



পাওয়ার গ্রিড কোম্পানি অফ বাংলাদেশ লি: POWER GRID COMPANY OF BANGLADESH LTD.

(An Enterprise of Bangladesh Power Development Board)



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প্রকল্প পরিচালক
DWZTGE প্রকল্প,
পিজিসিবি, ঢাকা।

বিষয়:- “Design, Supply, Installation, Testing & Commissioning of Rampura –Bashundhara 132 kV Underground Cable Line on Turnkey Basis Under Dhaka and Western Zone Transmission Grid Expansion Project”(Package-2) শীর্ষক প্রকল্পের CESMP Report এর উপর মতামত প্রদান প্রসঙ্গে।

উপর্যুক্ত বিষয়ের আলোকে জানানো যাচ্ছে যে, বর্ণিত কাজের ঠিকাদার প্রতিষ্ঠান JV of TBEA and TBEA Luneng কর্তৃক ০৪/০২/২০২৪ তারিখে দাখিলকৃত (প্রকল্প দপ্তরে) DWZTGE প্রকল্পের (Package-2) এর CESMP রিপোর্টটি পরিবেশ ও সামাজিক ইউনিট এর মতামত সংযোজন করে প্রেরণ করা হয়েছে বিধায় তা পরিবেশ ও সামাজিক ইউনিট কর্তৃক গ্রহণযোগ্য এবং নিম্নে উল্লেখিত শর্তসমূহের সাপেক্ষে অনুমোদন করা যায়।

শর্তসমূহঃ

১. CESMP রিপোর্টে উল্লেখিত Management protocol সমূহ মেনে চলতে হবে।
২. প্রকল্প কাজ শুরুর পূর্বে Baseline Environmental Monitoring রিপোর্ট দাখিল করতে হবে।
৩. Environmental Monitoring রিপোর্ট প্রকল্পের IEE রিপোর্টে উল্লেখিত Monitoring Program (Environmental Management Plan) অনুযায়ী Monthly/ Quarterly/ Half yearly দাখিল করতে হবে।
৪. Health & Safety Management এবং Social issue (e.g. GRM, Gender, Compensation etc.) সমূহ সঠিক ভাবে পালন করতে হবে।
৫. উন্নয়ন সহযোগী সংস্থা ADB এবং AIIB কর্তৃক কোন প্রকার নতুন মতামত প্রদত্ত হলে তা সংযুক্ত করে পুনরায় সংশোধিত CESMP দাখিল করতে হবে।

এমতাবস্থায়, পরবর্তী প্রয়োজনীয় ব্যবস্থা গ্রহণের জন্য সুপারিশ করা হলো।

অনুলিপিঃ

১. ব্যবস্থাপনা পরিচালক, পিজিসিবি, ঢাকা।
২. নির্বাহী পরিচালক, পিএন্ডডি, পিজিসিবি, ঢাকা।
৩. প্রধান প্রকৌশলী, পিএন্ডডি, পিজিসিবি, ঢাকা।
৪. ব্যবস্থাপক, পরিবেশ ও সামাজিক ইউনিট, পিজিসিবি, ঢাকা।
৫. দপ্তর নথি।

১২/০২/২৪

মোঃ আদিল চৌধুরী
তত্ত্বাবধায়ক প্রকৌশলী (প্ল্যানিং)
পিজিসিবি, ঢাকা।

(Signature)



POWER GRID COMPANY OF BANGLADESH LIMITED

Construction Environment & Social Management Plan (CESMP) (Updated) of Dhaka and Western Zone Transmission Grid Expansion Project

Contract Package: Design, Supply, Installation, Testing & Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

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ABBREVIATIONS AND ACRONYMS

ADB	: Asian Development Bank
AP	: Affected Persons
BMD	: Bangladesh Meteorological Department
BRTA	: Bangladesh Road Transport Authority
BOD	: Biological Oxygen Demand
CESMP	: Construction Environmental and Social Management Plan
CO	: Carbon Mono-oxide
COD	: Chemical Oxygen Demand
CAP	: Corrective Action Plan
Db	: Decibel
DOE	: Department of Environment
DWZTGEP	: Dhaka and Western Zone Transmission Grid Expansion Project
DSC	: Design and Supervision Consultants
DO	: Dissolved Oxygen
ECR	: Environment Conservation Rules
EA	: Environmental Assessment
EIA	: Environmental Impact Assessment
EMP	: Environmental Management Plan
EQS	: Environment Quality Standards
EMoP	: Environmental Monitoring Plan
GPS	: Global Positioning System
GoB	: Government of Bangladesh
GRC	: Grievance Redress Committee
GRM	: Grievance Redress Mechanism
GSS	: Grid Substations
GW	: Ground Water
HSMP	: Health and Safety Management Plan
IEE	: Initial Environmental Examination
MoEF	: Ministry of Environment and Forest
NAAQS	: National Ambient Air Quality Standard
NCS	: National Conservation Strategy
NEMAP	: National Environment Management Action Plan
NEP	: National Environment Policy
NL	: Noise Level
NOx	: Oxide of Nitrogen
PM	: Particulate Matter
PIU	: Project Implementation Unit
PGCB	: Power Grid Company of Bangladesh
SMVT	: Slow Moving Vehicular Traffic
SO2	: Sulphur-di-Oxide
SW	: Surface Water
SPM	: Suspended Particulate Matters
SPS	: Safeguard Policy Statement
RoW	: Right of Way
UG	: Underground Cables

EXECUTIVE SUMMARY

1. INTRODUCTION

Background

It is anticipated that the proposed project will enable the construction of new substations and transmission lines as well as the enhancement of PGCB's current transmission network. With a total expenditure of \$750.0 million, the Dhaka and Western Zone Transmission Grid Expansion Project (DWZGEP) will guarantee an improvement in the technical efficiency of the transmission system together with an increase in the capacity of electricity supply in Dhaka and the western zone of Bangladesh. To improve reliability and efficiency, the DWZGEP will also fortify Bangladesh's southwest and northwest power transmission networks. In addition, growing industry in the southwest is expected to increase the region's need for power in the near future. Additionally, the project will increase PGCB's institutional capability by facilitating the installation and use of an enterprise resource planning (ERP) system and establishing a drone inspection center inside the organization's operation and maintenance division.

Objectives of the Study

In response to any potential consequences that are expected to arise during the project's development and construction phases, a set of monitoring and mitigation measures are outlined in the Construction Environment & Social Management Plan (CESMP). This CESMP aims to minimize adverse effects and maximize project benefits by adhering to the best environmental and social practices.

Scope of the Study

The project will span a 9 km underground transmission cable network and be constructed in Dhaka at the Rampura-Bashundhara location. The route passes through the following areas: Moddho Badda (7-8 km), Madani Avenue (3-4 km), Notun Bazar (4-6 km), Badda Link Road (6-7 km), and Merul Badda (8-8.85 km). The scope of the CSEMP is incorporated in the following list below:

- Suggest ways to improve and mitigate potential environmental dangers in order to prevent, lessen, or eliminate them.
- The preparation of environmental reports and other documents required by the engineer.
- Keep track of any environmental concern you need to address for the project's environmental audit.
- Comply to the environmental impact assessment report's recommended environmental management plan.
- Aims and parameters for various environmental management strategies are established.
- Determining possible sources of dangers and effects from the building operations.
- Identification of potential impacts and risks in the construction site and surrounding area.
- Expand one's understanding and proficiency in environmental matters.

Methodology

To prepare the CSEMP report, specific methods were followed. Firstly, reviewed the Initial Environmental Examination (IEE) with other relevant documents of Dhaka and Western Zone Transmission Grid Expansion Project. Secondly, incorporated all relevant and applicable environmental laws, regulations and

standards of the project. Thirdly, consultation was provided by Environmental and social Specialist to monitor the environmental and social condition of the project area. To conclude, quantitative and qualitative Environmental approaches were also incorporated to prepare the whole document.

2. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

According to Environmental Conservation Rules (ECR) 2023, the proposed project falls under the “Red” Category which means it is a must to submit IEE/EIA for the Site and Environmental Clearance. Besides, it is a requirement to renew the ECC within 30 days after the expiry. To prevent the environmental pollution and lessen the impacts, different rules and regulations have been set out such as **Air Pollution Control Rules, 2022, Hazardous Waste Management Rules, 2011, National 3R Strategy for Waste Management, 2010, Environment Conservation Act, 2010 (Amendment), Noise Pollution (Control) Rules, 2006, National Biodiversity Strategy and Action Plan (2004), Environment Court Act, 2000 (subsequent amendments in 2002), Environment Conservation Act, 1995 (amendments in 2000 & 2002), The Ground Water Management Ordinance, 1985, Bangladesh Wild Life (Preservation) Act, 1974 etc. and so on.**

3. PROJECT DESCRIPTION

The proposed underground 132 kV transmission line is 11 km long and is located in Dhaka North City Corporation (DNCC). The line traverses Bashundara Residential area (0- 3 km), Madani Avenue between 3 and 4 km, Notun Bazar (4-6 km), Badda Link Road (6-7 km), Moddho Badda (7-8 km) and Merul Badda (8.- 8.85 km). The road network of underground cabling as follows: Rampura substation- Jahirul Islam Avenue/Aftab Nagar main road - Bir Uttam Rafiqul Islam Avenue - Hatir Jeel link road - Bir Uttam Mir Shawkat Sarak - Shaheed Tajuddin Ahmed Avenue - Bir Uttam A. K Khandakar Road - Gulshan Avenue - Road 34 - Gulshan Bridge -Road 19A - Kamal Atatürk Avenue - Madani Avenue - Pragati Avenue - Kuril-Bishwa Road – and Purbachal Express Highway.

4. DESCRIPTION OF THE ENVIRONMENT

To illustrate the environment of the proposed transmission project, **physical environment** such as climate, temperature, rainfall, humidity level etc. of the project area were assessed. **Environmental quality** such as ambient air, noise level, groundwater, surface water, soil etc. were monitored and recorded. Besides, **biological environment** (flora, fauna), **socio-economic environment** as well as **environmental and social hotspot** of the project area were described in this part.

5. RISK ASSESSMENT MATRIX

Environmental considerations will affect construction activity, but the activity will also affect the environment. Consequently, there are risks involved in doing the work. The possible effects that the various project components could have on the **physical, biological, and socioeconomic environments** are listed in this section. Identifying the possible effects will be taken into account during the building phase. Identification and analysis of possible impacts are based on the actions carried out at each step of the project. Based on elements like **length of the impact; regional area of the impact; reversibility; likelihood; and legal standards and established professional criteria**, the possible impacts have been classified as large, moderate, small, or minimum.

6. ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

This chapter consists of three areas, **management, monitoring and budget** of Environmental Monitoring. Different management plans are incorporated in the management plan section such as **tree management plan, fire management plan, biodiversity management plan, labor management plan, traffic management plan** etc. To execute the environmental monitoring plan effectively, environmental issues and parameters, impacts, proper implementation and supervision are strictly maintained. Overall, the budget for executing environmental monitoring were **30,59,700 BDT**.

7. IMPLEMENTATION OF THE CSEMP

To implement the CSEMP in an appropriate and feasible way, there are a bunch of steps need to be followed by PGCB. **Firstly**, reporting is an essential part to implement the aim or objectives of this report in the project area. This will facilitate to identify the gaps, address the issues and resolve them in an appropriate way. **Secondly**, it is very important to organize training for the project site staff. This activity will help them to attain a basic knowledge about the core values of CSEMP. **Thirdly**, after identifying the issues or gaps, corrective action needs to be taken. **Finally**, arrange all the roles and responsibilities institutionally.

8. GRIEVANCE REDRESSES MECHANISM

GRM's goal is to handle grievances and complaints regarding any irregularities or project-related difficulties that are brought to the attention of the Grievance Redress Committee (GRC). The GRC will make an effort to swiftly and amicably address any disputes in order to guarantee that the project implementation goes on without interruption and in accordance with ADB's safeguard requirements. The **definition and aim of GRM, GRM Committee, Filing Grievance Cases and Documentation, Approval of GRCs, and Monitoring** were incorporated in details in this chapter.

9. OCCUPATIONAL HEALTH AND SAFETY PLAN

The Management Plan for Occupational Health and Safety is a very useful communication tool. It describes how health and safety will be handled on the job and is an essential component of the agreement between the parties. Subcontractors and main contractors create an SSHSMP to ensure that health and safety is routinely and consistently monitored, and that all pertinent site information is readily available and updated on a regular basis. Establishing and maintaining an efficient health and safety management system is the aim of this plan. In addition, the objectives of a health and safety plan are to ensure that it is effective in managing risks and minimizing losses. The safety plan arranges the **interdependent operations and related measures** in an organized manner in order to improve the job and process's safety performance and control any potential hazards. However, the **objective, purpose, scope, Contractors OHS System, International (ADB, IFC) OHS Policy, HSE Policy and Plan, Roles and Responsibilities** etc. and so on were incorporated in this chapter.

10. CONCLUSIONS

The project's benefits will mostly be felt at the level of the national economy. The project will boost the electricity supply industry's contribution. According to the CESMP, the proposed sub-project may have certain short-term environmental effects, but these would be mitigated and enhanced with appropriate

steps. The planned project sites do not contain any reserve forests, national parks, or ecologically sensitive areas. There is no notable, permanent negative effects. Since it is a dynamic document, the CESMP will be revised often to take into account shifting site conditions and environmental concerns. The preceding chapter discussed necessary mitigation strategies that must be correctly executed in order to prevent such environmental pollutions. Furthermore, it is imperative to provide consistent monitoring during the construction process. Corrective action must be taken in accordance with the mitigating measure as well. In order to accomplish this, the contractor will put the CESMP into practice by conducting regular internal audits, monitoring, verification, and checking.

1 INTRODUCTION

1.1 Background

1. The Dhaka and Western Zone Transmission Grid Expansion Project (DWZGEP) of a total investment of \$750.0 million will ensure that the capacity of electricity supply in Dhaka and western zone of Bangladesh is upgraded, with improvements in the technical efficiency of the transmission system. The proposed project is expected to provide support for the construction of new substations and transmission lines and support the improvements of existing transmission network of PGCB.

2. The DWZTGEF will also strengthen the power transmission system in southwest and northwest Bangladesh to enhance its reliability and efficiency. The project area comprises agricultural land, where, due to inadequate surface water supply, cultivation mostly depends on groundwater. Hence electricity demand is at its peak during the irrigation season. Furthermore, the electricity demand in the southwest is expected to rise in the near future with large scale industrialization.

3. The DWZTGEF are situated in five administrative divisions and twenty districts of Bangladesh, comprising construction of 15 new substations, ten overhead transmission lines and ten Line-In Line-Out (LILO) connections of a total length of 394 km overhead lines, 14 km underground lines in Dhaka, and bay extensions in 9 existing grid substations. Also, the project will strengthen the institutional capacity of PGCB by (i) supporting installation and operation of an Enterprise Resource Planning (ERP) System and (ii) establishing a Drone Inspection Center within the Operation and Maintenance Department of PGCB.

4. This Construction Environment & Social Management Plan (CESMP) is the primary document for managing potential environmental risks and opportunities during the Project. It provides the framework for identifying environmental and social aspects and impacts associated with the construction phase of the Project. In these consequences, This CESMP is going to be prepare for the package of Design, Supply, Installation, Testing & Commissioning of 9Km Rampura- Bashundhara 132kV Underground Cable Line on Turnkey Basis (refer as Package-2). This document describes the environmental management plan by which the Contractor recognizes the need to manage the significant environmental aspects and related impacts throughout the construction period. Contractor will follow and maintain all environmental requirements to accomplish the project in a manner that will provide a high level of concern for the environment and minimize pollution and environmental-related issues in and around the project sites.

5. Construction Environment & Social Management Plan (CESMP) is a site and work specific document mentioning detailed action plan to mitigate the environmental impacts by proper planning, implementation, appropriate documentation checking of construction related activities through regular monitoring and evaluation and performing necessary preview and modification of management system if needed in order to mitigate impending environmental hazards.

6. The CESMP includes the environmental monitoring and mitigation program developed by the contractor, to continuous evaluation of the environmental impacts during construction stage. The CESMP will form part of the contract documents & will be used as monitoring tool for compliance.

1.2 Objectives of the CESMP

7. The CESMP is a project level document developed for specialized contractors (such as MEP, Civil, ICT etc.) to conduct construction activities in an environmentally and socially responsible manner.

8. The Construction Environment & Social Management Plan (CESMP) outlines a series of monitoring and mitigation steps that must be implemented in response to any potential effects that are anticipated to occur during the project's development and construction phases. The objective of this CESMP is to adhere to the best environmental and social practices in order to reduce unfavorable effects and enhance project benefits. The specific objectives of this CESMP are to:

- Identifying those construction activities that may have a detrimental impact on the environment and social receptors;
- Identify a range of mitigation measures that could reduce and mitigate the potential impacts to minimal or insignificant levels;
- Provide a standard guideline for management and control of construction-related measures;
- Detail specific actions necessary to assist in mitigating the environmental impact of the project.
- Gives an overview about the E&S Management System that is being implemented to ensure systematic and effective execution of these commitments, including roles and responsibilities between the PIA/Implementation Consultant and the Contractor.
- Identify the (environment, social, and health) aspects of the project that need to be managed and recommend appropriate and justified mitigation and enhancement measures;
- Identify the responsibilities of the organization of the project site.
- Promote best environmental on-site practices during the construction phase.
- Establishing the reporting system to be undertaken during the construction.
- Identify the environmental issues that will be taken into account due to project activities.
- Determine the magnitude of potential environmental concerns and to ensure that environmental considerations are given adequate weight at planning/design stage.
- Identify and suggest remedial actions against the anticipated impacts;

1.3 Scope of the CESMP

9. The Project will be constructed at the Rampura-Bashundhara site of Dhaka where it will cover will cover 9km underground transmission cable line. The line traverses Bashundara Residential area (0- 3 km), Madani Avenue between 3 and 4 km, Notun Bazar (4-6 km), Badda Link Road (6-7 km), Moddho Badda (7-8 km) and Merul Badda (8.-8.85 km).

10. Following steps has been adopted for the CESMP study:

- Preparation of environmental report and other necessary document to Engineer.
- Maintain a register of all environmental issues to implement for the project environmental audit.
- Comply with the environmental management plan outlined in the environmental impact assessment report.
- Establishment of objectives and scope for different environmental management plans.
- Target outcome for individual environmental management plans.
- Identification of potential sources of impacts and risks from the construction activities.
- Identification of potential impacts and risks in the construction site and surrounding area.

- Maintain the equality to the capacity of equipment and manpower.
- Increase the knowledge and developed skill in environmental issues.
- Propose mitigation and enhancement measures to avoid reduce or eliminate the possible environmental risks.

1.4 Methodology of the CESMP

1.4.1 General Approaches

11. Environmental observation around the sub-project site through a structured checklist to determine the potential area of concern/impact along the proposed line. Similarly, discussions with stakeholders and project team, review of project documents, available online resources and other sources will also have carried out.

12. CESMP is to demonstrate how the proposed construction works can be delivered in a logical, sensible and safe sequence with the incorporation of specific environmental and social control measures relevant to construction works of this nature. The following steps were followed to prepare the CESMP:

- Reviewing IEE report and all the relevant documents in connection with the Dhaka and Western Zone Transmission Grid Expansion Project.
- Ensuring the CESMP is consistent with applicable environmental laws, regulations and standards of the project.
- Consultation was done by the Environmental and social Specialist to monitor the environmental and social condition of the project area.

13. The general approach of establish the environmental baseline will be to survey the package 2 of project corridor for identification of the environmental features those are mentioned in the CSEMP document.

1.4.2 Quantitative Environmental Approaches

14. During the construction stage of the project, it may raise several concerns about certain environmental adverse impacts on the surrounding environment. By implementing the monitoring and mitigation programme, the adverse impacts can be effectively managed. The environmental quality tests (air quality, noise, water quality and soil quality) for several environmental parameters will be conducted from the project sites to comply with the CESMP.

1.4.3 Qualitative Environmental Approaches

15. The qualitative information will be collected through conventional method of environmental study. Environmental Monitoring Team/officer dedicatedly work the construction team to ensure the compliance with environment safeguards monitoring services.

16. Important Environmental Components (IECs) that are likely to be impacted by the project will be identified. The impacts of the proposed interventions on the IECs, assessed in the previous stage, will be quantified to the extent possible.

17. The institutional requirements and environmental monitoring plan will be prepared suggesting mitigation measures for minimizing the effect of the negative impacts, enhancement plan for increasing

the benefit of the positive impacts, compensation plan for compensating the negative impacts and an environmental monitoring plan for monitoring changes taking place through implementation of the project.

18. Review of the CESMP is required to maintain continual improvement, suitability and effectiveness of the CSEMP and to review the performance. A formal review will be undertaken every six months by the Environmental Specialist of Project Support Implementation Consultant (PISC) of PGCB in harmonizing with contactor's environmental focal person.

1.5 What is CESMP?

19. Construction Environment & Social Management Plan (CESMP) defines the environmental and social objectives for the project, describes its contractor's responsibilities regarding environmental management and provides guidance on a consistent approach for managing environmental and social aspects and impacts during the construction phase.

20. CESMP is a site and work specific document mentioning detailed action plan to mitigate the environmental and social impacts by proper planning, implementation, appropriate documentation checking of construction related activities through regular monitoring and evaluation and performing necessary preview and modification of management system if needed in order to mitigate impending environmental hazards.

21. The Construction Environment & Social Management Plan (CESMP) defines a set of mitigation and monitoring actions to be taken, in response to potential impacts predicted to take place during the construction and operating periods of the Project. The CESMP is presented as two tables, defining not only the impacts, mitigate and monitoring actions to be implemented, but also where, when and who will be responsible for implementing them. The CESMP describes well known and best available mitigate actions to be taken to prevent negative impacts from taking place, and if that is not possible to mitigate them to an acceptable level. Some common CESMP components may include:

- Description of the project and the site
- Identification of potential environmental risks
- Mitigation measures to minimize or eliminate risks
- Environmental monitoring and reporting requirements
- Contingency plans in the event of an environmental incident or emergency
- Roles and responsibilities of project personnel for environmental management
- Communication and consultation plan for stakeholders and regulatory agencies

2 POLICY, LAWS AND REGULATIONS

2.1 Overview

22. Transmission project activities by their inherent nature and flexibility have negligible impacts on environmental and social attributes. The Bangladesh laws relating to environmental and social issues have strengthened in the last decade both due to local needs and international commitments. All activities under the project will be within the purview of these laws keeping in mind appropriate international obligations and directives and guidelines with respect to environmental and social considerations.

23. According to the national environmental legislation of Bangladesh all development projects are governed by some legal and institutional requirements. As such, assessment of relevant legal provisions, policies, strategies and institutional issues are very important for any project proponent or developer before execution of a program or plan. The proponent has to be well aware of these requirements and comply with the provisions as applicable and necessary.

24. To address the environmental and social risks of any project and its associated components; to protect and conserve the environment from any adverse impacts, the GoB and ADB have specified laws and legislations. This section presents an overview of the major national environmental laws and regulations that are relevant and applicable to the activities supported by the project.

2.2 Organizations Related with Enforcement of Environmental Standards

25. Roles and responsibilities of various Ministries and Departments involved in the enforcement of environmental requirements are described below-

2.2.1 Ministry of Environment and Forest

26. The Ministry of Environment and Forest (MoEF) is the key government institution in Bangladesh for all matters relating to national environmental policy and regulatory issues. Realizing the ever-increasing importance of environmental issues, the MoEF replaced the Ministry of Agriculture and Forest in 1989 and is at present a permanent member of the Executive Committee of the National Economic Council. The National Economic Council is the major decision-making body for economic policy issues and is also responsible for approving all public investment projects. The MoEF oversees the activities of the following technical and implementing agencies:

- Department of Environment;
- Forest Department; and
- Forest Industries Development Corporation.

2.2.2 Department of Environment (DoE)

27. The government adopted the Environmental Pollution Control Ordinance in 1977 to expand the scope of environmental management and to strengthen implementation powers. The ordinance established an Environmental Pollution Control Board, which formulates policies and proposes measures for their implementation. In 1982, the Board was renamed as the Department of Environmental Pollution Control. Six divisional offices were established in Dhaka, Chattogram, Khulna, Barisal, Sylhet and Rajshahi.

