediment laden runoff entering waterbodies. Minimize double handling and drop loads.</li> <li>- Remove materials that have the potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover, seed or fence stockpiles to prevent wind whipping.</li> <li>- Trucks transporting any loose materials or loose spoil from construction sites to local approved disposal sites will be covered with tarpaulin to reduce dust.</li> <li>- Position any stationary emission sources (e.g. diesel generators, compressors, etc.) as far as practical from sensitive receptors (houses, schools, clinics, mosques, etc.)</li> </ul>						

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		<ul style="list-style-type: none"> <li>- Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems.</li> <li>- Impose speed limits on construction vehicles to minimize exhaust and dust emissions along areas where sensitive receptors are located (houses, schools, clinics, mosques, etc.) - 10km/hr on site and 30km/hr on unpaved roads otherwise per the national limits.</li> <li>- Clean dust from access roads daily and then once after all construction work is completed.</li> <li>- Strictly prohibit the burning of waste generated by project-related activities.</li> <li>- Ensure workers working near or having long exposure to vehicle exhausts and earthworks are provided with clean N95 dust masks to avoid inhalation or particulate matter and other pollutants.</li> </ul>						
Use of materials in construction works including works for	Generation of construction wastes and use of	- In locations where waste is dumped (existing site conditions) the contractor will clean the site and collect the waste for	- No deterioration in soil and water	Throughout construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
temporary facilities especially fuel, oil and chemicals	hazardous materials	<p>onward disposal before they commence their works.</p> <ul style="list-style-type: none"> <li>- Contractor to provide adequate facilities for handling and storage of construction materials to reduce the amount of waste that is caused by damage or exposure to the elements and a system for the collection/storage of wastes generated. Provide a central covered warehouse for storage of construction materials etc. Only volumes of material required for the day's work will be stored on-site</li> <li>- Fuel, oil, and chemicals used to be kept under lock and key and stored in labelled, sealed containers on drip trays to provide secondary containment. Waste oil to be stored in drums and similarly stored. In designated storage areas, these will be located on an impermeable 110% bunded surface and be under cover.</li> <li>- Mount construction plant and equipment containing oil and diesel on drip trays to catch leaks - all diesel operated equipment to have self-contained fuel tank.</li> <li>- Provide spill prevention kits (sorbent pads, loose sorbent material, etc.) at storage areas and other at-risk locations within</li> </ul>	<p>quality from baseline levels</p> <ul style="list-style-type: none"> <li>- EMP/CEMP requirements successfully implemented as determined through regular site checks, photographic record etc.</li> <li>- No outstanding pollution or waste related grievances from local communities or other interested stakeholders</li> </ul>					



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sup>1</sup>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>clearly labelled containers to immediately confine any spills or leaks that occur.</p> <ul style="list-style-type: none"> <li>- Provision of designated hard standing areas for equipment servicing, refueling and wash down at least 50m from surface water and groundwater wells, with drainage directed through oil and grease interceptors before being discharged into a settling pond prior to discharge offsite.</li> <li>- No wastewater will be discharged direct to surface waterbodies or groundwater without adequate treatment. Use of pit latrines is prohibited as is open defecation and urination. Provision of adequate on-site sanitation facilities including connection to existing sewerage system linked to a wastewater treatment plant, septic tanks with soak-aways or alternative temporary sanitary facilities that do not allow untreated disposal of sewage to adjacent water bodies e.g., portable toilets where the wastewater generated is enclosed in a container and will later be taken offsite for wastewater treatment and disposal.</li> <li>- Minimize waste generation, restrict use of plastics and polyethene and use recyclable/biodegradable materials during</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>construction to the extent possible. Ensure that the waste hierarchy is followed including prevention, minimization, reuse and recycling -- maximum reuse and recycling of waste.</p> <ul style="list-style-type: none"> <li>- Any plant or equipment that is rejected during the installation and commissioning due to damage or failure to immediately be removed from the site and returned to the supplier.</li> <li>- Constructions wastes, rejects, parts, etc. are not to be dumped outside substation boundaries or in drains/khals/beels/rivers or on agricultural land but stored for disposal in a temporary designated storage area.</li> <li>- It must be ensured that spoil reused on site is not contaminated with solid and hazardous waste (including oil spills) by maintaining good housekeeping and waste segregation/storage/transport/disposal. If spoil is contaminated it will need to be taken off site by a licensed waste management operator for disposal at a licensed waste management facility suitable for accepting hazardous waste.</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<ul style="list-style-type: none"> <li>- Records of excavated spoil, generated waste, and transfer records will be kept by the contractors. Contractors will keep copies of the waste management company's licenses on file at the site office. Document all volumes and types of wastes generated and removed off site (inert, solid, hazardous) using transfer notes, to be taken by licensed waste contractors who should reuse/recycle or dispose of the waste according to type to suitably licensed and engineered waste management facilities. Spoil that is not required on site can be used by local communities if not contaminated.</li> <li>- Collect and transport construction waste to appropriately engineered and licensed solid/hazardous waste management facilities. Unsanitary open dumps and are not to be used by the contractor. Municipal waste collection systems must not be used as this is likely to mean that the waste is open dumped. Hazardous waste will need to be safely and soundly separately stored for disposal to suitably licensed hazardous waste management facilities. Contractor will identify the suitable vendors/facilities</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		to take the waste generated for approval by the PIU.						
Onsite construction activities in general including works for temporary facilities	Health and safety risks to workers and the community	<ul style="list-style-type: none"> <li>- Contractor is responsible for ensuring H&amp;S of everyone on construction site including visitors and sub-contractor workers regardless they have been formally or informally employed.</li> <li>- Ensure adequate health and safety supervision is always on site (if staff temporarily off sick or on short term leave of less than a fortnight contractor to provide a named alternate in advance; if safeguard staff are on longer term leave, are posted elsewhere, or resign, contractor to ensure replacement CV is submitted to DESCO in 7 days of the contractor becoming aware with the staff joining the site within one month)</li> <li>- Require workers to confirm they have seen and understood the requirements of the health and safety plan before proceeding with the work.</li> <li>- Construction plant and equipment used on or around the site will be modern and fitted with appropriate safety devices.</li> <li>- Ensure adequate health and safety signage is provided - using graphics and in Bangla</li> </ul>	<ul style="list-style-type: none"> <li>- EMP/CESMP requirements successfully implemented as determined through regular site checks, photographic record etc.</li> <li>- No outstanding health and safety grievances from workers, local communities or other interested stakeholders</li> </ul>	Throughout construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>and other languages of the workers found on site.</p> <ul style="list-style-type: none"> <li>- Ensure shaded rest area with 4 liters of drinking water per worker and toilets that are easily accessible and can accommodate the number of workers on site.</li> <li>- MSDS or equivalent data/information in Bangla and other languages of the construction workers are to be readily available to any exposed workers and the first-aid personnel.</li> <li>- Ensure good housekeeping at construction site, storage areas, staff accommodation, etc. -- to be kept neat and tidy, e.g., no materials, equipment, trash laying around, cleanup worksites so that they are free of debris on daily basis.</li> <li>- If works are not completed within the day the contractor must not leave any hazardous conditions (e.g., unsigned, unfenced, and unlit open excavations without means of escape and emergency contacts in case an accident occurs) overnight unless absolutely no access by public can be ensured.</li> <li>- In the dense urban areas transport equipment only during non-rush hours i.e.,</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
		<p>avoid the hours of 6am to 8am and 4pm to 6 pm to minimize traffic congestion.</p> <ul style="list-style-type: none"> <li>- Road safety standards and norms to be strictly implemented by contractor, construction vehicles to strictly follow road regulations</li> <li>- During construction works, ensure qualified first aider and trained fire marshal is always available on-site with an appropriately equipped first aid kit and appropriate fire extinguisher and other firefighting equipment immediately available for use.</li> <li>- Provide an ambulance for more serious cases to transport the patient to the hospital for treatment</li> <li>- Emergency contact number and details for medical, fire, etc. are to be displayed in all construction sites.</li> <li>- Construction workers to be given medical checkup per statutory requirements before being allowed on site; medical records are to be maintained by the contractor's labor officer.</li> </ul>						
Site reinstatement including of	Unanticipated damage to existing public	- A photographic record will have been made of the pre-construction condition of land used for temporary facilities before	- Land reinstated to its former condition as	On the completion of construction works prior to	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO <sub>1</sub>	CSC <sup>2</sup>	Contractor <sup>3</sup>	
temporary facilities	and private property	<p>construction to inform the reinstatement works. After completion of the construction work any temporary structures will be completely removed and the temporary land will be restored to its earlier condition with all waste being removed.</p> <p>- All planned and unanticipated damage to existing public and private property will be restored to pre-project condition and/or compensated at the cost of the contractor.</p>	<p>compared to photographic record.</p> <p>- No grievances regarding reinstatement of land and property to its former condition.</p>	handover to DESCO				

## Part 2 – New Substations and Bay Extensions

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
<b>Detailed Design and Pre-Construction Phase</b>								
Substation detailed design and construction EHS management planning during pre-construction	Environmental and social impacts of construction and O&M phase -- lack of management of detailed design, construction and O&M leading to environmental degradation, H&S risks for construction and O&M workers as well the local community	<ul style="list-style-type: none"> <li>– Detailed design to ensure works will only take place on modified habitat found within the boundaries of the allocated substation land.</li> <li>– Detailed design to minimize the need to cut mature trees that are present at the substation sites</li> <li>– Detailed design to minimize visual impact and clutter with buildings in keeping with the local vernacular. Landscaping to be included as part of the detailed design to enhance ecology and visual appearance of the substation.</li> <li>– Take a life-cycle approach to detailed design, considering the use of construction materials and the energy and water efficiency of the building during operation adopting the “green building” concept e.g., using natural ventilation for reducing the need for air conditioners. Detailed design is to include rainwater harvesting and enable DESCO to readily fit additional</li> </ul>	Detailed Design cleared and approved reflects EMP requirements to minimize impacts and risks on EHS during subsequent stages of the project	Prior to detailed design approval and for implementation during construction	√	√	√	DESCO and Contract Cost



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>solar panels on the building rooftop once operational.</p> <ul style="list-style-type: none"> <li>- Selection of an environmentally safe and sound solar photovoltaic panel from a manufacturer who offers a facility for return of end-of-life equipment. Solar panels installed must not contain hazardous materials e.g., cadmium, lead, or selenium. Equipment purchased for use on the project is to be accompanied by letter from the manufacturer stating its composition and the leaching potential of any heavy metal content to determine if it is acceptable and how it is to be disposed on at end-of-life. Solar panels to have an anti-reflective coating to minimize glint and glare and maximize light absorption, racking to be anti-reflective made of galvanized steel or aluminum.</li> <li>- Detailed design to ensure all lighting is of energy efficient LED type with solar powered LED lighting where practical Use of fluorescent/HPSV lamps will be avoided since they are less energy efficient/classed as</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>hazardous waste for purposes of disposal.</p> <ul style="list-style-type: none"> <li>- Outdoor lighting to be installed must be of low intensity with little or no blue wavelength and operated using passive infrared (PIR) technology movement sensors set at person height so as not to be kept permanently on overnight, it must be directional and shielded, so light does not fall outside the site boundary.</li> </ul>						
	Emissions of SF6, a potent greenhouse gas, to the atmosphere	<ul style="list-style-type: none"> <li>- Use of alternative insulation medium (such as Hydrophobic Cycloaliphatic Epoxy) to be considered as the preferred option.</li> <li>- If no alternative the use of SF6 in gas insulated equipment must be minimized.</li> <li>- Detailed design of SF6 insulated equipment (e.g., switchgear) and GIS substations will comply with international norms and standards for handling, storage, and management of SF6.</li> <li>- SF6 insulated equipment and GIS will be hermetically pressure sealed "sealed for life" units, tested and</li> </ul>	Detailed Design cleared and approved reflects EMP requirements including leak detection system with copies of equipment purchase letters included in EMRs, all SF6 project equipment must have <0.1% leakage rate etc.	Prior to detailed design approval and for implementation during construction	√	√	√	Contract Cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>guaranteed by the supplier at less than 0.1% leakage</p> <ul style="list-style-type: none"> <li>- rate. Equipment purchased by DESCO or the contractor for use on the project is to be accompanied by letter from the manufacturer stating that it meets these requirements.</li> <li>- GIS and substations with SF6 insulated equipment to be equipped with a Leak Detection System (LDS) for SF6. This will be designed such that any leakage of SF6 will trigger an alarm to the nearest concerned O&amp;M location so that staff may immediately rectify any leak.</li> <li>- Provision of SF6 leakage detection kit at each substation.</li> <li>- SF6 emergency response plan to be prepared by contractor for construction. DESCO in relation to operation to deal with event of an accidental leak.</li> <li>- SF6 in fire extinguishers provided at substations to be avoided.</li> </ul>						
	Pollution of soils and water due to discharge of transformer oil or	- Use of PCBs will be prohibited in all new transformers and other substation equipment. Equipment purchased by DESCO or the	Detailed Design cleared and approved reflects EMP requirements with copies of equipment purchase	Prior to detailed design approval and for implementation	√	√	√	DESCO and Contract Cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
	other fuel, oil or chemicals into the environment due to spills or leaks or discharge of wastewater from substation washrooms	<p>contractor for use on the project is to be accompanied by letter from the manufacturer stating that it is guaranteed PCB free and to be labelled as PCB free before its installation.</p> <ul style="list-style-type: none"> <li>- Contractor to provide DESCO with Material Data Sheets for insulating oil meeting technical specifications for use in new transformers.</li> <li>- Toilets/washrooms to be connected to either existing sewerage system (connected to a sewage treatment plant) or to septic tank with soakaway sufficient distance from waterbodies - any discharge to surface water must meet effluent quality standards in Appendix XI.</li> <li>- Detailed design of substations to locate new transformers, storage areas and septic tanks/soakaway as far away as possible from any surface waterbodies and groundwater sources to reduce pollution risk. If within 500m of surface water or groundwater well further assessment to be carried out by contractor to demonstrate using a source-pathway-</li> </ul>	letters and MDS included in EMRs.	during construction				

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>receptor model there will be no adverse impact on aquatic ecology or human health.</p> <ul style="list-style-type: none"> <li>- Detailed design of transformers and fuel, oil chemical, and waste storage areas to incorporate impermeable concrete surface bunded to 110% volume which is not connected to the drainage system to collect spills and leaks.</li> <li>- Detailed design of fuel, oil chemical, and materials and waste storage areas to provide for a covered storage area of sufficient size to accommodate all anticipated storage requirements with segregation of wastes, ensure storage areas can be locked, are well-ventilated and will not reach extreme temperatures. Ensure space also provided in the storage area for solid and hazardous waste garbage bins to be stored.</li> <li>- Provide spill prevention kits (sorberent pads, loose sorberent material, etc.) at storage areas and other at-risk locations within clearly labelled containers.</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Conduct a flood and drainage risk assessment and incorporate effective drainage design (allowing for climate change) to prevent possible flooding or waterlogging of the substation during the wet season, whilst ensuring that surface runoff from the project site is no more than the existing site runoff rate.</li> <li>- No drainage water will be permitted to discharge direct to surface water allowed, oil interceptors are to be fitted on all drainage to catch oil spill.</li> </ul>						
	Health and safety risks related to fire safety and emergency response	<ul style="list-style-type: none"> <li>- Detailed design of control buildings to follow national building and fire safety standards as well as international good practice</li> <li>- Provide fire walls on all transformers.</li> <li>- Detailed design of building to include emergency exits with emergency exit signage</li> <li>- Provide fully stocked, in-date first aid kit installed in a prominent, signed position, first aid posters and emergency contacts to also be displayed</li> </ul>	Detailed Design cleared and approved reflects EMP requirements	Prior to detailed design approval and for implementation during construction	√	√	√	DESCO and Contract Cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Provide eye wash station and water supply to shower located near the storage areas for fuel/oil/chemicals</li> <li>- Detailed design of substations to include fire safety measures including detector, alarm, and firefighting equipment in accordance with national regulations and IFC EHS Guidelines on OHS.</li> <li>- Provide sand buckets, full of sand, placed in a prominent, signed location near to fire-risk locations such as transformers and oil storage areas.</li> <li>- Provide fire extinguishers (including for oil and electric fires) in a prominent, signed location near to fire-risk locations such as transformers and oil storage areas with service and expiration dates clearly labelled.</li> <li>- Provide automatic fire alarm and fire suppression system in the control buildings along with posters on fire safety.</li> <li>- All electrical hazards will feature written and visual warning signs that meet the IEEE standards to include the ISO 7010 "Hazard Type: Electrical</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		Symbol" warning of the risk of electrocution.						
	Impacts to health and safety of O&M workers and the public	<ul style="list-style-type: none"> <li>- Use of any asbestos containing materials is prohibited.</li> <li>- Include in the design of all substations (if not already present or in poor condition) and around transformers a secure wall or fence sufficiently high it cannot be climbed over with lockable entry featuring written and visual warning signs to include the ISO 7010 "Hazard Type: Electrical Symbol" warning of the risk of electrocution.</li> <li>- Indoor work areas at substations to be well ventilated and naturally or artificially well-lit in accordance with national regulations and the IFC EHS Guidelines on OHS.</li> <li>- Detailed design of substations to ensure EMF levels within the substation boundary are within international good practice levels as per International Commission on Non-Ionizing Radiation Protection (ICNIRP) (reference and peak values)</li> </ul>	<ul style="list-style-type: none"> <li>- Detailed Design cleared and approved reflects EMP requirements</li> <li>- Compliance with ICNRP occupational/community EMF exposure levels (reference and peak values)</li> </ul>	Prior to detailed design approval and for implementation during construction	√	√	√	DESCO and Contract Cost



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>for occupational exposure;<sup>7</sup> in areas where EMF levels could be exceeded posting of written and visual warning signs. Use of shielding equipment/materials to decrease EMF exposure as required.</p> <ul style="list-style-type: none"> <li>- Detailed design of substations to ensure EMF levels at the boundary is within international good practice levels as per International Commission on Non-Ionizing Radiation Protection (ICNIRP) (reference and peak values) applicable to the public exposure.</li> <li>- Pit latrines and disposal of untreated sanitary wastewater to surface or groundwater is prohibited. Staff will reside off site but detailed design of substations to include adequate sanitation and welfare facilities for all workers to be posted at or visiting the substations including indoor kitchen, eating and rest areas and adequate number of indoor toilets/washrooms (one per six staff and separate for men/women with hot and cold running water hand washing</li> </ul>						

<sup>7</sup> <https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf>

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>facilities) which are connected to either existing sewerage system or to septic tank with soakaway. Provide a dedicated shelter and rest area for the 24-hour security guards, shielding them from rain, wind, and extreme (hot and cold) temperatures.</p> <ul style="list-style-type: none"> <li>- Disposal of worker generated waste (e.g., plastic bottles) on-site is prohibited and adequate waste storage areas to be incorporated into the detailed design. Composting of food waste may be permitted on-site if detailed design incorporates enclosed composting facilities (enclosed to avoid attraction of vermin etc.) located away from accommodation and any properties outside the site boundary.</li> <li>- Source of drinking water that meets drinking water standards to be provided to substations. If any surface or groundwater sources are proposed for use in substations, Contractor is to undertake a baseline water quality sampling per EMoP (Appendix XII) to confirm its suitability for use. If drinking water standards are not met, detailed</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>design to consider alternative source or include water treatment facilities (RO) at the substation to facilitate safe drinking water supply. Detailed design to include water meters for monitoring of water abstracted.</p> <ul style="list-style-type: none"> <li>– Provide gated, safe vehicular access for entry/exit off the public highway having adequate sight lines for all drivers and warning signs of entrance as well as adequate parking for cars.</li> </ul>						
	Impacts from dust generated by earthworks	<ul style="list-style-type: none"> <li>– Detailed design of substations to minimize cut and fill and land raising to reduce the extent of earthworks and thus dust generation during construction, also maximize reuse of spoil to minimize the need for disposal off site.</li> <li>– During detailed design, contractors will quantify extent of earthworks required, amount of spoil to be generated and location for disposal of excavated spoil through landscaping within the site boundary – generation of excess spoil to be avoided.</li> </ul>	Detailed Design cleared and approved reflects EMP requirements	Prior to detailed design approval and for implementation during construction	√	√	√	DESCO and Contract Cost
	Impacts due to substation noise	<ul style="list-style-type: none"> <li>– Detailed design to ensure maximum sound power level of equipment at 1 m is 85 dBA through use of sound</li> </ul>	– Detailed Design cleared and approved reflects EMP requirements	Prior to detailed design approval and for	√	√	√	DESCO and Contract Cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>attenuation, in areas where these noise levels will be exceeded OHS noise warning signage identifying that ear protection to be worn must be installed as part of detailed design.</p> <ul style="list-style-type: none"> <li>- Detailed design of transformers and other noise sources to be located as far as practical from the substation site boundary since noise diminishes with distance.</li> <li>- Contractors will be required to measure and confirm the distance from their detailed design and construction works to sensitive receptors to confirm if the noise standards can be met. If any properties are within 100m of the substation site boundary<sup>8</sup> then baseline measurements must be carried out during detailed design (refer to EMoP Appendix XII) by the contractor who will also undertake quantitative noise assessment using internationally recognized noise</li> </ul>	<ul style="list-style-type: none"> <li>- Compliance with noise levels applicable to the substation location per Appendix XI</li> </ul>	implementation during construction				

<sup>8</sup> Per the EIA general construction impacts and operational noise exceedance in silent zone might be possible up to 100m. However, if the louder types of piling (impact or vibratory hammers) that generate over 85 dBA are intended to be used by the contractor baseline measurements must be carried out at substation sites with any properties present in 500m due to the increased impact area that will result.

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>modelling software of (i) the detailed design considering low frequencies associated with transformer hum and (ii) construction methods to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation – industrial levels must be achieved at the site boundary with residential levels at the nearest properties with silent levels achieved when schools are present.</p> <p>– Given transformers are generally in the range 60-80 dBA at 1m if outdoors they are to be located at least 5 m inside the substation site boundary but this distance will need to be increase to between 20m – 100m depending on the land use adjacent to the substation for noise limits to be met without additional attenuation. The quietest available equipment with manufacturer-supplied noise mitigation will be installed. If noise levels cannot be met through siting and design alone detailed design to incorporate acoustic barrier designed to international good practice around</p>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>either the noise source and/or substation site boundary to attenuate noise to level such that noise levels at the receptors will be met. As operational noise is permanent the acoustic noise barrier will need to be a permanent installation as part of the detailed design</p> <p>- Contractor to avoid soil compaction, piling, blasting and other vibration inducing activities as much as possible. If needed a management plan is to be prepared for approval. Oil will not be used as a drilling fluid. The plan will include measures to avoid water pollution from use of bentonite clay slurry if required - decanting ponds will need to be fully enclosed to avoid spills or leaks to adjacent land. Where water is used any excess must be disposed of to open ground for percolation, or if no open ground to waiting tanker trucks for proper disposal. Drilling fluid must not be disposed of to surface water. The quietest equipment available will be used, noise attenuation measures will include, (i) fitting of high efficiency mufflers to</p>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>the noise generating equipment; and (ii) keeping acoustic enclosures around piling/drilling equipment. For piling it will not be possible to use the louder types of piling (impact or vibratory hammers) that generate over 85 dBA without resulting in a significant impact because noise from piling equipment of 120 dBA at 1m would exceed 85dBA, the level at which hearing damage is caused at adjacent properties if found within 100m. If noise levels are still exceeded a temporary acoustic noise barrier will be provided or alternatively temporary relocation of occupants during works to a rented property. In locations where soil compaction, piling, blasting and other vibration inducing activities are unavoidable Contractor to identify properties within the zone of influence and undertake pre-construction structural surveys to identify level of risk with reference to the guideline vibration levels per Appendix XI. If there is a risk of structural damage to properties due to their current condition, consider</p>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		alternative construction methods or temporary relocation of occupants during works if at risk to a rented property. Consider the need to install monitors to monitor structural movement. Structural or cosmetic damage to be repaired by Contractor to at least pre-project condition at their own cost.						
	Impacts to surface and groundwater resources	<ul style="list-style-type: none"> <li>- Construction activities must be planned not to limit the availability of or restrict access to water sources (e.g., groundwater wells) used by local communities; natural flow of any surface water or drains must not be obstructed or if not possible diverted through a drainage system to another direction.</li> <li>- Any piling or excavation works within 500m of groundwater wells used as a drinking water source by local communities will require pre-construction and post construction water quality monitoring against drinking water standards to ensure there is no contamination of the water supply.</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring data demonstrates compliance with national standards</li> <li>- No unresolved grievances regarding water resources</li> </ul>	Prior to mobilization and site establishment and for implementation during construction	√	√	√	Contract cost