28. The DoE is a department of the MoEF and is headed by a Director General. The Director General has complete control over the DoE. The power of the Director General, as given under the Environment Conservation act, is outlined as follows:

- The Director General as the operator of DoE has the authority to stop activities considered harmful to human life or the environment. The operator has the right to appeal and procedures are in place for this. However, if the incident is considered an emergency, there is no opportunity for appeal;
- Director General has the authority to declare an area affected by pollution as an ecologically critical area. The DoE governs the type of work or process within that area;
- Before undertaking any new development project, the project proponent must take an environmental clearance from the DoE; and
- Failure to comply with any part of the Environment Conservation Act 1995 may result in punishment by a maximum of 5 years' imprisonment or a maximum fine of Tk100,000, or both.

2.2.3 Other related Organizations

29. There are several other organizations, which have certain social and environmental functions. These organizations include:

- Ministry of Land: Land Reform and Land Acquisition Directorate;
- Ministry of Labour and Employment (Occupational Health and Safety and labour issues); and
- Ministry of Power and Energy (supply and safety guidelines)

2.3 National Legislation Related to Environment

30. Nation environmental legislation related to the project are summarized in following **Table 2.1**. Laws/rules/acts ordinances pertaining to different environmental domains having interaction/effect directly or indirectly with the project activities have been discussed.

Table 2.1: National and International Policies and Acts Relevance to the Project

Name of the Act/Rule	Enforcement Agency/Authority	Key Features	Applicability to the Project
Environmental Conservation Rules, 2023	Ministry of Environment Forests and Climate Change	▪ Declaration of Ecologically critical areas ▪ Requirement of environmental clearance certificate for various categories of projects ▪ Requirement of IEE/EIA as per category ▪ Renewal of the environmental clearance certificate within 30 days after the expiry ▪ Provides standards for quality of air, water and sound and acceptable limits for emissions/discharges	Applicable as the project falls under the "Red" Category

Name of the Act/Rule	Enforcement Agency/Authority	Key Features	Applicability to the Project
		from vehicles and other sources	
Air Pollution Control Rules-2022	Ministry of Environment, Forests and Climate Change	Prevention of Air Pollution Standards for Ambient Air Quality	Applicable since several air pollution sources like construction activities and other project activities.
The Bangladesh National Building Code (BNBC) 2020	Building Construction Committee, GoB	Sets out the constructional responsibilities of relevant authority to adopt precautionary measures to ensure the safety of the workmen. According to Section 1.2.1 of Chapter 1 of Part 7, "In a construction or demolition work,	Applicable since the project involves both construction and demolition activities.
The Acquisition and Requisition of Immovable Property Act 2017	Ministry of Land	- Current GoB Act and Guidelines, relating to acquisition and requisition of land - It has been replaced with the 1982 ordinance in order to overcome its shortcomings "Acquisition means acquiring the ownership and possession of any immovable property for any requiring person or organization in exchange for compensation or rehabilitation or both."	Applicable
Bangladesh Labor Law, 2006; Bangladesh Labor Rules 2015	Ministry of Labor	This Act pertains to the occupational rights and safety of workers and the provision of a comfortable work environment and reasonable working conditions	Applicable
Hazardous Waste Management Rules, 2011	Ministry of Environment, Forest and Climate Change	Restriction of storage of hazardous waste more than 90 days Enforcement to dispose only through the licensed collector	Applicable as the project will generate hazardous waste materials.
National 3R Strategy for Waste Management, 2010	Ministry of Environment, Forest and Climate Change	Provide guideline to develop waste management strategy according to 3R Sector specific promotion strategy for 3R	Applicable as the project site will generate waste.
Environment Conservation Act, 2010 (Amendment)	Ministry of Environment, Forest and Climate Change	This Act aims to provide for further amendments to the Bangladesh Environment Conservation Act No. 1 of 1995. Amendments regulate and give new definition to several aspect of the	Applicable as the project will need to protect the environment during its construction

Name of the Act/Rule	Enforcement Agency/Authority	Key Features	Applicability to the Project
		original Act, such as: wetland; hazardous waste; ecologically critical area; restriction on cutting hill; restriction on production, import, storage, loading, transportation etc. of hazardous waste to protect the environment; restriction on pollution; environmental clearance certificate; penalties; claim for compensation; confiscation of materials and equipment involved; etc.	and operation phase
Noise Pollution (Control) Rules, 2006	Ministry of Environment, Forest and Climate Change	Prevention of Noise pollution Standards for noise levels	Applicable.
National Biodiversity Strategy and Action Plan (2004)	Ministry of Environment, Forest and Climate Change	- Conserve, and restore the biodiversity of the country for wellbeing of the present and future generations; - Maintain and to improve environmental stability for ecosystems; - Ensure preservation of the unique biological heritage of the nation for the benefit of the present and future generations; - Guarantee the safe passage and conservation of globally endangered migratory species, especially birds and mammals in the country; and - Stop introduction of invasive alien species, genetically modified organisms and living modified organisms.	Applicable as the project corridor consists of variable biodiversity
Environment Court Act, 2000 (subsequent amendments in 2002)	Ministry of Environment, Forest and Climate Change and Judiciary	GoB has given highest priority to environment pollution. Passed 'Environment Court Act, 2000' completing environment related legal proceedings effectively	Applicable for completing environmental legal requirements effectively
Environment Conservation Act, 1995 (amendments in 2000 & 2002)	Ministry of Environment, Forest and Climate Change	- Define Applicability of environmental clearance - Regulation of development activities from environmental perspective - Framing applicable limits for emissions and effluents - Framing of standards for air, water	Applicable as according to this act (Section 12), no industrial unit or project will be established or undertaken without

Name of the Act/Rule	Enforcement Agency/Authority	Key Features	Applicability to the Project
		- and noise quality ▪ Formulation of guidelines relating to control and mitigation of environmental pollution, conservation and improvement of environment Declaration of Ecologically critical areas	obtaining, an Environmental Clearance Certificate (ECC) from the Director General of DoE.
The Ground Water Management Ordinance, 1985	Upazila Parishad	❖ Management of ground water resources ❖ Installation of tube-wells at any place after license from Upazila Parishad only	Applicable
Bangladesh Wild Life (Preservation) Act, 1974	Ministry of Environment and Forest; Bangladesh Wild Life Advisory Board	❖ Preservation of Wildlife Sanctuaries, Parks, and Reserves	Applicable since the project area is habitat of many important aquatic fauna. An endangered species.

2.4 Policy Related with Energy Development

2.4.1 The Electricity Act (1910) and Electricity Rules (1937)

31. Under the act, any person can obtain a license to supply electricity and lay down or place electric supply lines. The licensee can open and break up the soil and pavement of any street, railway or tramway and can lay down any line or do other work near other utility services (gas, telecommunication, water, sewer, etc.), provided prior permission is taken from the respective authority, as stated in Sections 12-18 of the Act.

32. 38. According to Section 19 (1) of this act, the licensee shall give full compensation for any damage, detriment or inconvenience caused by, or anyone employed by, that licensee.

33. Sub-section (1) of Section 51 of the Electricity Rules, 1937 advises that the licensee should take precautions in laying down electric supply lines near or where any metallic substance or line crosses to avoid electrocution.

2.4.2 The Electricity Act, 2018

34. The Electricity Act 2018, repeals the provisions of Electricity Act 1910. A chain of penal measures, intended to serve temporary demand, have been taken. Anyone involved with electricity misappropriation, pilferage, wastage, or with interference or destruction of supply lines, be they civilians or government officials or corporations, may now be subjected to both fines and imprisonment. The current Act does not require officials to obtain a magisterial order before entering the premises of consumers to test or terminate supply.

2.4.3 The Telegraph Act (1885) Part III Power to place Telegraph Lines and posts

35. Under the Act 10- 19, the government can build towers on public land without giving any land compensation.

2.4.3.1 The Power Policy, 1995

36. a) Like the Petroleum Policy, this is presently an integral part of the National Energy Policy 1996. It has different policy statements on demand forecast, long- term planning and project implementation, investment and lending terms, fuels and technologies, power supply to the west zone, isolated and remote load centers, tariff, captive and stand by generation, system loss reduction, load management and conservation, reliability of supply, system stability, load dispatching, institutional issues, private sector participation, human resource development, regional/international cooperation, technology transfer and research program, environment policy and legal issues.

b) As the proposed project is a Power Transmission Project, all necessary requirements mentioned above will be adopted for the project.

2.4.3.2 The Energy Policy (Updated 2004)

37. The first National Energy Policy (NEP) of Bangladesh was formulated in 1996 by the Ministry of Power, Energy, and Mineral resources to ensure proper exploration, production, distribution and rational use of energy resources to meet the growing energy demands of different zones, consuming sectors and consumer's groups on a sustainable basis. With rapid change of global as well as domestic situation, the policy was updated in 2004. The updated policy included additional objectives namely to ensure environmentally sound sustainable energy development programmes causing minimum damage to environment, to encourage public and private sector participation in the development and management of energy sector and to bring the entire country under electrification by the year. The policy highlights the importance of protecting the environment by requiring an EIA for any new energy development project, or introduction of economically viable and environment friendly technology.

2.4.4 Mineral Gas Safety Rules (1991)

38. These Rules deal with the materials, design and construction of gas pipelines, pipeline crossings of railways, testing and commissioning, protection against corrosion, pipeline operation and maintenance, storage and distribution, and reporting of accidents. The Rules are quite prescriptive, and include stipulations as to the distances between pipelines and the public, as well as reference to American and British materials standards.

2.4.5 Petroleum Policy (1993)

39. The Petroleum Policy was formulated with the primary objective of promoting, monitoring, and regulating all activities in the oil and gas sector in relation to exploration, development, refining, marketing, and export.

2.5 Compliance with ADB Safeguard Policy Statement, 2009

40. ADB's environmental and social safeguards form the cornerstone of its support to inclusive economic growth and environmental sustainability in Asia and the Pacific. In July 2009, ADB's Board of

Directors approved the new Safeguard Policy Statement (SPS) governing the environmental and social safeguards of ADB's operations. The objectives of the SPS are to avoid, or when avoidance is not possible, to minimize and mitigate adverse project impacts on the environment and affected people. Objectives also include helping borrowers strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

41. ADB's environmental safeguards emphasize development and implementation of a comprehensive EMP. Key elements of EMP are mitigation measures, monitoring programs, budgets, and institutional arrangements for implementation. In addition, the environmental assessment process emphasizes public consultation, information disclosure, and consideration of alternatives.

42. Further, ADB adopts a set of specific safeguard requirements that borrowers or clients are required to meet in addressing environmental and social impacts and risks associated with a specific project. ADB will not finance projects that do not comply with its safeguard policy statement, nor will it finance projects that do not comply with the host country's social and environmental laws and regulations. The safeguard policy statement applies to all ADB-financed and/or ADB-administered sovereign and non-sovereign projects, and their components, regardless of the source of financing.

2.5.1 ADB's Environmental Safeguard Requirements – Policy Principles

43. Environmental assessment incorporates the following policy principles:

- Conduct an environmental assessment for each project. Assess potential transboundary and global impacts, including climate change.
- Examine alternatives to the project's location, design, technology, and components. Avoid, minimize, mitigate, and/or offset adverse impacts.
- Prepare an EMP.
- Carry out meaningful consultation with affected people and facilitate their informed participation.
- Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.
- Implement the EMP and monitor its effectiveness. Document and disclose monitoring results.
- Do not implement project activities in areas of critical habitat, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area.
- Apply pollution prevention and control technologies and practices consistent with international good practices such as the World Bank Group's Environmental, Health and Safety Guidelines.

- Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease.
- Conserve physical cultural resources (PCRs) and avoid destroying or damaging them by using field-based surveys.

44. The project categorization system and the assessment required are described in Table 2-2. Most of the environmental impacts of the project are temporary and reversible. This project is categorized as an Environmental Category B project.

Table 2.2: ADB's Environmental Safeguards Categorization¹

Category	Definition
A	Likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, and may affect an area larger than the sites or facilities subject to physical works.
B	Likely to have adverse environmental impacts that are less adverse than those of Category A. Impacts are site-specific, few if any of them irreversible, and in most cases mitigation measures can be designed more readily than Category A.
C	Likely to have minimal or no adverse environmental impacts.
FI	Project involves investment of ADB funds to or through a financial intermediary (FI).

2.6 Compliance with PGCB Health Environment and Safety Requirements

45. PGCB has its own policy and requirements for compliance relating to environment, health and safety issues for its operations. The company is committed to managing its operations in a safe, efficient and environmentally responsible manner. The PGCB's Health Environment and Safety (HES) manuals, guidelines, procedures, and plans are important tools indicating their commitment. HES manuals include:

- Environmental Impact Assessment Module;
- Guideline on Integrated Impact Assessment;
- Health Impact Assessment Module; and
- Social Impact Assessment Module.

46. In addition, the requirement for impact assessment is affirmed in the PGCB's Statement of General Business Principles. The PGCB is committed to:

- Pursuing the goal of no harm to people;
- Protecting the environment; and,
- Managing HES as any other critical business activity.

47. The mandatory company Operations Management System, Environmental Care Element/ Standards, issued in March 1997, refers to Environmental Assessment indicating that "EIA (including a consideration of social impacts) will be conducted prior to all new activities and facility developments, or significant modifications of existing ones.

¹ ADB Safeguard Policy Statement 2009

2.7 National Environment Quality Standards

48. The standards, which are commonly known as Environmental Quality Standards (EQS), have legal bindings. Details of the environmental standards applicable in Bangladesh are described in Environment Conservation Rules (ECR). Regulated areas spread to all industries and regulated items are air quality, water quality (surface water, drink water), noise (boundary, source), emissions from motor vehicles or ships, odor, sewage discharge, waste from industrial units and industrial effluents, or emissions. Items and standards, which are related to the construction and operation of project are listed below. Tables and annotations of environmental regulation are described as textual description of ECR. The contractor will follow these standards for the quantitative environmental monitoring.

2.7.1 Air Quality

49. Air quality is mainly due to emission from the vehicles which is insignificant. The windblown dust also causes air quality degradation. Open burning of the waste's materials and roadside disposal of the wastes cause also air quality degradation.

50. The construction activities may degrade the air quality of the subproject area though the impacts are anticipated to be insignificant. Air Quality Standards are listed in **Table 2.3**.

Table 2.3: Ambient Air Quality Standards

Parameter	TSP/ SPM	PM _{2.5}	PM ₁₀	NO ₂	SO ₂	CO	O ₃
Air Pollution Control Rules 2022 ²	-	65 (µg/m ³)	150 (µg/m ³)	80 µg/m	80 µg/m ³	5 mg/m ³	100 µg/m ³
Time period (Hours)	24	24	24	24	24	8	8

Source: Air Pollution Control Rules-2022, DoE

2.7.2 Noise Level

51. Noise generated due to the vehicle movement and hydraulic horns. In the subproject activities, mixer machine, vibrator machine, mechanical compaction machine, rod cutter, hydraulic excavator, asphalt plant may create localized noise nuisance though the impacts are anticipated to be within the tolerable limits. Noise level standards are described in Table 2.4.

Table 2.4: Bangladesh Standards for Noise Level

Bangladesh Standard ³	Day Time	Night Time
Industrial area	75	70
Commercial	70	60
Mixed area	60	50
Residential area	55	45
Silent Area	50	40
World Bank / IFC Standard		
Industrial area	70	70
Residential; Institutional; Educational	55	45

Note:

- a) Daytime start from 6.00 am morning and end at 9.00 pm night.
- b) From night 9:00 pm to 06:00 am

2.7.3 Water Quality Standards

52. The monitoring of the water quality to be carried out quarterly during construction and operation phase according to the Surface water quality standards of ECR 2023. Standard for Ground water and Surface water table are given below in Table 2.5 and 2.6.

Table 2.5: Standard for Inland Surface Water

² Air Pollution Control Rules'2022 Schedule-01, Department of Environment, Govt. of Bangladesh

³ Noise Pollution Control Rules, 2006

Ways of Usage			Parameter Standard ⁴							
			DO	BOD	NO3-N	PO ₄ -P	COD	TOC	TSS	Oil & Grease
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Source of Drinking waterfor supply only after disinfecting	≥6	≤ 2	7.0	0.1	10	NYS	NYS	NYS		
Water usable for recreational activity	≥ 5	≤ 3	7.0	0.5	10	NYS	NYS	NYS		
Source of drinking waterfor supply after conventional treatment	≥ 5	≤ 3	7.0	0.5	25	NYS	NYS	NYS		
Water usable by fisheries	≥ 5	≤ 6	7.0	0.5	50	NYS	NYS	NYS		
Water usable by various process and cooling industries	≥ 1	12	-	-	100	NYS	NYS	NYS		
Water usable for irrigation	-	≤ 12	5.0	2.0	100	NYS	NYS	NYS		

Note: Electrical Conductivity for Irrigation water -2250 µS/cm (at a temperature of 25° C: Sodium less than 26%: boron less than 0.2%). NYS= Not Yet Set

Table 2.6: Bangladesh Standards for Drinking Water

Parameter ⁵	Unit	Standards
Fecal Coliform	NFU/100ml	0
Total Coliform	NFU/100ml	0
Arsenic (As)	mg/L	0.05
Total Chromium (Total Cr)	mg/L	0.05
Iron (Fe)	mg/L	0.3-1.0
pH	-	6.5-8.5
Suspended Solids (SS)	mg/L	10
Total Dissolved Solids (TDS)	mg/L	1000
Temperature	°C	20-30

2.8 International Standards

53. The General EHS Guidelines of International Finance Corporation (IFC) contain information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors.

54. The standards and limits are required set according to the requirements of various industries and projects. This guideline provides an approach to the management of significant sources of emissions, including specific guidance for assessment and monitoring of impacts.

Table 2.7: WHO Ambient Air Quality Guidelines

⁴ Environmental Conservation Rule-2023, Standards for Inland Surface Water (Rule 31, Schedule 2- KA)

⁵ Environmental Conservation Rule-2023, Standards for Drinking Water (Rule 31, Schedule 2- KHA)

WHO Ambient Air Quality Guidelines ^{6,7}		
Parameters	Averaging Period	Guideline value in mg/m ³
Sulfur Dioxide (SO ₂)	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	10 minutes	500 (guideline)
Nitrogen dioxide (NO ₂)	1-year 1-hour	40 (guideline)
		200 (guideline)
Particulate Matter PM ₁₀	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter PM _{2.5}	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Table 2.8: WHO Noise Level Guidelines

Noise Level Guidelines ⁸		
Receptor	One Hour LAeq (dBA)	
	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational ⁹	55	45
Industrial; commercial	70	70

Table 2.9: WHO Drinking Water Quality Standards

Water Quality Parameters	Unit	WHO Guidelines for Drinking Water (2004)
pH	-	6.5-8.5
Arsenic (As)	mg/L	0.01
Electric Conductivity (EC)	µS/cm	-

⁶ World Health Organization (WHO). Air Quality Guidelines Global Update, 2005 PM 24-hour value is the 99th percentile

⁷ Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines

⁸ Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999

⁹ For acceptable indoor noise levels for residential, institutional, and educational settings refer to WHO (1999)

Water Quality Parameters	Unit	WHO Guidelines for Drinking Water (2004)
Iron (Fe)	mg/L	<0.3
Temperature	°C	-
TSS	mg/L	-
TDS	mg/L	<1000
Coliform (Total)	CFU/100 ml	0
Coliform (Fecal)	CFU/100 ml	0
Cr	mg/L	0.05

3 PROJECT DESCRIPTION

3.1 Project Area

55. In order to meet the growing demand for electricity in Greater Dhaka, PGCB envisages to construct a ring of 400 kV transmission lines around the Dhaka metropolitan area with 230 kV transmission lines leading into the city, fed by the 400 kV ring. Component 1, which is based on this plan, includes: i) construction of 400 kV, 230 kV and 132 kV transmission lines with cumulative line lengths of 22 km, 9 km and 9 km respectively; ii) construction of 400/230 kV and 230/132 kV substations with cumulative capacities of 3,750 MVA and 900 MVA respectively; and iii) construction of two 230 kV bay extensions at an existing substation. Given this situation, finding suitable corridors for construction of overhead transmission lines is difficult.

56. The proposed underground 132 kV transmission line is 11 km long and is located in Dhaka North City Corporation (DNCC). The line traverses Bashundara Residential area (0- 3 km), Madani Avenue between 3 and 4 km, Notun Bazar (4-6 km), Badda Link Road (6-7 km), Moddho Badda (7-8 km) and Merul Badda (8-8.85 km). The road network of underground cabling as follows: Rampura substation- Jahirul Islam Avenue/Aftab Nagar main road - Bir Uttam Rafiqul Islam Avenue - Hatir Jeel link road - Bir Uttam Mir Shawkat Sarak - Shaheed Tajuddin Ahmed Avenue - Bir Uttam A K Khandakar Road - Gulshan Avenue - Road 34 - Gulshan Bridge -Road 19A - Kamal Ataturk Avenue - Madani Avenue - Pragati Avenue - Kuril-Bishwa Road – and Purbachal Express Highway. The proposed route of the underground transmission cable line is given in Figure 3.1. Physical features of this Underground Transmission Cable line are found in Table 3.1.

Table 3.1: Physical Features of the Project

Physical Features	Attribute
Voltage Rating	132 kV
Type of transmission line	Double circuit
No of transmission towers	Underground cable
Conductor material	2,000 mm ² Copper
Type of connection	Bashundhara and Rampura Grid Substations
Duration of project implementation	Approximately 3 years

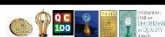
Client ID: DTHK-3820

Details & Dimension Map of "Proposed Rampura - Bashundhara 132KV Double Circuit Underground Cable line of Power Grid Company of Bangladesh Ltd. Under Dhaka & Western Zone Transmission Grid Expansion Project".

Printing Scale 1 : 6050



Project Information	Client Name	Consultant Name	Resource Personnel for this Project				
Title: "Proposed Rampura - Bashundhara 132KV Double Circuit Underground Cable Line of Power Grid Company of Bangladesh Ltd. Under Dhaka & Western Zone Transmission Grid Expansion Project". Project Name: Dhaka and Western Zone Transmission Grid Expansion Project Date of Survey: 03 to 08 April 2021 Date of Submission: 18 April 2021 Calculated Length: 10.42 Kilometer	 Dhaka and Western Zone Transmission Grid Expansion Project. Power Grid Company of Bangladesh Ltd. (PGCL)	 House: 408/7 (Ground Floor), Lane: 07 DOHS Baridhara, Dhaka 1206 Phone: +88 02 841 3873 Mobile: +880 1755 600365 Email: grihayansd@grihayansbd.com Web: www.grihayansbd.com	Team Leader Engr. Pulak Kanti Barua, FIEB Fellow No -11918				
			Field Engineer Mr. Royel Barua	CAD Engineer Sultan Ahmed Tamanna	CAD Designer Md. Ali Ashraf	GIS & RS Analyst Istiak Hasnat	Project Engineer Eng. Shantanu Barua



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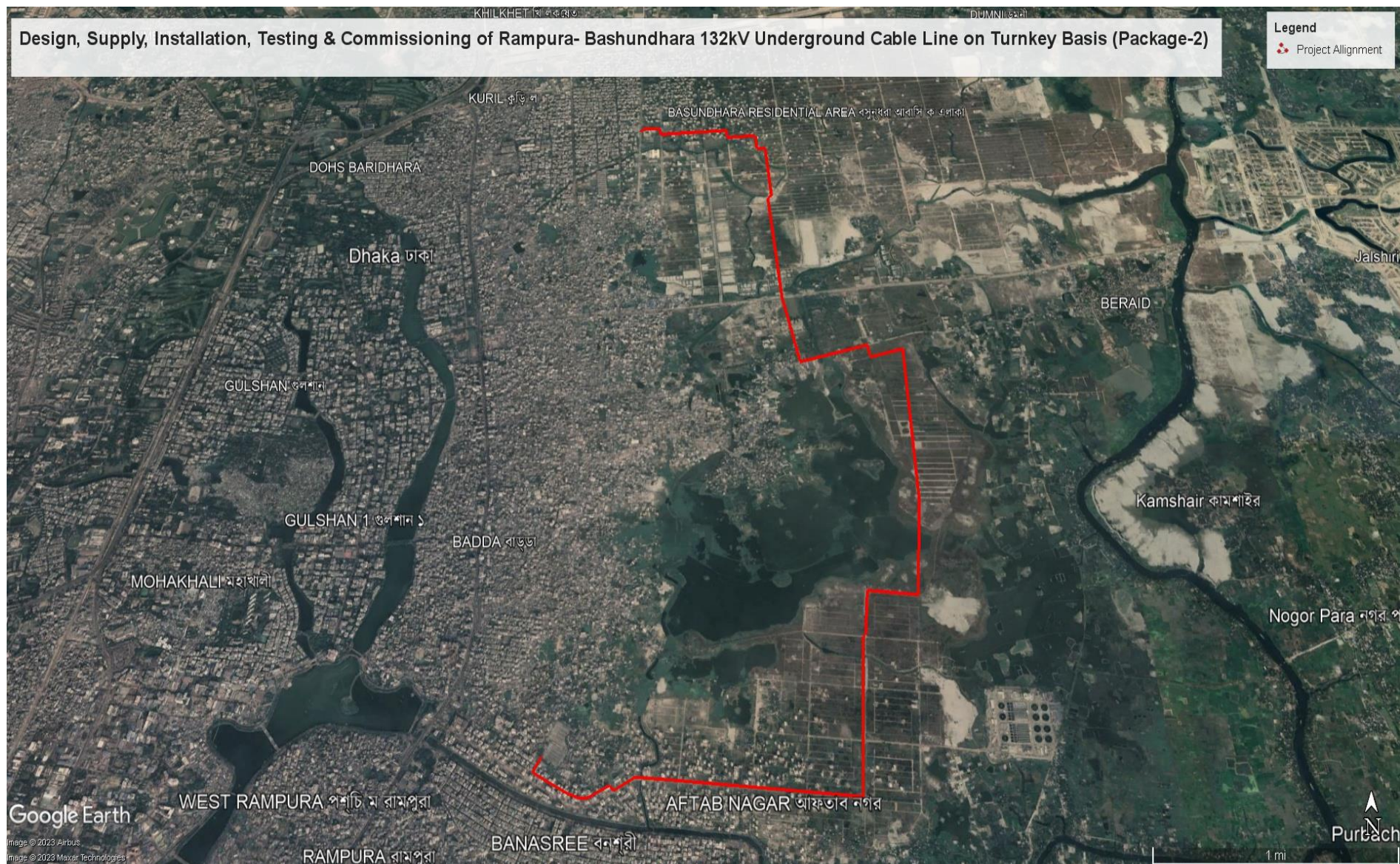


Figure 3.1: Route of the Underground Cable Line (Rampura-Bashundhara)

3.2 Scope of Project

57. The construction work of a 132kV double circuit from Rampura AIS substation to Bashundhara GIS substation is including two parts: underground cable section and overhead line: (i) - 9.5km buried cable section, 132kV dual circuit 1200sqmm single core XLPE cable, with one optical fiber; (II) - 1.5km overhead line section, 132kV dual loop single split ACCC conductor with one OPGW. The detailed of the scope of work is listed in Table 3.2.