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Construction water to be sourced from an existing licensed commercial supplier (preferred option especially for potable water supplies), where available, or rainwater harvesting. If using an existing surface water or an existing borewell for construction water, permissions to be obtained from the relevant authorities together with the agreement of local communities.</li> <li>- Prior agreement is required from local community users to use any existing surface water/borewell or local piped water either temporarily during construction or permanently for substations; in cases where use of local water source is not agreed, contractor to import tanked water to the project area.</li> <li>- No groundwater will be used in locations without additional groundwater capacity - in other locations groundwater will only be used after it has been confirmed through assessment that there will be no additional stress on groundwater resources as a result.</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>– Permissions for any new borewell installation (for construction or permanent supply to substation) to be obtained together with agreement of local communities before abstraction, include water meter for monitoring of water abstracted.</li> </ul>						
	Impacts of temporary access roads	<ul style="list-style-type: none"> <li>– All substations will be accessed via the existing road network and no new access road will be constructed, although new entranceways may be created onto main roads. Junctions between new entrances and existing roads will not impede or damage the latter nor any associated drainage channels, public utilities, etc.</li> <li>– A photographic record will be made of the pre-construction condition of access roads to inform the reinstatement works. After completion of the construction work access roads will be restored to their original condition.</li> </ul>	<ul style="list-style-type: none"> <li>– Access roads reinstated to their former condition as compared to photographic record.</li> <li>– No grievances regarding reinstatement of access roads to their former condition.</li> </ul>	Prior to mobilization and site establishment and for implementation during construction	√	√	√	Contract cost
Construction Phase (including demolition by EPC contractors)								
Onsite construction activities	Emissions of SF6, a potent greenhouse gas, to the atmosphere	<ul style="list-style-type: none"> <li>– Careful installation of SF6 insulated equipment (e.g., switchgear) and GIS substations following international norms and standards for handling,</li> </ul>	<ul style="list-style-type: none"> <li>– EMP/CESMP requirements successfully implemented as</li> </ul>	Throughout construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>storage, and management of SF6 to avoid damage/ruptures/leakages of SF6 gas.</p> <ul style="list-style-type: none"> <li>- Provision of SF6 awareness raising to construction workers and training of O&amp;M staff on the operation of the SF6 LDS and emergency response procedures during the commissioning stages.</li> </ul>	determined through regular site checks, photographic record etc.					
	Impacts due to dust from earthworks	<ul style="list-style-type: none"> <li>- Plan the construction site layout so that machinery and dust-causing activities are located away from receptors, as far as is possible.</li> <li>- Erect solid screens or barriers around the dusty activities or the site boundary that are at least as high as any stockpiles on site to fully enclose operations.</li> <li>- Contractors to undertake quantitative air quality monitoring as per the EMoP (Appendix XII). In addition to quantitative monitoring (as per EMoP) contractors will undertake weekly dust soiling checks of surfaces of adjacent properties during earthworks and help with cleaning of external surfaces of property if dust is evident.</li> </ul>	<ul style="list-style-type: none"> <li>- EMP/CESMP requirements successfully implemented as determined through regular site checks, photographic record etc.</li> <li>- No exceedance of air quality levels (Appendix XI) or increase in baseline air pollution levels where they are already exceeded.</li> <li>- No outstanding grievances related to impacts from dust and air pollution.</li> </ul>	Throughout construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- If air quality levels are exceeded, an increase in existing background air pollution is recorded where they were already exceeded, or complaints are received contractor will be required to implement additional dust mitigation e.g., barricading/isolating sources of dust, use of wheel wash, adjusting working methods, to ensure the levels are met.</li> </ul>						
	Impacts due to construction noise	<ul style="list-style-type: none"> <li>- During night (6am to 10pm) no works will be permitted at substations.</li> <li>- Contractor's maximum working hours (including the movement of heavy vehicles for construction on off-site access roads) will be 7 am – 7 pm.</li> <li>- Residents within 500m will be informed well in advance of the construction schedule for noisy activities taking place on-site. Noisy construction activity at substations (especially demolition and piling works) will only take place between the hours of 10 am - 4 pm. No noisy work and heavy vehicle movements will take place on Saturdays and</li> </ul>	<ul style="list-style-type: none"> <li>- EMP/CESMP requirements successfully implemented as determined through regular site checks, photographic record etc.</li> <li>- No exceedance of noise levels (Appendix XI) or increase in baseline noise levels where they are already exceeded.</li> <li>- No outstanding grievances related to impacts from noise and vibration.</li> </ul>	Throughout construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>during school/college/university exam periods. No work on Sundays, holidays and festival days. Sensitive receptors to be consulted with any other special days when they would wish noise levels to be minimized.</p> <ul style="list-style-type: none"> <li>- For substations with properties in 50m loud construction noise must be limited to only very short periods of activity to minimize disturbance.</li> <li>- Layout substations to keep noisiest construction works the furthest distance possible from adjacent receptors and adopt construction methods that ensure noise generated from construction is minimized. If the noise levels at the site boundary or receptors will exceed the required noise levels, are more than 3dBA above background when already exceeded, or there are complaints then a temporary acoustically designed noise barrier will need to be installed around the substation perimeter to be able to meet required noise level.</li> <li>- Sound levels received by workers must not be over 85 dB(A) during</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>continuation of 8 working hours without wearing PPE.</p> <p>– Contractors to undertake quantitative noise monitoring as per the EMoP (Appendix XII). If noise levels are exceeded, an increase in existing or noise levels &gt;3dBA recorded where they were already exceeded, or complaints are received contractor will be required to implement additional noise mitigation e.g., adjusting working methods, or placing of temporary acoustically designed noise barriers to ensure met.</p>						
	Site restoration	– Rehabilitate any disturbed areas beyond the substation infrastructure footprint to through revegetation and landscaping using native species.	– EMP/CESMP requirements successfully implemented as determined through regular site checks, photographic record etc.	On the completion of construction works prior to handover to DESCO	√	√	√	Contract cost
<b>O&amp;M Phase (Measures to be Implemented by DESCO including RMU management on Distribution Network)</b>								

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
Operation and maintenance activities	EHS impacts and risks in general	<ul style="list-style-type: none"> <li>- Update operational SOP for substations covering pollution control, solid and hazardous waste management, health and safety risk assessments and management plans addressing both occupational and community risks and including permit to work system of critical activities such as electrical or work at height and emergency preparedness and response provisions (content will be similar to those of construction phase but tailored to reflect operational aspects)</li> <li>- Substation workers will need to be trained in update SOP and good housekeeping practices including how to clean up oil/fuel spills and dispose of contaminated sorbent material which would be treated as hazardous waste etc.</li> <li>- During maintenance activities mitigation measures applicable to the construction phase are also applicable to DESCO maintenance workers or contractors and are to be followed</li> </ul>	<ul style="list-style-type: none"> <li>- Compliance with GOB regulations</li> <li>- No fatalities or lost time incidents 100% of H&amp;S incidents including near miss recorded, immediately investigated, and corrective action taken to prevent repeat.</li> <li>- Compliance with noise levels: 1- hour LAeq 70 dB(A) at the site boundary, 60dB(A) within commercial zones, 45 dB(A) at the nearest residential properties including those in commercial zones and 40dB(A) within 100m of silent zones</li> <li>- Compliance with ICNRP occupational/community EMF exposure levels</li> </ul>	Throughout the O&M Phase	√			DESCO

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Material Safety Data Sheets for all fuel/oil/chemical kept on site to be posted</li> <li>- Records volumes of waste generated and keep transfer records at the substation with copies of the waste management company's licenses on file.</li> <li>- Defunct solar PV and also batteries (e.g., lead acid) installed at the substations at their end-of-life will need to be disposed of as hazardous waste.</li> <li>- During O&amp;M, internal audits will be undertaken by the DESCO ESU Environment Officer and Health and Safety Officer</li> </ul>	<p>(reference and peak values) at substations</p> <ul style="list-style-type: none"> <li>- EMP/CESMP requirements successfully implemented as determined through regular site checks, photographic record etc.</li> <li>- No outstanding grievances from local communities or other interested stakeholders</li> </ul>					
	Gas insulated equipment including ring main units (RMU) in distribution network – release of SF6 as GHG	<ul style="list-style-type: none"> <li>- Inventory to be maintained of all SF6 containing equipment at SS and RMU, their make and model, volume of SF6 contained, details of repair works undertaken, dates of SF6 replenishment, leakage incidents etc.</li> <li>- Inventory to be used to monitor SF6 leakage from SS and RMU. If trend of lowering gas pressure is observed investigate the cause and rectify any</li> </ul>						



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>leak per the manufacturer's instruction.</p> <ul style="list-style-type: none"> <li>- If SF6 used on site or in RMU carry out regular inspections and periodic preventative maintenance to minimize SF6 leakages; monitor SF6 leakage rates using leak detection equipment</li> <li>- For RMU SF6 leakages to trigger an alarm at the nearest concerned SS from which staff at to immediately attend to stop the leakage.</li> <li>- SOP to define a safe SF6 retrieval arrangement with appropriate handling, storage, disposal process for end-of-life circuit breakers and RMU equipment by a certified industrial waste management company who will need to remove SF6 and treat the equipment prior to disposal in accordance international good practice International Electrotechnical Commission (IEC) standard 61634 to ensure SF6 not released to atmosphere.</li> </ul>						
	Occupational health safety of	<ul style="list-style-type: none"> <li>- Maintain incident logbook and medical tests / health check-up of staff</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
	maintenance staff - accident risk	<ul style="list-style-type: none"> <li>- Provide everyone who enters the SS with an OHS induction</li> <li>- Keep vents/windows unblocked and replace defunct bulbs/lights immediately</li> <li>- Ensure all SS workers receive basic first aid and firefighting training with annual refreshers</li> <li>- Ensure that at least one staff at SS is fully trained as a first aider and fire marshal</li> <li>- Maintain fully stocked, in-date first aid kit, keep first aid posters and emergency contact lists that are posted up to date</li> <li>- Maintain firefighting systems including in-date fire extinguishers and full sand buckets and keep fire safety posters up Carry out regular inspections and periodic maintenance to ensure electrical standards are being upheld</li> <li>- Keep emergency exits clear at all times and maintain emergency exit signs Maintain written warning signages including the ISO 7010 Hazard Type: Electrical Symbol warning of the risk of electrocution.</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Collect, segregate, and store in the designated and labelled storage areas all wastes including food wastes for onward disposal as per construction.</li> <li>- Undertake regular pest control using integrated pest management approach Maintain vegetation at the SS that poses a health and safety hazard Prohibit the use of herbicides, pesticides or burning to control any vegetation growth or to manage vegetation waste.</li> <li>- O&amp;M to be performed only by suitably qualified and experienced workers who are regularly trained staff of DESCO or a contractor under supervision of a Health and Safety Officer following the SOP for H&amp;S.</li> <li>- O&amp;M workers to be given required PPE and other requisite safety equipment, provide sufficient PPE spares available on site for visitors etc.</li> <li>- Sanitation and welfare facilities as per construction will also be required for O&amp;M workers.</li> <li>- Continue to provide potable drinking water supply meeting GoB drinking</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>water standards (regular testing of drinking water is included in EMoP scope)</p> <ul style="list-style-type: none"> <li>- Cleaning of toilets on daily basis, use of disinfectant and floor cleaners; keep toilets/septic tank/soakaway maintained Periodic spot monitoring using mobile phone app of noise levels and ambient EMF for substations at the boundary fence/near transformers to ensure they are below the occupational/community noise levels and ICNRP occupational/community EMF exposure levels</li> </ul>						
	Community H&S risks – impact on surrounding community, noise, EMF, accidents etc.	<ul style="list-style-type: none"> <li>- Maintain security and prevent entry by the local community by maintaining adequate boundary fencing or wall, always keeping control room doors and gates shut, and having security persons present 24x7 to prevent unauthorized public access and trespass.</li> <li>- RMU in the public domain to be kept secure (doors/gates shut and locked) There is a risk of fire associated with RMU although use of solid or SF6 gas insulation minimizes this. All</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>necessary precautions to ensure emergency procedures are to be posted and fire extinguishers available at the location of the RMUs in the event of a fire.</p> <ul style="list-style-type: none"> <li>- Maintain written warning signages including the ISO 7010 Hazard Type: Electrical Symbol warning of the risk of electrocution.</li> <li>- Regular checks and periodic maintenance of equipment like transformers and capacitors to minimize corona noise emissions.</li> <li>- DESCO in conjunction with local municipalities and the media with the support of CSOs to continue to organize health and safety campaigns on electrical safety community awareness raising activities in local communities and schools within 500 m of the substations</li> </ul>						
	Use of mineral oil for transformers – accidental spillage contaminating both land and water	<ul style="list-style-type: none"> <li>- Maintain inventory of transformers on site, make, model, risk of PCBs and other details including transformer test report, details any maintenance works undertaken, dates oil changes, leakage incidents etc.</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Carry out regular inspections and periodic preventive maintenance to minimize oil leakages; ensure valves, nuts and bolts are fully functional and tightly secured, ensure rubber seals of radiators are intact</li> <li>- The acceptance of mineral oil at substation to be accompanied with Material Safety Data Sheet and certification that it is PCB free.</li> <li>- Waste oil to be disposed as hazardous waste using appropriately licensed waste management company with environmentally safe and sound storage, transport, and disposal</li> <li>- Maintain spill management materials (sorberent pads, loose sorberent material, sand, etc.) next to storage areas for immediately soaking up any leaks or spills that do accidentally occur</li> </ul>						
<b>Site-specific Mitigation at Substation (SS) Sites</b>								
<b>Airport SS</b>								
<b>Detailed Design and Preconstruction Phase</b>								
Demolition works	Risk of site being contaminated by asbestos and other waste materials due	- On the site there are office buildings for the Airport Authority. This land has been donated to DESCO and the buildings and materials/debris/waste	- No asbestos was present prior to demolition work. If present asbestos remedial action plan	Prior to demolition of the buildings by Airport Authority	√	N/A	N/A	DESCO in conjunction with Airport Authority

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
	to demolition of office buildings – no ACMs are anticipated to be present, but the risk exists as ACMs not banned by national laws	<p>stored will be removed by the Authority. Demolition will be undertaken prior to hand-over of the land to DESCO. DESCO will work with the Authority to ensure that asbestos survey is undertaken prior to demolition. If present this is to be treated as an unanticipated impact and asbestos remedial action plan developed and implemented by the Authority prior to demolition.</p> <p>– DESCO will confirm if asbestos requirements were followed, and all demolition material/waste has been removed from site such that it is “clean” for construction prior to taking over the land.</p>	<p>developed and implemented prior to demolition.</p> <p>– Demolition of any buildings containing ACMs follow national laws and regulations, and international good practice such as ADB’s Good Practice Guidance on the Use of Asbestos.</p> <p>– No workers and communities affected by exposure to ACMs.</p>					
Detailed design	Low lying land at risk of waterlogging during heavy rain, waterbody is present immediately adjacent to the boundary wall	– Contractor to conduct a flood risk and drainage assessment and ensure that all substation equipment is raised on foundations located above the flood level including an allowance for climate change plus freeboard.	Substation design is climate resilient.	Prior to approval of detailed design	√	√	√	Contract cost
	Residential properties are located within	– Presence of school the opposite side of the substation means that the	– No breaches of compliance with noise standards during O&M.	Prior to approval of detailed design	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
	100m – per the EIA operational noise exceedance in silent zone might be possible up to 100m	<ul style="list-style-type: none"> <li>applicable noise limit at this site is of “silent zone”</li> <li>– Due to proximity of properties to substation site contractor to appropriately locate transformers if possible so they are screened by the control building and undertake quantitative noise assessment using internationally recognized noise modelling software of the detailed design to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>– No outstanding noise grievances from local communities or other interested stakeholders.</li> </ul>					
Detailed design	Loss of mature trees	<ul style="list-style-type: none"> <li>– Detailed design is to minimize the loss of mature trees at the substation site; permission to be obtained by the contractor for any trees to be cut and replacement planting at 1:3 ratio to be undertaken.</li> </ul>	Trees cut are compensated for at 1:3 (no net loss of biodiversity)	Prior to approval of detailed design	√	√	√	Contract cost
Demolition and substation construction activities	Disturbance to residential properties immediately adjacent from the construction traffic and works	<ul style="list-style-type: none"> <li>– Presence of school the opposite side of the substation means that the applicable noise limit at this site is of “silent zone”</li> <li>– CSEMP to include the following measures as well reflecting the ECPs and all the general EMP measures;</li> </ul>	<ul style="list-style-type: none"> <li>– CSEMP and H&amp;S Plan approved before commencement of construction works minimizes EHS impacts and risks and is subsequently complied with during construction</li> </ul>	Prior to and then for implementation during construction	√	√	√	Contract cost



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Ensure water suppression is used during construction works and do not conduct dusty work on windy days; dust levels not to exceed ambient air quality standards per Appendix XI at adjacent properties.</li> <li>- Provide adjacent properties with cleaning service for external surfaces and windows on a weekly basis during the construction due to buildup of dust.</li> <li>- Construction to be conducted only during the daytime between 10am-4pm with noisy activity such as piling only between 10am-12pm and 2-4pm to minimize disturbance and is not to be conducted on weekends or on festivals or holidays; noise limits per Appendix XI to be achieved at the adjacent properties.</li> <li>- To inform CESMP and any piling management sub-plan due to proximity of properties to substation site contractor to undertake quantitative noise assessment of construction works using internationally recognized noise modelling software to confirm that</li> </ul>	<p>works as determined through regular site checks, photographic record etc.</p> <ul style="list-style-type: none"> <li>- No breaches of compliance with regulatory requirements or GIIP including ambient air quality and noise standards.</li> <li>- No outstanding dust, noise and general disturbance and disruption grievances from local communities or other interested stakeholders.</li> </ul>					

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation. If required to meet noise standards contractor to install noise barrier etc.</p> <ul style="list-style-type: none"> <li>- Properties adjacent are to be consulted one-to-one and subject to structural survey and photographic record in case of vibration impact during construction.</li> <li>- No storage area or labor camp is to be established at this substation site due to lack of space.</li> <li>- No fuel, oil or chemicals are to be stored at this site and stockpiles to be kept to materials required during the day's work due to immediately adjacent waterbody.</li> <li>- If piling is required method statement for management of piling mud is to be prepared to ensure the immediate adjacent waterbody is protected, there must be no discharge of piling mud to surface water.</li> <li>- Flagmen to be used to control the construction traffic management on the road access (not just at entrances)</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		due to presence of school and tight turnings in a residential area.						
	Bashundara SS							
Detailed Design and Preconstruction Phase								
Demolition works	Risk of site being contaminated by asbestos and other waste materials due to demolition of temporary buildings – no ACMs are anticipated to be present, but the risk exists as ACMs not banned by national laws	<ul style="list-style-type: none"> <li>– On the site there are temporary buildings for Bashundara Group’s Housing Office. This land has been donated to DESCO and the buildings will be removed by the Group – they will also remove septic tanks and pipelines and any debris/waste. Demolition will be undertaken prior to hand-over of the land to DESCO. DESCO will work with the Group to ensure that asbestos survey is undertaken prior to demolition. If present this is to be treated as an unanticipated impact and asbestos remedial action plan developed and implemented by the Group prior to demolition.</li> <li>– DESCO will confirm if asbestos requirements were followed, and all demolition material/waste has been removed from site such that it is “clean” for construction prior to taking over the land.</li> </ul>	<ul style="list-style-type: none"> <li>– No asbestos was present prior to demolition work. If present asbestos remedial action plan developed and implemented prior to demolition.</li> <li>– Demolition of any buildings containing ACMs follow national laws and regulations, and international good practice such as ADB’s Good Practice Guidance on the Use of Asbestos.</li> <li>– No workers and communities affected by exposure to ACMs.</li> </ul>	Prior to demolition of the buildings by Bashundara Group	√	N/A	N/A	DESCO in conjunction with Bashundara Group

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>DESCO will also ensure the existing septic tank and drainage pipes have been removed prior to taking over the land.</li> </ul>						
Detailed design	Loss of mature trees	<ul style="list-style-type: none"> <li>Detailed design is to minimize the loss of mature trees at the substation site; permission to be obtained by the contractor for any trees to be cut and replacement planting at 1:3 ratio to be undertaken.</li> </ul>	Trees cut are compensated for at 1:3 (no net loss of biodiversity)	Prior to approval of detailed design	√	√	√	Contract cost
	Residential properties are to be located within 100m on completion of housing development area – per the EIA operational noise exceedance in silent zone might be possible up to 100m	<ul style="list-style-type: none"> <li>Due to proximity of future properties to substation site contractor to appropriately locate transformers if possible so they are screened by the control building and undertake quantitative noise assessment using internationally recognized noise modelling software of the detailed design to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>No breaches of compliance with noise standards during O&amp;M.</li> <li>No outstanding noise grievances from local communities or other interested stakeholders.</li> </ul>	Prior to approval of detailed design	√	√	√	Contract cost
Substation construction activities	Disturbance to residential properties from the construction traffic and works	<ul style="list-style-type: none"> <li>CSEMP to include the following measures as well reflecting the ECPs and all the general EMP measures:</li> <li>To inform CESMP and any piling management sub-plan due to reasonably close proximity of</li> </ul>	<ul style="list-style-type: none"> <li>CSEMP and H&amp;S Plan approved before commencement of construction works minimizes EHS impacts and risks and is</li> </ul>	Prior to and then for implementation during construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		properties to substation site contractor to undertake quantitative noise assessment of construction works using internationally recognized noise modelling software to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation. If required to meet noise standards contractor to install noise barrier etc.	subsequently complied with during construction works as determined through regular site checks, photographic record etc.					
<b>Tongi SS</b>								
<b>Detailed Design and Preconstruction Phase</b>								
Infilling of low-lying land including modified wetland area as part of site preparation for housing development that is to be induced by construction of the substation	Environmental and social impacts due to infilling works including on wetland birds – no threatened species, aquatic ecology of the wetland and 50-100 people directly or indirectly relying on the wetland	<ul style="list-style-type: none"> <li>– The site allocated to the substation lies adjacent to a rain-fed waterbody which develops during the rainy season and reduces again in size during the dry season. Chayakunka 5th Residential Project Authority (Housing Developer) has donated the site to DESCO and on their behalf intends to undertake land fill of the substation site together with infilling of the modified wetland for their housing development.</li> <li>– Before commencing any infill, it must be ensured this activity is legally permitted. DESCO to obtain a copy of</li> </ul>	SCC or ECC document for infilling works obtained and shared with ADB and implementation of infilling works in accordance with the clearances provided and EMP requirements by Housing Developer as reported on in EMR.	Prior to infilling of the low-laying land by the Housing Developer and DESCO accepting the land for substation construction	√	N/A	N/A	DESCO in conjunction with Housing Developer

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>national EIA/IEE and a valid national permission document to ensure work is permitted.</p> <ul style="list-style-type: none"> <li>- The following measures are to be undertaken in addition to the requirements of the national SCC/ECC and DESCO is to request the Housing Developer's contractor to adopt them:</li> <li>- Installation of notices at the site informing of the DESCO GRM contact number (call center and PD numbers) as although this work will be done by contractor of Housing Developer it is for development of the DESCO substation.</li> <li>- The adjacent properties to be informed at least one month prior that the infill is to be commenced.</li> <li>- Conduct infilling during the dry season when the site is not waterlogged and migratory birds are not present at the adjacent wetland, also to minimise the risk of sediment laden runoff.</li> <li>- Maintain throughout construction safe and secure access to the property which is currently accessed directly</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>through the land that is allocated to DESCO.</p> <ul style="list-style-type: none"> <li>- Ideally the contractor will wait until the access road has been upgraded to avoid cumulative impact although only few truck movements will be required</li> <li>- Removal of all dumped waste from the site for disposal to a suitably licensed waste management facility prior to infilling - no waste must be buried under the infill.</li> <li>- Mud sand will be pumped to site using the existing pipeline and must only be obtained from existing licensed sources; copies of licenses to be obtained by DESCO prior to the commencement.</li> <li>- Erection of a robust bund or wall to contain the mud sand whilst the water evaporates or discharges to ground.</li> <li>- Photographic record of the access road and adjacent paddy land and properties to be taken before the site of infill works.</li> <li>- If any damage occurs to the adjacent paddy land due to the infill activity</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>then this must be compensated by DESCO.</p> <ul style="list-style-type: none"> <li>- Following infill, the dry raised land must be seeded and the slopes planted with native grass species, short water tolerant plants and reeds at the base to prevent soil erosion whilst the detailed design work is completed.</li> <li>- DESCO to ensure an environmental specialist supervises and monitors infilling activities and in doing so ensures works are undertaken following national laws and regulations and these additional EMP requirements.</li> </ul>						
Detailed design	Low lying land at risk of waterlogging during heavy rain, wetland is adjacent to the site	<ul style="list-style-type: none"> <li>- Contractor to conduct a flood risk and drainage assessment and ensure that all substation equipment is raised on foundations located above the flood level including an allowance for climate change plus freeboard.</li> <li>- Detailed design to ensure adjacent flood levels do not increase due to loss of floodwater storage as a result of the infill e.g., by providing a small pond that can also provide wildlife</li> </ul>	Substation design is climate resilient.	Prior to approval of detailed design	√	√	√	Contract cost



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		benefit to mitigate the loss of seasonal wetland habitat.						
	Residential properties are located within 100m – per the EIA operational noise exceedance in silent zone might be possible up to 100m	<ul style="list-style-type: none"> <li>– Due to proximity of properties to substation site contractor to appropriately locate transformers so they are screened by the control building and undertake quantitative noise assessment using internationally recognized noise modelling software of the detailed design to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>– No breaches of compliance with noise standards during O&amp;M.</li> <li>– No outstanding noise grievances from local communities or other interested stakeholders.</li> </ul>	Prior to approval of detailed design	√	√	√	Contract cost
	Migratory bird interaction with substation and connecting OHL	<ul style="list-style-type: none"> <li>– Substation lighting to be designed so as not to spill onto the adjacent wetland habitat.</li> <li>– Due to loss of wetland habitat the substation design is to have the input of a landscape architect/biodiversity expert and to follow the recommendations of the bird survey to provide biodiversity enhancement e.g., creation of a small wildlife pond, planting of the northern boundary with red silk-cotton tree/ shimul (<i>Bombax ceiba</i>), hijol (<i>Barringtonia acutangula</i>), fig (<i>Ficus bengalensis</i>)</li> </ul>	Substation adopts recommendations of the bird survey and a bird friendly design per GIIP	Prior to approval of detailed design	√	√	√	Contract cost (DESCO for future OHL connections into the SS)

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>etc., design the control building to allow for rooftop gardening.</p> <ul style="list-style-type: none"> <li>– Ensure the substation and any connecting OHL adopt a bird friendly design in accordance with GIIP9 and avoids any nighttime lighting spilling outside of the substation compound using movement detection sensors</li> </ul>						
Substation construction activities	Impacts due to poor condition of access roads	<ul style="list-style-type: none"> <li>– Do not commence construction works until the municipality has completed upgrading of the access road to the substation to avoid cumulative impacts but also to minimize dust due to the poor condition of the existing road</li> <li>– Photographic record of the access road condition is to be undertaken before the construction</li> <li>– Flagmen to be used to control the construction traffic management on the road access (not just at entrances) due to the narrowness of the road and busy traffic.</li> </ul>	No works commence until after the access road is upgraded	Prior to construction	√	√	√	Contract cost
	Maintenance of property access	<ul style="list-style-type: none"> <li>– Maintain throughout construction a safe and secure access to the property</li> </ul>	No grievances from the property occupants	Prior to and then for implementation	√	√	√	Contract cost

<sup>9</sup> Avian Power Line Interaction Committee (APLIC) 2006 and 2012

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		which is currently accessed directly through the land that is allocated to DESCO	regarding access being blocked	during construction				
	Disturbance to wetland and migratory birds	<ul style="list-style-type: none"> <li>- Schedule noisy works to avoid the bird migratory season in Bangladesh when the water level in the wetland is at its highest and migratory birds are present.</li> </ul>	EMP/CSEMP requirements successfully implemented as determined through regular site checks, photographic record etc.	Prior to and then for implementation during construction	√	√	√	Contract cost
	Disturbance to residential properties immediately adjacent from the construction traffic and works; disturbance to adjacent wetland birds (if wetland not infilled) especially during the over wintering season	<ul style="list-style-type: none"> <li>- CSEMP to include the following measures as well reflecting the ECPs and all the general EMP measures:</li> <li>- Construction to be conducted only during the dry season when the wetland birds present will be fewer in number.</li> <li>- Ensure water suppression is used during construction works and do not conduct dusty work on windy days; dust levels not to exceed ambient air quality standards per Appendix XI at adjacent properties.</li> <li>- Provide adjacent properties with cleaning service for external surfaces and windows on a weekly basis during the construction due to buildup of dust.</li> <li>- Construction to be conducted only during the daytime between 10am-</li> </ul>	<ul style="list-style-type: none"> <li>- CSEMP and H&amp;S Plan approved before commencement of construction works minimizes EHS impacts and risks and is subsequently complied with during construction works as determined through regular site checks, photographic record etc.</li> <li>- No breaches of compliance with regulatory requirements or GIIP including ambient air quality and noise standards.</li> <li>- No outstanding dust, noise and general</li> </ul>	Prior to and then for implementation during construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>4pm with noisy activity such as piling only between 10am-12pm and 2-4pm to minimize disturbance and is not to be conducted on weekends or on festivals or holidays; noise limits per Appendix XI to be achieved at the adjacent properties.</p> <ul style="list-style-type: none"> <li>- No temporary lighting is to be used.</li> <li>- To inform CESMP including any piling management sub-plan due to proximity of properties to substation site contractor to undertake quantitative noise assessment of construction works using internationally recognized noise modelling software to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation. If required to meet noise standards contractor to install noise barrier etc.</li> <li>- Properties adjacent are to be consulted one-to-one and subject to structural survey and photographic record in case of vibration impact during construction.</li> <li>- Site-specific traffic management plan to be developed and implemented</li> </ul>	disturbance and disruption grievances from local communities or other interested stakeholders.					

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>given the residential location with transport of equipment, materials and construction waste likely to result in congestion due to narrow and poor-quality road. Provision of flag men at entry points and along the access road to control the traffic flow and ensure pedestrian and vehicular safety.</p> <ul style="list-style-type: none"> <li>- No storage area or labor camp is to be established at this substation site due to lack of space.</li> <li>- No fuel, oil or chemicals are to be stored at this site and stockpiles to be kept to materials required during the day's work due to immediately adjacent waterbody.</li> <li>- If piling is required a method statement for management of piling mud is to be prepared to ensure the immediate adjacent waterbody is protected, there must be no discharge of piling mud to surface water.</li> <li>- Sensitive wetland habitats adjacent to be avoided during construction will be flagged for protection. As there may be a risk of workers accidentally straying into these areas then worker</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		training and the code of conduct will cover measures to ensure that wildlife will be protected.						
	Presence of water hyacinth (invasive species)	<ul style="list-style-type: none"> <li>- CSEMP to include an invasive species management plan. Any water hyacinth to be cut and removed from site under the supervision of an ecologist for drying and reuse or disposal to a suitably licensed and engineered land fill site. Cut water hyacinth must not be disposed to or allowed to enter waterbodies to avoid its spread.</li> <li>- Equipment removed from the site will be carefully washed before leaving site under the supervision of an ecologist to ensure no invasive species material is transferred outside the site.</li> </ul>	No spread of water hyacinth beyond the construction site	Prior to and then for implementation during construction	√	√	√	Contract cost
<b>Kalshi SS</b>								
<b>Detailed Design and Preconstruction Phase</b>								
Detailed design	Low lying land at risk of waterlogging during heavy rain	<ul style="list-style-type: none"> <li>- Contractor to conduct a flood risk and drainage assessment and ensure that all substation equipment is raised on foundations located above the flood level including an allowance for climate change plus freeboard.</li> </ul>	Substation design is climate resilient.	Prior to approval of detailed design	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
	Residential properties are located within 100m – per the EIA operational noise exceedance in silent zone might be possible up to 100m	<ul style="list-style-type: none"> <li>– Presence of school the opposite side of the substation means that the applicable noise limit at this site is of “silent zone”</li> <li>– Due to proximity of properties to substation site contractor to appropriately locate transformers so they are screened by the control building and undertake quantitative noise assessment using internationally recognized noise modelling software of the detailed design to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>– No breaches of compliance with noise standards during O&amp;M.</li> <li>– No outstanding noise grievances from local communities or other interested stakeholders.</li> </ul>	Prior to approval of detailed design	√	√	√	Contract cost
	Loss of mature trees	<ul style="list-style-type: none"> <li>– Detailed design is to minimize the loss of mature trees at the substation site; permission to be obtained by the contractor for any trees to be cut and replacement planting at 1:3 ratio to be undertaken.</li> <li>– Tree cutting is to be avoided during the bird nesting season.</li> </ul>	Trees cut are compensated for at 1:3 (no net loss of biodiversity)	Prior to approval of detailed design	√	√	√	Contract cost
Substation construction activities	Disturbance to residential properties immediately	<ul style="list-style-type: none"> <li>– Presence of school the opposite side of the substation means that the applicable noise limit at this site is of “silent zone”</li> </ul>	<ul style="list-style-type: none"> <li>– CSEMP and H&amp;S Plan approved before commencement of construction works</li> </ul>	Prior to and then for implementation during construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
	adjacent from the construction traffic and works	<ul style="list-style-type: none"> <li>- CSEMP to include the following measures as well reflecting the ECPs and all the general EMP measures:</li> <li>- Waste that has been dumped on site is to be removed by the Contractor prior to any works and disposed of at a suitably licensed waste management facility with transfer notes kept.</li> <li>- Ensure water suppression is used during construction works and do not conduct dusty work on windy days; dust levels not to exceed ambient air quality standards per Appendix XI at adjacent properties.</li> <li>- Provide adjacent properties with cleaning service for external surfaces and windows on a weekly basis during the construction due to buildup of dust.</li> <li>- Construction to be conducted only during the daytime between 10-4pm to minimize disturbance and is not to be conducted on weekends and holidays or during examination periods due to presence of school – dean to be consulted regarding the appropriate timing of the</li> </ul>	<ul style="list-style-type: none"> <li>minimizes EHS impacts and risks and is subsequently complied with during construction works as determined through regular site checks, photographic record etc.</li> <li>- No breaches of compliance with regulatory requirements or GIIP including ambient air quality and noise standards.</li> <li>- No outstanding dust, noise and general disturbance and disruption grievances from local communities or other interested stakeholders.</li> </ul>					



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>construction activities; noise limits per Appendix XI to be achieved at the adjacent properties.</p> <ul style="list-style-type: none"> <li>- To inform CESMP due to proximity of properties to substation site contractor to undertake quantitative noise assessment of construction works using internationally recognized noise modelling software to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation. If required to meet noise standards contractor to install noise barrier etc.</li> <li>- Properties adjacent are to be consulted one-to-one and subject to structural survey and photographic record in case of vibration impact during construction.</li> <li>- Flagmen to be used to control the construction traffic management on the road access (not just at entrances) due to presence of school.</li> </ul>						
<b>Rupayan City SS</b>								
<b>Detailed Design and Preconstruction Phase</b>								

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
Detailed design	Residential properties are located within 100m - per the EIA operational noise exceedance in silent zone might be possible up to 100m	<ul style="list-style-type: none"> <li>Due to proximity of properties to substation site contractor to appropriately locate transformers so they are screened by the control building and undertake quantitative noise assessment using internationally recognized noise modelling software of the detailed design to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>No breaches of compliance with noise standards during O&amp;M.</li> <li>No outstanding noise grievances from local communities or other interested stakeholders.</li> </ul>	Prior to approval of detailed design	√	√	√	Contract cost
	Avoidance of involuntary resettlement	<ul style="list-style-type: none"> <li>Site access will need to be created through the development area wall, location to be selected so no resettlement of informal properties is required</li> </ul>	No resettlement is required for implementation of the detailed design.	Prior to and then for implementation during construction	√	√	√	Contract cost
	Loss of mature trees	<ul style="list-style-type: none"> <li>Detailed design to ensure all coconut palms are retained, no trees to be cut</li> </ul>	No trees are cut.	Prior to approval of detailed design	√	√	√	Contract cost
Substation construction activities	Disturbance to residential properties immediately adjacent from the construction traffic and works	<ul style="list-style-type: none"> <li>CSEMP to include the following measures as well reflecting the ECPs and all the general EMP measures:</li> <li>Ensure water suppression is used during construction works and do not conduct dusty work on windy days; dust levels not to exceed ambient air</li> </ul>	<ul style="list-style-type: none"> <li>CSEMP and H&amp;S Plan approved before commencement of construction works minimizes EHS impacts and risks and is subsequently complied with during construction works as determined</li> </ul>	Prior to and then for implementation during construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>quality standards per Appendix XI at adjacent properties.</p> <ul style="list-style-type: none"> <li>- Provide adjacent properties with cleaning service for external surfaces and windows on a weekly basis during the construction due to buildup of dust.</li> <li>- Construction to be conducted only during the daytime between 10am-4pm with noisy activity such as piling only between 10am-12pm and 2-4pm to minimize disturbance and is not to be conducted on weekends or on festivals or holidays; noise limits per Appendix XI to be achieved at the adjacent properties.</li> <li>- To inform CESMP and any piling management sub-plan due to proximity of properties to substation site contractor to undertake quantitative noise assessment of construction works using internationally recognized noise modelling software to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation. If</li> </ul>	<p>through regular site checks, photographic record etc.</p> <ul style="list-style-type: none"> <li>- No breaches of compliance with regulatory requirements or GIIP including ambient air quality and noise standards.</li> <li>- No outstanding dust, noise and general disturbance and disruption grievances from local communities or other interested stakeholders.</li> </ul>					

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		required to meet noise standards contractor to install noise barrier etc. - Properties adjacent are to be consulted one-to-one and subject to structural survey and photographic record in case of vibration impact during construction.						
<b>Purbachal SS</b>								
<b>Detailed Design and Preconstruction Phase</b>								
Detailed design	Low lying land at risk of waterlogging during heavy rain, small pond is present at site	- Contractor to conduct a flood risk and drainage assessment and ensure that all substation equipment is raised on foundations located above the flood level including an allowance for climate change plus freeboard.	Substation design is climate resilient.	Prior to approval of detailed design	√	√	√	Contract cost
	Informal settlement properties are located within 100m - per the EIA operational noise exceedance in silent zone might be possible up to 100m	- Due to proximity of informal settlement properties to substation site contractor to appropriately locate transformers so they are screened by the control building and undertake quantitative noise assessment using internationally recognized noise modelling software of the detailed design to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation.	- No breaches of compliance with noise standards during O&M. - No outstanding noise grievances from local communities or other interested stakeholders.	Prior to approval of detailed design	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
	Loss of mature trees	<ul style="list-style-type: none"> <li>- Detailed design is to minimize the loss of mature trees at the substation site; permission to be obtained by the contractor for any trees around site boundary to be cut and replacement planting at 1:3 ratio to be undertaken.</li> </ul>	Trees cut are compensated for at 1:3 (no net loss of biodiversity)	Prior to approval of detailed design	√	√	√	Contract cost
Substation construction activities	Disturbance to informal squatters immediately adjacent from the construction traffic and works	<ul style="list-style-type: none"> <li>- CSEMP to include the following measures as well reflecting the ECPs and all the general EMP measures:</li> <li>- Ensure water suppression is used during construction works and do not conduct dusty work on windy days; dust levels not to exceed ambient air quality standards per Appendix XI at adjacent properties.</li> <li>- Provide adjacent properties with cleaning service for external surfaces and windows on a weekly basis during the construction due to buildup of dust.</li> <li>- Construction to be conducted only during the daytime between 10am-4pm with noisy activity such as piling only between 10am-12pm and 2-4pm to minimize disturbance and is not to be conducted on weekends or on festivals or holidays; noise limits per</li> </ul>	<ul style="list-style-type: none"> <li>- CSEMP and H&amp;S Plan approved before commencement of construction works minimizes EHS impacts and risks and is subsequently complied with during construction works as determined through regular site checks, photographic record etc.</li> <li>- No breaches of compliance with regulatory requirements or GIIP including ambient air quality and noise standards.</li> <li>- No outstanding dust, noise and general disturbance and disruption grievances</li> </ul>	Prior to and then for implementation during construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>Appendix XI to be achieved at the adjacent properties.</p> <ul style="list-style-type: none"> <li>- To inform CESMP and any piling management sub-plan due to proximity of properties to substation site contractor to undertake quantitative noise assessment of construction works using internationally recognized noise modelling software to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation. If required to meet noise standards contractor to install noise barrier etc.</li> <li>- Properties adjacent are to be consulted one-to-one and subject to structural survey and photographic record in case of vibration impact during construction.</li> <li>- No fuel, oil or chemicals are to be stored at this site and stockpiles to be kept to materials required during the day's work due to immediately adjacent waterbody.</li> <li>- If piling is required method statement for management of piling mud is to be prepared to ensure the immediate</li> </ul>	from local communities or other interested stakeholders.					

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		adjacent waterbody is protected, there must be no discharge of piling mud to surface water.						
<b>Kalachandpur SS</b>								
<b>Detailed Design and Preconstruction Phase</b>								
Site access route	Residential route is to be used for construction traffic to avoid temporary relocation	<ul style="list-style-type: none"> <li>- No temporary access is to be formed from the adjacent commercial road, access must be through the residential route to avoid temporary relocation impact.</li> </ul>	No temporary relocation is required for construction	Prior to demolition of the existing switchyard (confirmation of site access route)	√	√	√	Contract Cost
Demolition works	Demolition works will result in dust, noise and pollution risks to soil and water quality requiring environmental management measures to be adopted, especially given densely populated location with property immediately adjacent to site.	<ul style="list-style-type: none"> <li>- Contractor to prepare site-specific demolition EMP reflecting the EMP requirements and international engineering best practice/good EHS practices reviewed and approved by the PIU before commencement demolition.</li> <li>- Health and safety risk assessment to consider that residential properties located immediately adjacent to the buildings to be demolished and ensure measures to avoid and minimize community H&amp;S risks included in H&amp;S Plan.</li> <li>- Demolition EMP and H&amp;S Plan to include the following measures as well reflecting the ECPs and general</li> </ul>	<ul style="list-style-type: none"> <li>- Demolition EMP and H&amp;S Plan approved before commencement of demolition works minimizes EHS impacts and risks and is subsequently complied with during demolition works as determined through regular site checks, photographic record etc.</li> <li>- No breaches of compliance with regulatory requirements or GIIP including</li> </ul>	Prior to demolition of the existing switchyard	√	√	√	Contract Cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>community consultation, construction noise and dust measures:</p> <ul style="list-style-type: none"> <li>- Communication with the local community present within 500m and prior notice of demolition activities.</li> <li>- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust)</li> <li>- Ensure water suppression is used during demolition operations and do not conduct demolition work on windy days; dust levels not to exceed ambient air quality standards per Appendix XI at adjacent properties.</li> <li>- Demolition to be conducted only during the daytime between 10-12pm and 2-4pm to minimize disturbance and not on weekends or on festival or holidays; noise limits per Appendix XI to be achieved at the adjacent properties.</li> <li>- Contractor to ensure all removed electrical and mechanical equipment, defunct transformers and disused equipment from switchyard is transferred to the DESCO stores or</li> </ul>	<p>ambient air quality and noise standards.</p> <ul style="list-style-type: none"> <li>- No outstanding dust, noise and general disturbance and disruption grievances from local communities or other interested stakeholders.</li> </ul>					



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>ensure it is disposed of at suitably licensed waste management facilities.</p> <ul style="list-style-type: none"> <li>- Particular attention to handling of all batteries and oil containing used equipment, transformers to be checked for PCB presence.</li> <li>- Measures to prevent access to the site from the public during demolition work and from debris falling on the public road and into the adjacent properties.</li> <li>- Site-specific traffic management plan to be developed and implemented given the residential location with transport of equipment and demolition waste likely to result in congestion.</li> <li>- No storage area or labor camp is to be established at this substation site due to lack of space.</li> </ul>						
	Risk of transformers being contaminated with PCBs harming the health of demolition worker	- Inventory to be prepared of existing defunct transformers stored on site, make, model, risk of PCBs and other details including transformer oil test report (EMoP) 10	No workers and communities affected by exposure to PCBs.	Prior to and during demolition of the existing switchyard	√	√	√	Contract Cost

<sup>10</sup> The most suitable way to determine if PCB is present is for a suitably qualified institute to sample and analyze the oil in accordance with United Nations Environment Protection Agency (UNEP) Guidelines (PCB\_ID\_1st\_print-2.PDF (unep.org)) following a health and safety risk assessment and plan referring to PCB Transformers and Capacitors: From

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
	and contaminating soil or water if released to the environment	<ul style="list-style-type: none"> <li>- Health and safety risk assessment for exposure of staff to PCBs to be undertaken before demolition work is undertaken for existing transformers.</li> <li>- Unless transformers have been certified PCB free workers interacting with them must wear suitable chemical and/or oil resistant gloves, goggles, and protective clothing whilst taking samples and/or working with transformers.<sup>11</sup> Water supply to sink/shower and eye wash station to be provided on-site during works due to risk of PCB coming into contact with skin.</li> <li>- Provide training to workers on PCBs to raise awareness of the risks and the need for compliance with international good practices.</li> </ul>						

Management to Reclassification and Disposal - First Issue (unep.org). It is not recommended to take an oil sample from hermetically sealed oil distribution transformers since the transformer itself is fully closed to the environmental condition, but a sample for PCB testing can be taken by experienced staff. Conservator type transformers can be readily tested. Once transformers have been found to contain PCBs they must be labelled as such, any PCB storage areas should also be marked to allow expeditious identification and response to a PCB accident. Similarly, transformers found to be PCB free should be marked and the log of test results to support this kept by DESCO prior to the demolition.

<sup>11</sup> If oil meets the skin, the workers should immediately rinse the affected area with large amounts of running water. This may be done in a sink if the hands are the only portion of the body contacted or under a safety shower if the exposure area is more extensive. If large parts of the skin met with the oil, the workers should remove contaminated clothing while under the shower for a minimum of 15 minutes. Hand wash, safety shower and eyewash stations are therefore required to be available for immediate use.

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Transformers prior to being removed from site are to be placed in a designated storage area, to be either be stored on an impermeable floor bunded to 110% capacity of volume stored, or if not available in the short-term kept on drip trays to provide secondary containment.</li> <li>- For those transformers confirmed as containing PCBs ensure these are dechlorinated with storage, transport, and disposal as hazardous waste.</li> <li>- Contractor will ensure all demolition material has been removed from site and disposed of to a suitably licensed waste management facility with records maintained.</li> </ul>						
	<p>Risk of site being contaminated by asbestos and other waste materials due to demolition of existing switchyard</p> <ul style="list-style-type: none"> <li>- no ACMs are anticipated to be present, but the risk exists as ACMs not</li> </ul>	<ul style="list-style-type: none"> <li>- Contractor will ensure that asbestos survey is undertaken prior to demolition. If present this is to be treated as an unanticipated impact and asbestos remedial action plan developed and implemented by DESCO prior to demolition.</li> <li>- Contractor will ensure all demolition material has been removed from site and disposed of to a suitably licensed</li> </ul>	<ul style="list-style-type: none"> <li>- No asbestos was present prior to demolition work. If present asbestos remedial action plan developed and implemented prior to demolition.</li> <li>- Demolition of any buildings containing ACMs follow national laws and regulations,</li> </ul>	Prior to demolition of the existing switchyard	√	√	√	Contract Cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
	banned by national laws	waste management facility with records maintained.	and international good practice such as ADB's Good Practice Guidance on the Use of Asbestos. - No workers and communities affected by exposure to ACMs.					
Detailed design	Residential properties are located within 100m – per the EIA operational noise exceedance in silent zone might be possible up to 100m	- Due to proximity of properties to substation site contractor to appropriately locate transformers so they are screened by the control building and undertake quantitative noise assessment using internationally recognized noise modelling software of the detailed design to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation.	- No breaches of compliance with noise standards during O&M. - No outstanding noise grievances from local communities or other interested stakeholders.	Prior to approval of detailed design	√	√	√	Contract cost
	Loss of mature trees	- Detailed design is to minimize the loss of mature trees at the substation site; permission to be obtained by the contractor for any trees to be cut and replacement planting at 1:3 ratio to be undertaken.	- Trees cut are compensated for at 1:3 (no net loss of biodiversity)	Prior to approval of detailed design	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
Substation construction activities	Disturbance to residents immediately adjacent from the construction traffic and works due to densely populated location	<ul style="list-style-type: none"> <li>- CSEMP to include the following measures as well reflecting the ECPs and all the general EMP measures:</li> <li>- Ensure water suppression is used during construction works and do not conduct dusty work on windy days; dust levels not to exceed ambient air quality standards per Appendix XI at adjacent properties.</li> <li>- Provide adjacent properties with cleaning service for external surfaces and windows on a weekly basis during the construction due to buildup of dust.</li> <li>- Construction to be conducted only during the daytime between 10am-4pm with noisy activity such as piling only between 10am-12pm and 2-4pm to minimize disturbance and is not to be conducted on weekends or on festivals or holidays; noise limits per Appendix XI to be achieved at the adjacent properties.</li> <li>- To inform CESMP and any piling management sub-plan due to proximity of properties to substation site contractor to undertake quantitative noise assessment of</li> </ul>	<ul style="list-style-type: none"> <li>- CSEMP and H&amp;S Plan approved before commencement of demolition works minimizes EHS impacts and risks and is subsequently complied with during construction works as determined through regular site checks, photographic record etc.</li> <li>- No breaches of compliance with regulatory requirements or GIIP including ambient air quality and noise standards.</li> <li>- No outstanding dust, noise and general disturbance and disruption grievances from local communities or other interested stakeholders.</li> </ul>	Prior to demolition of the existing switchyard, then for implementation during construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>construction works using internationally recognized noise modelling software to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation. If required to meet noise standards contractor to install noise barrier etc.</p> <ul style="list-style-type: none"> <li>- Measures to prevent access to the site from the public during demolition and construction work and from debris falling on the public road and into the adjacent properties.</li> <li>- Site-specific traffic management plan to be developed and implemented given the residential location with transport of equipment, materials and construction waste likely to result in congestion. Provision of flag men at entry points and along the entrance road to control the traffic flow and ensure pedestrian and vehicular safety.</li> <li>- Choice of least disruptive access to construction site - access from rear.</li> <li>- No storage area or labor camp is to be established at this substation site due to lack of space.</li> </ul>						

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
<b>Mirpur Ceramics SS</b>								
<b>Detailed Design and Preconstruction Phase</b>								
Demolition works	Demolition works will result in dust, noise and pollution risks to soil and water quality requiring environmental management measures to be adopted, especially given densely populated location with property immediately adjacent to site.	<ul style="list-style-type: none"> <li>- Contractor to prepare site-specific demolition EMP reflecting the EMP requirements and international engineering best practice/good EHS practices reviewed and approved by the PIU before commencement demolition.</li> <li>- Health and safety risk assessment to consider that residential properties/madrasah located immediately adjacent to the buildings to be demolished and ensure measures to avoid and minimize community H&amp;S risks included in H&amp;S Plan.</li> <li>- Presence of madrasah on the opposite side of the substation, at a distance of approximately 100m from the site boundary means that the applicable noise limit at this site is of "silent zone."</li> <li>- Demolition EMP and H&amp;S Plan to include the following measures as well reflecting the ECPs and general</li> </ul>	<ul style="list-style-type: none"> <li>- Demolition EMP and H&amp;S Plan approved before commencement of demolition works minimizes EHS impacts and risks and is subsequently complied with during demolition works as determined through regular site checks, Photographic record etc.</li> <li>- No breaches of compliance with regulatory requirements or GIIP including ambient air quality and noise standards.</li> <li>- No outstanding dust, noise and general disturbance and disruption grievances from local communities or other interested stakeholders.</li> </ul>	Prior to demolition of the existing switchyard	√	√	√	Contract Cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>community consultation, construction noise and dust measures:</p> <ul style="list-style-type: none"> <li>- Communication with the local community present within 500m and prior notice of demolition activities.</li> <li>- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust)</li> <li>- Ensure water suppression is used during demolition operations and do not conduct demolition work on windy days; dust levels not to exceed ambient air quality standards per Appendix XI at adjacent properties.</li> <li>- Demolition to be conducted only during the daytime between 10-4pm to minimize disturbance and not on weekends or holidays or during examination periods due to presence of madrasah – they are to be consulted regarding the appropriate timing of the construction activities; noise limits per Appendix XI to be achieved at the adjacent properties.</li> <li>- Ensure all materials removed from site that are not reused or recycled</li> </ul>						



Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		are disposed of at suitably licensed waste management facilities with the transfer records kept.						
	Risk of site being contaminated by asbestos and other waste materials due to demolition of existing switchyard – no ACMs are anticipated to be present, but the risk exists as ACMs not banned by national laws	<ul style="list-style-type: none"> <li>– Contractor will ensure that asbestos survey is undertaken prior to demolition. If present this is to be treated as an unanticipated impact and asbestos remedial action plan developed and implemented by DESCO prior to demolition.</li> <li>– Contractor will ensure all demolition material has been removed from site and disposed of to a suitably licensed waste management facility with records maintained.</li> </ul>	<ul style="list-style-type: none"> <li>– No asbestos was present prior to demolition work. If present asbestos remedial action plan developed and implemented prior to demolition.</li> <li>– Demolition of any buildings containing ACMs follow national laws and regulations, and international good practice such as ADB's Good Practice Guidance on the Use of Asbestos.</li> <li>– No workers and communities affected by exposure to ACMs.</li> </ul>	Prior to demolition of the existing switchyard	√	√	√	Contract Cost
Detailed design	Residential properties are located within 100m - per the EIA operational noise exceedance in silent	<ul style="list-style-type: none"> <li>– Presence of madrasah on the opposite side of the substation means that the applicable noise limit at this site is of "silent zone"</li> <li>– Due to proximity of properties to substation site contractor to appropriately locate transformers so</li> </ul>	No breaches of compliance with noise standards during O&M.	Prior to approval of detailed design	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
	zone might be possible up to 100m	they are screened by the control building and undertake quantitative noise assessment using internationally recognized noise modelling software of the detailed design to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation.	- No outstanding noise grievances from local communities or other interested stakeholders.					
	Loss of mature trees	- Detailed design is to minimize the loss of mature trees at the substation site; permission to be obtained by the contractor for any trees to be cut and replacement planting at 1:3 ratio to be undertaken. Coconut palm in the corner is to be retained during detailed design.	Trees cut are compensated for at 1:3 (no net loss of biodiversity) and coconut palm is kept.	Prior to approval of detailed design	√	√	√	Contract cost
Substation construction activities	Disturbance to residents adjacent from the construction traffic and works	- CSEMP to include the following measures as well reflecting the ECPs and all the general EMP measures: - Ensure water suppression is used during construction works and do not conduct dusty work on windy days; dust levels not to exceed ambient air quality standards per Appendix XI at adjacent properties. - Provide adjacent properties with cleaning service for external surfaces	- CSEMP and H&S Plan approved before commencement of demolition works minimizes EHS impacts and risks and is subsequently complied with during construction works as determined through regular site	Prior to demolition of the existing buildings, then for implementation during construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>and windows on a weekly basis during the construction due to buildup of dust.</p> <ul style="list-style-type: none"> <li>- Construction to be conducted only during the daytime between 10-4pm to minimize disturbance and is not to be conducted on weekends and holidays or during examination periods and prayer times due to presence of madrasah – who are to be consulted regarding the appropriate timing of the construction activities; noise limits per Appendix XI to be achieved at the adjacent properties.</li> <li>- To inform CESMP due to proximity of properties to substation site contractor to undertake quantitative noise assessment of construction works using internationally recognized noise modelling software to confirm that noise standards per Appendix XI can be achieved for the substation alone without additional noise mitigation. If required to meet noise standards contractor to install noise barrier etc.</li> </ul>	<p>checks, photographic record etc.</p> <ul style="list-style-type: none"> <li>- No breaches of compliance with regulatory requirements or GIIP including ambient air quality and noise standards.</li> <li>- No outstanding dust, noise and general disturbance and disruption grievances from local communities or other interested stakeholders.</li> </ul>					

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
<b>Bay Extensions at PGCB Substation (Mirpur Digun)</b>								
Detailed design	Low lying land at risk of waterlogging during heavy rain, former land use is waterbody	<ul style="list-style-type: none"> <li>- Contractor to conduct a flood risk and drainage assessment and ensure that all substation equipment is raised on foundations located above the flood level including an allowance for climate change plus freeboard.</li> </ul>	Bay extension design is climate resilient.	Prior to approval of detailed design	√	√	√	Contract cost
Site clearance works at existing substation	Risk of transformers being contaminated with PCBs harming the health of demolition worker and contaminating soil or water if released to the environment	<ul style="list-style-type: none"> <li>- Inventory to be prepared of existing defunct transformers stored on site, make, model, risk of PCBs and other details including transformer oil test report (EMoP) 12</li> <li>- Health and safety risk assessment for exposure of staff to PCBs to be undertaken before demolition work is undertaken for existing transformers.</li> <li>- Unless transformers have been certified PCB free workers interacting with them must wear suitable</li> </ul>	No workers and communities affected by exposure to PCBs.	Prior to and during site clearance for the bay extensions.	√	√	√	Contract Cost

12 The most suitable way to determine if PCB is present is for a suitably qualified institute to sample and analyze the oil in accordance with United Nations Environment Protection Agency (UNEP) Guidelines (PCB\_ID\_1st\_print-2.PDF (unep.org)) following a health and safety risk assessment and plan referring to PCB Transformers and Capacitors: From Management to Reclassification and Disposal - First Issue (unep.org). It is not recommended to take an oil sample from hermetically sealed oil distribution transformers since the transformer itself is fully closed to the environmental condition, but a sample for PCB testing can be taken by experienced staff. Conservator type transformers can be readily tested. Once transformers have been found to contain PCBs they must be labelled as such, any PCB storage areas should also be marked to allow expeditious identification and response to a PCB accident. Similarly, transformers found to be PCB free should be marked and the log of test results to support this kept by DESCO prior to the demolition.