Table 3.2: Scope of the Project

Name of the Project	Dhaka and Western Zone Transmission Grid Expansion Project
Type of Connection	132kV double circuit from Rampura AIS substation to Bashundhara GIS substation
Length	11 Km
Type of Cable	132 kV single core 1200sqmm copper conductor, XLPE insulated, corrugated Al sheathed & MDPE outer sheathed cable
Voltage rating	132 kV
Status of Line	1.5km overhead line section, 132kV dual loop single split ACCC conductor with one OPGW
Start Point	Rampura AIS Substation [23°46'3.46"N; 90°25'56.22"E]
End Point	Bashundhara GIS substation [23°49'2.32"N; 90°26'9.24"E]
Upazila	Bashundhara
District	Dhaka

3.3 Component of the Construction Works

58. The phasing of construction works for the UG transmission lines is indicated in Table 3.3 below. The construction methods are discussed separately for underground cable and grid substations.

Table 3.3: The Phasing of Construction Works

Component	Activities During Construction
Underground Cable	Contractor and manpower recruitment
	Establishment of construction camps and workers
	Clearing of RoW
	Establishment of temporary access tracks
	Transport of materials and equipment to tower sites
	Civil works (foundation work, RCC, etc.)
	Tower erection
	Conductor stringing

3.4 Construction Equipment for the Project

59. The construction of the project will require a considerable quantities of construction equipment's with various types. A list of major construction equipment's required for this project is presented in Table 3.3.

Table 3.4: Construction Equipment's of the Project

No.	Name of the Equipment	Qty. (pcs.)	Country of origin	Used for
1	Mobile Crane	1	Japan	Equipment and Cable Handel
2	Excavator	1	Japan	Excavation
3	Dump Truck	10	Japan	Wastage Transportation
4	Cutting Machine	5	China	Road Cutting
5	Winch Machine	6	China	Cable Pulling
6	Horizontal Directional Drilling HDD Machine	1	China	HDD Work
7	HDD Tracker Machine	1	China	HDD Traking
8	Bitfusion 200	1	China	HDP Pipe Joint
9	Generator Local	5	China	Power Supply Remote Aria
10	Concrete Mixer Machine	2	Local	Slab Casting
11	Cutting Machine	2	China	Re-bar Cutting
12	Pickup	01	Japan	Heavy Equipment
13	HDD Machine	01	China	HDPE Pipe Bowring
14	HDPE Pipe Joint Machine	01	China	Pipe Joint Works
15	Mixture Machine	01	Local	Concrete Cushion Mixed
16	Shutter Set	500	Local	Slab Casting
17	Water Pump	02	China	Dewatering
18	Generator	01	China	Electricity Supply
19	Spade, Belcha, Buskets & Others	Lot	Local	Excavated Works

Source: TBEA

3.5 Construction of Underground Cable

60. Construction of underground cable involves the following activities: site preparation, excavations, bedding, tiling and warning tape, cable laying, and backfilling.

3.5.1 Route Survey and Site Preparation

61. Proposed cable route needs to be carefully surveyed to identify every possible obstacle prior to the excavations. As a part of the survey, trial pits will be made at an interval of 15-20 m in the proposed cable route so that the soil condition and any parallel utility service lines can be identified. However, it is essential to contact relevant utility organizations such as water, telecommunication, etc. to identify the existing service network buried within the cable network area. While laying underground cables, every precaution must be made to prevent damages to the cable; as such damages may lead to the breakdown which causes disturbances to the supply. Not like overhead lines, it is difficult to repair such damages immediately and hence zero damages to the cable while lying is essential. During the survey, road crossings, culverts, railway and drain crossings will be clearly identified and special cable laying constructions will be developed for such sections.

3.5.2 Excavations

62. Trenching is the most difficult activity in the cable laying work. As most of the trenching activity will be done in roads and pavements, safety of the general public will be ensured with minimized disturbances. Therefore, night work is preferred for trenching work as it will be less disturbing. During the excavations, barricading, danger signs, warning lights and boards will be used to prevent any accidents.

63. One common method which is adopted by the utilities in laying cables in densely populated areas is to excavate the trench and temporarily backfilling with sand or quarry dust. Once the whole section excavation is completed, the trench will be re-excavated for cable laying. Depth and width of the trench depends on the type of cables laid in the trench. When two different cables are running on the same trench, cables will be laid in layers to maintain minimum buried depths or on the same layer that satisfy the minimum depth requirement of the highest voltage cable.

64. To prevent any mechanical damages to the cable (which alter the geometry of the inside cable), the cable route will be carefully designed to match the minimum bending radius of the cable. This measurement will slightly vary with different manufactures and hence shall check the technical data sheet for the selected conductor.

3.5.3 Bedding, Tiling and Warning Tape

65. Once the trench excavation is completed, the bottom of the trench will be prepared for cable laying. As the cable is dragged along the trench while laying, there is a possibility to get damaged if the trench bed is not well prepared. Therefore, 100 mm depth of sand layer is spared at the bottom of the trench prior to the cable laying. This sand bed also serves as a good medium for heat conduction which needs for cooling the cable during the operation. Once the cable is laid, again sand layer of 100 mm above the conductor is applied as a back- filling layer.

66. The cable will be protected from the impacts in case of excavations by unknown parties. For that concrete cable tiles will be laid on the sand layer to cover the cable from impacts. General dimensions of such covering tile will be 400 x 200 x 50 mm (L x W x H). If multiple cables were laid, bottom of the trench will be fully covered with tiles. As a measure of conveying the danger of the cables laid below, a warning tape (Black and Yellow color Polyethylene tape) will be laid at the depth of 300 mm from the top level.

3.5.4 Cable Laying

67. For laying the cable, the cable drum will be in a suitable place at the end of the trench with supports from jacks such that the drum can be easily rotate to pull the cable out. The cable will be pulled out from the top of the drum and not from the bottom as follows.



Figure 3.2: Placement of Cable Drum and Correct Method of Pulling

68. Once the trench is prepared for cable laying with spreading of sand at the bottom, cable can be pulled along the trench. To prevent any damages to the cable and also for the ease of pulling, rollers must be placed along the route within a gap of 5 m. The correct method of pulling is to use a winch and apply suitable tension which is below the maximum pulling tension specified by the manufacturer.

69. As most of the damages to the sheath occur during the pulling of the cable, the activity will be completed with extreme care. If multiple cables are laid on the same trench, cables will be laid in the trench first and each cable will be adequately separated from each other manually before the backfilling with sand. Generally, it takes much time for completing the end terminations and hence both ends of the cable will be protected from moisture by properly sealing with end caps.

3.5.5 Backfilling

70. Materials used for backfilling will vary as different authorities recommend specific various methods of backfilling. Generally backfilling will be done with quarry dust up to the top 200 mm limit and top surface will be backfilled with uniformly graded aggregates. In by roads, soil backfilling is permitted, however the backfilling soil will be smooth and free from heavy particles. If the excavated soil is not suitable for backfilling, suitable material will be transported to the site.

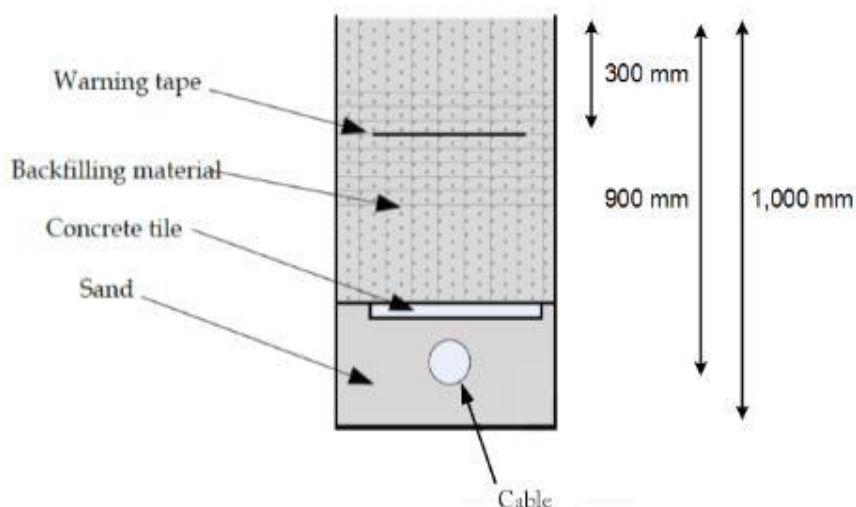


Figure 3.3: Typical Cross-Section of a Trench Profile

3.5.6 Special Locations

71. Special locations such as road crossings, culverts, railway crossings, drain crossings, etc. are locations where additional protection for the cable is necessary. For such location's ducts will be used as a special protective measure in addition to the covering tile shield. For road and railway crossings, type 1000 PVC pipes will be used as ducts whereas at culvert and drain crossings thickness 3.5 mm steel GI ducts will be used. In any other location where possibility of cable damage is high, suitable protective measures will be adopted. A detailed traffic plan is incorporated in Chapter 6.

3.5.7 Cable Testing

72. Before laying the cables, insulation resistance will be checked to ensure that the cable is health before the installation. At the time of starting the end terminations, again insulation resistance will be checked to verify that the cable has not suffered insulation failures at the time of installations.

73. Once the end terminations were completed, high potential test will be carried out to ensure that the whole cable is ready for service. In High Pot test, 100 % of original factory test voltage in accordance with manufacturer's recommendations is applied to the cable and leakage current is measured at the specified durations (normally 1 min). The manufacturer specifies the maximum leakage current for the cable and High Pot test readings will be within that limit for the acceptance for operations.

3.6 Project Implementation Schedule

Item	Description/Time Frame
Name of the Project	Dhaka and Western Zone Transmission Grid Expansion Project
Name of the Package	Design, Supply, Installation, Testing & Commissioning of Rampura- Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2).
HDD Boring	December, 2023 to January, 2024
Soil Excavation	February, 2024 to October, 2024
Cable Pulling, Slab Setting & Back Filling	March, 2024 to November, 2024
Joint Box Casting	July, 2024 to December, 2024.
Joint Box Back Filling & Slab Casting	August, 2024 to December, 2024.
Testing & Commissioning	January, 2025.

4 DESCRIPTION OF THE ENVIRONMENT

4.1 General

74. The purpose of this section is to review and assess the environmental baseline condition of the of the sub-project area. The analysis has been completed following the collection of secondary data/information from various organizations and primary data through extensive field surveys. This section also subsequently includes the existing environmental baseline status of the project area, covering both the natural and social environments. The analysis was completed using a combination of secondary data in addition to extensive on-ground reconnaissance and baseline studies to establish an understanding of the environmental and socio-economic baseline of the project area. Data for this chapter were collected from:
- a. **Secondary Sources:** This included data from literature review, maps and monitoring reports;
 - b. **Primary Sources:** This included gathering information from field surveys, environmental quality sampling, laboratory analysis, monitoring data, Focus Group Discussion (FGD)/Household Survey (HHs) and Key Informant Interview (KII) in the project area.
75. The baseline condition of environmental quality in the locality of project site serves as the basis for identification, prediction and evaluation of impacts. The baseline environmental quality is assessed through field studies within the impact zone for various components of the environment such as air, noise, water, soil and sediment, soil etc.
76. Data was collected from secondary sources for the macro-environmental setting like climate (temperature, rainfall and humidity), physiography, topography etc. First-hand information has been collected to record the micro-environmental features within and adjacent to the project area. Collection of primary information includes extrapolating environmental features on project design, location and measurement of socio-cultural features adjoining project area. Ambient air, noise, water and soil quality samples were collected in terms of environment quality to prepare a baseline database. Consultation was another source of information to explain local environmental conditions, impacts and suggestions etc. The following section describes the baseline environment into four broad categories:
- a. **Physical Environment:** Climate, Topography, Topology, Geology and Soil, Land-use, Drainage etc.
 - b. **Biological Environment:** Factors related to life such as habitats, aquatic life, fisheries, terrestrial habitats, flora and fauna;
 - c. **Environmental Quality:** Air Quality, Noise and Vibration Level, Water Quality (Surface and Ground) Soil and Sediment Quality;
 - d. **Socio-Economic Environment:** Anthropological factors like ethnic communities, social/reserve forest, PAPs, Land Acquisition, Compensation details etc.

4.2 Physical Environment

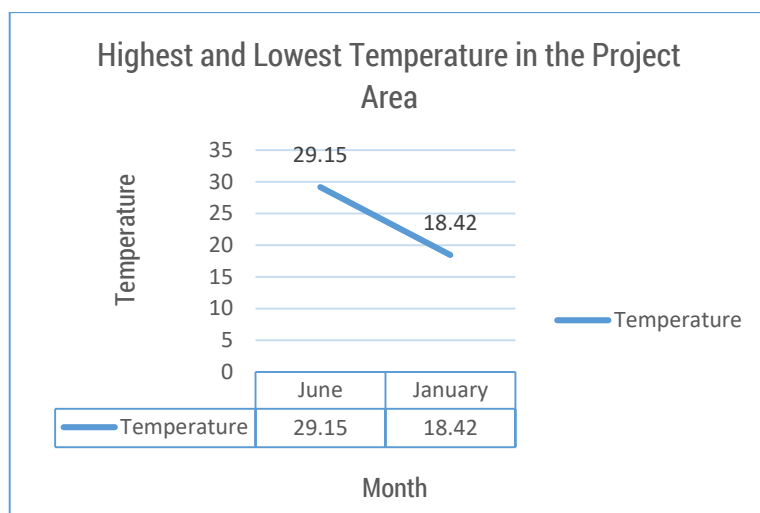
77. The secondary data of the project area has been collected from Bangladesh Meteorological Department (BMD), Banglapedia, and others different research and publications. The secondary data of the project area including **climate, temperature, rainfall, wind speed, physiography, topography, seismic scenario and natural hazards** are in detailed below.

4.2.1 Climate

78. Although less than half of Bangladesh lies within the tropics, the presence of the Himalaya Mountain range has created a tropical macroclimate across most of the east Bengal land mass. The project area experiences a hot, wet and humid tropical climate. Under the Köppen climate classification, Dhaka has a tropical wet and dry climate. The city has a distinct monsoonal season, with an annual average temperature of 25 °C (77 °F) and monthly means varying between 18 °C (64 °F) in January and 29 °C (84 °F) in August. Nearly 80% of the annual average rainfall of 1,854 millimeters (73.0 in) occurs during the monsoon season which lasts from May until the end of September.

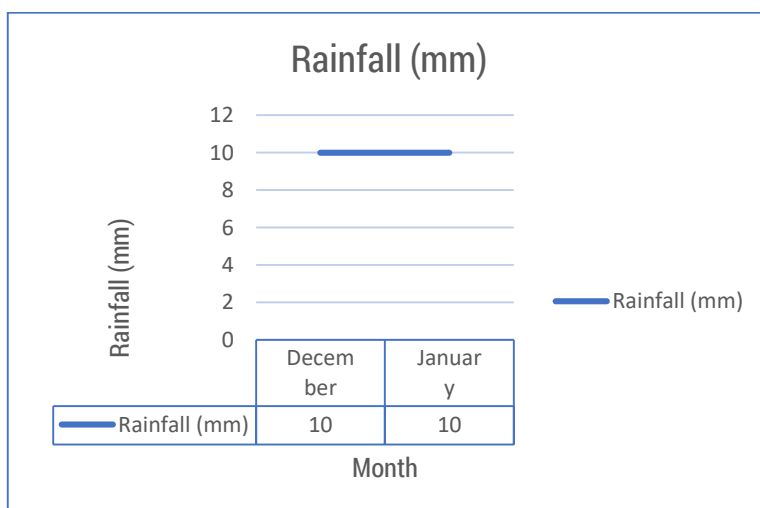
4.2.2 Temperature

79. The project area is located in South-central climatic zone where the high temperature from April to September and lowest temperature during winter remains from December to February. The highest average recorded temperature in this weather station was 29.15°C in June. The lowest average recorded temperature was found in the month of January which was 18.42°C.



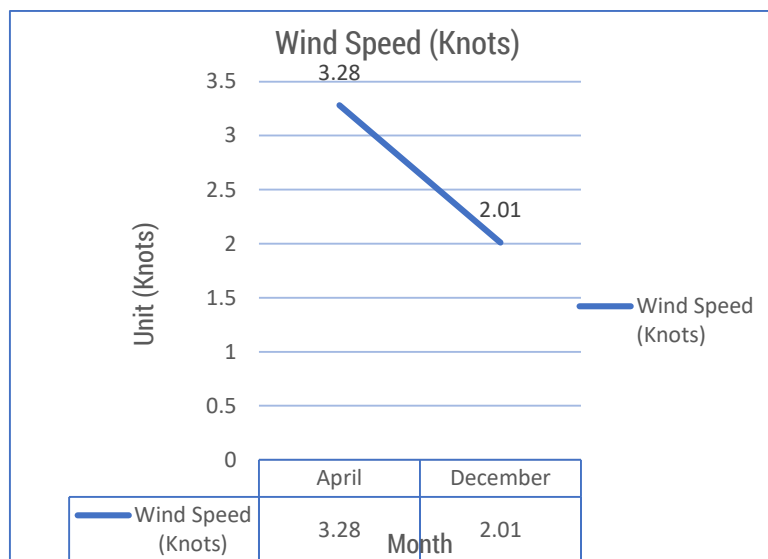
4.2.3 Rainfall

80. Dhaka experience more than 300 mm rainfall during monsoon. In the month of December and January of winter season around 10 mm rainfall occurred in the region of Dhaka.



4.2.4 Wind Speed

81. The average wind speed maximum value was 3.28 knots in April. The minimum wind speed value was 2.01 knots in the month of December in the Dhaka region.



4.2.5 Physiography

82. The project area falls in the junction of Madhupur Tract physiographic unit. Madhupur Tract is located in the central part of Bangladesh comprising greater Dhaka and Mymensingh districts, between the courses of the Old Brahmaputra and the Jamuna Rivers. Soil category of the project area falls into Non-Calcareous Grey Floodplain Soils. Generally, they comprise a grey topsoil and a cambic B-horizon in the subsoil with a grey matrix or grey gleans.

4.2.6 Topography

83. The project area is located in central Bangladesh at 23°42'N 90°22'E, on the eastern banks of the Buriganga River. The city lies on the lower reaches of the Ganges Delta and covers a total area of 270 square kilometers (100 square meter). Tropical vegetation and moist soils characterize the land, which is flat and close to sea level. This leaves Dhaka susceptible to flooding during the monsoon seasons owing to heavy rainfall and cyclones. Due to its location on the lowland plain of the Ganges Delta, the city is fringed by extensive mangroves and tidal flat ecosystems. Dhaka District is bounded by the districts of Gazipur, Tangail, Munshiganj, Rajbari, Narayanganj, and Manikganj.

4.2.7 Seismicity

84. Bangladesh is situated in one of the most tectonically active regions in the world. Here are where three major plates meet (the Indian Plate, the Tibet Sub-Plate, and the Burmese Sub-Plate). The project area is located over the Indian Plate, which is moving north (Zahiruddin, 1983). On the distribution of earthquake epicenters and morpho-tectonic behavior of different tectonic blocks, Bangladesh has been divided into four generalized seismic zones as per Bangladesh National Building Code (BNBC), 2020. The sub-project site falls into Zone-II with a seismic coefficient of 0.20 and belongs to moderate seismic intensity.

4.2.8 Natural Hazards

85. In Bangladesh, due to its unique geographic location, suffers from devastating tropical cyclones frequently. The funnel-shaped northern portion of the Bay of Bengal causes tidal when cyclones make landfall due to which thousands of people living in the coastal areas are affected. Some of the most devastating natural disasters in recorded history with high casualties were tropical cyclones that hit the region now forming Bangladesh (Banglapedia, 2015). The project area does not fall under the risk zone of cyclone. But due to its geographic location, flooding and water logging sometimes occurred in the project area.

4.3 Environmental Quality

86. The environmental quality in the locality of project site serves as the basis for identification, prediction and evaluation of impacts. The baseline environmental condition of this report has been accessed by the secondary sources through review of different reports, research and publications. The environmental quality (primary data) of the project area will be measured as quarterly basis [based on EMP contract specifications] after getting approval of this CESMP. The environmental quality will be monitored throughout the construction period within the impact zone for various components of the environment, viz. air, noise, water, soil etc. The primary data on environmental quality [air, water, noise, soil etc.] with analytical reports will be provided during each quarterly report submission.



Figure 4-1: Locations of Environmental Quality Monitoring

4.3.1 Ambient Air Quality

87. Ambient air quality will be monitored at Three (03) locations of the project area as quarterly basis during the construction period. The portable OCENUS AQM-09 Air Quality Monitoring Station will be used to collect, measure and document critical pollutants including Carbon monoxide, Ozone, Nitrogen dioxide, Sulfur dioxide and Particulates Matter.



Figure 4-2: Ambient Air Quality Monitoring Equipment (OCENUS: AQM-09)

88. Sampling and analysis of ambient air quality will conduct by referring to the recommendation of the United States Environmental Protection Agency (USEPA). Air quality data will be measured automatically every one minute and directly recorded onsite for measured parameters (SPM, PM₁₀, PM_{2.5}, SO₂, NO₂ and CO and O₃) as shown in Table 3-1. Different analysis methods, such as Particulates 90° Infrared Light Scattering for particulate matters (SPM, PM₁₀, PM_{2.5}), and electrochemical sensors for toxic gases (NO₂, SO₂, O₃ and CO) are integrated in the device.

Table 4-1: Methods of Air Quality Sampling and Analysis

Parameter	Instrument Name	Methods of Testing	Analysis Method
SPM	OCENUS AQM-09	On Site Recording	Light Scattering Nephotometer
PM _{2.5}	OCENUS AQM-09	On Site Recording	Light Scattering Nephotometer
PM ₁₀	OCENUS AQM-09	On Site Recording	Light Scattering Nephotometer
Sulfur Dioxide (SO ₂)	OCENUS AQM-09	On Site Recording	High Sensitivity Electrochemical
Oxides of Nitrogen (NO _x)	OCENUS AQM-09	On Site Recording	High Sensitivity Electrochemical
Carbon monoxide (CO)	OCENUS AQM-09	On Site Recording	High Sensitivity Electrochemical
Ozone	OCENUS AQM-09	On Site Recording	High Sensitivity Electrochemical

89. As per the national standard, SPM, CO and O₃ will be monitored for 8 hours to compare with the national standard. For Particulate Matter (PM 2.5 and PM 10) and gaseous pollutants (NO₂ & SO₂) the standard

duration is 24 hours. A conversion equation will be used to convert the data from specific time period to expected time period in order to be able to compare results to the GoB standards.

Table 4.2: Air Quality Monitoring Locations

ID	Sample Area	Latitude	Longitude	Justification of Selecting Location
AQ 01	Near the Substation Area in Bashundhara Residential Area	23°49'0.90"N	90°26'10.16"E	To identify the Air Quality impacts of the sub-station area
AQ 02	Near United University Mosque	23°47'59.40"N	90°26'55.29"E	Sensitive receptors around the project site.
AQ 03	Near the Substation Area of Aftabnagar	23°46'0.40"N	90°25'52.46"E	To identify the Air Quality impacts of the sub-station area

90. According to the Daily Star, dated 11 December 2023, Dhaka has topped the list of cities worldwide with the worst air quality with an AQI score of 321. Dhaka's air was classified as "hazardous" -- posing serious health risks to residents, according to the air quality index. Dhaka has long been grappling with air pollution issues. Its air quality usually turns unhealthy in winter and improves during the monsoon¹⁰. Several studies found that both local, regional, and long-distance trans-boundary sources are responsible for air pollution, especially by particulate matter, in Dhaka city. The main sources of particulate matter in the air of Dhaka are wood burning, soil dust, brick kilns, fugitive pb, road dust, Zn sources, motor vehicles, and sea salt (Begum and Hopke 2019)¹¹. According to BBC Bangla, fine substances coming from neighboring countries like India and Myanmar are responsible for about 30% of the capital's air pollution¹².

4.3.2 Noise Level

91. Noise level will be measured from the Seven (07) locations of the project as per quarterly basis routine time sampling. Noise measurement will be done continuously for 15 minutes at day time for the sampling locations. The Lutron SL-4033DS noise level meter shown in below figure will be used for noise level monitoring. The device will record data throughout the monitoring period. After getting the raw data from the device, appropriate formula will be applied to calculate Leq for monitored locations.

¹⁰ <https://www.thedailystar.net/environment/pollution/air-pollution/news/dhakas-air-quality-3rd-worst-the-world-morning-3489796>

¹¹ Begum BA and Hopke PK (2019) Identification of Sources from Chemical Characterization of Fine Particulate Matter and Assessment of Ambient Air Quality in Dhaka, Bangladesh. Aerosol and Air Quality Research 19: 118-128

¹² <https://www.prothomalo.com/opinion/column/q4lrrb2nlo>



Figure 4-3: Noise Level Monitoring Equipment (Lutron SL-4033DS)

Table 4.3: Noise Level Monitoring Locations

ID	Sample Area	Latitude	Longitude	Justification
NL 01	Near the Substation Area in Bashundhara Residential Area	23°49'1.03"N	90°26'10.72"E	Identify the impact of noise level in the sub-station area.
NL 02	Near United University Mosque	23°47'59.42"N	90°26'55.91"E	Sensitive receptor around the project site.
NL 03	Near the Substation Area of Aftabnagar	23°45'59.98"N	90°25'52.36"E	Identify the impact of noise level in the sub-station area.
NL 04	Near UU university	23°47'51.76"N	90°26'56.89"E	Sensitive receptor around the project site.
NL 05	Near Base camp Area	23°46'4.41"N	90°26'58.23"E	Noise level due to construction equipment operation and maintenance.
NL 06	Near Mosque in Aftabnagar	23°45'53.51"N	90°26'50.48"E	Sensitive receptor around the project site.
NL 07	Near Hospital in Aftabnagar	23°45'55.90"N	90°26'12.85"E	Sensitive receptor around the project site.

92. UN Environment Program (UNEP, 2022) report declared Dhaka the world's noisiest city. Against the permissible limits of 55 decibels as set by the WHO, the noise levels in Dhaka were found to be at least twice that, at 110-132 decibels. 75% of noise pollution in Dhaka originates from vehicles. According to the WHO, around 5% of the world's population is facing several kinds of health hazards due to complexities related to noise pollution. Around 11.7% of the population in Bangladesh has lost their hearing due to noise pollution, says the Department of Environment (DoE) study, which was conducted in order to check noise pollution, the government has introduced Bangladesh Sound Pollution (Control) Rules, 2006. According to the guidelines, exceeding the maximum noise level in a certain area is a punishable offense.

4.3.3 Groundwater Quality

93. The groundwater samples will be collected by maintaining standard procedures from Three (03) locations of the project corridor as per quarterly basis routine time sampling. The parameters will be pH, Turbidity, Total Suspended Solids (TSS), Dissolved Oxygen (DO), Chloride, Iron (Fe), Manganese (Mn), Arsenic (As) and Total Coliform etc. After collected, the samples will be placed into appropriate and labeled black bottle and kept in an ice cooler. Then the samples will be submitted to DPHE/BEETLSL laboratory for analysis of parameters. Groundwater results has been compared with national standard [ECR, 2023)].

Table 4.4: Groundwater Sampling Locations

ID	Sample Area	Latitude	Longitude	Justification
GW 01	Near the Substation Area in Bashundhara Residential Area	23°49'0.40"N	90°26'9.82"E	Groundwater sources of the surrounding project area.
GW 02	Near United University Mosque	23°47'59.09"N	90°26'54.50"E	During construction, workers may use this water for drinking purposes.
GW 03	Near the Substation Area of Aftabnagar	23°46'0.03"N	90°25'52.73"E	

4.3.4 Surface Water Quality

94. Three (03) surface water samples will be collected from the surrounding water body of the project corridor as per quarterly basis routine time sampling. Surface water samples will be collected by grab water sampler to a 1-liter sterilized clean PET bottle for complete physico-chemical tests respectively. The parameters are pH, Turbidity, DO, BOD₅, COD, Total Suspended Solids (TSS), Total Coliform etc. The samples will be placed into appropriate labeled black bottles. After collected, the samples will be submitted to DPHE/ BEETLSL laboratory for analysis of parameters. Surface water results have been compared with national standard [ECR, 2023].

Table 4.5: Surface Water Sampling Locations

ID	Sample Area	Latitude	Longitude	Justification
SW 01	Near Bashundhara L Block Lack Side	23°48'47.74"N	90°26'53.34"E	Surface water body of the surrounding project area.
SW 02	Near United University Mosque	23°48'2.92"N	90°26'56.63"E	
SW 03	Near Aftabnagar Steel Bridge	23°45'56.36"N	90°26'16.54"E	

95. The construction and operation of the subprojects will not have major impacts on the surface and groundwater quality in the area. However, in Dhaka City the local groundwater level is lowered to approximately 6 m below ground level during the dry season, with levels returning to their normal level before the end of the monsoon, as reported by the Department of Public Health. This fall in groundwater levels is an entirely natural process that arises because of the hydrological link with the river. Several studies revealed that the surface water of all rivers around Dhaka City is highly polluted. "Inadequate sewage and inefficient waste management contribute to the water pollution. Moreover, untreated industrial waste and household sewage are discharged into the river system, leading to the extinction of aquatic life and the failure of ecosystems," according to the ESDO study.

4.3.5 Soil Quality

96. Soil samples will be collected from Three (03) locations of the project corridor as per quarterly basis routine time sampling. The samples will be collected in a composite sampling method by Auger boring below the surface level. The samples will first place in zipped lock plastic bags and then transferred to appropriate plastic labeled jars. The collected samples will be tested from Soil Resource Development Institute (SRDI), Dhaka Laboratory.

Table 4.6: Soil Quality Sampling Locations

ID	Sample Area	Latitude	Longitude	Justification
SQ 01	Near the Substation Area in Bashundhara Residential Area	23°49'1.65"N	90°26'10.66"E	To identify the resistivity of soil which is important for grounding substation
SQ 02	Near United University Mosque	23°47'58.80"N	90°26'55.36"E	
SQ 03	Near the Substation Area of Aftabnagar	23°46'0.71"N	90°25'53.22"E	

97. Dhaka is largely an alluvial plain consisting of fine sand and silt deposits with shallow ground water table in most places. Dhaka soil largely consists of fine sand with clay deposit at uppermost layer (Islam *et al*; 2013).

4.4 Biological Environment

98. The status of terrestrial and aquatic floras and faunas at the project surrounding area were assessed from visual observations, review of literature, and information documented by other agencies. The project area consists of several ecological subsystems e.g. open land, homesteads, and roadside vegetation. The faunal species in the include birds, amphibians, fish, snakes' rodents and a few mammals. The vegetation covers of are different crop species, weeds and other herbaceous plants species. The project area also covered by fruit, timber, fuel wood, medicinal plants and various multipurpose tree species. The project command area does not encompass the protected habitats of endangered species designated by the country laws or international treaties and conventions. No endangered species for any particular species of flora and fauna will be specifically affected due to project implementation.

4.5 Socio-Economic Environment

4.5.1 Ethnic Communities

99. There are no indigenous or ethnic people settlement in the subproject area. Therefore, there are no measures needed for ethnic people's safeguard.

4.5.2 Social/Reserve Forest

100. No social/reserve forest will be affected through the project interventions.

4.5.3 Project Affected People (PAP)

101. The exact number of PAPs (project-affected persons) is not referred to the Initial Environmental Examination (IEE) report under the project. However, according to the IEE report, to specify the benefit of PAPs, all of them will receive compensation for the trees and fruits. Also, they will be able to take away the timber. PAPs will get also additional compensation for fruit bearing trees.

4.5.4 Land Acquisition

102. Land acquisition is not required for this project. In addition, the project social experts will evaluate the social issues regarding the project intervention and measures will be given accordingly.

4.5.5 Compensation Details

103. Compensation for project affected persons/structures will be provided in accordance with the compensation plan of the resettlement action plan.

4.5.5.1 Crop/Land Compensation

104. According to the IEE report, no crop/land compensation is necessary to initiate the project activities as no crop/land is affected by the project implementation

4.5.6 Social Conflicts and Development Activities

105. The local people welcomed the project and there are no conflicts between the local communities regarding the project implementation.

4.5.6.1 Stakeholder Engagement Schedule and Associated Measures

106. To implement this project, stakeholder engagement, schedule, and associated measures are critical elements to ensure this project as a successful project and positive relationships with all parties involved. Here are some guidelines for addressing stakeholder engagement schedule and associated measures on a construction site:

Stakeholder Engagement:

1. Identification of Stakeholders:

- Identify all stakeholders involved in this construction project, including owners, contractors, subcontractors, regulatory authorities, local communities, and environmental groups. To specify, PGCB, TBEA, Local People, Businessman etc. are included as stakeholders.

2. Stakeholder Analysis:

- Understand the interests, needs, and concerns of each stakeholder group.
- Prioritize stakeholders based on their influence and impact on the project.

3. Communication Plan:

- Develop a comprehensive communication plan outlining how, when, and what information will be communicated to each stakeholder group.
- Ensure that the communication plan addresses concern and promotes transparency.

4. Feedback Mechanism:

- Establish a feedback mechanism for stakeholders to express concerns, ask questions, or provide input.
- Regularly collect and address stakeholder feedback.

Schedule Management:

1. Project Schedule Development:

- Develop a detailed project schedule that includes all construction phases, milestones, and deadlines.
- Consider dependencies between different tasks and allocate resources effectively.

2. Risk Assessment:

- Identify potential risks that could impact the construction schedule.
- Develop contingency plans for managing risks and minimizing schedule disruptions.

3. Regular Monitoring and Updates:

- Regularly monitor the progress of construction activities against the schedule.
- Update the schedule as needed based on actual progress and any changes in project scope.

Associated Measures:

1. Performance Metrics:

- Define key performance indicators (KPIs) related to stakeholder engagement, such as satisfaction levels, response times to concerns, and resolution of issues.

2. Quality Assurance:

- Implement measures to ensure construction activities adhere to quality standards and regulations.
- Conduct regular inspections and audits to verify compliance.

3. Environmental and Safety Measures:

- Include measures to address environmental concerns and ensure compliance with safety regulations.

- Monitor and report on environmental impact and safety performance.

4. Community Impact Assessment:

- Assess the impact of construction activities on the local community.
- Implement measures to mitigate negative impacts and contribute positively to the community.

4.5.7 Landscape and Topography

107. The UG transmission lines, mostly in urban areas, will change the appearance of the natural landscape. This is unavoidable but can be minimized with proper landscaping and management plan and the proposed project would take appropriate and feasible landscaping and management plan to minimize this unavoidable issues on the project site. Therefore, managing construction activities involves adapting to changes in the landscape, both physical and regulatory. Here are some key changes and management approaches for construction activities:

- Environmental Considerations:

Change: Increasing emphasis on sustainable construction practices and environmental protection.

Management Approach: Implement green building standards, use eco-friendly materials, and adopt energy-efficient construction methods. Develop and adhere to environmental management plans to minimize the project's ecological impact.

- Technological Advancements:

Change: Rapid advancements in construction technology, such as Building Information Modeling (BIM), drones, and automated machinery.

Management Approach: Embrace modern technology to enhance project efficiency, accuracy, and safety. Provide training for workers on new tools and technologies.

- Regulatory Changes:

Change: Evolving construction regulations and safety standards.

Management Approach: Stay informed about regulatory changes, and ensure that construction practices comply with updated standards. Establish a robust safety program and conduct regular training sessions for workers.

- Climate Change Impact:

Change: Increasing frequency and severity of extreme weather events.

Management Approach: Incorporate climate-resilient design and construction methods. Develop contingency plans to address potential disruptions caused by extreme weather conditions.

- Community Engagement:

Change: Growing importance of involving local communities in construction projects.

Management Approach: Foster positive relationships with local communities through transparent communication, addressing concerns, and providing community benefits. Implement social responsibility programs to contribute positively to the community.

- **Supply Chain Challenges:**

Change: Disruptions in the supply chain due to global events, such as pandemics or geopolitical issues.

Management Approach: Diversify suppliers, maintain strong relationships with key suppliers, and establish contingency plans for potential disruptions. Adopt just-in-time inventory management to minimize inventory holding costs.

- **Digital Project Management:**

Change: Increased reliance on digital tools for project management and collaboration.

Management Approach: Implement robust project management software, cloud-based collaboration tools, and communication platforms. Foster a digital-savvy culture within the construction team.

- **Offsite Construction:**

Change: Growing popularity of offsite construction methods (modular construction, prefabrication).

Management Approach: Evaluate the feasibility of offsite construction for specific project components. Integrate offsite construction methods to reduce on-site work, improve quality control, and accelerate project timelines.

- **Quality Control and Assurance:**

Change: Heightened focus on ensuring construction quality and minimizing defects.

Management Approach: Establish stringent quality control measures, conduct regular inspections, and implement quality assurance programs. Invest in training programs to enhance the skills of construction teams.

- **Labor Shortages:**

Change: Fluctuations in the availability of skilled labor.

Management Approach: Develop a workforce management strategy that includes training programs, talent retention initiatives, and collaboration with educational institutions. Explore innovative recruitment methods and consider utilizing apprenticeship programs.

4.6 Environmental & Social Hotspot

108. There is no protected area, Ecologically Critical Area (ECA) and important cultural/historical site was observed in the surrounding project area. However, the health care, educational institutes and religious institutes (mosque, temple) of the subproject area bring some environmental and social values to the local community. The details of the important environmental and social components are given in the following **Table 4.7** and **Figure 4.4**.

Table 4.7: Environmental and Social Hotspots along the Project Surrounding

S/L	Name	GPS Coordinates
1	Bashundhara Eye Hospital & Research Institute	23° 48' 59.88"N, 90° 26' 9.67"E

S/L	Name	GPS Coordinates
2	Playpen School	23°48'59.9"N 90°26'09.7"E
3	L Block Sector-2 Jame Masjid	23°45'54.60"N, 90°26'58.56"E
4	Aftabnagar Masjid Madrasa Complex	23°45'57.60"N, 90°27'12.10"E
5	Shree Shree Radial Krishna Temple, Aftabnagar	23°46'14.14"N, 90°27'0.29"E
6	Banasree National Ideal School (Permanent Campus)	23°46'42.34"N, 90°27'32.44"E
7	Zahir Sahana Cottage	23°47'21.07"N, 90°27'13.41"E
8	Satarkul Cemetery	23°47'16.26"N, 90°27'2.27"E
9	Madrasatus Sunnah	23°47'26.49"N, 90°27'37.91"E
10	Glenrich International School	23°47'31.59"N, 90°27'20.98"E
11	United International University	23°47'51.80"N, 90°26'59.32"E
12	Masjid Al Mustafa	23°47'58.49"N, 90°26'53.40"E
13	Dhaka Imperial college	23°45'58.18"N, 90°25'47.81"E
14	Salaryman Jame Mosque	23°45'54.93"N, 90°26'5.01"E
15	Matrichhaya Residential school & college	23°45'53.43"N, 90°26'20.27"E
16	Baitullah Jame mosque	23°45'53.22"N, 90°26'31.91"E
17	Darul Huda Girls Madrasa	23°45'56.67"N, 90°26'36.71"E
18	Early Bird Daycare & Preschool, Aftabnagar	23°45'55.85"N, 90°26'37.00"E



Figure 4-4: Environmental and Social Hotspot of the Project Surrounding Area

5 RISK ASSESSMENT MATRIX

5.1 General

109. Construction activities are carried out in the project area within the site's environmental constraints. Construction activity will be impacted by environmental factors, but environmental factors will also be impacted by the activity. As a result, there are hazards associated with carrying out the work. For instance, work done during the wet season often carries higher risks than work done during the dry season. Any construction operation that will include risk must be evaluated before it is started. The chance that the project's pre- and post-construction activities will have an impact on the environment, as well as the potential consequences of that impact, are used to assess risk. It is often described like this:

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

5.2 Risk Assessment

110. This section identifies the potential impacts that the various elements of the proposed project may have on aspects of the physical, biological and socio-economic environment. The identification of the potential impacts will be considered for the construction stage. The activities undertaken during each of the Project stages form the basis for potential impact identification and analysis.

111. Assessment of potential impacts requires a multi-disciplinary approach in which a wide range of issues are taken into consideration to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation. Most projects result in positive and negative potential impacts on the environment, society and economy, all of which are identified and assessed in this section.

112. The potential impacts have been categorized as major, moderate, minor or minimal, based on consideration of parameters such as: (i) duration of the impact; (ii) spatial extent of the impact; (iii) reversibility; (iv) likelihood; and (v) legal standards and established professional criteria. The magnitude of potential impacts has been identified according to the categories outlined in **Table 5.1**.

Table 5.1: Parameters for Determining Magnitude

Parameter	Major	Moderate	Minor	Minimal
Duration	Long-term (more than 15 years)	Medium-term Lifespan of the project (5 to 15 years)	Limited to construction period	Temporary with no detectable potential impact
Spatial extent	Widespread far beyond project boundaries	Beyond immediate project components, site boundaries or local area	Within project boundary	Specific location within project component or site boundaries, with no detectable potential impact
Reversibility	Potential impact is effectively permanent, requiring	Potential impact requires a year or so for recovering with some interventions to return to baseline	Baseline returns naturally or with limited Intervention within a few months	Baseline remains almost constant

Parameter	Major	Moderate	Minor	Minimal
	considerable intervention to return to baseline			
Legal standards and established professional criteria	Breaches national standards and/or international guidelines/obligations	Complies with limits given in national standards but breaches international lender guidelines in one or more parameters	Meets minimum national standard limits or international guidelines	Not applicable
Likelihood of occurrence	Occurs under typical operating or construction conditions (Certain)	Occurs under worst case (negative impact) or best case (positive impact) operating conditions (Likely)	Occurs under abnormal, exceptional or emergency conditions (Occasional)	Unlikely occur

113. The sensitivity of an environmental receptor (a parameter that may be affected by the project) has been determined based on review of the local population (including proximity/numbers/vulnerability) and presence of features at the project sites or the surrounding area. Criteria for determining receptor sensitivity are given in **Table 5.2**.

Table 5.2: Criteria for Determining Sensitivity

Sensitivity Determination	Definition
Very High	Vulnerable receptor with no capacity to absorb proposed changes or minimal opportunities for mitigation.
High	Vulnerable receptor with little or no capacity to absorb proposed changes or limited opportunities for mitigation.
Medium	Vulnerable receptor with some capacity to absorb proposed changes or moderate opportunities for mitigation
Low	Vulnerable receptor with good capacity to absorb proposed changes and/or good opportunities for mitigation

114. Following the assessment of magnitude provided by DoE guidance, and the quality and sensitivity of the receiving environment or potential receptor has been determined, the significance of each potential impact is established using the impact significance matrix shown in **Table 5.3**.

Table 5.3: Significance of Impact Criteria

Magnitude of Impact	Sensitivity of Receptors			
	Very High	High	Medium	Low
Major	Critical	Major	Moderate	Minor
Moderate	Major	Major	Moderate	Minor
Minor	Moderate	Moderate	Minor	Minimal
Minimal	Minimal	Minimal	Minimal	Minimal

Table 5.4: Environmental Aspects, Impacts and Controls Associated with Project interventions

Issues	Potential Impact	Sensitivity	Magnitude	Significance Prior to Mitigation	Control Measures
Pre-Construction/Construction Phase					
Tree felling, Clearing of vegetation	20 trees will be directly affected by cutting and trimming, as well as standing crops (if any) and bushes.	Medium	Moderate	Moderate Adverse	Prior to the start of clearing of vegetation, provide adequate compensation will be given to the owners.
Air Quality and Dust	- Air pollution and dust generation due to construction activities, especially during the underground cabling, generators and construction vehicle movement. - Suspended particulate matter from excavation works and land clearing, including vehicular emissions, may affect workers and community.	Medium	Moderate	Moderate Adverse	- All vehicles (e.g., trucks, equipment, and other vehicles that support construction works) will be well maintained and not emit dark or smoky emissions in excess of the limits described in the Environment Quality Standards (EQS). - Specific training will be focused on minimizing dust and exhaust gas emissions from heavy construction vehicles. - Drivers of vehicles used during construction will be under strict instructions to minimize unnecessary trips and minimize idling of engines. Dust suppression facilities (back pack water sprayer) will be available where earth and cement works are required. - Spray water on dry and loose surfaces of the construction sites regularly to minimize dust. - Maintain adequate moisture content of soil during transportation, compaction and handling. - Construction materials (sand, gravel, and rocks) and spoil materials will be transported in trucks covered with tarpaulins.

Issues	Potential Impact	Sensitivity	Magnitude	Significance Prior to Mitigation	Control Measures
					▪ Sprinkle and cover stockpiles of loose construction materials (e.g., fine aggregates, sand). ▪ Dust masks will be provided to all personnel in areas prone to dust emissions throughout the period of construction.
Noise Level	▪ Mobilization of heavy equipment and machinery, use of construction vehicles, transport of materials, pile driving and construction activities may increase ambient noise level. ▪ Exposure to high level ambient noise may cause anxiety and disturbance to workers and community.	Medium	Moderate	Moderate Adverse	▪ It is recommended that no construction will be allowed during night time (9 PM to 6 AM). ▪ Avoid using of construction equipment producing excessive noise at any time. ▪ Avoid prolonged exposure to noise (produced by equipment) by workers. ▪ Regulate use of horns and avoid use of hydraulic horns in project vehicles. ▪ Follow the government rules and regulations, EHS guidelines and WHO noise guidance whoever is more stringent on noise.
Quality of surface and groundwater	▪ Potential for siltation due to construction works near pond or river. ▪ The ground water resources will impact due to uncontrolled extraction of water for construction purpose.	Medium	Major	Moderate Adverse	▪ Provide culverts enough for accommodating flood flows in the access road of the substation. ▪ Ensure timely monitoring, especially if construction works are carried out during the monsoon period. ▪ Provision for pumping of congested water, if needed. No discharge to the surface water. ▪ Handling and storage of the potential contaminants (such as hazardous chemicals, fuels, lubricants, acids,

Issues	Potential Impact	Sensitivity	Magnitude	Significance Prior to Mitigation	Control Measures
					paints etc.) has to be organized under strict condition to avoid water pollution during construction. ▪ Handling of hazardous liquid should be done carefully by the experienced labors.
Soil Quality	▪ Soil Pollution	Medium	Major	Moderate Adverse	▪ Laboratory analysis of the soil materials to be confirmed prior to starting collection from the river by existing licensed suppliers. ▪ Prevention of spillage and leakage of liquids at construction sites and camp. ▪ Ensure no use of transformers containing PCB to avoid soil and air pollution. ▪ Oil storage in drums stored on impermeable surface with 110% bunded capacity
Construction Waste	▪ Generation of construction wastes from the construction materials.	Medium	Major	Moderate Adverse	▪ Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time. ▪ Provision of facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements Purchase of perishable construction materials such as paints incrementally to ensure reduced spoilage of unused materials Use of building materials that have minimal packaging to avoid the generation of excessive packaging waste.