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>chemical and/or oil resistant gloves, goggles, and protective clothing whilst taking samples and/or working with transformers.<sup>13</sup> Water supply to sink/shower and eye wash station to be provided on-site during works due to risk of PCB coming into contact with skin.</p> <ul style="list-style-type: none"> <li>- Provide training to workers on PCBs to raise awareness of the risks and the need for compliance with international good practices.</li> <li>- Transformers prior to being removed from site are to be placed in a designated storage area, to be either be stored on an impermeable floor bunded to 110% capacity of volume stored, or if not available in the short-term kept on drip trays to provide secondary containment.</li> <li>- For those transformers confirmed as containing PCBs ensure these are</li> </ul>						

<sup>13</sup> If oil meets the skin, the workers should immediately rinse the affected area with large amounts of running water. This may be done in a sink if the hands are the only portion of the body contacted or under a safety shower if the exposure area is more extensive. If large parts of the skin met with the oil, the workers should remove contaminated clothing while under the shower for a minimum of 15 minutes. Hand wash, safety shower and eyewash stations are therefore required to be available for immediate use.

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		<p>dechlorinated with storage, transport, and disposal as hazardous waste.</p> <ul style="list-style-type: none"> <li>Contractor will ensure all demolition material has been removed from site and disposed of to a suitably licensed waste management facility with records maintained.</li> </ul>						
	Potential for soil contamination due to existing substation harming the health of demolition worker and contaminating soil or water if released to the environment	<ul style="list-style-type: none"> <li>Existing substation will be surveyed by a contaminated land professional employed by the contractor to assess the potential for soil contamination to be present at the substation and specifically in the bay extensions working area.</li> <li>If signs of potential contamination are present, e.g., leaking transformers, oil staining, etc. soil sampling and testing shall be undertaken in the working area to determine the level of soil contamination. The findings and recommendations of the survey will be submitted to DESCO for approval.</li> <li>If soil contamination is noted in the working area, a method statement for the management and/or removal and disposal of the contaminated soil as hazardous waste will be prepared and submitted to DESCO for approval.</li> </ul>	No workers and communities affected by exposure to soil contamination.	Prior to and during site clearance for the bay extensions.	√	√	√	Contract Cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
Substation construction activities	Disturbance to residents adjacent from the construction traffic and works	<ul style="list-style-type: none"> <li>- CSEMP to include the following measures as well reflecting the ECPs and all the general EMP measures:</li> <li>- Ensure water suppression is used during construction works and do not conduct dusty work on windy days; dust levels not to exceed ambient air quality standards per Appendix XI at adjacent properties.</li> <li>- Provide adjacent properties with cleaning service for external surfaces and windows on a weekly basis during the construction due to buildup of dust.</li> <li>- Construction to be conducted only during the daytime between 10-4pm to minimize disturbance and is not to be conducted on weekends and holidays; noise limits per Appendix XI to be achieved at the adjacent properties.</li> <li>- To inform CESMP due to proximity of properties to substation site contractor to undertake quantitative noise assessment of construction works using internationally recognized noise modelling software to confirm that noise standards per</li> </ul>	<ul style="list-style-type: none"> <li>- CSEMP and H&amp;S Plan approved before commencement of works minimizes EHS impacts and risks and is subsequently complied with during construction works as determined through regular site checks, photographic record etc.</li> <li>- No breaches of compliance with regulatory requirements or GIIP including ambient air quality and noise standards.</li> <li>- No outstanding dust, noise and general disturbance and disruption grievances from local communities or other interested stakeholders.</li> </ul>	Prior to site clearance, then for implementation during construction	√	√	√	Contract cost

Project Activity	Impact or Risk	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (implementation, supervision and monitoring)			Budget Source
					DESCO	CSC	Contractor	
		Appendix XI can be achieved for the substation alone without additional noise mitigation. If required to meet noise standards contractor to install noise barrier etc.						

### Part 3 – Transmission and Distribution Lines including Distribution Transformers and RMUs

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
<b>Detailed Design and Pre-Construction Phase</b>								
Connection to Existing Substations	Environmental audit has identified gaps in EHS management at existing substations to which the cables/lines will connect resulting in pollution, health and safety risks	<ul style="list-style-type: none"> <li>- DESCO to undertake (request PGCB to undertake) the corrective actions set out in the Corrective Action Plan (CAP) for existing substations to which cables/lines will be connected prior to allowing the contractor access to them to start work. Contractor at request of DESCO to address corrective actions as part of their scope of works.</li> <li>- If asbestos is identified but does not need to be disrupted and is not weathered and appears in good condition, consider leaving it where</li> </ul>	Implementation of the corrective action plan, all existing facilities (substations) meet national laws and regulations and are consistent with SPS 2009 requirements prior to the contractor being allowed access to them	Prior to access being granted to the contractor	√ plus PGCB	√	TBC	DESCO (Contract Cost if requested by DESCO)



Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>it is, as main health risks occur when asbestos is moved. If any asbestos will be disturbed by construction works, it must be removed following national requirements and international good practice per EHS General Guidelines on OHS and ADB Good Practice Guidance for the Management and Control of Asbestos and disposed of as hazardous waste material.</p> <ul style="list-style-type: none"> <li>- CSC to submit a report, including photos for each existing substation, on the status of corrective action implementation, compliance with national laws and regulations, and consistency with SPS 2009 requirements to validate DESCO or PGCB's compliance with the CAP and submit to ADB for clearance. CAP must be fully implemented and DESCO must receive ADB clearance of this report before the contractor is given access to an existing substation to start work.</li> <li>- Once the contractor has taken access then any non-compliance at the existing substation will become their responsibility so they must</li> </ul>						

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		ensure they are satisfied CAP is completed by DESCO or PGCB.						
Cable laying and overhead line installation, including distribution transformers and RMUs	Impacts on sensitive receptors particularly from construction of the 11 kV and 0.4 kV distribution lines where routes will be decided on an as needs basis as indicative routes are yet to be assessed in the EIA	<ul style="list-style-type: none"> <li>- Infrastructure bundling as far as possible – cables and lines to be laid alongside or within roads with all distribution transformers to be pole mounted and RMUs sited in the ROW of the road to avoid private land take; land requiring extensive landfill or levelling as well as agricultural, forest and wetland will not be used for RMUs.</li> <li>- Contractor to employ field ecologists to undertake ROW walkover, map habitat and species encountered, and enumerate the number and species of trees requiring to be cut and lopped, submit survey report alongside detailed design.</li> <li>- There will be no clearance of mature trees for cable/line/RMU installation unless essential. Cutting or trimming of trees will only be planned when required to meet safety clearance requirements. Properties, public utilities and street furniture will be avoided. The above ground infrastructure to be placed so it does not block the</li> </ul>	<ul style="list-style-type: none"> <li>- Disclosed EIA update addendum reflects final cable/line routes and distribution transformer and RMU sites</li> <li>- No significant impacts to sensitive receptors</li> <li>- Any residual impacts in compliance with national regulations</li> </ul>	Prior to cable/line routes and distribution transformer or RMU sites being approved by DESCO	√	√	√	Contract and CSC Cost

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>road or footpath, and to avoid visual clutter. Any temporary disturbance to be compensated per the resettlement plan.</p> <ul style="list-style-type: none"> <li>- Given greater vulnerability of children to health and safety risk, the crossing of school compounds and playgrounds and any other similar community facilities will be avoided by overhead lines routes.</li> <li>- Photographic record of land condition to be undertaken before any work.</li> <li>- Contractor to complete route surveys including ecology surveys and consultations and document the findings in the Project Description/Baseline Setting/Environment Assessment sections of the checklist and Consultation Proforma in Appendix XIII (consulting with potentially affected persons and local communities within 50m of RoWs, distribution transformers and RMUs and other stakeholders including local authorities and public utilities during design in order that any concerns raised during consultations can be</li> </ul>						

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		reflected in the choice of route alignment, siting and construction method) which is to be verified by CSC in the field and submitted to PIU for inclusion by DESCO in EIA update addendum, to identify and ensure cable and line routes and RMU sites avoid sensitive receptors etc. Prior to DESCO approval of the detailed designs and commencement of construction DESCO will seek ADB clearance of the consolidated environmental assessment forms and consultation proformas, and update the EIA as required, confirming no change from the impacts and risks described and assessed in the IEE, or undertaking site-specific assessment and developing a site-specific EMP if required, seeking ADB clearance of any updated EIA before works start.						
Underground cable and overhead line installation	Impacts on sensitive receptors from the installation of underground cables and overhead lines	– Route alignments to be designed to be within road/sidewalk as far as is practical, having minimal impact on private land holdings and any informal settlement, street vendors etc.	– Detailed Design cleared and approved reflects EMP requirements and minimizes impacts and risks during subsequent	Prior to cable/line routes being approved by DESCO	√	√	√	Contract and CSC Cost

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- H&amp;S plan for cable/line works to include a Traffic Management sub-plan considering both the safety of pedestrians and vehicles and need to avoid traffic congestion; it is to be developed in consultation with relevant local authorities to ensure proper execution of traffic controls including where temporary blockage of one lane of the road or footpath is needed for installation.</li> <li>- Contractors will dedicate enough health and safety supervision staff to each underground cable or overhead line section (at least one health and safety steward per underground cable or overhead line, each steward will supervise a maximum of 50 workers) and develop a work plan to ensure each stretch is completed and the road restored before moving onto the next.</li> <li>- Open trenching will only be used where sufficient open space is available away from congested road junctions, there will be no disturbance to trees/vegetation/waterbodies, and</li> </ul>	<p>stages of project implementation</p> <ul style="list-style-type: none"> <li>- Local communities and other concerned stakeholders kept informed throughout project implementation, and aware of construction etc.</li> <li>- No significant impacts to sensitive receptors</li> <li>- Any residual impacts in compliance with national regulations</li> </ul>					

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>no social safeguard constraints present.</p> <ul style="list-style-type: none"> <li>- Underground cables will be bored and laid using trenchless method through Horizontal Directional Drilling (HDD) machine as the preferred option wherever environment and social constraints are present.</li> <li>- For river crossings where HDD is not used the cable will be run along a cable bridge. For Turag Khal a new cable bridge will be installed and for Balu River the existing cable bridge will be used so that disturbance to the watercourses is minimized.</li> <li>- Route alignment and location of open trenches/entry and exit pits placed to avoid tree crowns especially mature trees. Root damage to trees is to be avoided so unstable trees do not present a public safety hazard.</li> <li>- Minimum horizontal clearance of 50 m from the ECA river alignment will be maintained while traversing parallel to it.</li> </ul>						

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Overhead lines will use covered conductors to minimize health and safety risk. Horizontal and vertical safety clearances will be maintained for all overhead lines to the nearest buildings etc. Contractor to undertake ROW walkover and enumerate any structures within the ROW and if safety clearances can be met, submit survey report alongside detailed design.</li> <li>- To prevent against cable break incident of underground cables, cable markings will be installed above the cable to inform those who may be excavating in future. In case the armor is broken by a third party and the core damaged, protection relays to which the underground cables connect will be designed to detect this and stop sending electricity immediately by automatically opening switchgear to prevent a live shock to the person.</li> <li>- Contractor to ensure structural safety of poles especially in the event of high winds/cyclones (allowing for climate change) or an</li> </ul>						

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>earthquake by designing for maximum loadings and following GoB codes; select an appropriate foundation design considering both climatic and seismic risks present. Design to include adequate pole foundation in order that all poles remain vertical during operation, and that the lines are tensioned. Install on all poles a visual and written warning signages to the public to include the ISO 7010 Hazard Type: Electrical Symbol warning of the risk of electrocution.</p> <ul style="list-style-type: none"> <li>- Install lighting arrestors along all distribution lines. Install anti-climbing deterrents on all the poles and suitable means of ensuring security of the cable to avoid vandalism.</li> </ul>						
	Impacts due to damage to property and public utilities	<ul style="list-style-type: none"> <li>- Contractor will check with relevant local authorities (electric, water, telecoms) whether there are known pipes, cables, or other utility lines and carry out a scan using cable avoidance tool to identify any unknown underground utilities prior to excavation.</li> <li>- Contractors to identify in consultation with service providers</li> </ul>						



Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>appropriate measures to minimize period of disruption to utilities and reduce health and safety risks during installation. If services must be disrupted contractors (via service providers if appropriate) to notify affected communities well in advance of any power outage etc. Existing poles may be used for other utilities e.g., street lighting in which case poles may need to be retained or the utilities shifted in conjunction with utilities.</p> <ul style="list-style-type: none"> <li>- Ensure that when replacing overhead lines alternative arrangements are put in place to maintain health and safety and any street lighting and other cables that use existing poles prior to their removal.</li> <li>- In relation to cumulative impact liaise with other developers and utilities regarding the timing and extent of other construction works in the same road ROW and ensure plans for construction works are coordinated so emissions/disruption/ disturbance are minimized.</li> </ul>						

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Contractors to conduct an inventory of property / physical cultural resources / utilities / street furniture in and adjacent to the RoW prior to the start of any works. For any at risk of damage during construction, including from potential breaking/drilling vibration damage (buildings, roads, drains etc.) photographic and/or structural pre-condition surveys are to be completed and agreed with DESCO prior to any works, including site establishment. To be documented in a pre-project condition report, which will serve as baseline in case any inadvertent damage or vibration impact to property occurs. If risk of structural damage to adjacent properties from vibration identified due to current condition, consider alternative construction methods or temporary relocation of occupants during works if at risk.</li> <li>- Provide information to the public about the scope and schedule of construction activities and expected disruptions and access</li> </ul>						

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		restrictions at least one week before the disruptions.						
Existing transformer connections and distribution transformer purchase and installation	Pollution of soils and water due to discharge of transformer oil	<ul style="list-style-type: none"> <li>- If not already in-situ install around the base of all ground mounted transformers to which cables/lines connect a fence with locked gate and for pole mounted transformers a fence or suitable anti-climbing deterrent, together with provision of hazard warning signs.</li> <li>- If during the route survey existing transformers not maintained in good condition and to which the distribution lines must connect are identified these are to be reported to DESCO who will need to either remove or maintain/repair the transformer, so it is left in good condition. Health and safety risk assessment for exposure to PCBs to be undertaken before removal/maintenance/repair/</li> <li>- connection work is undertaken on any existing transformers.<sup>14</sup></li> </ul>	Detailed Design cleared and approved reflects EMP requirements with copies of equipment purchase letters included in EMRs, all project equipment must be ensured PCB free etc.	Prior to detailed design approval and for implementation during construction	√	√	√	Contract Cost

<sup>14</sup> In the absence of documentary evidence (e.g., contract specification or certification for supply of original transformer, maintenance records for oil replacement including material safety data sheet, or transformer oil test results etc.) for given transformers confirming they are PCB-free, all old transformers must be considered by the staff at risk of containing PCBs. Mineral oil-filled transformers were not designed to use PCBs, but many have been found to be contaminated with PCBs due to oil changes etc. If existing transformers are at risk of containing PCBs DESCO will arrange for them to be tested by the contractor (such testing is included in EMoP scope). Dechlorinating or removing those confirmed as containing PCBs

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Use of PCBs will be prohibited in all new transformers. Equipment purchased by DESCO or the contractor for use on the project is to be accompanied by letter from the manufacturer stating that it is guaranteed PCB free and to be labelled as PCB free before its installation.</li> <li>- Contractor to provide DESCO with Material Data Sheets for insulating oil meeting technical specifications for use in new transformers.</li> <li>- Transformers to be pole mounted and sited as far away as possible from any surface waterbodies and groundwater sources to reduce pollution risk. If within 50m of surface water or groundwater well further assessment to be carried out by contractor to demonstrate using a source-pathway-receptor model there will be no adverse impact on aquatic ecology or human health.</li> </ul>						

from the distribution network by 31.12.25 per the Stockholm Convention with transport, storage, and disposal through facilities capable of safely transporting (closed trucks) and disposing of hazardous waste containing PCBs. In stores, these transformers will need to be stored undercover on a bunded concrete pad or drip tray enough to contain 110% of the liquid contents should they spill or leak.

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
RMU purchase and installation	Emissions of SF6, a potent greenhouse gas, to the atmosphere and discharge of transformer oil into the environment due to spills or leaks	<ul style="list-style-type: none"> <li>- Use of alternative insulation medium (such as Hydrophobic Cycloaliphatic Epoxy) to be considered as the preferred option. If no alternative the use of SF6 in gas insulated equipment must be minimized.</li> <li>- Detailed design of SF6 insulated RMUs will comply with international norms and standards for handling, storage, and management of SF6.</li> <li>- SF6 insulated RMUs will be hermetically pressure sealed "sealed for life" units, tested and guaranteed by the supplier at less than 0.1% leakage rate. Equipment purchased by DESCO or the contractor for use on the project is to be accompanied by letter from the manufacturer stating that it meets these requirements.</li> <li>- RMUs to be equipped with a Leak Detection System (LDS) for SF6. This will be designed such that any leakage of SF6 will trigger an alarm to the nearest concerned O&amp;M location so that staff may immediately rectify any leak.</li> </ul>	<ul style="list-style-type: none"> <li>- Detailed Design cleared and approved reflects EMP requirements including leak detection system with copies of equipment purchase letters included in EMRs, all SF6 project equipment must have &lt;0.1% leakage rate etc.</li> <li>- Compliance with noise levels applicable to the RMU location per <b>Appendix XI</b></li> </ul>	Prior to detailed design approval and for implementation during construction	√	√	√	Contract Cost

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Provision of SF6 leakage detection kit sufficient for each line manager.</li> <li>- SF6 emergency response plan to be prepared by contractor for construction. DESCO in relation to operation to deal with event of an accidental leak.</li> </ul>						
	Impacts due to siting of RMUs	<ul style="list-style-type: none"> <li>- Conduct a flood and drainage risk assessment and incorporate effective drainage design (allowing for climate change) to prevent possible flooding or waterlogging of the RMUs during the wet season, whilst ensuring that surface runoff from the site of the RMU is no more than the existing site runoff rate.</li> </ul>						
	Impacts due to noise	<ul style="list-style-type: none"> <li>- Ensure maximum external sound power level of RMU in public domain is no more than 70 dBA and in accordance with the applicable noise level for the location through the use of sound attenuation. If the internal sound power level is more than 85 dBA OHS noise warning signage identifying that ear protection to be worn must be installed as part of design.</li> </ul>						
	Health and safety risks related to	<ul style="list-style-type: none"> <li>- Detailed design of RMUs to include fire safety measures including</li> </ul>						

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
	fire safety and emergency response	<p>detector, alarm, and firefighting equipment in accordance with national regulations and IFC EHS Guidelines on OHS.</p> <ul style="list-style-type: none"> <li>- Provide fire extinguishers (including for oil and electric fires) in a prominent, signed location near to fire-risk locations such as transformers and oil storage areas with service and expiration dates clearly labelled.</li> <li>- Provide automatic fire alarm and fire suppression system in the RMU along with posters on fire safety.</li> <li>- Designs to comply with the ICRNP limits of electromagnetic interference</li> <li>- All electrical hazards will feature written and visual warning signs that meet the IEEE standards to include the ISO 7010 "Hazard Type: Electrical Symbol" warning of the risk of electrocution.</li> <li>- RMU located in the public domain will be sited in a gated area or secured cabinet that automatically locks shut so that members of the public cannot access electrical equipment, fence and kiosk to</li> </ul>						

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>feature written and visual warning signs that meet the IEEE standards to include the ISO 7010 "Hazard Type: Electrical Symbol" warning of the risk of electrocution.</p> <p>- Contractors will also ensure that ICNRP occupational/community EMF exposure levels (reference and peak values) will be achieved</p>						
<b>Construction Phase (including demolition by EPC contractors)</b>								
Onsite construction activities	Emissions of SF6, a potent greenhouse gas, to the atmosphere	<p>- Careful installation of SF6 insulated RMUs following international norms and standards for handling, storage, and management of SF6 to avoid damage/ruptures/leakages of SF6 gas.</p> <p>- Provision of SF6 awareness raising to construction workers and training of O&amp;M staff on the operation of the SF6 LDS and emergency response procedures during the commissioning stages.</p>	- EMP/CESMP requirements successfully implemented as determined through regular site checks, photographic record etc.	Throughout construction	√	√	√	Contract cost
	Impacts due to dust and soil erosion from open trenching	- Dust emissions will be minimized by adopting a rolling construction method and immediately restoring the surface of excavations including road pavements once construction activities are completed.	- EMP/CSEMP requirements successfully implemented as determined through regular site checks,	Throughout construction	√	√	√	Contract cost



Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Open trenches and HDD entry/exit pits will be refilled with temporary repaving of the excavated area done manually immediately once cable installation is completed.</li> <li>- Soil scattered on pavements and roads shall be immediately swept up to avoid windblown dust.</li> <li>- Vehicle movements will be restricted to defined access routes.</li> <li>- Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems.</li> <li>- Minimize removal of existing vegetation and topsoil. Excavation of open trenches will be conducted during the dry season to minimize soil erosion and sedimentation of watercourses although it has potential to exacerbate dust impact.</li> <li>- If there is an unacceptable increase in existing background air pollution or complaints are received contractor will be required to implement additional dust</li> </ul>	<ul style="list-style-type: none"> <li>photographic record etc.</li> <li>- No outstanding grievances related to impacts from dust and air pollution.</li> </ul>					

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		mitigation e.g., barricading/isolating sources of dust, etc.						
	Impacts due to construction noise	<ul style="list-style-type: none"> <li>- Only daytime working is permitted unless in commercial/industrial zones with dense urban areas for reasons of road safety and avoiding traffic congestion and it is otherwise agreed in writing with the local authorities and following consultation with all adjacent residents/occupants of buildings to avoid noise nuisance.</li> <li>- Noise generating construction-related activities will be avoided during evenings, school hours, exam periods, prayer times, religious or cultural events near the sensitive receptors in consultation with receptors on days they would wish noise levels to be minimized.</li> <li>- Loud construction noise, breaking and drilling activities in particular, must be limited to very short periods of activity adjacent to receptors to minimize disturbance. Contractor to use suitably designed mufflers or sound reduction equipment on breakers/drills and</li> </ul>	<ul style="list-style-type: none"> <li>- EMP/CSEMP requirements successfully implemented as determined through regular site checks, photographic record etc.</li> <li>- No outstanding grievances related to impacts from noise pollution.</li> </ul>	Throughout construction	√	√	√	Contract cost

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>ensure all leaks in the air line are sealed on them.</p> <p>- If there is an unacceptable increase in existing background noise levels or complaints are received contractor will be required to implement additional noise mitigation e.g., temporary noise screen etc.</p>						
	Drilling fluid	<p>- HDD equipment will use water as a drilling fluid to reduce noise level. Do not allow the use of oil or bentonite clay as a drilling fluid. Where water is used any excess must be disposed of to open ground for percolation, or if no open ground to waiting tanker trucks for proper disposal, it must not be disposed of to surface water.</p>	<p>- EMP/CSEMP requirements successfully implemented as determined through regular site checks, photographic record etc.</p> <p>- No outstanding grievances related to impacts from soil or water pollution.</p>	Throughout construction	√	√	√	Contract cost
	Impacts due to access and blocking of road/footpath	<p>- Follow design drawings and implement careful construction practices to avoid damage to existing public and private property outside the working area. All unanticipated damage to existing public and private property shall be restored immediately to pre-project condition and/or</p>	<p>- EMP/CSEMP requirements successfully implemented as determined through regular site checks, photographic record etc.</p>	Throughout construction	√	√	√	Contract cost

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>compensated at the cost of the contractor.</p> <ul style="list-style-type: none"> <li>- In dense urban areas or on busy roads installation works affecting footpaths and roads to avoid rush hours e.g., 6am to 8am and 4pm to 6 pm; the construction period will be kept to the absolute minimum to reduce the period of road narrowing.</li> <li>- Stockpiling of spoil and any new equipment (cable reels) shall be away from properties and only in designated areas where no access or road use will be blocked.</li> <li>- The construction site is to be cordoned off, clearly signposted and marked by warning lights. Additional nighttime warning lights are to be installed.</li> <li>- Pedestrian pathway to be clearly marked and signposted. In order to enable access to the roadside shops and other buildings, concrete or wooden bridges with side protection will be laid at regular intervals and in front of key locations for pedestrians to be able to cross over unimpeded.</li> </ul>	<ul style="list-style-type: none"> <li>- No outstanding grievances related to impacts from access restrictions.</li> </ul>					

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Robustly fence with solid barrier and sign/light open trenches and entry/exit pits with security presence to prevent public access during construction works. Planks to be placed in the trenches to allow any animals to climb out of them.</li> <li>- Do not allow children to play in or adjacent to the construction site</li> <li>- Do not leave hazardous conditions (e.g, unsigned, unfenced, no unlit open excavations without means of escape, emergency contacts posted in case of accident) overnight unless no access by public can be ensured.</li> <li>- Damage to roads must be immediately repaired to ensure that local communities can continue to safely use the public highways. On completion of construction works roads must be left by the contractors in no poorer condition than when construction started.</li> <li>- DESCO will ensure roads will be resurfaced in conjunction with Dhaka North City Corporation</li> </ul>						

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>immediately on completion of each section to minimize disruption.</p> <ul style="list-style-type: none"> <li>- The final surfacing works for the roads will be paid for by DESCO but done by Dhaka North City Corporation. However, immediately following cable installation works, the contractors will infill the roads to the extent that they can be safely reused again by people and vehicles and will continue to maintain them to ensure safe travel whilst avoiding dust and erosion up until the final surfacing works are completed by the city corporation.</li> </ul>						
	Occupational and community health and safety	<ul style="list-style-type: none"> <li>- Implement agreed traffic management plan. Traffic management will need to be done in consultation with the affected communities to ensure they are aware of likely disruption.</li> <li>- Wherever traffic diversions, warning signs, traffic control signals, barriers and the like are required, the contractor will install them to the satisfaction of the CSC and local authority prior to commencing the work.</li> </ul>	<ul style="list-style-type: none"> <li>- EMP/CSEMP requirements successfully implemented as determined through regular site checks, photographic record etc.</li> <li>- No outstanding grievances related to occupational or community health and safety</li> </ul>	Throughout construction	√	√	√	Contract cost

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<ul style="list-style-type: none"> <li>- Where the execution of the works requires single-lane operation/beside public road the contractor will provide and maintain all necessary barriers, warning signs and traffic control signals to the satisfaction of the CSC and local authority.</li> <li>- Safe access to property and roads should be maintained and safe alternative routes and access provided where there are temporary diversions or blockages, safe alternative routes to be clearly signed where there are temporary diversions or blockages.</li> <li>- Safety guides should be provided where works are on footpaths or in locations of pedestrian crossings to help guide pedestrians, especially vulnerable persons, safely around the working area. For congested and narrow roads flagmen should be utilized to warn road users of the situation.</li> <li>- Implement traffic management controls during construction works with advance warning signs or flag persons to ensure health and safety of construction workers and road</li> </ul>						

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>users. Road safety and warning signs must be posted at 500m, 100m, and immediately in advance of the works at least one week prior to the works commencing to inform the public of the temporary blockage of one lane of the road.</p> <ul style="list-style-type: none"> <li>- Diversion works to be immediately dismantled on completion of works and the footpath and roads restored to their original condition.</li> <li>- For removal of any existing lines scaffolds and safety nets will be used to protect pedestrians and vehicles (and the conductor itself) from potential injury/damage – this will be used wherever stringing crosses over roads and securing a road closure is not possible, presenting a possible risk to traffic, waterbodies, or is in settlement presenting a possible risk to local communities where access cannot be completely prevented, especially where buildings have encroached into the safety clearances and in the vicinity of schools.</li> <li>- Ensure proper grounding and deactivation of live power lines during construction</li> </ul>						



Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>/decommissioning work or before any work near the lines and this will be checked and certified by Health and Safety Officer in advance.</p> <ul style="list-style-type: none"> <li>- Require workers to observe WBG EHS Guideline on T&amp;D requirements for working at height. Require workers to test the structural integrity of poles prior to proceeding with the work. Use fall protection measures when working on poles, i.e., mobile elevated working platform, all workers are required to wear body harness.</li> <li>- For the transient works provide workers with access to an existing functional toilet facility with hand washing facilities (e.g., public toilets) or provide a self-contained portable toilet with hand washing facilities (one toilet per six workers) that do not allow untreated disposal of sewage to adjacent water bodies e.g., sewage enclosed in a container and will later be taken offsite for wastewater treatment and disposal. Open defecation and use of pit latrines to be prohibited.</li> </ul>						
<b>O&amp;M Phase (Measures to be Implemented by DESCO, for RMU O&amp;M Measures See Part 2 of Mitigation Plan)</b>								

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
Operation and maintenance activities	EHS impacts and risks of the project during O&M in general including occupational and community health and safety risks Community H&S risks due to presence of overhead lines – hazards of electrocution, lightning strike, strong winds snapping live cables etc. People can climb poles and get electrocuted	<ul style="list-style-type: none"> <li>- During maintenance activities mitigation measures applicable to the construction phase are also applicable to DESCO maintenance workers or contractors and are to be followed</li> <li>- Carry out regular inspections (at least monthly) on the distribution lines and periodic maintenance to ensure that integrity of the poles and line is in good condition including possible conductor snapping and de-energizing of the line within three cycles to avoid the potential for electrocution from a breakage, the clearances are maintained, and electrical standards are being upheld.</li> <li>- Inspection protocol should confirm electrical safety warning signs and lighting arrestors in place and identify any missing or corroded parts for immediate replacement.</li> <li>- If property is found to be encroaching into the safety clearances notification is to be immediately issued to the owner/occupier by DESCO along with awareness raising materials with respect to the importance of maintaining the horizontal and vertical clearance from buildings and the matter will be taken up further in</li> </ul>	<ul style="list-style-type: none"> <li>- Compliance with GOB regulations 100% of project transformers are PCB free by 31.12.25 per Stockholm Convention</li> <li>- No fatalities or lost time incidents 100% of H&amp;S incidents including near miss recorded, immediately investigated, and corrective action taken to prevent repeat.</li> <li>- Compliance with safety clearances along distribution lines</li> <li>- EMP requirements successfully implemented as determined through regular site checks, photographic record etc.</li> <li>- No outstanding grievances from local communities or</li> </ul>	Throughout the O&M Phase	√			DESCO

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>consultation with the appropriate authorities.</p> <ul style="list-style-type: none"> <li>- Regular pruning or lopping of trees ensure the integrity and safety of the distribution lines</li> <li>- Prohibit the use of herbicides, pesticides or burning to control any vegetation growth or to manage vegetation waste.</li> <li>- Maintain written warning signages including the ISO 7010 Hazard Type: Electrical Symbol warning of the risk of electrocution.</li> <li>- Maintain inventory of transformers on the distribution network, make, model, risk of PCBs and other details including transformer test report, details any maintenance works undertaken, dates oil changes, leakage incidents etc.</li> <li>- Carry out regular inspections and periodic preventive maintenance to minimize oil leakages; ensure valves, nuts and bolts are fully functional and tightly secured, ensure rubber seals of radiators are intact. Any leaking oil that is observed must be immediately addressed.</li> <li>- Unless transformers have been certified PCB free workers interacting with them must wear suitable chemical and/or oil resistant gloves, goggles,</li> </ul>	other interested stakeholders					

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>and protective clothing whilst taking samples and/or working with transformers.</p> <ul style="list-style-type: none"> <li>- For all maintenance works undertake risk assessment and prepare H&amp;S plan in accordance with EHS Guidelines, considering occupational and community H&amp;S and including adherence to electrical safety standards and emergency preparedness and response plan with communication systems and protocols to report an emergency.</li> <li>- O&amp;M to be performed only by suitably qualified and experienced workers who are regularly trained staff of DESCO or a contractor under supervision of a Health and Safety Officer with an appropriately equipped first aid kit and appropriate fire extinguishers immediately available for use</li> <li>- Restricting working at height and with electricity only by workers who are trained and certified to do so.</li> <li>- O&amp;M workers to be given required PPE and other requisite safety equipment</li> <li>- Workers to observe guidelines to minimum approach distances for excavations, tools, vehicles, pruning,</li> </ul>						

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		<p>and other activities when working around power lines.</p> <ul style="list-style-type: none"> <li>- Testing of structural integrity prior to proceeding with the work and the use of fall protection measures such as harnesses, tool bags, ropes etc.</li> <li>- Proper grounding and deactivation of live power lines during maintenance work or when working near the lines.</li> <li>- Map distribution lines in GIS and share the information of the routing of all underground cables to the relevant authorities that may be undertaking works that could disturb them</li> <li>- In the event of an incident such as cable break DESCO staff/community must immediately notify the nearest DESCO incident coordinator for handling measures: power cuts, technical O&amp;M staffing to inspect and repair.</li> <li>- DESCO in conjunction with local municipalities and the media with the support of CSOs to continue to organize health and safety campaigns on electrical safety community awareness raising activities in local communities and schools within 50 m of the ROWs</li> <li>- In case of fire events, explosion, and other related situations, given the</li> </ul>						

Project Activity	Impact	Mitigation/ Compensation/ Contingency/ Enhancement Measures	Performance Indicator	Timing	Responsibilities (including implementation, supervision and monitoring)			Budget/Source
					DESCO	CSC	Contractor	
		DESCO may not be available immediately the community should be educated with respect to emergency response with 24/7 emergency contact numbers for DESCO included on signs; DESCO will need to ensure this is manned 24/7 to ensure that it is effective reporting route.						

## **Appendix X: Environmental Codes of Practice (ECPs)**





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## Introduction

The objective of the Environmental Codes of Practice (ECPs) is to address all potential general construction related impacts during implementation of the Project. The ECPs provide guidelines for international good practices and environmental management guidelines to be followed by the contractors for management of all environmental issues. These ECPs as part of the EMP will be annexed to the general conditions of all the contracts, including subcontracts, carried out under the Project.

The list of ECPs prepared for the Project is:

- ECP 1: Waste Management
- ECP 2: Fuels, Oils and Other Hazardous Substances Management
- ECP 3: Water Resources Management
- ECP 4: Drainage Management
- ECP 5: Soil Quality Management
- ECP 6: Erosion and Sediment Control
- ECP 7: Top Soil Management
- ECP 8: Topography and Landscaping
- ECP 9: Air Quality Management
- ECP 10: Noise and Vibration Management
- ECP 11: Protection of Flora
- ECP 12: Protection of Fauna
- ECP 13: Protection of Fisheries
- ECP 14: Road Transport and Road Traffic Management
- ECP 15: Construction Site and Labor Camp Management
- ECP 16: Cultural and Religious Issues
- ECP 17: Workers Health and Safety (H&S) (including COVID-19 Prevention and Protection)
- ECP 18: SF6 Management

Contractors will prepare Construction Environmental and Social Management Plans (CESMPs)<sup>51</sup> and H&S Plans with sub-plans for each contract/construction site in compliance with ADB and Government of Bangladesh requirements as set out in the EMP and EC respectively and based on the guidance given in the ECPs. The contractors' implementation of the CESMPs and H&S Plans will be supervised and monitored by DESCO along with implementation of the EMP and EC requirements. It is mandatory for the contractors procured directly by the Project to include these ECPs in their subcontracts along with the requirements from the EMP and EC applicable to subcontractor activities. Non-compliance by the contractors procured directly by the Project or their subcontractors will require corrective action to be taken or penalties being imposed on the contractors.

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<sup>51</sup> This will need to include the measures suggested by Baridhara Society for the case applicable ( Kalachandpur SS) which are added in public consultation chapter of EIA/Rules for Construction Activities in Baridhara Society Area

**ECP 1: Waste Management**

<b>Project Activity/Impact Source</b>	<b>Environmental Impacts</b>	<b>Mitigation Measures/ Management Guidelines</b>
Solid Waste and Wastewater Generation	Health hazards and soil and water pollution from the improper management of excess materials including inert spoil from any earthworks, solid wastes and wastewater	<p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Prepare and follow the site-specific waste management plan covering all waste streams (e.g., reusable and recyclable waste, flammable waste, construction debris, food waste, e-waste etc.) submitted to PIU and CSC for approval</li> <li>• Organize disposal of all wastes generated during construction in the designated disposal sites.</li> <li>• Minimize the production of waste materials by 3R (Reduce, Recycle and Reuse) approach.</li> <li>• Segregate and reuse or recycle all the wastes, wherever practical.</li> <li>• Vehicles transporting loose materials and solid waste will be covered with tarpaulins or nets to prevent spilling waste along the route.</li> <li>• Train and instruct all personnel in waste management practices and procedures as a component of the environment management induction process.</li> <li>• Request suppliers to minimize packaging where practicable.</li> <li>• Place a high emphasis on good housekeeping practices.</li> <li>• Maintain all construction sites in a clean, tidy and safe condition.</li> <li>• Provide refuse containers at each worksite.</li> <li>• Provide and maintain appropriate waste management facilities for the temporary storage of all waste types before transportation and final disposal.</li> <li>• Plastic bag and container use to be avoided.</li> <li>• Potable water imported to be supplied in bulk containers to reduce the quantity of plastic waste (plastic bottles).</li> </ul>
Hazardous Waste Generation	Health hazards and soil and water pollution from the improper management of excess hazardous materials and hazardous waste	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Collect chemical wastes in 200-liter drums (or similar sealed container), appropriately labeled for safe transport to an approved chemical waste depot.</li> <li>• Store, transport and handle all chemicals avoiding potential environmental pollution.</li> <li>• Store all hazardous wastes appropriately in bunded areas away from water courses.</li> <li>• Make available Material Safety Data Sheets (MSDS) for hazardous materials on-site during construction.</li> <li>• Collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at approved locations.</li> <li>• Construct concrete or other impermeable flooring to prevent seepage in case of spills.</li> </ul>

## ECP 2: Fuels, Oils and Other Hazardous Substances Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Use of fuels, oils, chemicals and other hazardous substances	Materials used in construction have the potential to be a source of contamination. Improper storage and handling of fuels, lubricants, chemicals and hazardous goods/materials on-site, and potential spills from these goods may harm the environment or health of construction workers and/or communities in the vicinity.	<p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Prepare and follow spill control procedures and submit them for PIU and CSC approval.</li> <li>• Train the relevant construction personnel in handling of fuels, oils (such as transformer oils) and spill control procedures.</li> <li>• Store dangerous goods in banded areas on top of a sealed plastic sheet away from watercourses.</li> <li>• Refueling will occur only within banded areas.</li> <li>• Store and use fuels in accordance with material safety data sheets (MSDS).</li> <li>• Make available MSDS for chemicals and dangerous goods on-site.</li> <li>• Transport hazardous which cannot be recycled, to a suitably licensed and designed hazardous waste facility for disposal.</li> <li>• Provide absorbent and containment material (e.g., absorbent matting) where hazardous materials are used and stored; and ensure personnel trained in the correct use.</li> <li>• Provide protective clothing, safety boots, helmets, masks, gloves, goggles, to the construction personnel, appropriate to materials in use.</li> <li>• Make sure all containers, drums, and tanks that are used for storage are in good condition and are labeled with expiry date. Any container, drum, or tank that is dented, cracked, or rusted might eventually leak. Check for leakage regularly to identify potential problems before they occur.</li> <li>• Store all liquid fuels in fully banded storage containers, with appropriate volumes, a roof, a collection point and appropriate filling/decanting point.</li> <li>• Store hazardous materials above flood level considered for construction purposes</li> <li>• Put containers and drums in temporary storages in clearly marked areas, where they will not be run over by vehicles or heavy machinery. The area will preferably have slope or drain so that the fuels or hazardous lubricants can be safely collected in an event of a spill.</li> <li>• Take all precautionary measures when handling and storing fuels and lubricants, avoiding environmental pollution.</li> <li>• Avoid the use of materials with greater potential for contamination by substituting them with more environmentally friendly materials.</li> </ul>

## ECP 3: Water Resources Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Hazardous material and waste	Water pollution from the storage, handling and disposal of hazardous materials and general construction waste, and accidental spillage	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Follow the management guidelines proposed in ECPs 1 and 2.</li> <li>• Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways or storm water systems.</li> </ul>
Discharge from construction sites	Construction activities, sewerage from construction sites and work camps may affect the surface water quality. The construction works will modify the groundcover and topography changing the surface water drainage patterns of the area. These changes in hydrological regime may lead to an increased rate of runoff, increase in sediment and contaminant loading, increased flooding, and affect habitat of fish and other aquatic biology.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Install temporary drainage works (channels and bunds) in areas required for sediment and erosion control and around storage areas for construction materials.</li> <li>• Install temporary sediment basins, where appropriate, to capture sediment-laden run-off from site.</li> <li>• Divert runoff from undisturbed areas around the construction site.</li> <li>• Stockpile materials away from drainage lines</li> <li>• Prevent all solid and liquid wastes entering waterways by collecting solid waste, oils, chemicals, bitumen spray waste and wastewaters from brick, concrete and asphalt cutting where possible and transport to an approved waste disposal site or recycling depot.</li> <li>• Wash out ready-mix concrete agitators and concrete handling equipment at washing facilities off site or into approved bunded areas on site. Ensure that tires of construction vehicles are cleaned in the washing bay (constructed at the entrance of the construction site) to remove the mud from the wheels. This should be done in every exit of each construction vehicle to ensure the local roads are kept clean.</li> <li>• Sewerage and grey water from portable toilets on the construction site and labor camps is to be collected and tankered off for offsite treatment and disposal.</li> <li>• Dewater sites by pumping water to a sediment basin prior to release off site – and should not pump directly off site.</li> <li>• Protect water bodies from sediment loads by silt screen or other barriers.</li> <li>• Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways or storm water systems</li> </ul>

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		<ul style="list-style-type: none"> <li>Do not discharge cement and water curing used for cement concrete directly into water courses and drainage inlets.</li> </ul>
Soil erosion and siltation	Soil erosion and dust from the material stockpiles will increase the sediment and contaminant loading of surface water bodies.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>Stabilize the cleared areas not used for construction activities with vegetation or appropriate surface treatments as soon as practicable following earthwork to minimize erosion.</li> <li>Ensure that roads used by construction vehicles are swept regularly to remove dust and sediment.</li> <li>Water the loose material stockpiles, access roads and bare soils on an as required basis to minimize dust. Increase the watering frequency during periods of high risk (e.g., high winds).</li> </ul>
Drinking water	Untreated surface water is not suitable for drinking purposes due to presence of suspended solids and E. coli.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>Provide drinking water that meets national and WBG EHS Guidelines.</li> </ul>

#### ECP 4: Drainage Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Excavation and earth work, and construction yards	Lack of proper drainage for rainwater/liquid waste or wastewater owing to the construction activities harms environment in terms of water and soil contamination, and mosquito growth.	<ul style="list-style-type: none"> <li>The Contractor will</li> <li>Prepare and follow drainage management procedures submitted to PIU and CSC approval.</li> <li>Prepare a program to prevent/avoid standing waters, which PIU and CSC will verify in advance and confirm during implementation.</li> <li>Provide alternative drainage for rainwater if the construction works/earth-filling cut the established drainage line.</li> <li>Establish local drainage line with appropriate silt collector and silt screen for rainwater or wastewater connecting to the existing established drainage lines already there.</li> <li>Rehabilitate road drainage structures immediately if damaged by contractors' road transports.</li> <li>Build new drainage as appropriate with oil interceptors connecting to the available nearby recipient water bodies.</li> <li>Ensure wastewater quality conforms to national and WBG EHS Guidelines before it is being discharged into the recipient water bodies.</li> <li>Ensure that there will be no water stagnation at the construction sites and camps.</li> <li>Provide appropriate silt collector and silt screen at the inlet and manholes and periodically clean the drainage system to avoid drainage congestion.</li> </ul>

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		<ul style="list-style-type: none"> <li>Protect natural slopes of drainage channels to ensure adequate storm water drains.</li> <li>Regularly inspect and maintain all drainage channels to assess and alleviate any drainage congestion problem.</li> </ul>
Ponding of water	Health hazards due to mosquito breeding	<ul style="list-style-type: none"> <li>Do not allow ponding of water especially near the waste storage areas and construction camps.</li> <li>Discard all the storage containers that are capable of storing of water, after use or store them in inverted position.</li> </ul>

### ECP 5: Soil Quality Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Storage of hazardous and toxic chemicals	Spillage of hazardous and toxic chemicals will contaminate the soils	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>Strictly manage the wastes management plans proposed in ECP1 and storage of materials in ECP2.</li> <li>Construct appropriate spill contaminant facilities for all fuel storage areas.</li> <li>Establish and maintain a hazardous material register detailing the location and quantities of hazardous substances including the storage, and their disposals.</li> <li>Train personnel and implement safe work practices for minimizing the risk of spillage.</li> <li>Identify the cause of contamination, if it is reported, and contain the area of contamination. The impact may be contained by isolating the source or implementing controls around the affected site.</li> <li>Remediate the contaminated land using the most appropriate available method.</li> </ul>
Construction material stock piles	Erosion from construction material stockpiles may contaminate waterbodies	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds.</li> </ul>

### ECP 6: Erosion and Sediment Control

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Clearing of construction sites	Cleared areas and slopes are susceptible for erosion of top soils, which affects the growth of vegetation and causes ecological imbalance.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>Prepare and follow site specific erosion and sediment control measures and submit them for PIU and CSC approval.</li> <li>Reinstate and protect cleared areas as soon as possible.</li> </ul>

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		<ul style="list-style-type: none"> <li>Cover unused areas of disturbed or exposed surfaces immediately with mulch/grass turf/tree plantations.</li> </ul>
Construction activities and material stockpiles	Soil erosion and dust from the material stockpiles will increase the sediment and contaminant loading of surface water bodies.	<ul style="list-style-type: none"> <li>The Contractor will</li> <li>Locate stockpiles away from drainage lines.</li> <li>Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds.</li> <li>Remove debris from drainage paths and sediment control structures.</li> <li>Cover the loose sediments of construction material and water them if required.</li> <li>Divert natural runoff around construction areas prior to any site disturbance.</li> <li>Install protective measures on site prior to construction, for example, sediment traps.</li> <li>Install 'cut off drains' on large cut/fill batter slopes to control water runoff speed and hence erosion.</li> <li>Observe the performance of drainage structures and erosion controls during rain and modify as required.</li> </ul>
Soil erosion and siltation	The impacts of soil erosion are (i) increased run off and sedimentation causing a greater flood hazard to the downstream, and (ii) destruction of aquatic environment by erosion and/or deposition of sediment damaging the spawning grounds of fish	<p>The Contractor will:</p> <ul style="list-style-type: none"> <li>stabilize the cleared areas not used for construction activities with vegetation or appropriate surface water treatments as soon as practicable following earthwork to minimize erosion.</li> <li>Ensure that roads used by construction vehicles are swept regularly to remove sediment.</li> <li>Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust. Increase the watering frequency during periods of high risk (e.g. high winds).</li> </ul>

### ECP 7: Top Soil Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Land clearing and earth works	Earthworks will impact the fertile top soils that are enriched with nutrients required for plant growth or agricultural development.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>Strip the top soil to a depth of 15 cm and store in stock piles of height not exceeding 2m.</li> <li>Remove unwanted materials from top soil like grass, roots of trees and similar.</li> <li>Stockpiles will be done in slopes of 2:1 to reduce surface runoff and enhance percolation through the mass of stored soil.</li> </ul>

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		<ul style="list-style-type: none"> <li>• Locate topsoil stockpiles in areas outside drainage lines and protect from erosion.</li> <li>• Construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil.</li> <li>• Spread the topsoil to maintain the physico-chemical and biological activity of the soil. Stored top soil will be utilized for covering all disturbed area and plantation sites.</li> <li>• Prior to the re-spreading of topsoil, the ground surface will be ripped to assist the binding of the soil layers, water penetration and revegetation</li> </ul>
Transport	Vehicular movement outside RoW or temporary access roads will affect the soil fertility of the agricultural lands	<ul style="list-style-type: none"> <li>• Limit equipment and vehicular movements to within the approved construction zone.</li> </ul>

### ECP 8: Topography and Landscaping Work

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Land clearing and earth works	Construction activities especially earthworks will change the topography and disturb the natural rainwater/flood water drainage as well as changing the local landscape.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Prepare a landscaping and tree plantation plan and submit the plan for PIU and CSC approval.</li> <li>• Ensure the topography of the final surface of all raised lands (construction sites, access roads, etc.) are conducive to enhance natural draining of rainwater/flood water.</li> <li>• Keep the final or finished surface of all the raised lands free from any kind of depression that causes water logging.</li> <li>• Undertake erosion control/prevention by grass-turfing and tree plantation, where there is a possibility of rain-cut that will change the shape of topography.</li> <li>• Cover immediately the uncovered open surface that has no use of construction activities with grass-cover and tree plantation to prevent soil erosion and bring improved landscaping.</li> <li>• Reinststate the natural landscape of the temporary construction sites after completion of works.</li> </ul>



## ECP 9: Air Quality Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Air quality can be adversely affected by vehicle exhaust emissions and combustion of fuels.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Prepare air quality management plan (under the Pollution Prevention Plan) and submit the plan for PIU and CSC approval.</li> <li>• Fit vehicles with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition.</li> <li>• Operate the vehicles in a fuel-efficient manner.</li> <li>• Cover haul vehicles carrying dusty materials moving outside the construction site.</li> <li>• Impose speed limits on all vehicle movement at the worksite to reduce dust emissions.</li> <li>• Control the movement of construction traffic.</li> <li>• Water construction materials prior to loading and transport.</li> <li>• Service all vehicles regularly to minimize emissions.</li> <li>• Limit the idling time of vehicles to not more than 2 minutes.</li> </ul>
Construction machinery	Air quality can be adversely affected by emissions from machinery and combustion of fuels.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Fit machinery with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition in accordance with the specifications defined by their manufacturers to maximize combustion efficiency and minimize the contaminant emissions. Proof or maintenance register will be required by the equipment suppliers and contractors.</li> <li>• Focus special attention on containing the emissions from generators.</li> <li>• Machinery causing excess pollution (e.g. visible smoke) will be banned from construction sites.</li> <li>• Service all equipment regularly to minimize emissions.</li> <li>• Provide filtering systems, duct collectors or humidification or other techniques (as applicable) to any concrete batching and mixing plant to control the particle emissions in all its stages, including unloading, collection, aggregate handling, cement dumping, circulation of trucks and machinery.</li> </ul>
Construction activities	Dust generation from construction sites, material stockpiles and access roads is not only a nuisance for local people, it aggravates the environment and can bring forth multiple health hazards, and can also affect the local crops	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Water the material stockpiles, access roads and bare soils on an as required basis to minimize the potential for environmental nuisance due to dust. Increase the watering frequency during periods of high risk (e.g., high winds).</li> <li>• Stored materials such as gravel and sand will be covered and confined to avoid them being wind-drifted.</li> </ul>

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		<ul style="list-style-type: none"> <li>• Minimize the extent and period of exposure of the bare surfaces.</li> <li>• Restore disturbed areas as soon as practicable by vegetation/grass-turfing.</li> <li>• Store the cement in silos and minimize the emissions from silos by equipping them with filters.</li> <li>• Establish adequate locations for storage, mixing and loading of construction materials, in a way that dust dispersion is prevented because of such operations.</li> <li>• Water must not be used as a means of dust suppression on potentially contaminated areas.</li> <li>• Crushing of rocky and aggregate materials will be wet-crushed or performed with particle emission control systems.</li> <li>• Not permit the burning of solid waste.</li> <li>• Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.</li> </ul>

#### ECP 10: Noise and Vibration Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Noise quality will deteriorate due to vehicular traffic	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Prepare a noise and vibration management plan (under the Pollution Prevention Plan) and submit the plan for PIU and CSC approval.</li> <li>• Maintain all vehicles in order to keep them in good working order in accordance with manufactures maintenance procedures.</li> <li>• Make sure all drivers comply with the traffic codes concerning maximum speed limit, driving hours, etc.</li> <li>• Organize the loading and unloading of trucks, and handling operations for the purpose of minimizing construction noise on the work site.</li> </ul>
Construction machinery	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Appropriately site all noise generating activities to avoid noise pollution to local residents.</li> <li>• Use the quietest available plant and equipment.</li> <li>• Maintain all equipment in order to keep those in good working condition in accordance with manufactures maintenance procedures. Equipment suppliers and contractors will present proof of maintenance register of their equipment.</li> <li>• Install acoustic enclosures around generators to reduce noise levels.</li> </ul>