Issues	Potential Impact	Sensitivity	Magnitude	Significance Prior to Mitigation	Control Measures
					- Use of construction materials containing recycled content when possible and in accordance with accepted standards. - Adequate collection and storage of waste on site and safe transportation to the disposal sites and disposal methods at designated, licensed, engineered and sanitary landfill will be provided
Fauna (Wildlife)	Disturbance of wildlife, especially birds, due to project activities such as moving of project equipment and transports (especially during night time).	Medium	Moderate	Medium Adverse	Follow GoB rules and regulations on noise. Project workers should not disturb or kill birds or other animals.
Traffic Congestion/Road Accidents	Traffic congestion and road accidents due to movement of construction vehicles.	Medium	Major	Moderate Adverse	- Follow Bangladesh Road Traffic Authority (BRTA) traffic rules and regulations to develop a traffic plan. - Schedule deliveries of materials/ equipment during off-peak hours. - Engage flagmen especially at the entry of the substation sites and construction camps for traffic control. Engage experienced drivers to drive project vehicles. - Arrange for signal lights at night. Prepare and follow proper traffic management to be approved by PGCB before the access to site granted. - Avoid stockpiling of materials, especially at the road sides, that could disturb traffic movement.

Issues	Potential Impact	Sensitivity	Magnitude	Significance Prior to Mitigation	Control Measures
Pollution due to wastes	Pollution due to wastes (construction wastes from construction activities and general wastes from workers' camps)	Medium	Major	Moderate Adverse	- Solid wastes collection system will be essential, which should include separation and collection of solid wastes in the dustbins/waste containers throughout the work sites, construction yard/ labor camps. - Wastes such as pieces of rods and wood, newspapers, containers etc. can be sold to the vendors and the rest of the waste must be taken to the licensed, engineered sanitary landfill by the contractor or licensed third party. - A log of the disposal of toxic and other waste materials is to be kept by the Contractors. - Separate solid waste into hazardous, non-hazardous and reusable waste streams and store temporary on site.
Hazardous Waste	- Hazardous materials may be use in this project including Mineral oil, Substation Batteries and Sulfur Hexafluoride Gas in circuit breakers. - Pollution due to hazardous waste such as used oil, hydraulic fluids, waste fuel, grease and waste oil containing rags.	Medium	Major	Moderate Adverse	- Chemical (like diesel, machine oil, cement, grease, fast compacting chemical etc.) storage room will be designed according GHS guideline. - Material Safety Data Sheet (MSDS) should be provided at the storage location of each chemical and will be keep away from water and fire source. - Hazard symbol need to be labeled on the container of every hazardous material such as chemicals will be used in designated section. - Chemical handler will be properly trained and well protected with PPE.

Issues		Potential Impact	Sensitivity	Magnitude	Significance Prior to Mitigation	Control Measures
						▪ Dispose of hazardous chemicals and containers in accordance with the Bangladesh Sludge Management Guideline for Sludge.
Community Health and Safety	▪	Community H&S nearby the substation site could be affected.	Medium	Minor	Minor Adverse	▪ Safety barriers and warning signs surrounding the construction site. ▪ Generators will be placed in closed rooms. ▪ Formulate and implement an emergency risk management plan, for approval by PGCB before access to site reflecting national and EHS Guideline requirements.
Occupational Health and Safety	▪	Health and safety risks of construction workers	Medium	Major	Moderate Adverse	▪ Appointment of Health & Safety (H&S) Manager with appropriate qualifications and experience. ▪ contractor to prepare H&S plan based on risk assessment for approval by PGCB following national and EHS guideline requirements. ▪ Only permit trained and certified workers to work with any electrical equipment. ▪ Safety induction by the H&S Manager will be provided for the workers and visitors before they will be allowed to access the site. ▪ Prior to starting work, a tool box meeting will be arranged by the H&S Manager for the workers. ▪ First Aid Box and personal protective equipment, PPE (such as safety helmets, safety shoes, eye protection glasses, ear plugs/muffs, waist belts, masks, hand gloves, body protective aprons and insulating boots)

Issues	Potential Impact	Sensitivity	Magnitude	Significance Prior to Mitigation	Control Measures
					must be provided to the workers and ensure their use by the workers. - Safety signs, health signs, prohibition signs, warning signs, mandatory signs, emergency escape signs, first-aid signs, information signs, signboards, supplementary signboards, safety collar, symbol, pictogram, illuminated signs, acoustic signals, verbal communication and hand signals must be fitted at the designated sites of the subproject areas. - Provision of protective clothing for laborers handling hazardous materials, e.g. helmet, adequate footwear for bituminous pavement works, protective goggles, gloves etc.;
Employment generation/ income	- Employment opportunities for the local people, especially for PAPs. - Both technical and non-technical laborers will be required	Medium	Moderate	Moderate Beneficial	Employ local people, especially PAPs, for the project activities (as much as possible)

5.3 Record Register

In most cases, register refers to the act of recording an event, transaction, name, or other information, or an aggregation of stored data, usually containing past events, transactions, names or other information. There is different register used in the project site such as Accident Register, Health Safety Register, Visitor Register, First Aid Register, Vehicle Register, Store Register etc. to boost the accuracy of record keeping and minimize the risk. The number of record register is listed below which is added in details in Annex 4:

- a. **Accident/Incident Register:** The definition of an accident/incident register is a document or record of all the types and occurrences of incidents which have taken place on a select project, site or team.

- b. **Health & Safety Register:** The definition of a health & safety register is a document or record of all the relevant information of health & safety which helps to ensure the H&S related compliance in the project site.
- c. **Visitor Register:** A visitor register form is used to provide basic information about visitors when they visit the project site. It is used to keep track of who is entering your establishment and when they visit.
- d. **First Aid Register:** A first aid accident record book is an essential document used by employers and employees to record and report details of any specified injuries and incidents on the work premises and what action was taken
- e. **Vehicle Register:** A vehicle logbook is nothing but a document where you record all the information about your vehicles (personal or business). This includes information such as the name of the car, purchase year, insurance information, fuel log, service logs and any other expenses performed on the car.
- f. **Store Register:** A store register is nothing but a document where you record all the information about the raw materials, products stored in the store room.

6 ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

6.1 Management Plan

115. This section describes the modalities provided in the project for the implementation of the proposed mitigation measures to its potential negative impacts. It proposes the institutional responsibilities for the implementation of the mitigation measures, the implementation indicators, the time frame for monitoring and follow-up and for the implementation activities. The Environmental Management Plan of the project is summarized in a table below:

116. The following environmental issues that require environmental management plans based upon the potential impacts of activities for proposed project are as follows:

- Air Pollution / Dust Management plan.
- Noise Management plan
- Waste Management plan
- Soil Management Plan
- Drainage Management Plan
- Traffic Management Plan
- Ecological Flora & Fauna management plan
- Fire Management Plan
- Labor Management Plan
- Tree Plantation Plan
- Disaster Management Plan
- Biodiversity management Plan

Table 6.1: Air Pollution & Dust Management Plan

Objective	- To minimize the adverse impact to air quality caused by emission from construction vehicles and machinery, asphalt plant, generator & also dust management generated from construction works - To comply with relevant govt. rules and ADB's Safeguard Policy.
Performance Indicator	Performance indicators for an Air Pollution and Dust Management Plan are essential to evaluate the effectiveness of the plan in mitigating air quality issues. These indicators help measure progress, identify areas for improvement, and ensure that the goals of the plan are being met. Here are some key performance indicators (KPIs) that can be considered: a. Air Quality Index (AQI) b. Particulate Matter (PM) Levels c. Emission Reductions d. Compliance with Air Quality Standards e. Dust Control Efficiency f. Public Health Indicators g. Community Perception Surveys h. Number of Violations and Complaints i. Meteorological Data

	j. Greenhouse Gas Emissions k. Cost-effectiveness l. Emergency Response Readiness
Relevant Govt. Policies Act & Rules	- Air Pollution Control Rules, 2022, ECR 2023, ECA 1995, ECR 1997 (Amended in 2005), Brick Burning Control Act 1989, (Amended 1992), Motor Vehicle Act 1983.
Management Plan	Creating a comprehensive management plan for air pollution and dust involves a combination of regulatory compliance, monitoring, prevention, and mitigation strategies. Below is a general outline for such a plan. Keep in mind that the specifics may vary based on the location, industry, and local regulations. Always consult with relevant authorities and experts to tailor the plan to your specific situation. 1. Regulatory Compliance: a. Identify and understand local, regional, and national regulations related to air quality and dust emissions. b. Ensure compliance with emission limits, reporting requirements, and other relevant standards. c. Obtain necessary permits and licenses. 2. Inventory and Assessment: a. Conduct a comprehensive inventory of potential air pollutants and dust sources. b. Assess the impact of each source on air quality. c. Identify hotspots and vulnerable areas. 3. Monitoring and Measurement: a. Implement a robust air quality monitoring system. b. Regularly measure emissions from identified sources. c. Utilize real-time monitoring where possible. d. Establish baseline data for comparison and trend analysis. 4. Source Reduction and Prevention: a. Identify opportunities for reducing emissions at the source. b. Implement best practices and technologies to minimize dust generation. c. Regularly inspect and maintain equipment to prevent leaks and malfunctions. 5. Engineering Controls: a. Install dust control measures such as enclosures, barriers, and ventilation systems. b. Use dust collectors, filters, and other air pollution control devices. c. Optimize industrial processes for efficiency and emission reduction. 6. Operational Practices: a. Establish and enforce dust control procedures for routine operations. b. Train employees on pollution prevention measures. c. Implement a preventive maintenance schedule for equipment.

7. Emergency Response Plan:

- a. Develop an emergency response plan for accidental releases.
- b. Train employees on emergency procedures.
- c. Maintain emergency response equipment.

8. Community Engagement:

- a. Communicate with the local community about pollution control measures.
- b. Address community concerns and inquiries.
- c. Collaborate with local organizations and authorities.

9. Recordkeeping and Reporting:

- a. Maintain detailed records of emissions, monitoring data, and maintenance activities.
- b. Submit regular reports to regulatory agencies as required.
- c. Use data for continuous improvement.

10. Auditing and Review:

- a. Conduct regular internal audits to ensure compliance.
- b. Periodically review and update the management plan.
- c. Seek feedback from employees, regulators, and the community.

11. Continuous Improvement:

- a. Implement a continuous improvement process to update practices and technologies.
- b. Stay informed about new regulations and technological advancements.
- c. Engage in research and development for cleaner technologies.

12. Training and Education:

- a. Provide ongoing training to employees on air pollution prevention.
- b. Promote awareness of the importance of air quality within the organization.

13. Documentation of Incidents:

- a. Document any incidents or breaches of the air pollution control measures.
- b. Investigate the causes and implement corrective actions.

14. Collaboration with Stakeholders:

- a. Collaborate with industry peers, governmental bodies, and environmental organizations.
- b. Share best practices and participate in industry initiatives for pollution control.

15. Public Reporting:

- a. Consider transparent reporting to the public on emission levels and control measures.
- b. Foster trust by demonstrating commitment to environmental stewardship.

Besides, there are other steps need to be followed in the project site to manage the plan listed below:

	- Vehicle maintenance and control procedures will be established to ensure compliance of the machinery emissions with standards; - Regular maintenance of diesel engines will be undertaken to ensure that emissions are minimized; - All equipment used on site will be regularly maintained so as to be in good working order at all times to minimize potentially polluting exhaust emissions - Dust suppression along transportation links is to be ensured by deploying water tankers with sprinkling system are to be deployed along haul road - Hot mix plants will be at least 500 m away from human settlements and preferably located on leeward side of most dominant wind direction; - Consent/permits to establish and operate are to be obtained from DoE Pollution Control Board and all permit conditions are to be implemented/complied - Hot mix plants shall have required measures for control of dust, air pollution as per regulatory limits of Department of Environment measures;
Monitoring & Reporting	- Monitor the dust suppression at working site daily - Periodically quarterly monitor the ambient air quality (including dust level SPM, PM_{2.5}, PM₁₀, SO_x, NO_x, CO and O₃)
Time Frame	- Entire the Construction Period
Responsibility	Contactor's • Site Supervisor- Daily supervision of air quality management at working site • Project Manager- Air quality in the subproject site is good enough • Environmental Specialist/Health and Safety Specialist - Total implementation of above of air pollution management plan and monitor the hygiene of air environment inside & surrounding the site

Table 6.2: Noise Management Plan

Objective	- To avoid nuisance noise to nearby residents because of generator and other vibrating machineries of construction site. - To comply with noise standard of Bangladesh as well as IFC's standard.
Performance Indicator	In a Noise Management Plan, performance indicators are essential for assessing the effectiveness of noise control measures and ensuring compliance with regulations. Here are some key performance indicators (KPIs) that can be used to evaluate the success of a Noise Management Plan: - Noise Levels - Compliance with Regulatory Standards - Noise Monitoring Frequency - Source Identification - Noise Control Effectiveness - Noise Exposure Assessments - Community Complaints - Employee Training and Awareness - Maintenance and Equipment Checks - Noise Maps - Incident Reporting

	l. Cost of Noise Control Measures m. Public Relations and Communication n. Audits and Compliance Checks o. Continuous Improvement
Relevant Govt. Policies, Act & Rules	- National Noise Quality Standard (Schedule- 4: Standards for Sound, ECR, 1997 and Noise Pollution (control) rules 2006)
Management Plan	A Noise Management Plan (NMP) is a comprehensive strategy designed to assess, control, and mitigate the impact of noise generated by various sources in a specific environment. Whether it's a construction site, industrial facility, event venue, or any other location with potential noise issues, a well-developed Noise Management Plan can help minimize disturbances and ensure compliance with regulations. Here's a general outline for creating a Noise Management Plan: 1. Introduction and Objectives: a. Clearly state the purpose and scope of the Noise Management Plan. b. Define specific objectives, such as compliance with noise regulations, minimizing disruptions, and protecting the health and well-being of the community. 2. Site Description: Provide an overview of the site, including its location, size, and function. Identify sensitive receptors (residential areas, schools, hospitals) and any potential impact on them. 3. Noise Sources: a. Identify and categorize all potential noise sources on the site. b. Specify characteristics of each noise source, including intensity, frequency, and duration. 4. Applicable Regulations: a. List and describe relevant local, state, and federal noise regulations. b. Ensure that the plan aligns with legal requirements and standards. 5. Baseline Noise Assessment: a. Conduct a baseline noise assessment to determine existing ambient noise levels. b. Use appropriate equipment and methodologies to measure and record noise levels at different times and locations. 6. Noise Prediction Modeling: a. Utilize noise prediction modeling to estimate future noise levels based on planned activities. b. Identify potential areas of non-compliance and develop strategies to address them. 7. Noise Control Measures: a. Propose engineering controls to reduce noise at the source. b. Consider administrative controls, such as scheduling noisy activities during less sensitive hours. c. Implement barriers or soundproofing where applicable. 8. Construction and Operational Procedures: a. Develop detailed procedures for construction and operational activities that involve noise.

	b. Include guidelines for equipment usage, maintenance, and any other relevant processes. 9. Monitoring and Reporting: a. Establish a regular monitoring program to assess ongoing noise levels. b. Define reporting mechanisms for any deviations from the plan and the actions to be taken. 10. Communication and Community Engagement: a. Develop a communication strategy to inform stakeholders about the Noise Management Plan. b. Engage with the community and address concerns or complaints promptly. 11. Training and Education: a. Provide training for personnel on noise management procedures and the importance of compliance. b. Educate the community on the purpose of the plan and how they can contribute to its success. 12. Review and Update: a. Establish a schedule for periodic reviews and updates to the Noise Management Plan. b. Ensure that the plan evolves with changes in the site, technology, and regulations. 13. Emergency Response: a. Develop an emergency response plan for unexpected high-noise situations. b. Clearly outline the steps to be taken to mitigate and communicate during emergencies. <u>Besides, there are other steps need to be followed in the project site to manage the plan listed below:</u> ✓ Provide prior information to local population about work activities. Limiting working hours to 7am – 7pm, minimize the noise whenever possible. ✓ Ensure that all equipment & vehicles used for construction activity are in good condition; ✓ Carry out on site noise monitoring; ✓ Provide sufficient personal protective equipment's (PPE) at the work place. ✓ All the related personnel will be provided proper training about the relevant issues. ✓ Impose speed limit to truck/ other vehicles and machineries at conduction vehicles about using horn outside the locality.
Monitoring & Reporting	- Monitor the work place noise level quarterly as periodically
Time Frame	- Entire the Construction Period
Responsibility	Contactor's • Site Supervisor- • Project Manager • Environmental Specialist/ Health and Safety Specialist. • To hire Govt. organization/independent third party testing laboratory for testing noise level. • Ensure that all workers use PPE during operation.

Table 6.3: Waste Management Plan

Objective	- To minimize waste generation by developing strategies for the management and disposal of all waste in a manner that is sustainable and sensitive to the environment. - To comply with govt. waste management policy.
Performance Indicator	Performance indicators for a Waste Management Plan are crucial for assessing the effectiveness of waste management practices, ensuring compliance with regulations, and promoting continuous improvement in waste reduction and disposal. Here is key performance indicators (KPIs) that can be used to measure the performance of a Waste Management Plan: 1. Waste Generation Rates 2. Waste Composition 3. Waste Diversion Rates 4. Waste Reduction Targets 5. Landfill Disposal Rates 6. Cost Efficiency 7. Compliance with Regulations 8. Public Awareness and Participation 9. Waste Collection Efficiency 10. Waste Transportation 11. Hazardous Waste Management 12. Waste Facility Performance 13. Waste Audits 14. Employee Training
Relevant Govt. Policies, Act & Rules	- E-Waste Management Rules 2019 - Solid Waste Management Rules, 2021, ECA 95 & 2010 (amendment) and ECR, 23
Management Plan	A Waste Management Plan (WMP) is designed to address the efficient and environmentally responsible handling of waste generated by a particular project, organization, or community. Evaluating the performance of a Waste Management Plan involves assessing various indicators to ensure that waste is being managed effectively and in accordance with environmental regulations. Here are some key performance indicators (KPIs) that can be used to measure the success of a Waste Management Plan: 1. Waste Reduction Rate: • Calculation: $[(\text{Total waste generated} - \text{Total waste disposed of}) / \text{Total waste generated}] * 100$ • A higher percentage indicates successful waste reduction efforts. 2. Recycling Rate: • Calculation: $(\text{Total amount of recycled waste} / \text{Total waste generated}) * 100$ • This measures the percentage of waste that is diverted from landfills through recycling. 3. Compliance with Regulations: • Regular assessments of compliance with local, regional, and national waste management regulations. 4. Waste Diversion:

	- Tracking the percentage of waste diverted from landfill through methods like recycling, composting, or waste-to-energy. Waste Audits: - Regular waste audits to identify types and quantities of waste generated, allowing for targeted improvements in waste management practices. Cost-effectiveness: - Monitoring the costs associated with waste management activities to ensure they are within budgetary constraints. Community Engagement: - Measuring the level of community awareness and participation in waste reduction and recycling initiatives. Incident and Accident Reporting: - Monitoring and reporting incidents or accidents related to waste management to ensure the safety of workers and the community. Waste Composition Analysis: - Periodic analysis of the composition of waste to identify opportunities for further recycling or waste reduction strategies. Waste Storage and Handling Practices: - Evaluating the effectiveness of waste storage, handling, and transportation methods to prevent spills, leaks, or other environmental hazards. Environmental Impact Assessment: - Assessing the environmental impact of waste management activities, including greenhouse gas emissions, soil and water pollution, and habitat disruption. Employee Training and Awareness: - Ensuring that employees are adequately trained in waste management practices and assessing their awareness of the organization's waste reduction goals. <u>Besides, there are other steps need to be followed in the project site to manage the plan listed below:</u> ✓ Wastes produced during the cleaning of construction site will be managed in accordance with the waste management plan, prepared within the project. ✓ The inert waste generated during cleaning the site will be utilized in the backfilling works if any; ✓ The part of inert wastes that will not be suitable for use will be taken to designated inert waste disposal place. ✓ All operational areas under construction works like work sites, office/storage area, work force camps, and borrow areas, will be cleaned up and restored to its previous state soon after operations are complete. ✓ All construction waste will be disposed in approved areas. Local district authorities will be consulted to determine disposal site and implement any conditions imposed while issuing permits;
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	✓ Contractors shall comply with the Spoil Mass Disposal Management Guideline including the preparation of Disposal Plan of DOE. ✓ After completion of construction works, the site will be restored to its previous state by undertaking cleanup operations; ✓ All operational areas like storage, handling, loading, unloading areas will be paved, and have separate storm water collection system with facility for separation of oil/lubricants prior to discharge; ✓ Solid wastes are handover to local buyer for reuse or recycling and waste tracking record will be kept. ✓ The solid waste is stored properly. Solid waste are stored separately in a certain location in proper manner such as jute waste need to collect at one place and poly/carton waste should collect at another place. ✓ Daily wastes are stored in clearly labeled container's and in such a manner that they are released to open land, water courses or the atmosphere. ✓ All the related personnel are provided proper training about the relevant issues.
Monitoring & Reporting	✓ Daily wastes have to be collected & handover to govt. municipality agent; ✓ The inventory record of waste disposal will be maintained as proof for proper management as designed.
Time Frame	- Entire the Construction Period
Responsibility	Contactor's ✓ Site Supervisor- ✓ Project Manager- ✓ Environmental Specialist/Health and Safety Specialist ✓ Responsible for overall site cleanliness and waste management. ✓ Monitoring of site through cyclical inspections. ✓ All workers handling wastes ✓ Regular waste collection to minimize excessive waste storage.

Table 6.4: Soil Management Plan

Objective	✓ Utilize best practice topsoil management techniques
Performance Indicator	A soil management plan aims to enhance and sustain soil health and fertility while minimizing negative environmental impacts. Various performance indicators can be used to assess the effectiveness of a soil management plan. These indicators help measure the success of soil management practices and their impact on soil quality. Here are some common performance indicators: 1. Soil Organic Matter (SOM) Content 2. Soil Nutrient Levels: 3. pH Levels: 4. Soil Erosion Control 5. Water Infiltration Rate 6. Crop Yields 7. Soil Respiration 8. Biodiversity 9. Soil Moisture Management

	10. Soil Structure 11. Weed and Pest Control 12. Carbon Sequestration
Relevant Govt. Policies, Act & Rules	- ECR, 2023, ECR 97, National Conservation Strategy (NCS) 1992
Management Plan	A Soil Management Plan is a detailed document that outlines strategies and practices for the sustainable use and conservation of soil on a specific piece of land. It is a crucial component of land management, especially in agriculture, forestry, and construction projects. The primary goal of a Soil Management Plan is to maintain or improve soil health, fertility, and structure while minimizing negative environmental impacts. Key components of a Soil Management Plan may include: Site Description: - Provide a detailed description of the site, including its location, size, topography, and existing land use. Soil Assessment: - Conduct a thorough soil analysis to understand the soil's composition, fertility, pH, organic matter content, and potential constraints (e.g., compaction, erosion). Land Capability Assessment: - Evaluate the land's capability for various uses (e.g., agriculture, forestry, construction) based on soil characteristics, slope, and drainage. Land Use Planning: - Define the intended land use and associated activities. For agriculture, this could involve crop selection and rotation plans. For construction, it might include strategies to minimize soil disturbance. Erosion Control Measures: - Implement erosion control practices, such as cover cropping, contour plowing, or the installation of erosion control structures, to prevent soil erosion. Nutrient Management: - Develop a plan for the judicious use of fertilizers and soil amendments based on soil nutrient levels, crop requirements, and environmental considerations. Water Management: - Address water management issues, including irrigation plans, drainage systems, and strategies to prevent waterlogging or excessive runoff. Crop Rotation and Cover Crops: - Integrate crop rotation and cover cropping practices to enhance soil fertility, suppress weeds, and prevent soil erosion. Conservation Tillage Practices: - Implement conservation tillage methods to minimize soil disturbance, reduce erosion, and improve water retention. Monitoring and Evaluation:

	- Establish a system for regular monitoring and evaluation of the soil management practices to assess their effectiveness and make adjustments as needed. 11. Compliance with Regulations: - Ensure that the Soil Management Plan complies with local, regional, and national regulations related to land use and soil conservation. 12. Education and Training: - Provide education and training for land managers, farmers, or relevant personnel to ensure the proper implementation of the Soil Management Plan. <u>Besides, there are other steps need to be followed in the project site to manage the plan listed below:</u> ✓ Inspection of vehicles will be required to ensure that there is no leakage of fuel and lubricating materials into the soil; ✓ Contractors will ensure the proper handling and storage of lubricants, fuel and solvents to prevent any leakage of these materials into the soil; ✓ The cut and fill quantities required for profile correction shall be balanced to the extent possible, to avoid dependence on earth from borrow areas; ✓ Under no circumstances, topsoil will be allowed to be used as a fill material in the construction activities; ✓ Topsoil removed from the construction sites will be used for reinstatement of the topsoil on the embankments or in the adjacent construction corridor affected by the project activities. ✓ Topsoil will be reinstated separately from subsoil, with care taken to avoid mixing of the materials. The topsoil reinstatement will be sufficient to restore the fertile depth to the initial conditions as judged by the topsoil strip during visual observation and comparison of the reinstated site and adjacent land; ✓ The contamination of soil is avoided by suitable management of oil and fuel used in machineries & vehicles. ✓ Care is taken to compact the soil after refilling so that, soil erosion and consequent soil import is avoided. ✓ Tree plantation.
Monitoring & Reporting	- Daily visual inspections
Time Frame	- Entire the Construction Period
Responsibility	Contactor's ✓ Site Supervisor ✓ Project Manager ✓ Environmental Specialist/Health and Safety Specialist

Table 6.5: Drainage Management Plan

Objective	To protect groundwater dependent vegetation. Prevent pollution underlying groundwater sources.
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Performance Indicator	The performance of a drainage management plan can be evaluated based on various factors and criteria. Here are some key aspects to consider when assessing the effectiveness of a drainage management plan: 1. Flood Reduction 2. Infrastructure Functionality 3. Water Quality 4. Land Use Planning 5. Community Resilience 6. Cost-effectiveness 7. Public Satisfaction 8. Adaptability and Flexibility 9. Regulatory Compliance 10. Monitoring and Maintenance 11. Ecological Impact
Relevant Govt. Policies, Act & Rules	ECR 23, ECR 95, ECR 97, Environmental Court Act, 2000.
Management Plan	A Drainage Management Plan (DMP) is a strategic document that outlines how a specific area or community intends to manage its drainage systems to prevent flooding, control storm water runoff, and mitigate related environmental issues. The primary goal of a DMP is to ensure effective and sustainable drainage that minimizes the risk of flooding, protects infrastructure, and promotes the overall well-being of the community. Here are the key components typically found in a Drainage Management Plan: 1. Study and Analysis: • Hydrological Assessment: Analyzing rainfall patterns, runoff characteristics, and watershed behavior. • Topographic Analysis: Understanding the terrain and identifying vulnerable areas prone to flooding. 2. Existing Infrastructure Inventory: • Documenting the current state of drainage infrastructure, including channels, pipes, culverts, detention basins, and other components. 3. Risk Assessment: • Identifying areas at risk of flooding or drainage-related problems. • Evaluating the potential impact on public safety, property, and the environment. 4. Regulatory Compliance: • Ensuring alignment with local, regional, and national regulations related to drainage and storm water management. 5. Land Use Planning Integration: • Coordinating with land use planners to incorporate drainage considerations into development and zoning decisions. • Implementing measures to avoid or minimize adverse impacts from new construction. 6. Design Standards and Guidelines: • Establishing design standards for drainage infrastructure.

	• Providing guidelines for storm water management practices and sustainable design. 7. Mitigation Measures: • Recommending structural and non-structural measures to mitigate drainage issues. • Incorporating green infrastructure, retention basins, and other sustainable practices. 8. Emergency Response and Preparedness: • Developing protocols for responding to drainage-related emergencies. • Educating the community on emergency preparedness and evacuation procedures. 9. Monitoring and Maintenance Plan: • Defining a schedule for regular inspection and maintenance of drainage infrastructure. • Establishing protocols for addressing issues and repairs promptly. 10. Public Outreach and Education: • Communicating the importance of drainage management to the community. • Providing educational resources on storm water pollution prevention and water conservation. 11. Budget and Funding Mechanisms: • Outlining the budgetary requirements for implementing the drainage management plan. • Identifying potential funding sources, such as grants, fees, or taxes. 12. Climate Change Considerations: • Factoring in the potential impact of climate change on precipitation patterns, sea level rise, and extreme weather events. 13. Performance Monitoring and Reporting: • Establishing metrics to evaluate the plan's effectiveness. • Regularly monitoring and reporting on the performance of the drainage management measures. 14. Adaptability and Flexibility: • Ensuring that the plan can adapt to changing environmental conditions, land use patterns, and infrastructure needs.
Monitoring & Reporting	- Proper maintenance of drainage system will be conducted periodically.
Time Frame	- Entire the Construction Period
Responsibility	✓ Contactor's ✓ Site Supervisor- ✓ Project Manager- ✓ Environmental Specialist/Health and Safety Specialist

Table 6.6: Ecological Flora & Fauna Management Plan

Objective	Biodiversity Conservation. Compliance with site – specific landscape management plans.
Performance Indicator	An Ecological Flora and Fauna Management Plan typically aims to conserve and manage biodiversity within a specific area. To assess the performance of such a plan, various performance indicators related to the health and diversity of flora and fauna can be considered. Here are some key performance indicators: 1. Biodiversity Index 2. Population Trends 3. Habitat Quality 4. Endangered Species Protection 5. Invasive Species Management 6. Ecosystem Functioning 7. Water and Soil Quality 8. Connectivity and Corridor Effectiveness 9. Revegetation Success 10. Breeding Success 11. Community Engagement 12. Climate Change Resilience 13. Data Collection and Monitoring 14. Legislative Compliance 15. Success Stories and Case Studies
Relevant Govt. Policies, Act & Rules	National Environmental Management Action plan (NEMAP), 1995 Forest Policy (2013) Bangladesh Wildlife Preservation Act (1973, Amended in 1974)
Management Plan	An Ecological Flora and Fauna Management Plan (EFFMP) is a comprehensive document designed to outline strategies for the conservation, protection, and sustainable management of flora (plants) and fauna (animals) within a specific ecosystem or area. These plans are essential for mitigating the impact of human activities on biodiversity and promoting the overall health and resilience of ecosystems. Here is a general outline that you can use as a guide to create an Ecological Flora and Fauna Management Plan: 1. Introduction: • Overview of the ecosystem or area. • Purpose and objectives of the management plan. • Regulatory context and any legal requirements. 2. Ecosystem Description: • Detailed description of the flora and fauna present. • Identification of key species and their ecological roles. • Assessment of ecosystem health and any existing threats. 3. Goals and Objectives: • Clearly defined goals for flora and fauna conservation. • Specific, measurable, achievable, relevant, and time-bound (SMART) objectives. 4. Management Strategies:

	• Habitat protection and restoration measures. • Invasive species control and eradication plans. • Sustainable land use practices. • Monitoring and research programs. 5. Stakeholder Involvement: • Identification of key stakeholders (government agencies, NGOs, local communities). • Mechanisms for involving stakeholders in planning and decision-making processes. 6. Education and Outreach: • Public awareness campaigns to promote conservation. • Educational programs for schools and communities. • Collaboration with local media for disseminating information. 7. Monitoring and Evaluation: • Establishment of baseline data. • Regular monitoring of flora and fauna populations. • Evaluation of the effectiveness of management strategies. 8. Emergency Response Plan: • Protocols for responding to environmental emergencies (e.g., oil spills, natural disasters). • Contingency plans for addressing unexpected threats to flora and fauna. 9. Adaptive Management: • Flexibility to adjust strategies based on monitoring and evaluation results. • Regular review and updating of the management plan. 10. Budget and Resources: • Allocation of financial resources for implementation. • Identification of funding sources and partnerships. 11. Legal and Ethical Considerations: • Compliance with relevant environmental laws and regulations. • Ethical considerations related to the welfare of flora and fauna. 12. Conclusion: • Summary of the key points in the management plan. • Call to action and commitment to ongoing conservation efforts. <u>Besides, there are other steps need to be followed in the project site to manage the plan listed below:</u> All recognized natural habitats and protected areas in the immediate vicinity of the activity are not damaged or exploited, all staff are strictly prohibited from hunting, foraging, logging or other damaging activities. ✓ For large trees in the vicinity of the activity, mark and cordon off with a fence large tress and protect root system and avoid any damage to the trees. ✓ Adjacent wetlands and streams will be protected, from construction with appropriate erosion and sediment control feature
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	✓ Ensuring compensate of felling trees with 1:3 ratio to maintain the ecological balance.
Monitoring & Reporting	- Any incident involving death or injury to an animal is to be reported to a supervisor as an environmental incident.
Time Frame	Entire the Construction Period
Responsibility	✓ Contactor's Site Supervisor- Project Manager- Environmental Specialist/Health and Safety Specialist

Table 6.7: Traffic Management Plan

Objective	- To reduce the traffic congestion and accident - Compliance with site – road safety
Performance Indicator	Performance indicators for a Traffic Management Plan (TMP) are essential to assess the effectiveness of the plan in achieving its objectives and improving traffic flow, safety, and overall transportation efficiency. Here are some key performance indicators (KPIs) commonly used for evaluating a Traffic Management Plan: 1. Traffic Flow Metrics: 2. Safety Indicators: 3. Capacity Utilization: 4. Public Satisfaction: 5. Environmental Impact: 6. Transportation Equity: 7. Operational Efficiency: 8. Emergency Response: 9. Cost Efficiency: 10. Compliance with Regulations:
Relevant Govt. Policies, Act & Rules	✓ BRTA Traffic Rules and Regulations ✓ Road Transport Act 2018 ✓ The Motor Vehicles Ordinance, 1983
Management Plan	A Traffic Management Plan (TMP) is a comprehensive document that outlines strategies and measures for managing traffic within a specific area or for a particular event. The primary goal of a TMP is to ensure the safe and efficient movement of vehicles, pedestrians, and other road users while minimizing congestion and potential hazards. These plans are commonly used for construction projects, special events, road maintenance, or any situation that may impact normal traffic flow. Here's a general outline of what a Traffic Management Plan may include: 1. Introduction: • Overview of the project, event, or situation requiring traffic management. • Purpose and objectives of the Traffic Management Plan. • Identification of stakeholders and key personnel involved. 2. Site Description:

	• Detailed description of the project site or event location. • Identification of key access points, intersections, and roadways affected. • Assessment of existing traffic conditions. 3. Scope and Schedule: • Duration of the traffic management measures. • Project or event start and end dates. • Phases or stages of the project/event and associated traffic impacts. 4. Regulatory Compliance: • Identification of relevant local, state, and federal traffic regulations and guidelines. • Compliance with permits and approvals. 5. Traffic Impact Assessment: • Analysis of the potential impact on traffic flow, congestion, and safety. • Identification of high-traffic periods and sensitive times (e.g., school hours, rush hours). 6. Traffic Control Measures: • Description of temporary traffic control devices (e.g., signs, signals, barricades) to be used. • Lane closures, detours, and any other modifications to the existing road layout. • Use of flaggers or other personnel for directing traffic. 7. Pedestrian and Cyclist Management: • Measures to ensure the safety and convenience of pedestrians and cyclists. • Provision of temporary sidewalks or pathways. • Crosswalk locations and management. 8. Public Communication and Outreach: • Communication strategies for informing the public about traffic changes. • Informational signage and messaging. • Contact information for inquiries or concerns. 9. Emergency Response and Evacuation: • Procedures for handling emergencies and evacuations. • Access routes for emergency vehicles. • Communication protocols with emergency services. 10. Monitoring and Reporting: • Methods for monitoring traffic conditions during the implementation of the plan. • Reporting mechanisms for incidents, accidents, or changes in conditions. • Regular review and adjustments based on real-time data. 11. Contingency Plans: • Plans for addressing unexpected issues or changes in circumstances. • Alternative traffic management strategies.
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	12. Post-Implementation Evaluation: • Evaluation of the effectiveness of the Traffic Management Plan after completion. • Lessons learned and recommendations for future projects or events. <u>Besides, there are other steps need to be followed in the project site to manage the plan listed below:</u> ✓ To avoid/minimize traffic disruption traffic management schemes will be applied; ✓ The contractor has to work in close cooperation with local police department or local government agencies to regulate traffic on the project site; ✓ Parking place will be fenced with barriers and equipped with red signals of emergency stop during the day and with red signal floodlight at night; ✓ Flagmen will be provided with special uniforms and special footwear especially at busy intersection if any; ✓ Alternate access will be informed for vehicles and pedestrians prior to start construction. Appropriate lighting and signs will be employed.
Monitoring & Reporting	- Any incident involving death or injury to a workers or local people is to be reported to a supervisor as an environmental incident.
Time Frame	- Entire the Construction Period
Responsibility	✓ Contactor's Safety and Security Personnel ✓ Site Supervisor ✓ Project Manager & Environmental Specialist

Note: A detail Traffic management plan is given in Appendix of the report.

Table 6.8: Fire Management Plan

Objective	- Prevention: Implement measures to minimize fire risks through inspections and maintenance. - Emergency Preparedness: Establish clear evacuation protocols and response plans for fire emergencies. - Compliance and Improvement: Ensure adherence to regulations and continually enhance fire safety standards.
Performance Indicator	A Fire Management Plan is a comprehensive document that outlines strategies and measures for preventing, mitigating, and responding to wildfires. Performance indicators are crucial for evaluating the effectiveness of the plan and assessing the progress toward fire management goals. Here are some key performance indicators (KPIs) that can be used to measure the performance of a Fire Management Plan: 1. Fire Incidence Rates 2. Response Time 3. Resource Utilization 4. Community Protection 5. Prevention and Mitigation 6. Environmental Impact 7. Communication and Coordination 8. Weather Monitoring 9. Training and Capacity Building

	10. Regulatory Compliance 11. Post-Fire Analysis
Relevant Govt. Policies, Act & Rules	✓ Bangladesh National Building Code (BNBC), 2020 ✓ Fire Service Act, 1980 ✓ Occupational Safety, Health, and Welfare Act, 2006 ✓ Environmental Conservation Act, 1995 ✓ Bangladesh Fire Safety Rules
Management Plan	A Fire Management Plan is a comprehensive document that outlines strategies and measures for preventing, mitigating, and responding to wildfires. This plan is essential for areas prone to wildfires, including wildland-urban interfaces, forests, grasslands, and other landscapes where the risk of fires is significant. Here is a general outline of the key components typically included in a Fire Management Plan: 1. Introduction: • Overview of the purpose and objectives of the Fire Management Plan. • Background information on the area covered by the plan. • Identification of stakeholders, including government agencies, local communities, and relevant organizations. 2. Risk Assessment: • Analysis of the wildfire risk in the managed area. • Identification of factors contributing to fire risk (e.g., weather conditions, vegetation types, topography). • Mapping of high-risk areas and vulnerable assets (structures, critical infrastructure). 3. Legal and Regulatory Framework: • Overview of relevant local, state, and federal laws and regulations related to fire management. • Compliance requirements for fire prevention, control, and emergency response. 4. Goals and Objectives: • Clearly defined goals for fire prevention, mitigation, and response. • Specific, measurable, achievable, relevant, and time-bound (SMART) objectives. 5. Prevention Strategies: • Fuel reduction measures, including controlled burns and vegetation management. • Firebreak construction and maintenance. • Education and outreach programs for the community on fire prevention. 6. Preparedness Measures: • Development and communication of evacuation plans. • Emergency response training for firefighting personnel. • Establishment of a centralized command structure and coordination with other agencies. 7. Early Detection and Monitoring:

	• Implementation of early detection systems, such as fire lookout towers, surveillance cameras, and aerial patrols. • Monitoring weather conditions and fire danger indices. • Integration of technology for real-time monitoring and alert systems. 8. Response and Suppression Strategies: • Firefighting strategies, tactics, and resources. • Mutual aid agreements and coordination with neighboring jurisdictions. • Use of firefighting equipment, including aircraft, vehicles, and personnel. 9. Public Communication and Education: • Communication strategies for informing the public about fire risks and safety measures. • Community engagement programs to enhance public awareness and preparedness. 10. Community Engagement and Partnerships: • Collaboration with local communities, non-profit organizations, and businesses. • Partnerships with neighboring jurisdictions and agencies for mutual support. 11. Post-Fire Recovery and Rehabilitation: • Strategies for rehabilitating the landscape and ecosystems after a wildfire. • Support programs for affected communities and individuals. 12. Training and Exercises: • Regular training exercises for firefighting personnel. • Community drills and exercises to test emergency response plans. 13. Evaluation and Improvement: • Regular review and evaluation of the Fire Management Plan. • Incorporation of lessons learned from previous incidents. • Continuous improvement of strategies based on feedback and new information. 14. Budget and Resources: • Allocation of financial resources for the implementation of the plan. • Identification of funding sources and potential grants. <u>Besides, there are other steps need to be followed in the project site to manage the plan listed below:</u> ✓ Risk Assessment: Identify fire hazards and assess potential risks in buildings or premises. ✓ Preventive Measures: Implement fire prevention strategies through regular inspections, maintenance, and hazard mitigation. ✓ Emergency Preparedness: Establish clear evacuation procedures, train staff, and ensure functional fire safety equipment. ✓ Regulatory Compliance: Adhere to Bangladesh's fire safety regulations outlined in the National Building Code and relevant acts.
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	✓ Continual Improvement: Regularly review and update the fire management plan based on inspections, feedback, and evolving regulations.
Monitoring & Reporting	- Fire incidents that result in the death or injury of employees or local residents will be reported to the supervisor as soon as possible.
Time Frame	- Entire the Construction Period
Responsibility	✓ Fire Safety Officer ✓ Emergency Response Team ✓ Employees or Occupants ✓ Authorities and Inspectors

Table 6.9: Labor Management Plan

Objective	- To describes the requirements and expectations in terms of compliance, reporting, roles, supervision and training with respect to labor and working conditions, including camp accommodation - To comply with relevant govt. rules and international policy
Performance Indicator	A Labor Management Plan is designed to outline strategies and measures for the effective management of human resources within an organization. Performance indicators play a crucial role in assessing the success of a Labor Management Plan and ensuring that it aligns with the organization's goals and objectives. Here is key performance indicators (KPIs) commonly used to measure the performance of a Labor Management Plan: 1. Workforce Productivity: 2. Employee Satisfaction and Engagement: 3. Labor Turnover Rates: 4. Recruitment and Onboarding Effectiveness: 5. Training and Development: 6. Absenteeism Rates: 7. Overtime Usage: 8. Health and Safety Performance: 9. Diversity and Inclusion Metrics: 10. Labor Cost Efficiency: 11. Performance Management: 12. Career Progression and Development Opportunities: 13. Employee Retention Strategies: 14. Labor Compliance: 15. Human Capital ROI:
Relevant Govt. Policies Act & Rules	✓ Bangladesh Labor Act, 2006 (Amend in 2023) ✓ Bangladesh labor rules, 2015

Management Plan	A Labor Management Plan is a comprehensive document that outlines strategies and measures for the effective utilization, development, and management of human resources within an organization. It aims to optimize workforce performance, enhance employee satisfaction and engagement, and align labor practices with the overall goals and objectives of the organization. Below is a general outline that can guide the development of a Labor Management Plan: 1. Executive Summary: • Brief overview of the purpose and key objectives of the Labor Management Plan. • Summary of key strategies and initiatives. 2. Introduction: • Background information on the organization. • Context for the development of the Labor Management Plan. • Statement of the organization's mission, vision, and values. 3. Organizational Structure and Roles: • Overview of the organizational structure. • Description of key roles and responsibilities within the organization. • Identification of reporting relationships. 4. Workforce Planning: • Forecasting future workforce needs based on organizational goals. • Analysis of current workforce capabilities and skills. • Strategies for addressing potential skill gaps. 5. Recruitment and Selection: • Recruitment strategies for attracting top talent. • Selection criteria and processes. • Onboarding procedures for new hires. 6. Training and Development: • Identification of key skills and competencies needed for job roles. • Training programs to develop employee skills. • Opportunities for professional development and career advancement. 7. Performance Management: • Performance appraisal processes and criteria. • Goal-setting and performance measurement. • Recognition and rewards programs. 8. Employee Engagement: • Strategies for promoting a positive workplace culture. • Employee engagement initiatives and programs. • Communication channels for fostering engagement. 9. Compensation and Benefits: • Compensation structures and salary scales. • Employee benefits, including health insurance, retirement plans, etc. • Incentive programs. 10. Work-Life Balance: • Policies and practices promoting work-life balance.
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	• Flexible work arrangements. • Time-off policies. 11. Health and Safety: • Workplace safety measures and protocols. • Health and wellness programs. • Compliance with occupational health and safety regulations. 12. Employee Relations: • Strategies for maintaining positive employee relations. • Grievance resolution procedures. • Employee feedback mechanisms. 13. Diversity and Inclusion: • Initiatives to promote diversity and inclusion. • Equal opportunity employment practices. • Training programs on diversity awareness. 14. Succession Planning: • Identification of key positions and potential successors. • Talent development strategies for leadership roles. • Plans for managing transitions and knowledge transfer. 15. Labor Cost Management: • Budgeting and cost control measures related to labor. • Analysis of labor costs in relation to organizational performance. • Strategies for optimizing labor costs. 16. Legal Compliance: • Compliance with local, state, and federal labor laws. • Employee rights and responsibilities. • Employment contracts and agreements. 17. Communication and Employee Feedback: • Communication channels for sharing important information. • Employee feedback mechanisms, such as surveys and suggestion boxes. • Strategies for transparent and effective communication. 18. Monitoring and Evaluation: • Key performance indicators (KPIs) for measuring the effectiveness of the Labor Management Plan. • Regular reviews and evaluations to assess the plan's impact. • Continuous improvement strategies based on feedback and results. 19. Implementation Timeline: • Phased implementation plan with specific milestones and timelines. • Responsible parties for each phase of implementation. 20. Conclusion and Next Steps: • Summary of key points. • Outline of next steps and ongoing initiatives. • Commitment to continuous improvement and adaptation.
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	<u>Besides, there are other steps need to be followed in the project site to manage the plan listed below:</u> ✓ Compliance with Legal Framework: ▪ Ensure strict adherence to Bangladesh labor laws, including the Bangladesh Labor Act, Factories Act, EPZ Labor Act, and others. ▪ Implement policies and practices that align with legal requirements for working hours, wages, leave entitlements, safety, and employment conditions. ✓ Employee Recruitment and Fair Employment Practices: ▪ Conduct fair and transparent recruitment processes, adhering to non-discriminatory practices. ▪ Provide written employment contracts and clearly defined standing orders in compliance with relevant employment laws. ✓ Health, Safety, and Welfare Measures: ▪ Prioritize a safe work environment by adhering to occupational health and safety regulations. ▪ Conduct regular safety training, provide necessary safety equipment, and establish procedures for reporting and addressing workplace hazards. ✓ Fair Compensation and Benefits: ▪ Ensure compliance with minimum wage requirements and fair compensation for all employees. ▪ Implement benefits and leave entitlements according to legal standards and company policies. ✓ Employee Relations and Trade Union Engagement: ▪ Respect the rights of employees to form trade unions and engage in collective bargaining. ▪ Foster positive employee relations, establish channels for feedback, and address grievances promptly and fairly. ✓ Monitoring, Evaluation, and Continuous Improvement: ▪ Regularly monitor and evaluate the effectiveness of labor management practices. ▪ Conduct audits to ensure compliance, address any deficiencies, and make continuous improvements to the labor management plan.
Monitoring & Reporting	- Regular Audits: Conduct periodic assessments to ensure compliance with labor laws and internal policies. - Performance Tracking: Monitor key metrics such as safety incidents, turnover rates, and compliance indicators. - Transparent Reporting: Maintain clear records and reports, facilitating transparency and accountability in labor management practices.
Time Frame	- Entire the Construction Period
Responsibility	✓ Contactor's ✓ Site Supervisor ✓ Project Manager & Environmental Specialist/Health and Safety Specialist ✓ Compliance Officer/Manager

Note: A detail Labor management plan is given in Appendix of the report.