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		<ul style="list-style-type: none"> <li>• Fit high efficiency mufflers to appropriate construction equipment.</li> <li>• Avoid the unnecessary use of alarms, horns and sirens.</li> </ul>
Construction activity	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Notify adjacent landholders prior to any typical noise events outside of daylight hours.</li> <li>• Educate the operators of construction equipment on potential noise problems and the techniques to minimize noise emissions.</li> <li>• Employ best available work practices on-site to minimize occupational noise levels.</li> <li>• Install temporary noise control barriers where appropriate.</li> <li>• Notify potentially affected people if major noise generation activities will be undertaken, e.g. blasting.</li> <li>• Plan activities on site and deliveries to and from site to minimize impact.</li> <li>• Monitor and analyze noise and vibration results and adjust construction practices as required.</li> <li>• Avoid undertaking the high noise generating activities, where possible, when working at night near the residential areas.</li> </ul>

**ECP 11: Protection of Flora**

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Vegetation clearance	Local flora is important to provide shelter for the birds and small animals, offer fruits and/or timber/firewood, and protect soil erosion. As such damage to flora can have adverse environmental impacts.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Prepare a plan for protection of flora and submit the plan for PIU and CSC approval.</li> <li>• Minimize disturbance to surrounding vegetation.</li> <li>• Use appropriate type and minimum size of machine to avoid disturbance to adjacent vegetation.</li> <li>• Get approval from PIU and CSC for clearance of vegetation.</li> <li>• Undertake selective and careful pruning of trees where possible to reduce need of tree removal.</li> <li>• Control noxious weeds by disposing of at a suitably licensed waste management facility.</li> <li>• Clear only the vegetation that needs to be cleared in accordance with the engineering plans and designs.</li> <li>• Not burn off of cleared vegetation – where feasible, chip or mulch and reuse it for the rehabilitation of affected areas, temporary access tracks or landscaping. Mulch provides a seed source, can limit erosion, retains soil</li> </ul>

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		<p>moisture and nutrients, and encourages re-growth and protection from weeds.</p> <ul style="list-style-type: none"> <li>• Return topsoil and mulched vegetation (in areas of native vegetation) to approximately the same area it came from.</li> <li>• Avoid work within the drip-line of trees to prevent damage to the tree roots and compacting the soil.</li> <li>• Minimize the length of time the ground is exposed or excavation left open by clearing and re-vegetate the area at the earliest practically possible.</li> <li>• Ensure excavation works occur progressively and re-vegetation is done at the earliest.</li> <li>• Provide adequate knowledge to the workers regarding nature protection and the need to avoid felling trees during construction.</li> <li>• Supply appropriate fuel in the work camps to prevent fuel wood collection.</li> <li>• These measures are applicable to both the construction areas as well as to any associated activities such as sites for stockpiles, disposal of fill, etc..</li> </ul>

**ECP 12: Protection of Fauna**

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities	The location of construction activities can result in the loss of wildlife habitat and habitat quality,	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Prepare a plan for protection of fauna and submit the plan for PIU and CSC approval.</li> <li>• Limit the construction works within the designated sites allocated to the contractors.</li> <li>• Check the site for animals trapped in, or in danger from site works and use a qualified person (ecologist or veterinary) to relocate the animal.</li> </ul>
	Impact on birds, their habitat and their active nests	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Not be permitted to destruct active nests or eggs of birds.</li> <li>• Minimize the tree removal during the bird breeding season. If work must be continued during the bird breeding season, a nest survey will be conducted by a qualified biologist prior to commencing works to identify and locate active nests.</li> <li>• If bird nests are located/detected within the trees or on ledges or the ground, then those areas must be avoided.</li> <li>• Petroleum products must not come in contact with sensitive ecosystems.</li> </ul>

<b>Project Activity/ Impact Source</b>	<b>Environmental Impacts</b>	<b>Mitigation Measures/ Management Guidelines</b>
		<ul style="list-style-type: none"> <li>Minimize the release of oil, oil wastes or any other substances harmful to birds' habitats, to any waters, wetlands or any areas frequented by birds.</li> </ul>
Vegetation clearance	Clearance of vegetation may impact shelter, feeding and/or breeding and/or physical destruction and severing of habitat areas	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>Restrict the tree removal to the minimum numbers required.</li> <li>Fell the trees in a manner which reduces the potential for fauna mortality. Felled trees will be inspected before felling for fauna and if identified and readily accessible will be removed and relocated or rendered assistance if injured. After felling, hollow bearing trees will remain unmoved overnight to allow any animals to move of their own volition.</li> </ul>
Night time lighting	Lighting from construction sites and construction camps may affect the visibility of night time migratory birds that use the moon and stars for navigation during their migrations.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>Use lower wattage flat lens fixtures that direct light down and reduce glare, thus reducing light pollution,</li> <li>Avoid flood lights unless those are absolutely required.</li> <li>Use motion sensitive lighting to minimize needless lighting.</li> <li>Use, if possible, green lights that are considered as bird friendly lighting instead of white or red colored lights.</li> <li>Install light shades or plan the direction of lights to reduce light spilling outside the construction area.</li> </ul>
Construction camps	Illegal poaching	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>Provide adequate knowledge to the workers regarding protection of flora and fauna, and relevant government regulations and enforcements for illegal poaching.</li> <li>Ensure that staff and subcontractors are trained and empowered to identify, address and report potential environmental problems.</li> </ul>

### ECP 13: Protection of Fisheries

<b>Project Activity/ Impact Source</b>	<b>Environmental Impacts</b>	<b>Mitigation Measures/ Management Guidelines</b>
Construction activities on the land	The main potential impacts to aquatic flora and fauna are increased suspended solids from earthworks erosion, sanitary discharge from work camps, and hydrocarbon spills	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>Prepare procedures for protection of fish and submit those for PIU and CSC for approval.</li> <li>Follow mitigation measures proposed in ECP 3: Water Resources Management and EC4: Drainage Management.</li> <li>Contain oil immediately on river in case of accidental spillage from equipment; make an emergency oil spill containment plan (under the Fuels and Other Hazardous Substances Management Plan) to be supported with enough equipment, materials and human resources.</li> <li>Not dump wastes, be it hazardous or non-hazardous into the nearby water bodies or in the river.</li> </ul>

**ECP 14: Road Transport and Road Traffic Management**

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Increased traffic use of road by construction vehicles will affect the movement of normal road traffic and the safety of the road-users.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Prepare a traffic management plan and submit the plan for PIU and CSC approval updating it as needed if additional traffic routes or traffic diversion and management required.</li> <li>• Strictly follow the traffic management plan and work in close coordination with the local authorities.</li> <li>• Include in the traffic plan activities/precautions to ensure uninterrupted traffic movement during the construction stage: detailed drawings of traffic arrangements showing all detours, temporary road, temporary bridges temporary diversions, necessary barricades, warning signs / lights, road signs, etc.</li> <li>• Provide signs at strategic locations of the roads complying with the schedules of signs contained in the national traffic regulations.</li> </ul>
Pollution incidents	Accidents and spillage of fuels and chemicals	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Restrict truck deliveries, where practicable, to day time working hours.</li> <li>• Restrict the transport of oversize loads.</li> <li>• Operate vehicles, if possible, to non-peak periods to minimize traffic disruptions.</li> <li>• Enforce off- and on-site speed limit.</li> </ul>

**ECP 15: Construction Site and Labor Camp Management**

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Siting and location of construction camps	Labor campsites for construction workers can impact health and safety and disrupt nearby communities.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Prepare a construction camp management plan and submit the plan for PIU and CSC approval.</li> <li>• Build the construction camps within the designed construction sites or at areas which are acceptable from environmental, cultural or social point of view; and approved by the PIU and CSC.</li> <li>• Consider the location of construction camps away from communities in order to avoid social conflict in using the natural resources such as water or to avoid the possible adverse impacts of the construction camps on the surrounding communities.</li> <li>• Submit to the PIU and CSC for approval a detailed layout plan for the development of the construction camp showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps.</li> <li>• Local authorities responsible for health, conducting religious rituals and security will be duly informed on the set up of camp facilities to maintain effective surveillance over public health, social and security matters.</li> </ul>

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction Camp Facilities	Lack of proper infrastructure facilities, such as water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards for construction workers.	<p>Contractor will provide the following facilities in the campsites</p> <ul style="list-style-type: none"> <li>• Adequate housing for all workers.</li> <li>• Safe and reliable water supply, which should meet the national and WBG EHS guidelines. Drinking water to be chlorinated at source, and ensure presence of residual chlorine with 0.1 ~ 0.25 ppm as minimum after 30 minutes of chlorine contact time (WHO guideline).</li> <li>• Hygienic sanitary facilities and sewerage system. The toilets and domestic waste water will be collected through a common sewerage. Provide separate latrines and bathing places for males and females workers with total isolation by location. The minimum number of toilet facilities required is one toilet for every six persons.</li> <li>• Treatment facilities for sewerage of wastewater.</li> <li>• Storm water drainage facilities.</li> <li>• Paved internal roads.</li> <li>• Labor Camp will be constructed by maintaining all the safety issues to fight against COVID 19 and following COVID-19 Protocol of DG Health, Bangladesh. (<a href="https://old.dghs.gov.bd/images/docs/Guideline/Concise_Covid-19_guideline.pdf">https://old.dghs.gov.bd/images/docs/Guideline/Concise_Covid-19_guideline.pdf</a>)</li> </ul>
Disposal of waste	Management of wastes is crucial to minimize negative impacts on the environment	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Ensure the collection and disposal of solid wastes from the labor camps with disposal to suitably licensed waste management facilities</li> <li>• Insist on waste separation by source; organic wastes in one container and inorganic wastes in another container at household level.</li> <li>• Store inorganic wastes in a safe place within the household and clear organic wastes on a daily basis to waste collector.</li> <li>• Establish waste collection, transportation and disposal systems with the manpower and equipment/vehicles needed.</li> <li>• Do not establish site specific landfill sites.</li> </ul>
Fuel supplies for cooking purposes	Illegal sourcing of fuel wood by construction workers will impact the local flora and fauna	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Provide fuel to the construction camps for their domestic purpose, in order to discourage them to use fuel wood or other biomass.</li> <li>• Make available alternative fuels like natural gas or kerosene on ration to the workforce to prevent it from using biomass for cooking.</li> <li>• Conduct awareness campaigns to educate workers on preserving and protecting the biodiversity and wildlife of the project area, and relevant government regulations and enforcements on wildlife protection.</li> </ul>
Health and Hygiene	There will be a potential for diseases to be transmitted including malaria, exacerbated by	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Provide adequate health care facilities within the construction sites.</li> <li>• Provide first aid facility round the clock. Maintain stock of medicines in the facility and appoint fulltime designated first aider or nurse.</li> </ul>

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	inadequate health and safety practices. There will be an increased risk of construction workers spreading sexually transmitted infections and HIV/AIDS.	<ul style="list-style-type: none"> <li>• Provide ambulance facility for the labors during emergency to be transported to nearest hospitals.</li> <li>• Carry out initial health screening of the labors coming from outside areas.</li> <li>• Train all construction workers in basic sanitation and health care issues and safety matters, and on the specific hazards of their work.</li> <li>• Provide HIV awareness programming, including STI (sexually transmitted infections) and HIV information, education and communication for all workers on a regular basis.</li> <li>• Provide adequate drainage facilities throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form anywhere near the site.</li> <li>• Regular mosquito repellent sprays (not pesticides subject to bans) are used during rainy season in offices and construction camps and yards.</li> <li>• Do not dispose food waste openly as that will attract rats, cockroaches and other insects, and stray dogs.</li> <li>• Carry out short training sessions on best hygiene practices to be mandatorily participated by all workers.</li> <li>• Place display boards at strategic locations within the camps containing messages on best hygienic practices.</li> </ul>
Safety	Inadequate safety facilities to the construction camps may create security problems and fire hazards	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Provide appropriate security personnel (police or private security guards) and enclosures to prevent unauthorized entry into the camp area.</li> <li>• Maintain a register to keep a track on a head count of persons present in the camp at any given time.</li> <li>• Use flameproof material for the construction of labor housing / site office. Also, ensure that these houses/rooms are of sound construction and capable of withstanding wind storms/cyclones.</li> <li>• Provide firefighting equipment at the labor camps</li> <li>• Display emergency contact numbers clearly and prominently at strategic places in camps.</li> <li>• Communicate the roles and responsibilities of labors in case of emergency in the monthly meetings with contractors.</li> </ul>
Site Restoration	Restoration of the construction camps to original condition requires demolition of construction camps.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Dismantle and remove from the site all facilities established within the construction camp including the perimeter fence and lockable gates at the completion of the construction work.</li> <li>• Dismantle camps in phases as certain work gets done/decreased and not wait for the entire work to be completed.</li> <li>• Give prior notice to the labors before demolishing their camps/units.</li> <li>• Maintain the noise levels within the applicable noise levels during demolition activities.</li> <li>• Different subcontractors must be hired to demolish different structures to promote recycling or reuse of demolished materials.</li> <li>• Reuse the demolition debris to a maximum extent.</li> </ul>



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		<ul style="list-style-type: none"> <li>• Dispose remaining debris at the suitably licensed waste management facility.</li> <li>• Restore the site to its condition prior to commencement of the works or to an agreed condition with the landowner.</li> </ul>

**ECP 16: Cultural and Religious Issues**

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities near religious and cultural sites	Disturbance from construction works to the cultural, religious and educational sites, and construction workers lack of knowledge on cultural issues causes social disturbances.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Communicate to the public through community consultation regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restriction.</li> <li>• Not block access to cultural and religious sites, wherever possible.</li> <li>• Restrict all construction activities to within the footprints of the construction sites.</li> <li>• Stop construction works that produce noise (particularly during prayer time and school hours) if there are any mosque/religious/educational institutions close to the construction sites and users make objections.</li> <li>• Take special care and use appropriate equipment when working next to cultural/religious institutions.</li> <li>• Develop a Chance Find Procedure for archaeological remains. This procedure will require stopping work immediately and notify the site manager if, during construction, an archaeological or burial site is discovered. It is an offence to recommence work in the vicinity of the site until approval to continue is given.</li> <li>• Provide separate prayer facilities to the construction workers.</li> <li>• Allow the workers to participate in praying during construction time.</li> <li>• Show appropriate and decent behavior with all construction workers especially women and elderly people.</li> <li>• Resolve cultural issues in consultation with local leaders, PIU and CSC.</li> <li>• Establish a mechanism that allows local people to raise grievances arising from the construction process.</li> <li>• Inform the local authorities responsible for health, religious and security before commencement of construction works so as to maintain effective surveillance over public health, social and security matters.</li> </ul>

**ECP 17: Worker's Health and Safety (including COVID-19 Prevention and Protection)**

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Best practices	Construction works may pose health and safety risks to the construction workers and site visitors leading to severe injuries and deaths. The population in the proximity of the construction site and the construction workers will be exposed to a number of (i) biophysical health risk factors, (e.g. noise, dust, chemicals, construction material, solid waste, waste water, vector transmitted diseases etc.), (ii) risk factors resulting from human behavior (e.g. STD, HIV etc.) and (iii) road accidents from construction traffic.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Prepare an Occupational Health and Safety plan (including COVID management measures) and submit the plan for PIU and CSC approval.</li> <li>• Implement suitable safety standards for all workers and site visitors which must not be less than those laid down in international good practice guidelines (e.g., International Labor Organization guideline on 'Safety and Health in Construction; World Bank Group's 'Environmental Health and Safety Guidelines') and the contractor's own national standards or statutory regulations, in addition to complying with national requirements.</li> <li>• Appoint an environment, health and safety manager to look after the health and safety of the workers.</li> <li>• Provide the workers with a safe and healthy work environment, considering inherent risks in its particular construction activity and specific classes of hazards in the work areas.</li> <li>• Provide personal protection equipment (PPE) for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields, and ear protection. Maintain the PPE properly by cleaning dirty ones and replacing the damaged ones.</li> <li>• Safety procedures to include provision of information, training and protective clothing to workers involved in hazardous operations and ensuring safe performance in their job.</li> <li>• Inform the local authorities responsible for health, religious rituals and security before commencement of construction works and establishment of labor camps so as to maintain effective surveillance over public health, social and security matters.</li> </ul>
Incident Management	Lack of first aid facilities and health care facilities in the immediate vicinity will aggravate the health conditions of the victims	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Ensure health care facilities and first aid facilities are readily available; appropriately equipped first-aid stations to be easily accessible throughout the place of work.</li> <li>• Prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, as far as reasonably practicable, the causes of hazards, in a manner consistent with good international industry practice.</li> <li>• Identify potential hazards to workers, particularly those that may be life-threatening and provide necessary preventive and protective measures.</li> </ul>

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		<ul style="list-style-type: none"> <li>• Document and report occupational accidents, diseases, and incidents.</li> <li>• Provide awareness raising to the construction drivers to strictly follow the driving rules.</li> <li>• Provide adequate lighting in the construction area.</li> </ul>
Construction Camps	Lack of proper infrastructure facilities, such as water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards for construction workers.	<p>The Contractor will provide the following facilities in the labor campsites or other accommodation being provided to improve health and hygienic conditions as mentioned in ECP 15 Construction Camp Management</p> <ul style="list-style-type: none"> <li>• Construction Camps will be constructed by maintaining all the safety issues to fight against COVID 19 and following COVID-19 Protocol of DG Health, Bangladesh (<a href="https://old.dghs.gov.bd/images/docs/Guideline/Concise_Covid-19_guideline.pdf">https://old.dghs.gov.bd/images/docs/Guideline/Concise_Covid-19_guideline.pdf</a>)</li> <li>• Adequate ventilation facilities</li> <li>• Safe and reliable water supply meeting drinking water standards</li> <li>• Hygienic sanitary facilities and sewerage system.</li> <li>• Treatment facilities for sewerage</li> <li>• Storm water drainage facilities.</li> <li>• Safe storage facilities for petroleum and other chemicals in accordance with ECP 2</li> <li>• Solid waste collection and disposal system in accordance with ECP1.</li> <li>• Recreational and social facilities</li> <li>• Sick bay and first aid facilities</li> <li>• Paved internal roads.</li> <li>• Security fence at least 2 m height.</li> </ul>
Water and sanitation facilities at the construction sites	Lack of water and sanitation facilities at construction sites causes inconvenience to the construction workers and affects their personal hygiene.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Provide portable toilets at construction sites.</li> <li>• The location of portable toilets should be at least 6 m away from the storm drain system and surface waters.</li> <li>• Portable toilets must be cleaned once a day and all the sewerage pumped from the collection tank once a day and brought to a common septic tank for further treatment.</li> <li>• Provide safe and reliable drinking water facilities meeting drinking water standards to the construction workers at all the construction sites and accommodation provided for them</li> </ul>
Other ECPs	Potential risks to health of construction workers (and general public)	<p>The Contractor will follow the following ECPs to reduce health risks to the construction workers and nearby communities</p> <ul style="list-style-type: none"> <li>• ECP 2: Fuels, Oils and Other Hazardous Substances Management</li> <li>• ECP 4: Drainage Management</li> <li>• ECP 9: Air Quality Management</li> <li>• ECP 10: Noise and Vibration Management</li> <li>• ECP 14: Road Transport and Road Traffic Management</li> </ul>
Training and Awareness Raising	Lack of awareness and basic knowledge in health and safety among the	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Train all construction workers in general health and safety matters, and on the specific hazards of their work. Training should consist of basic hazard awareness, site specific hazard awareness,</li> </ul>

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	construction workforce, increases the risk of an incident or contracting of diseases	<p>safe work practices, and emergency procedures for fire, natural hazards, and evacuation, as appropriate.</p> <ul style="list-style-type: none"> <li>• Train all construction workers in basic sanitation and health care issues (e.g., hand washing etc.)</li> <li>• Keep up to date on the latest COVID Prevention and Protection Measures and provide training to the construction workers on them (<a href="https://old.dghs.gov.bd/images/docs/Guideline/Concise_Covid-19_guideline.pdf">https://old.dghs.gov.bd/images/docs/Guideline/Concise_Covid-19_guideline.pdf</a>)</li> <li>• Implement malaria, HIV/AIDS and STI education campaign targeting all workers hired by contractor and subcontractors, international and national, female and male, skilled, semi- and unskilled occupations, at the time of recruitment and thereafter pursued throughout the construction phase on an ongoing and regular basis. This should be complemented by easy access to condoms at the workplace as well as to voluntary counselling and testing.</li> </ul>

#### ECP 18: SF6 Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
SF6 emissions and leakages	SF6, a potent greenhouse gas, will be contained within GIS and in gas insulated circuit breakers and other equipment, improper handling of SF6 tanks and equipment can cause rupture and leakage to the atmosphere thus contributing to climate change.	<p>The Contractor will</p> <ul style="list-style-type: none"> <li>• Prepare an SF6 emergency response plan for construction.</li> <li>• Train and instruct all personnel in SF6 management practices and procedures as a component of the environment management induction process.</li> <li>• Store and handle SF6 tanks and gas insulated equipment with care to avoid any leakages of SF6.</li> <li>• Ensure that GIS and other gas insulated equipment are hermetically pressure sealed “sealed for life” units, tested and guaranteed by the supplier at less than 0.1% leakage rate.</li> </ul>

## Appendix XI: Applicable Standards for EMP

**Table 1: Applicable Noise Levels Standards**

Sl. No.	Category of areas	The Noise Pollution (Control) Rules 2006 (dBA)		IFC Standard, 2007 (One Hour LA <sub>eq</sub> dBA) <sup>a</sup>		Applicable to the Project per ADB Safeguard Policy Statement (dBA) <sup>b</sup>	
		Day	Night	Day (07:00-22:00)	Night (22:00-07:00)	Day	Night
1	Silent zone <sup>c</sup>	50	40	-	-	50	40
2	Residential zone	55	45	55	45	55	45
3	Mixed zone (mainly residential area, simultaneously used for commercial and industrial purposes)	60	50	-	-	60	50
4	Commercial zone	70	60	70	70	70	60
5	Industrial zone	75	70	70	70	70	70
6	Occupational Health and Safety (above these limits PPE to be worn)	TBC		85dB(A) (L <sub>aeq</sub> 8 hours) Peak sound pressure 140 dB(C) L <sub>Amax</sub> 110 dB(A)	85dB(A) (L <sub>aeq</sub> 8 hours) Peak sound pressure 140 dB(C) Average maximum 110 dB(A)		

Source: Bangladesh Noise Pollution Control Rules 2006, Guidelines for Community Noise, World Health Organization (WHO), 1999 and IFC World Bank Group. 2007. Environmental, Health and Safety General Guidelines. Washington, D.C.

a/ Except for occupational health and safety levels guidelines values are for noise levels measured out of doors. Noise monitoring should be carried out using a Type 1 or 2 sound level meter meeting all appropriate IEC standards.

b/ If less stringent levels or measures are appropriate in view of specific project circumstances, executing agency will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS within the disclosed IEE report.

c/ Area up to a radius of 100 meters around hospitals or educational institutions or special institutions/establishments identified/to be identified by the Government is designated as Silent Zones where use of horns of vehicles or other audio signals, and loudspeakers are prohibited.

**Table 2: Applicable Ambient Air Quality Standards**

Parameter	Bangladesh Ambient Air Quality Standard ( $\mu\text{g}/\text{m}^3$ ) <sup>a</sup>	WHO Air Quality Guidelines ( $\mu\text{g}/\text{m}^3$ )		Applicable to the Project per ADB Safeguard Policy Statement <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ )
		Global Update <sup>b</sup> 2005	Global Update <sup>c</sup> 2021	
TSP	200 (8-h)	-	-	200 (8-h)
PM <sub>10</sub>	50 (1-year) 150 (24-h)	20 (1-year) 50 (24-h)	15 (1-year) 45 (24-h)	45 (24-h)
PM <sub>2.5</sub>	35 (1-year) 65 (24-h)	10 (1-year) 25 (24-h)	5 (1-year) 15 (24-h)	15 (24-h)
SO <sub>2</sub>	250 (1-h) 80 (24-h)	20 (24-h) 500 (10-min)	40 (24-h)	40 (24-h) 500 (10-min)
NO <sub>2</sub>	100 (1-year)	40 (1-year) 200 (1-h)	10 (1-year) 25 (24-h)	25 (24-h) 200 (1-h)
CO	5,000 (8-h) 20,000 (1-h)	-	4,000 (24-h)	4,000 (24-h) 10,000 (8-h) 40,000 (1-h)
Lead	0.25 (1-year) 0.50 (24-h)	-	-	0.5 (1-year)
Ozone (O <sub>3</sub> )	180 (1-h) 100 (8-h)	100 (8-h)	100 (8-h) 60 (peak season, average 6 months)	100 (8-h)

ADB = Asian Development Bank, CO = carbon monoxide, h = hour,  $\mu\text{g}/\text{m}^3$  = microgram per cubic meter, min = minute, NO<sub>2</sub> = nitrogen dioxide, PM<sub>2.5</sub> = particulate matter 2.5 microns, PM<sub>10</sub> = particulate matter 10 microns, SO<sub>2</sub> = sulfur dioxide, TSP = total suspended particle, WHO = World Health Organization.

1. a/ SRO NO. 255-LAW/2022(Bangladesh Air Pollution Control Rules, 2022)). <https://mccibd.org/wp-content/uploads/2022/07/Air-Pollution-Control-Rules-2022.pdf>

b/ IFC World Bank Group. 2007. *Environmental, Health and Safety General Guidelines*. Washington, D.C.

c/ WHO. 2021. *WHO global air quality guidelines: particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide*. Geneva. 24-h standards are 99%iles.

d/If less stringent levels or measures are appropriate in view of specific project circumstances, executing agency will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS within the disclosed IEE.