Table 6.10: Tree Plantation Plan

Objective	✓ to mitigate negative impacts to trees prior to routine and planned infrastructure projects through such measures as tree protection fencing, root pruning, and modifying practices when possible to accommodate the tree. ✓ reduce the 'Greenhouse' effect by removing carbon dioxide from the air and releasing oxygen. ✓ To maintain ecological balance
Performance Indicator	A Tree Plantation Plan aims to guide the systematic and sustainable planting of trees in a specific area for environmental, ecological, and social benefits. Performance indicators are crucial for evaluating the success of the plan and ensuring that the tree planting initiatives align with the defined objectives. Here is key performance indicators (KPIs) commonly used to measure the performance of a Tree Plantation Plan: 1. Survival Rate 2. Growth and Health 3. Biodiversity Enhancement 4. Carbon Sequestration 5. Air Quality Improvement 6. Water Quality and Conservation 7. Community Engagement 8. Urban Heat Island Effect Mitigation 9. Aesthetic and Recreational Value 10. Cost Efficiency 11. Adaptation to Climate Change 12. Wildlife Habitat Enhancement 13. Maintenance and Care 14. Socioeconomic Benefits 15. Long-Term Sustainability
Relevant Govt. Policies Act & Rules	✓ The Forest Act, 2019
Management Plan	A Tree Plantation Plan is a comprehensive document that outlines strategies and actions for planting, nurturing, and managing trees in a specific area. The goal is typically to enhance environmental sustainability, address ecological concerns, improve biodiversity, and provide various social and economic benefits. Here is a general outline of components that could be included in a Tree Plantation Plan: 1. Introduction: • Overview of the Tree Plantation Plan. • Objectives and goals of the plan. • Importance of tree planting for the environment, community, and ecosystem. 2. Site Assessment: • Detailed analysis of the planting site, including soil type, topography, drainage, and existing vegetation. • Identification of potential challenges and opportunities for tree planting. 3. Species Selection:

	• Selection of tree species based on local climate, soil conditions, and ecosystem requirements. • Consideration of native species to promote biodiversity. • Identification of tree species with specific environmental or social benefits. 4. Planting Design and Layout: • Mapping out the planting area with proper spacing and arrangements. • Consideration of aesthetics, functionality, and long-term growth patterns. • Designating areas for specific species or purposes (e.g., shade, windbreak, conservation). 5. Seasonal Planting Schedule: • Determination of the appropriate seasons for tree planting. • Guidelines for the timing and frequency of planting events. 6. Community Engagement: • Involvement of local communities in the planning and planting process. • Outreach programs to raise awareness about the importance of trees. • Collaboration with schools, businesses, and local organizations for support. 7. Logistics and Resources: • Identification of necessary resources, including seeds, saplings, and planting materials. • Budgeting for equipment, tools, and labor. • Procurement and logistics planning for tree planting events. 8. Planting Techniques: • Guidelines for proper tree planting techniques. • Instructions for digging, planting depth, mulching, and watering. • Consideration of soil amendments and fertilizers if needed. 9. Watering and Irrigation: • Strategies for ensuring adequate water supply during the establishment phase. • Drip irrigation systems, rainwater harvesting, or other sustainable watering practices. 10. Maintenance Plan: • Guidelines for ongoing tree care, including pruning, weeding, and pest control. • Schedules for follow-up inspections and maintenance activities. • Instructions for community members or volunteers involved in maintenance. 11. Monitoring and Evaluation: • Establishment of monitoring protocols to assess tree health and growth. • Criteria for evaluating the success of the planting initiatives. • Regular reporting and documentation of monitoring results. 12. Educational Programs:
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	• Integration of educational initiatives to inform the community about the benefits of trees. • Workshops, seminars, or educational materials for schools and local organizations. 13. Partnerships and Collaboration: • Identification of potential partners, including governmental agencies, NGOs, and private entities. • Collaboration with environmental and conservation organizations. • Opportunities for joint projects and funding partnerships. 14. Sustainability and Long-Term Planning: • Strategies for ensuring the long-term sustainability of the planted trees. • Consideration of succession planning for future generations. • Integration of tree management into local and regional planning efforts. 15. Reporting and Communication: • Regular reporting mechanisms for stakeholders, funders, and the community. • Communication strategies to keep the public informed about the progress of the tree plantation initiatives. 16. Risk Management: • Identification of potential risks and challenges. • Strategies for mitigating and managing risks, such as disease outbreaks or extreme weather events. 17. Legal and Regulatory Compliance: • Adherence to local, state, and federal regulations related to tree planting. • Obtaining necessary permits and approvals. 18. Post-Implementation Assessment: • Evaluation of the outcomes and impact of the tree plantation plan. • Lessons learned and adjustments for future tree planting initiatives. To specify, cutting of trees will be minimum and compensatory plantation will be carried out in ratio of 3:1 (i.e. 3 trees planted for every tree cut). Therefore, a total number of 20 trees may be affected by the implementation of the project. Therefore, according to the ratio of compensatory plantation, a total number of 60 trees certainly be planted in the project boundary to prevent the adverse impacts on the environment which accounts for approximately 6400 tk. ✓ To plan for the protection and conservation of City trees ✓ To manage the removal of the City's trees and ✓ To plan for the renewal of the City's treed character ✓ To develop a comprehensive, coordinated and proactive plan to manage ✓ the renewal of the City's aging street trees. ✓ To create programs and policies that will inform, involve, and gain support ✓ from the public ✓ To develop a comprehensive and coordinated set of procedures for all
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	✓ tree maintenance activities: planting, watering, staking, fertilizing, pruning and tree removal. ✓ Establish a tree reserve fund with funds received for tree losses and/or damage to be used for the procurement and planting of trees in subsequent years. Any reserve not used will be carried forward to the next year and used according to policy. ✓ Develop a process and policy to encourage and support community based initiatives to plant trees and be stewards of the existing trees will be considered.
Monitoring & Reporting	- Monitoring for health, risk and diversity - Completion and maintenance of record keeping and inventory - Certification of tree workers and contractors - Preparation of annual work plans ahead of time, including a pruning program in the winter and summer, and the care and establishment of young trees. - Expansion of record keeping into removals, pruning and inspections.
Time Frame	- Entire the Construction and operation period
Responsibility	✓ Tree Management Committee (TMC): ▪ Regular review of every tree ▪ Shift from reactive to proactive management ▪ Improve the condition of trees ▪ Increase the overall value by taking care of the forest

Table 6.11: Disaster Management Plan

Objective	- to lessen the adverse impacts caused by any sorts of disaster occurred in the project area. - to assess the project from the viewpoint of disaster risk reduction by identifying the improvement points of the project. - ensure safety of life, protection of Environment, protection of installation, restoration of production and salvage operations in this same order of priorities.
Performance Indicator	A Disaster Management Plan is a comprehensive document that outlines strategies and procedures for preparing, responding to, recovering from, and mitigating the impacts of disasters. Performance indicators are critical for evaluating the effectiveness of the plan and ensuring that the organization or community can respond efficiently to various types of disasters. Here is key performance indicators (KPIs) commonly used to measure the performance of a Disaster Management Plan: 1. Emergency Response Time 2. Casualty and Injury Rates 3. Evacuation Effectiveness 4. Communication Efficiency 5. Search and Rescue Operations 6. Shelter Management 7. Medical Care and Health Services 8. Infrastructure Damage Assessment 9. Logistical Support 10. Coordination and Collaboration 11. Community Preparedness

	12. Post-Disaster Recovery Time 13. Damage and Loss Assessment 14. Resilience Building 15. Public Satisfaction and Feedback 16. Training and Drills Evaluation 17. Financial Management 18. Legal and Regulatory Compliance
Relevant Govt. Policies Act & Rules	✓ National Disaster Management Policy, 2015 ✓ Bangladesh National Building Code (BNBC), 2020
Management Plan	A Disaster Management Plan is a comprehensive document that outlines strategies and procedures for preparing, responding to, recovering from, and mitigating the impacts of disasters. The goal of such a plan is to minimize the loss of life, property damage, and disruption caused by disasters while ensuring an efficient and coordinated response. Below is a general outline of the key components typically included in a Disaster Management Plan: Executive Summary: - Brief overview of the plan's purpose and objectives. - Summary of key strategies and initiatives. Introduction: - Background information on the organization or community. - Explanation of the need for a Disaster Management Plan. - Overview of the planning process and stakeholders involved. Risk Assessment: - Identification and analysis of potential hazards and risks. - Vulnerability assessment for the community or organization. - Probability and impact analysis of different disaster scenarios. Goals and Objectives: - Clearly defined goals for disaster preparedness, response, recovery, and mitigation. - Specific, measurable, achievable, relevant, and time-bound (SMART) objectives. Organizational Structure: - Definition of roles and responsibilities for key personnel and response teams. - Establishment of a centralized command structure. - Coordination mechanisms with external agencies. Communication Plan: - Communication protocols and channels for internal and external stakeholders. - Emergency notification systems and procedures. - Public communication strategies during and after a disaster. Evacuation and Shelter Plans: - Evacuation routes and procedures. - Identification of shelter locations.

	• Transportation and logistics for evacuation. 8. Emergency Response Procedures: • Standard operating procedures (SOPs) for emergency response. • Activation criteria for emergency response teams. • Resource mobilization and deployment strategies. 9. Medical and Health Services: • Emergency medical services and first aid procedures. • Coordination with healthcare facilities and organizations. • Disease prevention and control measures. 10. Logistics and Resource Management: • Inventory of essential resources, including food, water, medical supplies, and equipment. • Resource allocation and distribution strategies. • Procedures for requesting and receiving external assistance. 11. Search and Rescue Operations: • Standardized procedures for search and rescue activities. • Coordination with specialized search and rescue teams. • Equipment and training requirements for response teams. 12. Community Awareness and Education: • Public awareness campaigns on disaster preparedness. • Community training programs and drills. • Educational materials and resources for the public. 13. Psychosocial Support: • Strategies for providing emotional and psychological support to affected individuals. • Coordination with mental health professionals and support organizations. • Post-disaster counseling services. 14. Infrastructure and Facility Management: • Procedures for assessing and managing damage to critical infrastructure. • Restoration and repair plans for key facilities. • Coordination with utility providers for essential services. 15. Post-Disaster Recovery and Rehabilitation: • Framework for long-term recovery efforts. • Economic and social recovery initiatives. • Community rebuilding and resilience-building strategies. 16. Training and Capacity Building: • Training programs for emergency response teams and volunteers. • Regular drills and exercises to test and improve response capabilities. • Continuous learning and skill development initiatives. 17. Monitoring and Evaluation: • Establishment of performance indicators and metrics. • Regular testing and evaluation of response and recovery procedures. • After-action reviews and lessons learned exercises. 18. Legal and Regulatory Compliance:
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	• Adherence to local, state, and national laws and regulations related to disaster management. • Compliance with environmental and safety standards. 19. Budget and Resource Allocation: • Allocation of financial resources for disaster management activities. • Identification of funding sources and potential grants. • Cost-benefit analysis for different preparedness and mitigation measures. 20. Documentation and Reporting: • Record-keeping and documentation of all disaster-related activities. • Timely and accurate reporting to relevant authorities. • Documentation of lessons learned and areas for improvement. 21. Plan Maintenance and Review: • Regular updates and revisions to the plan. • Schedule for plan reviews and drills. • Incorporation of new information, technologies, and lessons learned. <u>Besides, there are other steps need to be followed in the project site to manage the plan listed below:</u> ✓ measures will be taken from the beginning of the project to avoid any potential damage or loss from the project. ✓ To summarize the cycle, the cycle consists of two parts e.g. before event and after event. In before event, to reduce the impact caused by any disaster, appropriate mitigation measures and preparation need to be done by Emergency Action Committee. ✓ After that, when a disaster strikes, it is necessary to take the response as early as possible and take the feasible steps to recover the loss or damage in the project area. ✓ To illustrate the cycle, Once the likelihood of a disaster is suspected, action has to be initiated to prevent a failure. Engineers responsible for preventive action should identify sources of repair equipment, materials, Labor and expertise for use during emergency. ✓ Prevention, mitigation, response, and recovery are the four phases of the emergency management cycle used to address and manage various types of disasters and emergencies. These phases help organizations, communities, and governments prepare for, respond to, and recover from adverse events. ✓ Flood prevention, Cyclone and Storm Surge prevention, Earthquake, Prevention, Fire Prevention, Lighting Prevention
Monitoring & Reporting	- The level at which a situation will be termed a disaster must be specified. The Engineer-in-Charge should notify the Safety officer/Safety Supervisor for the following information: - Exit points, - Safety areas along the high raise apartment, and - Nearest medical facilities.
Time Frame	✓ Entire the Construction Period
Responsibility	Emergency Action Committee (EAC): ▪ Demarcation of the areas to be evacuated with priorities,

	▪ Safe route to be used, adequacy of transport for evacuation, and traffic control, ▪ Safe area and shelters, ▪ Security of property left behind in the evacuated areas, ▪ Functions and responsibilities of various members of evacuation teams, and ▪ Setting up of joint control room.
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Table 6.12: Biodiversity Management Plan

Objective	- Identifying the key biodiversity issues that require control measures - Developing strategies to manage impacts on biodiversity and implementing those strategies - Assigning responsibilities for impact monitoring and management
Performance Indicator	A Biodiversity Management Plan aims to conserve, protect, and sustainably manage the biodiversity within a specific area. Performance indicators are essential for assessing the effectiveness of the plan, ensuring that conservation efforts are on track, and identifying areas for improvement. Here is key performance indicators (KPIs) commonly used to measure the performance of a Biodiversity Management Plan: 1. Species Richness and Diversity 2. Population Trends 3. Habitat Quality and Integrity 4. Ecosystem Functionality 5. Endangered and Threatened Species Management 6. Invasive Species Control 7. Genetic Diversity 8. Protected Area Management 9. Monitoring of Indicator Species 10. Community Engagement 11. Educational Programs 12. Biodiversity Corridor Connectivity 13. Ecosystem Services 14. Restoration Success 15. Climate Change Adaptation 16. Research and Monitoring Programs 17. Collaboration with Stakeholders 18. Legal and Regulatory Compliance 19. Budget Utilization: 20. Public Awareness and Perception
Relevant Govt. Policies Act & Rules	- National Biodiversity Strategy and Action Plan (NBSAP) - National Environment Policy, 1992 - Bangladesh Environment Conservation Act, 1995 (amend in 2010) - Environment Conservation Rules, 2023
Potential Receptor	✓ Project site animal and others existing organism. ✓ Project staff ✓ Workers ✓ Local people

Management Plan	A Biodiversity Management Plan is a strategic document that outlines actions and measures to conserve, enhance, and sustainably manage biodiversity within a specific area. This plan aims to address the challenges faced by ecosystems and species, promote biodiversity conservation, and ensure the long-term health and resilience of natural environments. Below is a general outline for a Biodiversity Management Plan: 1. Introduction: • Overview of the biodiversity management plan. • Purpose and objectives of the plan. • Context and importance of biodiversity in the target area. 2. Context and Background: • Description of the geographical and ecological context. • Overview of the current state of biodiversity in the area. • Identification of key threats and challenges. 3. Goals and Objectives: • Clear and measurable goals for biodiversity conservation. • Specific objectives aligned with each goal. • Timeframes for achieving goals and objectives. 4. Stakeholder Analysis: • Identification of key stakeholders involved in or affected by biodiversity management. • Stakeholder roles and responsibilities. • Strategies for engaging and collaborating with stakeholders. 5. Biodiversity Inventory and Assessment: • Comprehensive assessment of existing biodiversity. • Identification of key species, ecosystems, and habitats. • Evaluation of the health and status of biodiversity components. 6. Threat Assessment and Risk Analysis: • Identification of potential threats to biodiversity. • Assessment of the level of risk associated with each threat. • Prioritization of threats based on their impact and urgency. 7. Conservation Strategies: • Designation of protected areas or reserves. • Habitat restoration and rehabilitation plans. • Invasive species management strategies. • Conservation of endangered or threatened species. 8. Habitat Management and Restoration: • Habitat restoration and reforestation initiatives. • Sustainable land use and management practices. • Soil and water conservation measures. • Protection and enhancement of critical habitats. 9. Biodiversity Monitoring and Research: • Establishment of monitoring programs for key species and habitats. • Research initiatives to better understand local ecosystems. • Collaboration with research institutions and organizations.
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	10. Education and Awareness Programs: • Public awareness campaigns on the importance of biodiversity. • Educational programs for schools and local communities. • Interpretation and eco-tourism initiatives. 11. Community Engagement and Participation: • Involvement of local communities in biodiversity conservation. • Community-based conservation initiatives. • Recognition and incorporation of traditional ecological knowledge. 12. Legislation and Regulatory Measures: • Compliance with local, national, and international biodiversity laws. • Development of additional regulations, if necessary. • Permitting and enforcement strategies. 13. Climate Change Adaptation: • Strategies to address the impacts of climate change on biodiversity. • Adaptive management practices. • Integration of climate resilience into conservation efforts. 14. Networking and Partnerships: • Collaboration with governmental agencies responsible for conservation. • Partnerships with non-governmental organizations (NGOs) and research institutions. • Engagement with local businesses and private landowners. 15. Budget and Resource Allocation: • Budget estimates for implementing the biodiversity management plan. • Identification of funding sources, grants, and potential partnerships. • Cost-effectiveness analysis of conservation activities. 16. Capacity Building: • Training programs for local communities and conservation professionals. • Development of local expertise in biodiversity management. • Capacity building in monitoring and research techniques. 17. Communication Plan: • Communication strategies for stakeholders, including the public, government agencies, and NGOs. • Public relations and media engagement. • Regular reporting mechanisms on progress and achievements. 18. Evaluation and Adaptive Management: • Development of performance indicators and benchmarks. • Periodic evaluations to assess the effectiveness of the plan. • Adaptive management strategies based on evaluation results. 19. Legal and Ethical Considerations: • Ethical considerations in biodiversity management. • Respect for the rights and knowledge of indigenous and local communities. • Legal and ethical guidelines for research and monitoring. 20. Conclusion and Next Steps:
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	• Summary of key points in the plan. • Outline of next steps and implementation timelines. • Commitment to ongoing evaluation and adaptation. <u>Besides, there are other steps need to be followed in the project site to manage the plan listed below:</u> ✓ All recognized natural habitats and sensitive receptors in the immediate vicinity of the activity are not damaged or exploited, all staff are strictly prohibited from hunting, foraging, logging or other damaging activities. ✓ For large trees in the vicinity of the activity, mark and cordon off with a fence large trees and protect root system and avoid any damage to the trees. ✓ Ensuring compensate of felling trees along the road with 1:3 ratios to maintain the ecological balance. ✓ Refinement of the project to incorporate ecological enhancement measures, mitigation measures to avoid or reduce negative impacts, and compensation measures for any residual significant negative impacts. ✓ Provision for monitoring and following up the implementation and success of mitigation measures and ecological outcomes, including feedback in relation to predicted outcomes.
Monitoring & Reporting	- Contractor will carry out ecological monitoring based on daily visual observations on birds and wildlife in the project and adjoining area. Any incidents of injury and death of fauna will be recorded and reported based on an investigation to understand the root cause. These observations and corrective actions will be verified during the periodic audits.
Time Frame	✓ Entire the Construction Period
Responsibility	✓ Contactor's ✓ Site Supervisor ✓ Project Manager & Environmental Specialist/Health ▪ Compliance Officer/Manager ▪ Stakeholder Engagement Officer

6.2 Monitoring Plan

117. Monitoring activities refer to the EIA implementation and to the impacts due to the implementation of the project. The program composed, is selective and pragmatic, focusing on the construction related issues for the control and management of the environmental impacts. Monitoring point have been selected with respect to sensitive receptors. The schedule has been developed based on the possible occurrence of adverse impacts and required mitigation actions.

Table 6.13: Environmental Monitoring Plan (Qualitative)

No.	Environmental Issues & Parameters	Environmental Impacts	Implementing Organization	Supervision Organization
01	Tree felling, Clearing of vegetation	20 trees will be directly affected by cutting and trimming, as well as standing crops (if any) and bushes.	Contractor	PGCB
02	Air Quality and Dust	- Air pollution and dust generation due to construction activities, especially during the underground cabling, generators and construction vehicle movement. - Suspended particulate matter from excavation works and land clearing, including vehicular emissions, may affect workers and community	Contractor	PGCB
03	Noise Level	- Mobilization of heavy equipment and machinery, use of construction vehicles, transport of materials, pile driving and construction activities may increase ambient noise level. - Exposure to high level ambient noise may cause anxiety and disturbance to workers and community.	Contractor	PGCB
04	Water Quality	Potential for siltation due to construction works near pond or river.	Contractor	PGCB
05	Soil Quality	Soil Pollution	Contractor	PGCB
06	Construction Waste	Generation of construction wastes from the construction materials.	Contractor	PGCB
07	Fauna (Wildlife)	Disturbance of wildlife, especially birds, due to project activities such as moving of project equipment and transports (especially during night time).	Contractor	PGCB
08	Traffic Congestion/Road Accidents	Traffic congestion and road accidents due to movement of construction vehicles.	Contractor	PGCB

No.	Environmental Issues & Parameters	Environmental Impacts	Implementing Organization	Supervision Organization
09	Pollution due to wastes	Pollution due to wastes (construction wastes from construction activities and general wastes from workers' camps)	Contractor	PGCB
10	Hazardous Waste	Pollution due to hazardous waste such as used oil, hydraulic fluids, waste fuel, grease and waste oil containing rags.	Contractor	PGCB
11	Community Health and Safety	Community H&S nearby the substation site could be affected.	Contractor	PGCB
12	Occupational Health and Safety	Health and safety risks of construction workers	Contractor	PGCB
13	Employment generation/ income	- Employment opportunities for the local people, especially for PAPs. - Both technical and non-technical laborers will be employed as per requirements	Contractor	PGCB

Table 6.14: Environmental Monitoring Plan (Quantitative)

No.	Items	Means of Monitoring	Location and Frequency	Implementing Organization	Supervision Organization
01	Air Quality	Portable Air Quality Sampler Parameters: SPM, PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ and CO and O ₃	03 Locations (Quarterly)	Contractor	PGCB
02	Noise Level (dB) (day and Night Time)	Digital Noise Meter Leq (day and night time)	07 Locations (Quarterly)	Contractor	PGCB
03	Water Quality (Ground Water and Surface Water)	Maintain standards sampling procedure Surface Water Parameters: pH, Turbidity, DO, BOD5, COD, Total Suspended Solids (TSS), Total Coliform etc.	03 Locations (Quarterly)	Contractor	PGCB

No.	Items	Means of Monitoring	Location and Frequency	Implementing Organization	Supervision Organization
		Groundwater Parameters: pH, Turbidity, DO, BOD5, COD, Total Suspended Solids (TSS), Total Coliform			
04	Soil Quality	Maintain standards sampling procedure (Composite sampling method) Parameters: pH, Zinc (Zn), Iron (Fe), Sulphate, Organic Matter, Nitrate and Phosphate	03 Locations (Quarterly)	Contractor	PGCB

6.2.1 Horizontal Directional Drilling Procedure and its Management Aspects

Horizontal Directional Drilling (HDD) is a trenchless construction method used to install underground utilities, including cable lines, without the need for open trenches. Here's a general procedural overview for Horizontal Directional Drilling on our underground (UG) cable line:

Project Planning and Survey:

- Conduct a thorough survey and site assessment to determine the drill path, taking into account soil conditions, existing utilities, and potential obstacles.
- Plan the drill entry and exit points, as well as the desired depth and alignment of the underground cable.

Permitting and Regulatory Compliance:

- Obtain the necessary permits from local authorities and regulatory agencies.
- Ensure compliance with environmental regulations and adhere to safety guidelines.

Site Preparation:

- Set up the HDD rig in a suitable location, considering access and safety requirements.
- Establish the workspace, including the location of the drill rig, support equipment, and drilling fluid mixing system.

Drill Path Design:

- Design the drill path based on the survey data, ensuring that it avoids obstacles and utilities.
- Determine the entry and exit angles to achieve the desired horizontal alignment.

Drilling Fluid Preparation:

- Mix the drilling fluid (mud) with additives appropriate for the soil conditions to aid in drilling, cuttings removal, and stabilization.
- Maintain the properties of the drilling fluid throughout the operation.

Equipment Inspection and Calibration:

- Inspect and calibrate the HDD equipment, including the drill rig, drill pipe, and downhole tools.
- Verify the alignment and orientation tools to ensure accurate tracking of the drill head.

Pilot Hole Drilling:

- Begin drilling the pilot hole using a downhole drilling motor.
- Monitor drilling parameters in real-time, including depth, pitch, and direction.
- Adjust the drilling path as necessary based on feedback from tracking equipment.