**Table 3: Applicable Effluent Discharge Standards by Receiving Environment**

Sl. No.	Parameters	Unit	Discharge To <sup>a</sup>			IFC Standard 2007, Treated Sanitary Sewage Discharge to Inland Surface Water
			Inland Surface Water	Public Sewerage system connected to treatment at second stage	Irrigated Land	
1	Ammoniacal nitrogen (as elementary N)	mg/l	50	75	75	-
2	Ammonia (as free ammonia)	mg/l	5	5	15	-
3	Arsenic (as As)	mg/l	0.2	0.05	0.2	-
4	BOD <sub>5</sub> at 20°C	mg/l	50	250	100	30
5	Boron	mg/l	2	2	2	-
6	Cadmium (as Cd)	mg/l	0.5	0.05	0.05	-
7	Chloride	mg/l	600	600	600	-
8	Chromium (as total Cr)	mg/l	0.5	1.0	1.0	-
9	COD	mg/l	200	400	400	125
10	Chromium (as hexavalent Cr)	mg/l	0.1	1.0	1.0	-
11	Copper (as Cu)	mg/l	0.5	3.0	3.0	-
12	Dissolved oxygen (DO)	mg/l	4.5-8	4.5-8	4.5-8	-
13	Electro-conductivity (EC)	micromho/cm	1200	1200	1200	-
14	Total dissolved solids	mg/l	2100	2100	2100	-
15	Fluoride (as F)	mg/l	2	15	10	-
16	Sulfide (as S)	mg/l	1	2	2	-
17	Iron (as Fe)	mg/l	2	2	2	-
18	Total Kjeldahl nitrogen (as N)	mg/l	100	100	100	10 (Total Nitrogen)
19	Lead (as Pb)	mg/l	0.1	1	0.1	-
20	Manganese (as Mn)	mg/l	5	5	5	-
21	Mercury (as Hg)	mg/l	0.01	0.01	0.01	-
22	Nickel (as Ni)	mg/l	1.0	2.0	1.0	-
23	Nitrate (as elementary N)	mg/l	10.0	Not yet set	10	-

Sl. No.	Parameters	Unit	Discharge To <sup>a</sup>			IFC Standard 2007, Treated Sanitary Sewage Discharge to Inland Surface Water
			Inland Surface Water	Public Sewerage system connected to treatment at second stage	Irrigated Land	
24	Oil and grease	mg/l	10	20	10	10
25	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	1.0	5	1.0	-
26	Dissolved phosphorus (as P)	mg/l	8	8	15	2 (Total Phosphorous)
27	Radioactive substance	(to be specified by Bangladesh Atomic Energy Commission)				-
28	pH	----	6-9	6-9	6-9	6-9
29	Selenium (as Se)	mg/l	0.05	0.05	0.05	-
30	Zinc (as Zn)	mg/l	5	10	10	-
31	Temperature	°C (summer)	40	40	40	-
		°C (winter)	45	45	45	
32	Suspended solids (SS)	mg/l	150	500	200	50 (TSS)
33	Cyanide (as Cn)	mg/l	0.1	2.0	0.2	-
	Total Coliform	MPN/100ml	-	-	-	400

<sup>a</sup> Schedule 10 Standards for Waste from Industrial Units or Projects Waste [See Rule 13]

Notes:

1. These standards shall be applicable to all industries or projects other than those specified under the heading "Standards for sector wise industrial effluent or emission."
2. Compliance with these standards shall be ensured from the moment an industrial unit starts trial production, and in other cases, from the moment a project starts operation.
3. These standards shall be inviolable even in case of any sample collected instantly at any point of time. These standards may be enforced in a more stringent manner if considered necessary in view of the environmental conditions of a particular situation.
4. Inland Surface Water means drains/ponds/tanks/water bodies/ ditches, canals, rivers, springs and estuaries.
5. Public sewerage system means treatment facilities of the first and second stage and also the combined and complete treatment facilities.
6. Irrigable land means such land area which is sufficiently irrigated by wastewater taking into consideration the quantity and quality of such water for cultivation of selected crops on that land.
7. Inland Surface Water Standards shall apply to any discharge to a public sewerage system or to land if the discharge does not meet the requirements of the definitions in notes 5 and 6 above.

<sup>b</sup> IFC World Bank Group. 2007. Environmental, Health and Safety General Guidelines. Washington, D.C.

MPM=maximum probable number



**Table 4: Applicable Drinking Water Quality Standards (Groundwater Quality)**

National Standards for Drinking Water (Schedule 3, Rule 12B of ECR 1997)			WHO Guidelines for Drinking Water Quality 4 <sup>th</sup> Edition incorporating the first addendum, 2017	Applicable to ADB- funded Projects per ADB Safeguard Policy Statement <sup>e</sup>
Parameter	Unit	Standards		
Aluminum	mg/l	0.2	None established	0.2
Ammonia (NH <sub>3</sub> )	mg/l	0.5	None established	0.5
Arsenic	mg/l	0.05	0.01	0.01
Barium	mg/l	0.01	1.3	0.01
Benzene	mg/l	0.01	0.01 <sup>b</sup>	0.01
BOD5 20°C	mg/l	0.2	-	0.2
Boron	mg/	1.0	2.4	1.0
Cadmium	mg/l	0.005	0.003	0.003
Calcium	mg/l	75	-	75
Chloride	mg/l	150 – 600 <sup>a</sup>	None established	150-600
Chlorinated alkanes				
Carbon tetrachloride	mg/l	0.01	0.004	0.01
1,1-Dichloroethylene	mg/l	0.001	-	0.001
1,2-Dichloroethylene	mg/l	0.03	0.05 (1,2-Dichloroethene)	0.03
Tetrachloroethylene	mg/l	0.03	0.04 (tetrachloroethene)	0.03
Trichloroethylene	mg/l	0.09	0.02 (trichloroethene)	0.02
Chlorinated phenols				
Pentachlorophenol	mg/l	0.03	0.009	0.0009
2,4,6 -Trichlorophenol	mg/l	0.03	0.2 (2,4,6 trichlorophenol)	0.03
Chlorine (residual)	mg/l	0.2	0.2 <sup>c</sup>	0.2

**Table 4: Applicable Surface Water Quality Standards**

Best Practice Based classification	pH	BOD mg/l	DO mg/l	Total Coliform number/100
a. Source of drinking water for supply only after disinfecting:	6.5-8.5	2 or less	6 or above	50 or less
b. Water usable for recreational activity	6.5 – 8.5	3 or less	5 or more	200 or less
Source of drinking water for supply after conventional treatment	6.5 – 8.5	6 of less	6 or more	5000 or less
d. Water usable by fisheries	6.5 – 8.5	6 of less	5 or more	-
e. Water usable by various process and cooling industries	6.5 – 8.5	10 or less	5 or more	5000 or less
f. Water usable for irrigation	6.5 – 8.5	10 or less	5 or more	1000 or less

Source: Standards for Inland Surface Water as per Schedule 3 of ECR, 1997

**Table 5: Applicable EMF Standards**

<b>Table 1. ICNIRP exposure limits for general public exposure to electric and magnetic fields.</b>		
<b>Frequency</b>	<b>Electric Field (V/m)</b>	<b>Magnetic Field (<math>\mu</math>T)</b>
<b>50 Hz</b>	5000	100
<b>60 Hz</b>	4150	83

Source: ICNIRP (1998) : \*Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz).

<b>Table 3. ICNIRP exposure limits for occupational exposure to electric and magnetic fields.</b>		
<b>Frequency</b>	<b>Electric Field (V/m)</b>	<b>Magnetic Field (<math>\mu</math>T)</b>
<b>50 Hz</b>	10,000	500
<b>60 Hz</b>	8300	415

Source: ICNIRP (1998) : \*Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz).

**Table 6: Applicable Illumination Standards**

<b>Table 2.3.3. Minimum Limits For Workplace Illumination Intensity</b>	
<b>Location / Activity</b>	<b>Light Intensity</b>
Emergency light	10 lux
Outdoor non working areas	20 lux
Simple orientation and temporary visits (machine storage, garage, warehouse)	50 lux
Workspace with occasional visual tasks only (corridors, stairways, lobby, elevator, auditorium, etc.)	100 lux
Medium precision work (simple assembly, rough machine works, welding, packing, etc.)	200 lux
Precision work (reading, moderately difficult assembly, sorting, checking, medium bench and machine works, etc.), offices.	500 lux
High precision work (difficult assembly, sewing, color inspection, fine sorting etc.)	1,000 – 3,000 lux

**Table 7: Guideline Values for Vibration Velocity to be Used When Evaluating Risks to Structures**

Group	Type of structure	Guideline Values for Velocity (mm/s)				
		Short-term				Long-term
		At foundation			Uppermost Floor	Uppermost Floor
		Less than 10 Hz	10 Hz to 50 Hz	50 to 100 Hz	All frequencies	All frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40	10
2	Residential dwellings and buildings of similar design and/or use	5 (105 dB)	5 to 15	15 to 20	15	5 (105 dB)
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3 (100.5 dB)	2 to 8	8 to 10	8	2.5 (99.0 dB)

Source: DIN 4150-3, Structural Vibration, Part 3: Effect of vibration on structures



## **Appendix XII: Environmental Monitoring Plan (EMoP)**



Quantitative Monitoring to be undertaken by Contractor

Qualitative Monitoring is reflected in the Mitigation Plan (**Appendix IX**)

**Part 1 – General (All Works)**

Environmental Parameters to be Monitored	Location	Time/Frequency/ Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
<b>Construction Phase</b>								
Water resources	All construction sites, including construction stores and labor camps	Ongoing throughout construction, monthly reporting of records kept by the contractor	Water volume used and source (construction and drinking water)	No grievance received during construction or operation regarding conflict with other water users	PIU to ensure record keeping by contractor and to report in EMR to ADB and DOE	CSC to supervise contractor and support PIU in checking compliance	Contractor to keep records and report to PIU in monthly progress reports	Part of contract cost, include costs of implementing EMoP as BOQ line
Construction materials and waste management: record keeping	All construction sites, including construction stores and labor camps	Ongoing throughout construction, monthly reporting of records kept by the contractor	- Keep records of all types of materials used and waste produced by type, volume/weight. Document waste handling full-cycle through transfer notes (including type, volume, source, transport, intermediaries if any, and final treatment or disposal facility with its license and capacity	Use of materials and transfer of all construction wastes documented with all wastes disposed of in an environmentally safe and sound manner.	PIU to ensure record keeping by contractor and to report in EMR to ADB and DOE	CSC to supervise contractor and support PIU in checking compliance	Contractor to keep records and report to PIU in monthly progress reports	Part of contract cost, include costs of implementing EMoP as BOQ line
Hazardous materials– incidents	All construction sites,	Ongoing throughout construction, monthly reporting	- Records of pollution incidents (e.g., type of	- No pollution incident affecting soil of water	- PIU to ensure record keeping by contractor and	CSC to supervise contractor and	- Contractor to keep records and	Part of contract cost, include costs of

Environmental Parameters to be Monitored	Location	Time/Frequency/ Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
	including construction stores and labor camps	of records kept by the contractor	material spilled, amount in kg or m <sup>3</sup> and action taken to clean up)  - Carry out visual inspection and interviews with workers and the community to identify if any unrecorded incidents occurred	quality - zero major incidents occurred.  - Minor incidents responded to in accordance with EMP response plan procedures with lessons learnt for future if they occur.	- to report in EMR to ADB and DOE  - Any pollution incident to be reported within 24 hours to ADB and DOE as per the EC requirements.	support PIU in checking compliance	report to PIU in monthly progress reports  - Any pollution incident to be reported within 24 hours to PIU and CSC	implementing EMoP as BOQ line
Occupational and community health and safety incidents: record keeping	All construction sites, including construction stores and labor camps	Ongoing throughout construction, monthly reporting of records kept by the contractor	- Keep records of near misses, minor, lost time, and fatal health and safety incidents related to the project, compile records from construction sites; carry out interviews with workers and the community to identify if any unrecorded incidents occurred.  - During the COVID-19 pandemic, temperature checks to be	- Zero lost time incidents or fatalities (among workers and community) - All near miss, minor, lost time, and fatal incidents as well as suspected/confirmed COVID-19 instances having adequate response plan, with lessons learnt for future if they occur.	- PIU to ensure record keeping by contractor and to report in EMR to ADB and DOE  - Any lost time incident or fatality to be reported within 24 hours to ADB and DOE as per the EC requirements	CSC to supervise contractor and support PIU in checking compliance	- Contractor to keep records and report to PIU in monthly progress reports  - Any lost time incident or fatality to be reported within 24 hours to PIU and CSC	For COVID-temperature checks frontal thermometer.  Part of contract cost, include costs of implementing EMoP as BOQ line



Environmental Parameters to be Monitored	Location	Time/Frequency/ Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
			carried out at entrance of the work site at start of shift, and records of all suspected and confirmed cases to be kept.					
Health and Safety: construction drinking water supplies	All construction sites, including construction stores and labor camps	Ongoing throughout construction, monthly testing or reporting of records kept by the contractor	- Water sample is to be taken in a clean, non-contaminated, well- sealed container and tested within the next 48h. Drinking water quality tests against Bangladesh drinking water standards by accredited laboratory (physical, chemical, and bacteriological tests including arsenic levels) where the contractor provides a surface or groundwater drinking water supply or sources where supplier is unable to provide water quality test results.	Drinking water provided meets national drinking water standards	PIU to ensure monitoring undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	- Water quality tests by accredited laboratory.  - Part of contract cost, include costs of implementing EMoP as BOQ line

Environmental Parameters to be Monitored	Location	Time/Frequency/ Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
			- Alternatively, documentary evidence that drinking water meeting national standards is being imported for workers consumption.					
<b>Operation and Maintenance</b>								
Hazardous materials- incidents	All substations, transmission and distribution lines	Daily checks for pollution incidents and record keeping during O&M	<ul style="list-style-type: none"> <li>- Records of pollution incidents (e.g, type of material spilled, amount in kg or m<sup>3</sup> and action taken to clean up)</li> <li>- Carry out visual inspection and interviews with workers and the community to identify if any unrecorded incidents occurred</li> </ul>	<ul style="list-style-type: none"> <li>- No pollution incident affecting soil of water quality - zero major incidents occurred.</li> <li>- Minor incidents responded to in accordance with O&amp;M response plan procedures with lessons learnt for future if they occur.</li> </ul>	<ul style="list-style-type: none"> <li>- Substation/line manager to keep records and report to ESU in monthly progress reports</li> <li>- Any pollution incident to be reported within 24 hours to ESU by substation/line manager</li> <li>- DESCO ESU to report to ADB</li> </ul>	NA	NA	DESCO O&M budget
Health and safety: accident records	All substations, transmission and distribution lines	Daily checks and record keeping during O&M	Keep records of health and safety incidents, compile records from substations and carry out interviews with workers and	<ul style="list-style-type: none"> <li>- Zero lost time incidents or fatalities (among workers and community)</li> <li>- All near miss, minor, lost time, and fatal incidents as well as</li> </ul>	<ul style="list-style-type: none"> <li>- Substation/line manager to keep records and report to ESU in monthly progress reports</li> </ul>	NA	NA	DESCO O&M budget

Environmental Parameters to be Monitored	Location	Time/Frequency/ Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
			the community to identify if any unrecorded incidents occurred	suspected/confirmed COVID-19 instances having adequate response plan, with lessons learnt for future if they occur.	<ul style="list-style-type: none"> <li>- Any lost time incident or fatality to be reported within 24 hours to ESU by substation/line manager</li> <li>- DESCO ESU to report to ADB</li> <li>- Any lost time incident or fatality to be reported within 24 hours to ADB</li> </ul>			

## Part 2 – New Substations and Bay Extensions at Existing Substations

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
<b>Detailed Design and Pre-Construction Phase</b>								
Ecology	Substation sites and any temporary facility areas used	Once prior to construction – baseline monitoring prior to the start of any activity onsite	Ecological survey of substation site and any temporary facility areas used to include presence flora and fauna and tree enumeration (numbers, species, size etc.)	No net loss of biodiversity following construction. Only types of habitats and number of trees documented in IEE are lost, any trees lost are compensated for, 1:3 replacement with native tree species in suitable alternative location, 100% survival rate. No damage to other habitats/trees/vegetation outside the substation.	ensure survey undertaken by contractor report in EMR to ADB and DOE	CSC to supervise survey in the field and support PIU in checking compliance	Contractor to undertake survey and report to PIU	- Ecological survey by qualified and experienced ecologists  - Part of contract cost, include costs if implementing EMP as BOQ line.
Air Quality: TSP, PM10, PM2.5, SO <sub>x</sub> and NO <sub>x</sub>	Nearest sensitive receptor within 500 m of substations on each boundary	Once prior to construction – baseline monitoring prior to the start of any activity onsite	To be measured as 1-hour and 24-hour averages along with meteorological data-temperature humidity, wind speed, and wind direction-during the dry season. Record details as required by the EC.	Compliance with ambient air quality standards to be applied to the project (see Appendix XI – Applicable Standards for EMP) or no increase above baseline if already exceeded	PIU to ensure monitoring undertaken by contractor report in EMR to ADB and DOE	CSC to support PIU in recruitment ensuring that air quality monitoring is carried out	Contractor to undertake measurements and report to PIU	- Professional, calibrated, portable outdoor air quality monitoring sensors to be used.  - Part of contract cost, include costs of implementing EMoP as BOQ line
Noise level: dB(A)	Site boundary and nearest sensitive	Once prior to construction – baseline monitoring prior to the start of any activity onsite	1hr LAeq over a 48-hour period including workday and weekend using professional,	Compliance with ambient noise standards to be applied to the project (see Appendix XI – Applicable Standards for	PIU to ensure monitoring	CSC to supervise measurements in the field and support PIU in	Contractor to undertake measurements	Portable, professional, real-time calibrated Type 1 or 2 sound

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
	receptor within 500m of substations on each boundary		calibrated portable monitoring devices. Noise levels to be measured outdoors in free field conditions. Record details as required by the EC.	EMP) or <3dBA increase above baseline if already exceeded	undertaken by contractor report in EMR to ADB and DOE	checking compliance	and report to PIU	level meter meeting all appropriate IEC standards to be used with a tripod.  - Part of contract cost, include costs of implementing EMoP as BOQ line
Water quality	Nearest surface waterbodies and groundwater sources (wells) unless >500m distant from the substation	Once prior to construction – baseline monitoring prior to the start of any activity onsite	- Water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next 48h. Water quality tests by accredited laboratory (physical, chemical, and bacteriological tests) to include pH, EC, turbidity, color, TSS, DO, BOD5, COD, oil and grease, TPH, fecal coliform. If used as source of drinking water to also test against Bangladesh drinking water standards per Appendix XI. For Kalachadpur Substation existing	No pollution incident affecting surface or groundwater quality and compliance with ambient water quality standards to be applied to the project (see Appendix XI – Applicable Standards for EMP) or no increase above baseline if already exceeded.	ensure monitoring undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	- Water quality tests by accredited laboratory.  - Part of contract cost, include costs of implementing EMoP as BOQ line

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
			switchyard, office building at Airport Substation, temporary buildings at Bashundara Substation, and temporary shed at Mirpur Ceramic also test for heavy metals, oil and grease, TPH and PCBs due to risk of contamination. - Record details as required by the EC.					
PCBs	Kalachadpur Substation, switchyard to be demolished by DESCO, all defunct transformers stored in yard that contain oil  Existing substation for bay extensions	One time for baseline establishment prior to the start of any demolition works/site clearance, no additional impact from project as all new equipment and oil procured will be PCB-free	Testing of transformer oil by accredited laboratory to follow UNEP Guidelines for PCB-tetsing	All existing transformers are PCB-free. If present this is to be treated as an unanticipated impact and PCB remedial action plan developed and implemented by the PIU prior to removal of the defunct transformers to the DESCO stores.	ensure monitoring undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Kalachadpur Substation and existing substation for bay extension – Part of contract cost, include costs of implementing EMoP as BOQ line
Asbestos	Kalachadpur Substation, switchyard and Mirpur Ceramics temporary	One time for baseline establishment prior to the start of any demolition works.	Licensed entity to survey and test for the presence of ACMs in electrical equipment and buildings to be demolished.	No asbestos was present prior to demolition work. If present this is to be treated as an unanticipated impact and asbestos remedial action plan developed and	ensure monitoring undertaken by contractor and	CSC to support PIU in supervision of contractor and liaison with third parties	Contractor to undertake measurements and report to PIU for Kalachadpur	Kalachadpur and Mirpur Ceramics Substations – Part of contract cost, include costs of

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
	labor shed to be demolsihed by DESCO  Airport Substation, office building; Bashundara Substation, temporary buildings to be demolished by third parties			implemented by the PIU or third parties prior to demolition.  Demolition of any electrical equipment and buildings containing ACMs follow national laws and regulations, and international good practice such as ADB's Good Practice Guidance on the Use of Asbestos.  No workers and communities affected by exposure to ACMs.	to report in EMR to ADB and DOE for Kalachadpur and Mirpur Ceramics  advise third parties to recruit licensed entity for survey and  testing at other substation sites prior to their demolition, obtain and report results of surveys in EMR to ADB and DOE	ensuring that asbestos survey and testing is carried out	and Mirpur Ceramics Substation	implementing EMoP as BOQ line  Other substations third party cost
Soil quality	For substation sites with electrical equipment and buildings to be demolished by	One time for baseline establishment prior to the start of any activity onsite	Soil samples to be taken from across the substation area at various locations at surface and at depth in clean, non-	No soil contamination was present prior to construction work. If present this is to be treated as an unanticipated impact and contaminated land	ensure monitoring undertaken by contractor and	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Soil quality tests by accredited laboratory.  Part of contract cost, include costs

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
	DESCO or involving land to be handed over to DESCO after demolition of existing structures by third parties (Kalachadpur Substation existing switchyard, office building at Airport Substation, temporary buildings at Bashundara Substation, and temporary shed at Mirpur Ceramic, existing substation for bay extensions)		contaminated, well-sealed containers and tested within the next 48h following international good practice for contaminated land investigation. <sup>1</sup> Soil quality tests by accredited laboratory to include pH, heavy metals, asbestos, oil and grease, TPH, PCBs and any other contaminants indicated by contaminated land professional	remedial action plan developed and implemented by the contractor before the start of any other on-site activity.  No pollution incident affecting soil quality and compliance with soil quality standards to be applied to the project e.g., international good practice guidelines. <sup>2</sup>	to report in EMR to ADB and DOE			if implementing EMP as BOQ line.

<sup>1</sup> There are various good practice guidelines that can be followed, such as: [https://www.health.vic.gov.au/sites/default/files/migrated/files/collections/policies-and-guidelines/h/hs680\\_land\\_contam--pdf.pdf](https://www.health.vic.gov.au/sites/default/files/migrated/files/collections/policies-and-guidelines/h/hs680_land_contam--pdf.pdf)

<sup>2</sup> There are various soil quality guidelines that can be followed to determine if land is contaminated such as those from Australia: <https://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox>



Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
Health and Safety: operational drinking water supplies	All sources that will be developed by contractor for use as an operational drinking water supply	One time for baseline establishment prior to the start of any activity onsite	Water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next 48h. Drinking water quality tests against Bangladesh drinking water standards by accredited laboratory (physical, chemical, and bacteriological tests including arsenic levels) per Appendix XI.	Drinking water provided for operational substations meets national drinking water standards or appropriate level of water treatment is incorporated into the project design	PIU to ensure monitoring undertaken by contractor and to report in EMR to ADB	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Water quality tests by accredited laboratory.  Part of contract cost, include costs of implementing EMoP as BOQ line
Health and safety/physical cultural resources: condition surveys in relation to property damage from construction	All substations; include surveys of all properties located immediately adjacent all boundaries (including informal settlements) at substations for which demolition and/or piling works are being required, plus properties	One time for baseline establishment prior to the start of any activity onsite	Photographic and/or structural precondition surveys of existing property condition including utilities, structures, drains etc. Risk assessment of potential damage to structures and additional recommendations for structural and vibration monitoring condition where there is a risk of property damage	Damages to property avoided but if caused, to be paid for by the contractor.  National Building Code to be referred to in relation to ensuring structural safety of property during works.	PIU to ensure surveys undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise surveys in the field and support PIU in checking compliance	Contractor to undertake surveys and report to PIU	Part of construction cost, include costs of implementing EMP as BOQ line.

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
	immediately adjacent to the narrow access road to Tongi substation site							
Construction Phase								
Ecology	Substation sites and any temporary facility areas used	<p>Ongoing throughout construction, monthly reporting of records kept by the contractor.</p> <p>Ecological survey once on commissioning and prior to handover of substation to DESCO</p>	<p>Ecological survey of substation site and any temporary facility areas used to include presence flora and fauna and tree enumeration (numbers, species, size etc.)</p> <p>Keep records of all compensatory tree plantation undertaken (numbers, species, size etc.) including survival and replacement of trees during defect liability period</p>	No net loss of biodiversity following construction. Only types of habitats and number of trees documented in IEE are lost, including minimum number of trees, any trees lost are compensated for, 1:3 replacement with native tree species in suitable alternative location, 3 100% survival rate. No damage to other habitats/trees/vegetation outside the substation.	PIU to ensure record keeping by contractor and to report in EMR to ADB and DOE	CSC to supervise contractor and support PIU in checking compliance	Contractor to undertake surveys, keep records and report to PIU in monthly progress reports	<p>Ecological survey by qualified and experienced ecologists</p> <p>Part of contract cost, include costs of implementing EMoP as BOQ line</p>
	Tongi Substation	Once on commissioning and prior to handover of substation to DESCO	Overwintering bird survey of PAI of substation site following methodology	No net loss of biodiversity following construction compared to baseline survey reported in the IEE.	PIU to ensure record keeping by	CSC to supervise contractor and support PIU in	Contractor to undertake surveys, keep records and	Ecological survey by qualified and experienced ecologists

<sup>3</sup> Tree plantation to be done by contractor considering native plant species as appropriate for the substation site in the vacant spaces to be kept as per BNBC 2020 – if there is not space at the substation then a suitable site in the neighborhood is to be identified for this tree plantation to be completed.

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
			used for baseline survey in the IEE.		contractor and to report in EMR to ADB and DOE	checking compliance	report to PIU in monthly progress reports	Part of contract cost, include costs of implementing EMoP as BOQ line
Air Quality: TSP, PM10, PM2.5, SO <sub>x</sub> and NO <sub>x</sub>	Nearest sensitive receptor within 500 m of substations on each boundary  Additional locations at request of PIU/CSC in the event of visible dust pollution or grievance received during construction.	Quarterly during active construction involving demolition and earthworks, and then as requested by PIU/CSC in event of visible dust pollution or grievance received during construction.	To be measured as 1-hour and 24-hour averages along with meteorological data-temperature humidity, wind speed, and wind direction-during the dry season. Record details as required by the EC.	No exceedance of ambient air quality standards (see Appendix XI – Applicable Standards for EMP) or no worsening if already exceeded (as per the baseline)	PIU to ensure monitoring undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Professional, calibrated, portable outdoor air quality monitoring sensors to be used.  Part of contract cost, include costs of implementing EMoP as BOQ line
Noise level: dB(A)	Site boundary and nearest sensitive receptor within 500 m of substations on each boundary. Additional	Monthly during active demolition and construction involving noisy activities, and then as requested by PIU/CSC in event of noise pollution concerns or grievance received during construction.	1hr LAeq over a 48-hour period including workday and weekend using professional, calibrated portable monitoring devices. Noise levels to be	No exceedance of ambient noise standards (see Appendix XI – Applicable Standards for EMP) or <3dBA increase if already exceeded (as per the baseline)	PIU to ensure monitoring undertaken by contractor and	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Portable, professional, real-time calibrated Type 1 or 2 sound level meter meeting all appropriate IEC standards to be

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
	locations at request of PIU/CSC in the event of noise pollution concerns or grievance received during construction	Once on commissioning and prior to handover of substation to DESCO to confirm operational substation meets noise standards.	measured outdoors in free field conditions. Record details as required by the EC.		to report in EMR to ADB and DOE			used with a tripod.  Part of contract cost, include costs of implementing EMoP as BOQ line
Water quality	Nearest surface waterbodies and groundwater sources (wells) unless > 500m distant from the substation. Additional locations at request of PIU/CSC in the event of water pollution concerns or grievance received during construction	Quarterly during active construction involving earthworks, and then only required if requested by PIU/CSC in event of water pollution concerns or grievance received during construction.	Water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next 48h. Water quality tests by accredited laboratory (physical, chemical, and bacteriological tests) to include pH, EC, turbidity, color, TSS, DO, BOD5, COD, oil and grease, TPH, fecal coliform. If used as source of drinking water to also test against Bangladesh drinking water standards per Appendix XI. Record details as required by the EC.	No pollution incident affecting surface or groundwater quality and compliance with ambient water quality standards to be applied to the project (see Appendix XI – Applicable Standards for EMP) or no increase above baseline if already exceeded.	PIU to ensure monitoring undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Water quality tests by accredited laboratory.  Part of contract cost, include costs of implementing EMoP as BOQ line

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
Soil	All substation sites with earthworks/cut and fill	Ongoing throughout construction, monthly reporting of records kept by the contractor	Keep records of earthworks involved, including total volume in m3 of soil excavated and reused (any disposed of as spoil off site to licensed waste disposal facilities recorded as per waste generation)	Earthworks documented, and all excavated and cut and fill volumes accounted for, either reused on-site or disposed of off-site to licensed waste disposal facilities	PIU to ensure record keeping by contractor and to report in EMR to ADB and DOE	CSC to supervise contractor and support PIU in checking compliance	Contractor to keep records and report to PIU in monthly progress reports	Part of contract cost, include costs of implementing EMoP as BOQ line
Health and Safety: operational drinking water supplies	All sources that will be developed for use as an operational drinking water supply as part of substation construction (pre- and post-treatment samples are to be taken)	Once on commissioning and prior to handover of substation to DESCO to confirm operational substation meets drinking water quality standards	Water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next 48h. Drinking water quality tests against Bangladesh drinking water standards by accredited laboratory (physical, chemical, and bacteriological tests including arsenic levels) per Appendix XI. Record details as required by the EC.	Drinking water provided for operational substations meets national drinking water standards or appropriate level of water treatment is incorporated into the project design	PIU to ensure monitoring undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Water quality tests by accredited laboratory.  Part of contract cost, include costs of implementing EMoP as BOQ line
Health and safety: electromagnetic field (EMF)	Substation sites	Substation boundary and adjacent to electrical equipment  Once on commissioning and prior to handover of	EMF levels to be monitored using professional, calibrated portable monitoring devices	No exceedance of ICNIRP reference levels	PIU to ensure monitoring undertaken by	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Portable but professional, calibrated EMF detector

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
		substation to DESCO to confirm operational substation meets EMF reference levels			contractor and to report in EMR to ADB and DOE			Part of contract cost, include costs of implementing EMoP as BOQ line
Health and safety/physical condition surveys in relation to property damage	Purbachal substation, and any other substation with adjacent properties at risk (ongoing survey of properties flagged at risk during pre-construction)	Ongoing throughout construction, daily site checks and additional monitoring of condition as per the recommendation of the pre-construction surveys  Once on commissioning and prior to handover of substation to DESCO to confirm no residual damage occurred	Ongoing photographic and/or structural condition surveys of existing property condition including utilities, structures, drains etc.  Structural condition monitoring of properties at risk as recommended during the pre-construction surveys	Damages to property avoided but if caused, to be paid for by the contractor.  National Building Code to be referred to in relation to ensuring structural safety of property during works.	PIU to ensure monitoring undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Part of contract cost, include costs of implementing EMoP as BOQ line
<b>Operation and Maintenance</b>								
GHG emissions: SF6 leakage	All substations	Daily checks and record keeping during O&M	Record of all SF6 leakage and any SF-6 related maintenance activities in substations	Leakage <0.1% and records of undertaking a regular maintenance	DESCO substation manager (supported by third party if needed) to undertake monitoring and report monthly to the ESU	NA	Contractor to supply monitoring equipment for use by DESCO SS manager during O&M	Portable but professional, calibrated SF6 leakage detector, to be provided by the contractor one per substation / include for equipment provision as a BOQ line

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
					DESCO ESU to report to ADB			DESCO O&M budget
Noise in dB(A)	Site boundary and nearest receptor to the substation	Semiannually or as may be required by DOE during O&M (monitoring can cease if compliance demonstrated at end of first year)	1hr LAq over a 48-hour period including workday and weekend using professional, calibrated portable monitoring devices. Record details as required by the EC.	No exceedance of noise standards specified in Appendix XI (or less than 3dBA increase if already exceeded) at site boundary and sensitive receptors	DESCO ESU (supported by third party if needed) to undertake monitoring and report to ADB.	NA	Contractor to supply monitoring equipment for use by DESCO ESU during O&M	1no. portable, professional, real-time calibrated Type 1 or 2 sound level meter meeting all appropriate IEC standards to be used with a tripod to be provided for ESU by the contractor / include for equipment provision as a BOQ line  DESCO O&M budget
Wastewater discharge	All substations not connected to existing sewerage system or septic tank with soak away	Semiannually or as may be required by DOE during O&M	Treated water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next 48h. Water quality tests against Bangladesh drinking	No pollution incident affecting surface or groundwater quality and compliance with effluent discharge standards to be applied to the project (see Appendix XI – Applicable Standards for EMP) or no	DESCO ESU to appoint third-party laboratory to undertake monthly testing and report the	NA	NA	Water quality tests by accredited laboratory.  DESCO O&M budget

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
			water standards by accredited laboratory (physical, chemical, and bacteriological tests) Record details as required by the EC.	increase above baseline if already exceeded.	results to ADB.			
Health and safety: drinking water supplies	All substations	Monthly testing or reporting of records kept	Water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next 48h. Drinking water quality tests against Bangladesh drinking water standards by accredited laboratory (physical, chemical, and bacteriological tests including arsenic levels) where a surface or groundwater drinking water supply was provided by the contractor or sources where supplier is unable to provide water quality test results. Alternatively, documentary evidence that drinking water meeting national	Drinking water provided for operational substations meets national drinking water standards or appropriate level of water treatment is being maintained	Substation manager to keep records and report to ESU in monthly progress reports  DESCO ESU to appoint third-party laboratory to undertake monthly testing and report the results to ADB.	NA	NA	Water quality tests by accredited laboratory.  DESCO O&M budget



Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
			standards is being imported for O&M workers consumption. Record details as required by the EC.					
Health and safety: electromagnetic field (EMF)	All substations	Semiannually or as may be required by DOE during O&M  Daily checks and record keeping during O&M for workers in close contact with EMF	EMF levels to be monitored using professional, calibrated portable monitoring devices  Continuous checks for substation workers in close contact with EMF through use of personal EMF monitor carried by workers at all times while working on or near live electrical equipment	No exceedance of ICNIRP reference levels and records of EMF checking	DESCO substation manager (supported by third party if needed) to undertake monitoring and report monthly to the ESU  DESCO ESU to report to ADB.	NA	Contractor to supply monitoring equipment for use by DESCO substation manager and staff during O&M	Portable but professional, calibrated EMF detector, to be provided by the contractor one per substation along with personal EMF radiation exposure monitoring equipment for substation workers / include for equipment provision as a BOQ line  DESCO O&M budget

## Part 3 – Underground Cables and Overhead Lines including Distribution Transformers and RMUs

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
<b>Detailed Design and Pre-Construction Phase</b>								
Ecology	Cable/line routes, RMUs and any temporary facility areas used	Once prior to construction – baseline monitoring prior to the start of any activity onsite	Ecological survey of cable/line routes, RMUs and any temporary facility areas used to include presence flora and fauna and tree enumeration (numbers, species, size etc.)	No net loss of biodiversity following construction. Only types of habitats and number of trees documented in IEE are lost, any trees lost are compensated for, 1:3 replacement with native tree species in suitable alternative location, 100% survival rate. No damage to other habitats/trees/vegetation outside the working area.	PIU to ensure survey undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise survey in the field and support PIU in checking compliance	Contractor to undertake survey and report to PIU	Ecological survey by qualified and experienced ecologists  Part of contract cost, include costs if implementing EMP as BOQ line.
Water quality	River crossings involving cable bridge crossings	Once prior to construction – baseline monitoring prior to the start of any activity onsite	Water sample is to be taken in a clean, non-contaminated, wellsealed container and tested within the next 48h. Water quality tests by accredited laboratory (physical, chemical, and	No pollution incident affecting surface or groundwater quality and compliance with ambient water quality standards to be applied to the project (see Appendix XI – Applicable Standards for EMP) or no increase above baseline if already exceeded.	PIU to ensure monitoring undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Water quality tests by accredited laboratory.  Part of contract cost, include costs of implementing EMoP as BOQ line

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
			bacteriological tests) to include pH, EC, turbidity, color, TSS, DO, BOD5, COD, oil and grease, TPH, fecal coliform. Record details as required by the EC.					
Soil	All transmission and distribution lines including RMUs with earthworks//cut and fill	Ongoing throughout construction, monthly reporting of records kept by the contractor	Keep records of earthworks involved, including total volume in m <sup>3</sup> of soil excavated and reused (any disposed of as spoil off site to licensed waste disposal facilities recorded as per waste generation)	Earthworks documented, and all excavated and cut and fill volumes accounted for, either reused on-site or disposed of off-site to licensed waste disposal facilities	PIU to ensure record keeping by contractor and to report in EMR to ADB and DOE	CSC to supervise contractor and support PIU in checking compliance	Contractor to keep records and report to PIU in monthly progress reports	Part of contract cost, include costs of implementing EMoP as BOQ line
PCBs	Existing transformers to which the distribution lines will connect	One time for baseline establishment, no additional impact from project as all new equipment and oil procured will be PCB-free	Testing of transformer oil by accredited laboratory to follow UNEP Guidelines for PCB-tetsing	All existing transformers are PCB-free. If present this is to be treated as an unanticipated impact and PCB remedial action plan developed and implemented by the PIU prior to removal of the	PIU to ensure monitoring undertaken and to report in EMR to ADB and DOE	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Existing transformers – Part of contract cost, include costs of implementing EMoP as BOQ line

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
				defunct transformers to the DESCO stores.				
Health and safety/physical cultural resources: condition surveys in relation to property damage from construction	All cable/line routes, RMUs; include surveys of all properties located immediately adjacent (including informal settlements)	One time for baseline establishment prior to the start of any activity onsite	Photographic and/or structural precondition surveys of existing property condition including utilities, structures, drains etc. Risk assessment of potential damage to structures and additional recommendations for structural and vibration monitoring condition where there is a risk of property damage	Damages to property avoided but if caused, to be paid for by the contractor.  National Building Code to be referred to in relation to ensuring structural safety of property during works.	PIU to ensure surveys undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise surveys in the field and support PIU in checking compliance	Contractor to undertake surveys and report to PIU	Part of construction cost, include costs of implementing EMP as BOQ line.
<b>Construction Phase</b>								
Ecology	Cable/line routes, RMUs and any temporary facility areas used	Ongoing throughout construction, monthly reporting of records kept by the contractor.	Ecological survey of cable/line routes, RMUs and any temporary facility areas used to include presence flora and	No net loss of biodiversity following construction. Only types of habitats and number of trees documented in IEE are lost, including minimum number of trees, any trees lost are	PIU to ensure record keeping by contractor and to report in EMR to ADB and DOE	CSC to supervise contractor and support PIU in checking compliance	Contractor to undertake surveys, keep records and report to PIU in monthly	Ecological survey by qualified and experienced ecologists

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
		Ecological survey once on commissioning and prior to handover of cables/lines/RMUs to DESCO	fauna and tree enumeration (numbers, species, size etc.)  Keep records of all compensatory tree plantation undertaken (numbers, species, size etc.) including survival and replacement of trees during defect liability period	compensated for, 1:3 replacement with native tree species in suitable alternative location, <sup>4</sup> 100% survival rate. No damage to other habitats/trees/vegetation outside the substation.			progress reports	Part of contract cost, include costs of implementing EMoP as BOQ line

<sup>4</sup> Tree plantation to be done by contractor considering native plant species -- a suitable site in the neighborhood is to be identified for this tree plantation to be completed.

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
Water quality	River crossings involving cable bridge crossings. Additional locations at request of PIU/CSC in the event of water pollution concerns or grievance received during construction	Quarterly during active construction involving river crossings, and then only required if requested by PIU/CSC in event of water pollution concerns or grievance received during construction.	Water sample is to be taken in a clean, non-contaminated, well- sealed container and tested within the next 48h. Water quality tests by accredited laboratory (physical, chemical, and bacteriological tests) to include pH, EC, turbidity, color, TSS, DO, BOD5, COD, oil and grease, TPH, fecal coliform. Record details as required by the EC.	No pollution incident affecting surface or groundwater quality and compliance with ambient water quality standards to be applied to the project (see Appendix XI – Applicable Standards for EMP) or no increase above baseline if already exceeded.	PIU to ensure monitoring undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Water quality tests by accredited laboratory.  Part of contract cost, include costs of implementing EMoP as BOQ line
Health and safety/physical cultural resources: condition surveys in relation to property damage from construction	All cable/line routes, RMUs; include surveys of all properties located immediately adjacent (including informal settlements)	Ongoing throughout construction, daily site checks and additional monitoring of condition as per the recommendation of the pre-construction surveys  Once on	Ongoing photographic and/or structural condition surveys of existing property condition including utilities, structures, drains etc. Structural condition	Damages to property avoided but if caused, to be paid for by the contractor.  National Building Code to be referred to in relation to ensuring structural safety of property during works.	PIU to ensure monitoring undertaken by contractor and to report in EMR to ADB and DOE	CSC to supervise measurements in the field and support PIU in checking compliance	Contractor to undertake measurements and report to PIU	Part of contract cost, include costs of implementing EMoP as BOQ line

Environmental Parameters to be Monitored	Location	Time/Frequency/Duration	Method of Measurements	Performance Standard / Quantitative Targets	Responsibilities			Equipment and Monitoring Cost (Million BDT)
					PIU	CSC	Contractor	
		commissioning and prior to handover of cable/line/RMU to DESCO to confirm no residual damage occurred	monitoring of properties at risk as recommended during the pre-construction surveys					
<b>Operation and Maintenance</b>								
GHG emissions: SF6 leakage	All RMUs	Daily checks and record keeping during O&M	Record of all SF6 leakage and any SF-6 related maintenance activities in RMUs	Leakage <0.1% and records of undertaking a regular maintenance	DESCO O&M line manager (supported by third party if needed) to undertake monitoring and report monthly to the ESU  DESCO ESU to report to ADB	NA	Contractor to supply monitoring equipment for use by DESCO O&M manager during O&M	Portable but professional, calibrated SF6 leakage detectors, to be provided by the contractor, sufficient number to enable DESCO line managers to monitor RMU leakage / include for equipment provision as a BOQ line  DESCO O&M budget





**Appendix XIII: Environmental Assessment Checklist, Consultation  
Proforma, and IEE Update Format**



### Environmental Assessment Checklist for Underground Cable/Overhead Line/RMU Site

Potential environmental impacts have already been identified at the project level and mitigation for these impacts has been identified in the project-level EMP so only locational issues need further consideration. If the answer to any of the assessment questions below is a yes or not known, then as part of updating the EIA report a site-specific assessment might be required for any components/activities of concern to determine the significance of potential impacts and any site-specific mitigation measures required. Further consultation should be undertaken with ADB environment safeguards specialist if the answer to any of these questions is identified to be a yes.

Item	Detail
<b>PROJECT DESCRIPTION</b>	
Transmission or Distribution Line Name/kV	132 kV/ 33 kV/11 kV/ 0.4 kV
Length (km)	
Type of works	Underground (length m/km) Overhead (length m/km)
No. Distribution Transformer to Install	
No. RMU to Install	
Administrative area	Ward/Union: Thana/Upazila: District:
Contract Package/Lot	
Name of the Contractor	
Construction timeline	
Start point coordinate and elevation	
Name of the Start Point	
Name of the Starting Substation (if applicable) Confirm connection works (complete environmental audit)	Photo of the substation (if available)
End point coordinate and elevation	
Name of the end point	
Name of the End Substation (if applicable) Confirm connection works (complete environment audit)	Photo of the substation (if available)
Map of final route alignment/distribution transformer locations/RMU sites (map(s) to be provided for entire route)	Insert or provide as a separate file map showing the line alignment with distribution transformer locations/RMU sites at readable scale (use GPS to map during site visit walkover)
Number of railway crossings and construction method (overhead or HDD)	
Number of road crossings and construction method (overhead or HDD)	

Item	Detail
Number of river crossings and construction method (HDD/cable bridge)	
Number overhead power line crossings	
Existing transformers distribution line is connected to: (details provided for all transformers; photo(s) of transformers provided as a separate file)	Type: ground mounted/pole mounted Model and date of manufacture: Date of last oil change or maintenance, if known: Evidence of oil leak: none/minor/major Existing safety features: fence/warning sign/climb deterrent Pollution prevention features for ground mounted transformers: none/concrete platform/bund Photo of the transformer (if available)
Temporary facilities required, including any construction camp Location/size (may use for multiple components)	
<b>BASELINE SETTING</b>	
Land use setting	(urban/suburb)
ROW with residential area traversed	km of line: number of poles (if above ground): number of RMU:
ROW with commercial area traversed	km of line: number of poles (if above ground): Number of RMU:
ROW with industrial area traversed	km of line: number of poles (if above ground): Number of RMU:
ROW with agricultural land traversed	km of line: number of poles (if above ground): Number of RMU:
ROW with other land type traversed: (detail land types)	km of line: number of poles (if above ground): Number of RMU:
Other land types within 50m of the ROW: (detail land types)	
ROW crossing of waterbodies e.g., rivers, streams, drains, ponds etc.	yes/no  If yes, details:
Other waterbodies within 50m of the ROW e.g., rivers, streams, drains, ponds etc.	Number and types of waterbody:
Presence of internationally or nationally important biodiversity sites in the PAI	yes/no (If yes, list together with minimum distance to distribution line route)

Item	Detail
Risk of critical habitat triggers or CR/EN/VU species being found in PAI informed by ecological walkover	
Habitat types found within 50m of ROW: (detail habitat types)	Modified/Natural
Private / public trees located within the safety clearance or RMU footprint and requiring to be cut	yes/no If yes, type and number:
Presence of internationally or nationally important physical cultural resources in the PAI	yes/no (If yes, list together with minimum distance to transmission or distribution line route)
Presence of locally important physical cultural resources in the PAI e.g., mosques	yes/no (If yes, list together with minimum distance to transmission or distribution line route)
Buildings located within the (i) ROW (ii) safety clearances	(i) yes/no (ii) yes/no  If yes, provide photos clearly showing baseline situation
School compounds or playgrounds located within (i) ROW (ii) safety clearances	(i) yes/no (ii) yes/no  If yes, provide photos clearly showing baseline situation
School compounds and/or playgrounds situated within 50m of the route alignment	yes/no  If yes, provide photos clearly showing baseline situation
Other public/private buildings that are situated within 50m of the route alignment	yes/no  If yes, provide photos clearly showing baseline situation
ROW crossing of public utilities e.g., power lines, telecommunications etc.	yes/no  If yes, details:

<b>ENVIRONMENTAL ASSESSMENT</b>	
<p>If the answer to any of the environmental assessment questions below is a yes or not known, then as part of updating the EIA a site-specific assessment might be required for any components/activities of concern to determine the significance of potential impacts and any site-specific mitigation measures required.</p> <p>Further consultation should be undertaken with ADB environment safeguards specialist if the answer to any of these questions is identified to be a yes.</p>	
<b>Section A Route Setting</b>	
Is any transmission or distribution line ROW adjacent to (e.g., within 50m) or in any of the following?	
Ecologically Critical Area ( ECA) <sup>52</sup>	Yes/no
Legally Protected Area	Yes/no
IBA	Yes/no
Ramsar Site <sup>53</sup>	Yes/no
Forest	Yes/no
Wetland	Yes/no
World Heritage Site <sup>54</sup>	Yes/no
Legally Protected Monument	Yes/no
<b>Section B Potential Environmental Impacts</b>	
Does the transmission or distribution line have the potential to...	
cause significant adverse environmental impacts that are irreversible, diverse, or unprecedented	Yes/no
result in the conversion or degradation of natural habitat because the ROW passes through or adjacent forest habitat, wetland area etc.?	Yes/no
encroach on any internationally or nationally important biodiversity sites as per Section A?	Yes/no
result in damage to locally important physical cultural resources?	Yes/no
result in damage to locally important physical cultural resources or require their removal?	Yes/no
encroach on any internationally or nationally important heritage areas as per Section A?	Yes/no

<sup>52</sup> An Ecologically Critical Area (ECA) is an environmental protection zone in Bangladesh ( e.g., four main rivers of Dhaka city).

<sup>53</sup> A Ramsar site is a wetland site designated to be of international importance under the Ramsar Convention, also known as "The Convention on Wetlands"

<sup>54</sup> World Heritage Sites are cultural and/or natural sites considered to be of Outstanding Universal Value

encroach on or be within the safety clearances for buildings especially school compounds or playgrounds?	Yes/no
cause damage to public utility services (water or gas pipelines, telephone lines etc.)	Yes/no
<b>Section C Other Impacts</b>	
Will the transmission or distribution line route cause any additional site-specific impacts to those detailed in the IEE and covered by the project-level EMP...	
<i>[insert details]</i>	
<i>[insert details]</i>	
<i>[insert details]</i>	

**Submitted by:**

Name and signature:

Position:

Date:

**Reviewed by:**

Name and signature:

Position:

Date:

**Note from the Reviewer, if any:**

### Consultation Proforma Record

Meaningful environmental consultations must be conducted for each substation and transmission and distribution line with one consultation proforma record to be completed for each. The meaningful consultation during the EIA update will be carried out by the route surveyors (Contractors and CSC) with the support of DESCO ESU. The consultation material will use photographs to help explain the scope of work and convey the findings of the EIA to disseminate information on the potential impacts/risks and their management, as well as informing of the works. An orientation program is proposed for DESCO, their Contractors and the CSC on how to conduct meaningful public consultations. For environment, the following government or civil society representatives should be met for each substation/transmission line/ distribution line as part of the EIA update. Identification of key stakeholders will be done by the contractors and CSC with due consultation with the DESCO ESU in line with project EMP requirements.

**Table 1: Summary Record of Subproject Environment Meetings and Discussions with Government and Civil Society Representatives\***

Date	Location	Name of the Person	Position or Title, Agency	Topics Discussed	Suggestions for Alignment and Mitigation	Contact Number	Signature

\* Provide photograph of the meeting in progress

For environment, a public consultation is to be completed for each substation and transmission line/distribution line as part of updating the EIA. DESCO, their contractors and CSC are also responsible for completing all other consultations during project implementation in accordance with the EMP. The contractors concerned with guidance from the CSC safeguards team will identify appropriate methods for public consultation at each location and dissemination platforms for broader reach. The contractor with guidance from the CSC will develop appropriate communication materials in local language for the purposes of consultation. For information disclosure purposes, the communication materials will include the positive and negative impacts, mitigation measures, grievance redress mechanism, construction schedule etc. Consultation process will be utilized to address the concerns and project implementation issues raised by the affected people during the consultation.

Consultations should also convey how DESCO and the contractor will ensure community health and safety during construction.

The contractor will give advance notice about the consultations or other engagement and will disseminate properly for wider participation of beneficiaries or affected people especially women and other vulnerable groups.

Public meetings are to be attended by at least 10% of the affected population in the project area of influence and have at least 30% representation of women excluding DESCO, their contractor and CSC



representatives. If it is not possible at the public consultation to achieve these levels of female participation a separate gender focus group must be held to ensure the concerns of women and other vulnerable groups are heard.

**Table 2: Summary Record of Public Consultations and Focus Groups\*<sup>55</sup>**

<b>Substation/Transmission Line/Distribution Line Name</b>		
<b>District</b>		
<b>Ward(s)</b>		
<b>Date and Time</b>		
<b>Total Population of Affected Persons within 500m or substation or 50m of ROW(estimate)</b>		
<b>Total Number of Participants</b>	Male:	Female:
<b>Note on Participants from Vulnerable Groups</b>		
<b>Names and Designations of Key Participants</b>		
DESCO		
CSC		
Contractor		
Ward administration/community representatives		
<b>Topics Discussed and Findings</b>		
Presence of biodiversity sites near to substations or along alignments		
Presence of fauna in the vicinity of substations or along alignments		
Presence of trees along alignments and if require cutting		
Presence of physical cultural resources near to substations or along alignments		
Presence of buildings along alignment and if conductor clearances are met		
Presence of school compounds, playgrounds or other community facilities along alignment and if conductor clearances are met		
Existing community H&S incidents and/or concerns with existing transmission lines/distribution lines		
Existing community H&S incidents or pollution (oil leak) and/or concerns with existing transformers		
Concerns of community related to H&S of new substations or transmission lines/distribution lines		
Concerns of community related to pollution and waste management during the works		
Concerns of community related to noise, vibration, dust, air pollution during the construction		
Concerns of community related to disturbance to commercial or agricultural activities during works		

<sup>55</sup> Those undertaking the consultations can use checklists similar to those used during the IEE preparation to obtain sufficient information to be able to complete the summary record. Photographs and attendance sheet to be attached with the consultation proforma.

Concerns of community related to disturbance to ongoing access to property and traffic management issues during works	
Concerns of community related to incoming skilled workers and their accommodation during the works	
Concerns of community related to local employment (jobs created for unskilled workers by construction are very minimal if any)	
GRM and types of grievances related to environment, health and safety that could be raised	
<b>Suggestions for Alignment and Mitigation</b>	

\* Provide photographs of the public meeting and/or focus groups in progress and copy of sign in sheet

**Submitted by:**

Name and signature:

Position:

Date:

**Reviewed by:**

Name and signature:

Position:

Date:

**Note from the Reviewer, if any:**

## EIA Report Update Outline

For new and existing substations only the consultation section of the EIA needs to be updated assuming there is no change in the scope of works from that described in the disclosed EIA report. For the transmission and distribution lines including distribution transformers and RMUs all sections need to be updated. Unless a site-specific assessment is required for a transmission and distribution line based on the final route alignment, the completed site-specific assessment forms and consultation proformas for all works will comprise the basis for the EIA report. The EIA update will be attached to the disclosed EIA report in the form of an addendum.

If a site-specific assessment is required, then a detailed assessment of the potential impacts and risks is to be included in the update addendum, together with a site-specific EMP to accompany the project-level EMP for implementation by the contractors.

- **Description of the Project**, attach the project description section describing all the 132 kV, 33kV, 11kV and 0.4kV transmission and distribution lines including RMU sites based on the completed project description forms.
- x. Note should be made of any alternative routings considered, and why the selected are preferred.
- **Description of the Environment**, attach the baseline setting section based on completed baseline forms for all the transmission and distribution lines.
  - **Site-Specific Environmental Impacts and Mitigation Measures** required only when DESCO/ADB identifies a site-specific assessment is required due to the presence of any sensitive receptors or unanticipated impacts being identified.
  - **Information Disclosure, Consultation, and Participation**, for each substation/transmission line/distribution line provide summary per below table and attach copies of completed consultation proformas.

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Consultation Activities	Yes	No	
Meaningful consultations with community were conducted before finalizing the alignment			Details of consultations undertaken, Table 1 and 2
Suggestions received in finalizing the alignment			Suggestions provided, Table 3
If suggestions received, are they incorporated into design			

xii.

- **Site-Specific EMP**, not required unless site-specific EMP is required by DESCO/ADB based on site-specific assessment.