Reaming:

- Enlarge the pilot hole using progressively larger reamers to accommodate the size of the underground cable or conduit.
- Monitor drilling fluid properties during reaming to ensure hole stability.

Pullback:

- Install the underground cable or conduit by pulling it back through the enlarged borehole.
- Monitor tension, speed, and alignment during the pullback process to prevent damage to the cable.

Cable Installation:

- Install the underground cable within the conduit, if applicable.
- Ensure proper support and alignment during the installation process.

Backfilling and Site Restoration

- Backfill the borehole with suitable material, compacting as necessary to restore surface integrity.
- Re-grade and restore the construction site to its original condition.

Testing and Inspection

- Conduct testing on the installed cable to verify its integrity and functionality.
- Inspect the completed installation to ensure compliance with specifications and regulations.

Documentation and As-Built Drawings

- Create as-built drawings documenting the exact location, depth, and specifications of the installed underground cable.
- Maintain comprehensive documentation for future reference and maintenance.

Post-Project Evaluation

- Conduct a post-project evaluation to assess the efficiency and success of the HDD process.
- Identify any lessons learned and areas for improvement in future projects.

6.2.1.1 Management Aspects

The management aspects of a Horizontal Directional Drilling (HDD) procedure are crucial for ensuring the success, efficiency, and safety of the drilling project. Effective management involves overseeing various elements, including planning, coordination, communication, safety protocols, and environmental considerations. Here are key management aspects to consider for HDD procedures in our construction site:

Project Planning:

- **Survey and Site Assessment:** Conduct a comprehensive survey and site assessment to gather information on soil conditions, utilities, and potential obstacles.
- **Permitting:** Ensure all necessary permits are obtained and comply with regulatory requirements.
- **Path Design:** Develop a well-thought-out drill path considering obstacles, entry and exit points, and alignment requirements.

Risk Management:

- **Risk Assessment:** Identify potential risks and hazards associated with the HDD procedure and develop strategies to mitigate them.
- **Contingency Planning:** Establish contingency plans for unexpected situations or challenges during the drilling process.

Project Coordination:

- **Team Coordination:** Foster effective communication and collaboration among project stakeholders, including engineers, drill operators, and support staff.
- **Scheduling:** Develop a detailed project schedule that considers critical milestones, resource allocation, and potential delays.

Equipment Management:

- **Inspection and Maintenance:** Regularly inspect and maintain HDD equipment to ensure optimal performance and safety.
- **Calibration:** Calibrate tracking and drilling equipment to maintain accuracy and precision during the drilling process.

Safety Protocols:

- **Training:** Provide comprehensive training for all personnel involved in the HDD procedure, emphasizing safety measures and emergency response.
- **Personal Protective Equipment (PPE):** Ensure that workers are equipped with the appropriate PPE for the drilling environment.

Environmental Considerations:

- **Drilling Fluid Management:** Implement measures to manage drilling fluid responsibly, minimizing environmental impact.
- **Vegetation Protection:** Take steps to protect vegetation and minimize disturbance to the natural environment.
- **Wildlife Protection:** Implement strategies to minimize disruption to wildlife habitats and adhere to environmental regulations.

Quality Control:

- **Monitoring and Inspection:** Implement a system for monitoring and inspecting the drilling process to ensure compliance with design specifications.
- **Material Testing:** Conduct tests on drilling fluid and backfill materials to meet quality standards.

Communication:

- **Stakeholder Communication:** Maintain open communication with project stakeholders, including clients, regulatory agencies, and the local community.
- **Daily Briefings:** Conduct regular briefings to update the project team on progress, challenges, and any changes to the plan.

Documentation and Reporting:

- **Recordkeeping:** Maintain accurate records of drilling activities, equipment performance, and any incidents or challenges encountered.
- **Reporting:** Provide regular progress reports to stakeholders and regulatory agencies as required.

Post-Project Evaluation:

- **Performance Review:** Evaluate the overall performance of the HDD project, identifying areas for improvement and lessons learned.
- **Client Feedback:** Seek feedback from the client to assess satisfaction and identify opportunities for enhancement.

Training and Development:

- **Continuous Training:** Provide ongoing training and professional development opportunities for project personnel to stay updated on industry best practices.

Budget Management:

- **Cost Tracking:** Monitor project expenses and adhere to the budgetary constraints.
- **Financial Reporting:** Provide regular financial reports to stakeholders.

Regulatory Compliance:

- **Monitoring Changes:** Stay informed about changes in regulations and standards related to HDD and ensure compliance.

6.3 Budget of Environmental Monitoring

118. Most of the mitigation measures require the contractors to adopt good site practice, which will be part of their normal procedures, so there are unlikely to be major costs associated with compliance. The achievement of environmental performance will be ensured through proper operation and maintenance.

119. The environmental monitoring cost is given in **Table 6.15**. The total cost for implementation of the monitoring is estimated as **BDT 3,059,700**.

Table 6.15: Cost for Environmental Monitoring

No	Activities/Items	Unit	Quantity	Rate (BDT)	Amount (BDT)
Environmental Quality Monitoring					
1	Air Quality	03 No.	36 [3*4*3] [Quarterly]	20000	7,20,000
2	Noise Level (Day and Night)	07 No.	84 [7*4*3] [Quarterly]	3000	2,52,000
3	Surface Water Quality	03 No.	36 [3*4*3] [Quarterly]	6000	2,16,000
4	Ground Water Quality	03 No.	36 [3*4*3] [Quarterly]	6000	2,16,000
5	Soil Quality	03 No.	36 [3*4*3] [Quarterly]	10000	3,60,000
Sub Total					17,64,000
Environmental Management					
Water Spray for Dust Suppression					150,000
Waste Management (Construction waste disposal, oil, hazardous waste etc.)					150,000
Community Health and Safety Plan					200,000
Site Occupational Health and Safety (Health and Vector born disease, COVID-19 pandemic etc.)					200,000
Traffic Management Plan (Traffic Congestion and Road Accidents)					300,000
Portable Water Supply and Hygienic Facility (including Labor camp, adequate sanitary facility etc.)					100,000
Sub Total					1,100,000
Establishment and Training					
Environmental training and awareness, Management Information System					50,000
SUB TOTAL (Environmental Quality Test, Management Plan and Training)					29,14,000
CONTINGENCIES @ 5% on total Environmental Costs					145,700
GRAND TOTAL (in BDT)					3,059,700

Note: Monitoring Budget is prepared based on 03 years' construction period; Source: Contract documents of the project

7 IMPLEMENTATION OF THE CESMP

7.1 General

120. The successful implementation of the CESMP is dependent upon clearly defining and documenting responsibilities and procedures. The CESMP, its implementation and management will be subjected to the same quality assurance and audit procedures that apply to the total project as specified in the Project Management Plan. The “monitoring and auditing” of the environmental and social performance of a project during construction will occur generally as follows:

- Monitoring, reporting and auditing during the construction period as specified in the CESMP and
- Monitoring, reporting and auditing by Supervising Engineer during the construction period.

121. The successful implementation of the CESMP is mainly dependent on human resource with the roles and responsibilities. Contractor will be engaged an Environmental and Social Specialist/Officer along with a Site Supervisor under the Project Manager who will mainly implement the CESMP at field level in co-ordination with the PMU and Environment and Social Unit of PGCB.

7.2 Reporting

122. The main components of the monitoring plans include: Environmental issue to be monitored and the means of monitoring, Specific areas, locations and parameters to be monitored; Applicable standards and criteria; Duration and frequency and Institutional responsibilities for monitoring and supervision. A field monitoring checklist has been prepared based on the CESMP and monitoring plan (Annexure). The field monitoring checklist will be used by the contractor field engineers. The signed checklists will be provided to the DSC they will be responsible for the follow-up and compliance reporting.

Table 7.1: Reporting Requirements

Report From	Report To	Purpose	Frequency
Contractors EMO	Contractors EHS Manager	Environmental Monitoring Report	Monthly and Quarterly
Contractors	Environment and Social Unit of PGCB in line with PIU	Environmental Monitoring Report	Monthly and Quarterly
PIU	PGCB	Environmental Monitoring Report	Monthly and Quarterly

EMO -Environmental Management Officer; PGCB-Power Grid Company of Bangladesh Limited, EHS-Environment, Health and Safety

7.3 Training for the Project Site Staff

123. All Project workers will undergo EHS knowledge training prior to start of work with the project. The training will cover EHS management system, operation procedure training, EHS risk and prevention measures in working areas, correct wearing of protection articles, usage of special personal protection equipment.

124. The Contractor will conduct at least one occupation health training per month. Three Level (environmental/health/safety)) training and education pursuant to relevant documents. All equipment operators and drivers must have training with certificates and will be tested prior to assignment. The health

and safety training will be done through formal training sessions, EHS induction, toolbox talks, training and awareness and daily pre-start meetings. Training and induction of workers will include topics such as, but not limited to the following:

- Camp Rules and Regulations
- Sanitation and Personal Hygiene
- Health and Safety at Work
- Environmental Management
- Solid waste management
- Wastewater and runoff management
- Hazardous waste management and spill control
- Ecological protection
- Protection of cultural resources
- Emergency Preparedness

125. Outside experts, lecturers and trainers for specialized topics like AIDS/HIV will be arranged as needed. The tentative training and induction schedule are as follows:

Table 7.2: Tentative Schedule of Training and Induction

Activities	Schedule and Frequency	Audience / Participants
EHS Induction	As per Training Plan	All workers and project personnel
Toolbox talks & training	As per Training Plan	All workers and project personnel
Daily pre start meeting	As per Training Plan	All workers and project personnel
Training on HIV/AIDS/COVID-19	As per Training Plan	All workers and project personnel
Training on Environmental Management	As per Training Plan	All workers and project personnel
Training on Ecological Conservation	As per Training Plan	All workers and project personnel

7.4 Corrective Action (Non-Compliance Report)

126. The mechanism for Corrective Action and Feedback is for purposes of knowing how to adjust the CESMP to changes during construction that are necessary especially those that have not been taken into account in the formulation of the CESMP. This will be done through the reporting process for non-urgent issues that may include those that will not have an immediate adverse impact on human health or the environment. For urgent issues that may have an immediate impact on health and safety or environmental resources, corrective actions will be issued and the executing agency informed.

127. Corrective Actions will be given to the contractor by the DSC Safeguards Officer if required at any stage during the construction program if there is evidence to indicate that the CESMP is not adhered to.

128. The PIU will disseminate monthly progress reports as appropriate and should the DSC, PGCB, ADB or other stakeholders identify an area of concern, the SSEMP will be adjusted accordingly.

7.5 Institutional Arrangement with the Role & Responsibilities

7.5.1 Organizational Set-Up of CESMP Implementation Team

129. The Environmental Management Plan (EMP) implementation requires the organizational support structure in the form of organizational requirements, trainings, mechanism to implement and information management system. The PGCB is the Executing Agency (EA) for the project. The project Implementation Unit (PIU) and Environment & Social Unit under planning division of PGCB will be responsible for ensuring that all components of the EMP are compiled during implementation of the project. The proposed Institutional Arrangement and site organization chart to implement the EMP is present in a flow diagram in below **Figure 7-1**.

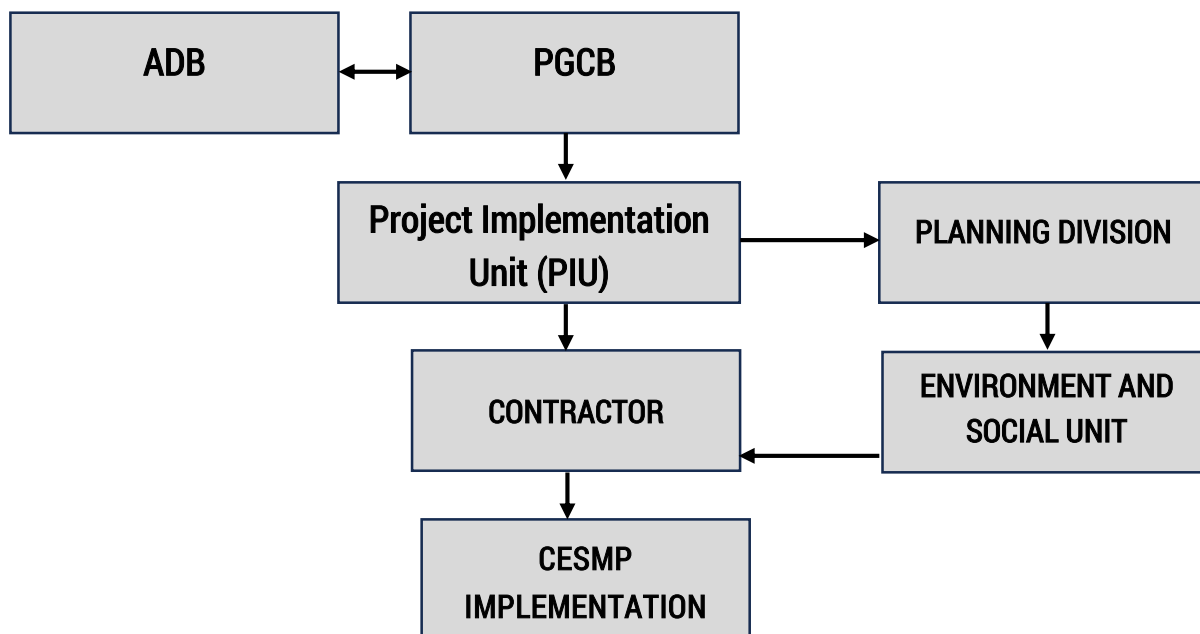


Figure 7-1: Organization Chart for Implementation Agencies of the CESMP

7.5.2 Roles and Responsibilities of CESMP Implementation Team

130. The description of Key responsibilities of various agencies and parties for implementing environment safeguards are provided below:

7.5.2.1 Asian Development Bank (ADB)

131. As a funding agency ADB is responsible for monitoring implementation of CESMP, providing technical guidance as necessary. Specific responsibilities entail the following:

- Review CSEMP and other supplementary environmental monitoring reports, provide feedback and disclose the reports on the ADB website as required by the ADB SPS;
- Issues approval of projects and project components based on the approval of the respective reports;
- Provide assistance to PGCB, if required, in carrying out its responsibilities and for building capacity for safeguard compliance;

- Monitor overall compliance of the project to IEE and CESMP through review missions;
- Review all environmental monitoring reports submitted by PGCB, provide feedback and disclose the reports on the ADB website as required by the ADB SPS;
- Provide guidance to the PGCB on issues related to, changes in project design/scope occurrence of unanticipated environmental impacts during project implementation, emergency situations and others as necessary;
- Organize, coordination and capacity building activities on environment safeguards for PGCB/PIU, and Contractor as and when necessary.

7.5.2.2 Power Grid Company of Bangladesh (PGCB)

132. The Power Grid Company of Bangladesh (PGCB) as the main project implementing agency, is responsible for the effective execution of the environmental safeguards. Although not directly involved in the day-to-day monitoring activities, PGCB will have oversight on the monitoring activities carried out by the Social & Environment unit and contractor through PIU and will report to ADB.

7.5.2.3 Environment and Social Unit of PGCB

133. The Environment and Social is under the planning division staffed by one Assistant manager and one Manager. The Environmental and Social Unit Division of planning division will provide guidance the PIU staff for developing mechanisms for effective project supervision throughout the project construction and even in operation phase. They will also assist contractors in conducting subsequent monitoring and reporting and in undertaking corrective options and establishment and implementation of an environmental management system.

7.5.2.4 Project Implementation Unit (PIU)

134. PIU is the PGCB Project Management Unit and responsible for the overall compliance to the ADB's SPS 2009 and the all-applicable laws and rules under the Ministry of Environment and Forest (MoEF). The PIU will be supported by the Environment and Social Unit of PGCB responsible for ensuring the project complies with the social and environmental safeguard requirements of the ADB. The PIU and field offices is responsible for ensuring the timely processing of environmental clearances yearly, tree- cutting permits, and other similar clearances and permits required for the project. They will also ensure timely and effective planning and implementation of resettlement and social development activities. The PIU and the field offices will conduct at least bi-monthly site visits and ensure the reports submitted by the contractor. The PIU will submit the environment monitoring reports prepared by the contractor and to the Department of Environment (DoE) of GoB. The PIU will ensure that Semi-Annual environmental monitoring reports are to be submitted within six calendar months from the end of the respective reporting period to ADB for disclosure on the ADB website.

135. The project implementation unit will be responsible for supervising implementation of the environmental management plan (EMP) and environmental monitoring plan (EMoP).

7.5.2.5 Contractors

136. The contractor/sub-contractor are legally mandated to implement the EMP and EMoP and obtain all environment related permits and clearances required for construction. Under the Contractor there will be Environmental Specialist. The roles and responsibilities of the Environmental specialist are as follows:

- Supervising and monitoring of compliance with the CESMP;
- Recoding all relevant matters concerning environmental management, inspections and audits, related incidents etc.
- Implement the CESMP and ensure the construction works comply with it and conditions of all environmental clearances and permits issued by respective statutory bodies;
- Conduct monitoring of environmental quality parameters in accordance with EMoP;
- Conducting periodic environmental and safety training and mock drill for contractor's engineers, supervisors and workers;
- Ensure that construction activities are carried in a manner that avoids, mitigates and minimizes adverse impacts on the biodiversity as given in the IEE reports and CESMP;
- Identify locations for siting construction camps and other plants, machinery, vehicles and equipment, as well as locations for storage and disposal of wastes, both from the construction camps and from the site and obtain approval for the same from PIU.
- Detail out site-specific environmental mitigation and enhancement measures and obtain approval of the PIU for the same;
- Ensure that safety of the workers and other site users is not compromised;
- Conduct and submit monitoring report as EMP/EMoP;
- Preparing the registers for material sources, labor, pollution monitoring results, public complaints and as may be directed by the PIU
- Undertake enhancement measures as outlined in the IEE including CESMP;
- Preparing and submitting monthly reports to PIU on status of implementation environment safeguard measures.

8 GRIEVANCE REDRESSES MECHANISM

8.1 GRM Objective

137. The project will establish a Grievance Redress Mechanism (GRM) to address complaints and grievances made to the Grievance Redress Committee (GRC) about any irregularities or inconveniences related to the project. The GRC will try to resolve the issues/conflicts amicably and quickly to ensure the project implementation proceeds unhindered and in compliance with ADB's safeguard guidelines.

138. GRM is a locally based, project-specific extra-legal way to deal with and resolve complaints and grievances faster and thus enhance project performance standards in terms of environmental, social and resettlement management. The fundamental objectives of the GRM, implemented through a Grievance Redress Committee (GRC) serving as a para-legal body, are to resolve any environmental and resettlement related grievances in consultation with the aggrieved party to facilitate smooth implementation of environmental and resettlement plans and establish accountability of the affected people.

8.2 Complaints and Grievance Redresses

139. Affected persons may appeal any disagreeable decision, practice or activity arising from project related activities to the GRC. Affected persons will be fully informed of their rights and of the procedures for addressing complaints, either verbally or in writing during consultation, survey, and time of compensation.

8.3 Grievance Redresses Committee

140. The project will establish a three-tier GRM, which will function throughout the life cycle of the project implementation and PGCB will ensure its accessibility to affected parties, and transparency and efficiency in grievance resolution. However, it will not deal or interfere with any matters which are already placed before the country's courts of law. The Project will provide wider publicity for the GRM established using a variety of media such as brochures and leaflets printed in Bengali, and through community level awareness raising programs. The roles and functions of the GRM and its different tiers, specific locations where the different tiers are established, grievance reporting procedures, time frames for grievance resolution at each level etc. will be disseminated to the affected persons as well as the general public using the above-mentioned modes of communication. Furthermore, the Project will provide orientation and training to the members of the GRM on effective grievance handling procedures.

141. **GRM – Level 1:** Level 1 of the GRM will be the project officers appointed by PGCB. The persons can be sub assistant engineers, or any other engineers appointed by PGCB to the sites. Also, contractors on project sites can be windows for field level grievances. In case of grievances that are urgent and minor, aggrieved parties can easily approach PGCB's field officers and/or contractors. Contact phone numbers, mails and names of the focal persons will be posted at all construction sites at visible locations. Considering female complainants, a contact point of a female focal will be posted too. The field officers of PGCB and focal persons of the contractors will record the name of the complainants, the dates of complaints and the nature of the complaints. The field officers of PGCB and/or focal persons of contractors will communicate with the complainants to reach an amicable settlement within a period of two weeks.

142. **GRM – Level 2:** Level 2 of the GRM will be the Local Grievance Redress Committee (LGRC) chaired by one of the Executive Engineers. PGCB will establish Dhaka LGRCs, the rest of the members of the GRC with

special care of gender balance will include (i) the project officers from concerned project areas; (ii) the focal persons from the contractors; (iii) representatives of the concerned Unions; and (iv) representatives of the relevant government offices such as DC. Grievances that cannot be resolved at GRM-Level 1 or else if the affected persons were dissatisfied with the Level 1 resolution can submit their grievances to LGRC. The meetings of the LGRC will be held at the local office of PGCB or the union office in the area where the complaint originated. The LGRC can convene the affected person to explain his/her grievance at the meeting. The complainant can also send his/her nominee to the LGRC, if he/she is unable to physically participate in the LGRC. During the committee deliberations, LGRC will clarify the issues involved, and would try its best to reach a settlement acceptable to both the affected person and the project within a period of two weeks. The executive engineer can also consult the deputy project director (DPD) for advice and guidance if necessary. If an agreement or resolution is reached, the key points of the agreement/resolution will be summarized, documented and signed by both the affected person and the members of the GRC. The project officer of PGCB at site level from where the complaint is submitted to LGRC will assist in the documentation and record keeping, summaries of which will also be reported to ADB through monitoring reports.

143. **GRM – Level 3:** Level 3 of the GRM will be the Project Management Unit (PMU) of PGCB. The GRC at the PMU with special care of gender balance will be chaired by Project Director (PD) and comprise (i) External monitor for resettlement; (ii) dedicated safeguards specialist(s) under PMU/ESU; (iii) relevant technicians and engineers from PGCB and contractor; and (iv) representatives of the relevant government offices. The complainant and/or representative will be called to appear before the Level 3 GRC and explain his/her grievance. An officer from ESU/PMU will coordinate with the complainant. The complainant can send his/her nominee to the GRC, and in the event of both being unable to physically participate in the GRC, the ESU/PMU officer will explain the grievances on behalf of the complainant. If necessary, GRC members will undertake field inspections to verify the issues reported. Level 3 GRC will reach a settlement through consensus among its membership, failing which the decision may be taken on a majority vote. The GRC located at PMU will conclude its proceedings within a period of one month since the submission of the grievance and inform the complainant the conclusion. Any significant grievances which may pose a life-and-death scenario should be resolved immediately. Also, in the case of critical issues to be resolved, PD can also consult the managing director of PGCB for advice and guidance. The ESU/PMU officer will assist in the documentation and record keeping, and summary outcomes will be reported to ADB through monitoring reports. Also, the external monitor will take a role as a liaison between the GRC and ADB.

144. Apart from the above described three levels of GRM, contractors will also establish GRM at site level which will exclusively address the issues and grievances of the labour teams. However, whenever necessary, the aggrieved laborers also have the choice of approaching the project based GRM.

145. GRM does not impede access to the legal system. Affected persons can resort to legal action through the country's judiciary system at any time. They can also submit their grievances to ADB's Accountability Mechanism, which has both a problem-solving function to respond to concerns of project affected people and a compliance review function where there is discrepancy with implementation of ADBs operational policies.

146. The member secretary of GRCs will be regularly available and accessible for affected persons to address concerns and grievances. The legal advisor of the PGCB will support the GRCs in the regular process.

Table 8.1: Hierarchy of GRMs

Level	Members at Different Levels & Time Frame
Field Level	Project officers appointed by PGCB (Time frame is two weeks)
Local Community Level	1. Executive engineer of the project; 2. Contractor or his representative; 3. A male and a female member of the concerned Union; 4. A representative of the aggrieved party (the representative should be a female if the aggrieved party is a female). (Time frame is two weeks)
PMU Level	1. Project Director of the relevant subproject; 2. Resettlement Specialist of the environmental and social unit; 3. Team Leader of the contractor; 4. The one responsible for land acquisition; 5. A representative of the aggrieved party; 6. A representative of the civil society. (Time frame is one month)

8.4 Filing Grievance Cases and Documentation

147. Grievances will be filed without any fear and stress. The contractors will support the affected persons in drafting the grievances. All grievances must be submitted in writing to the Chair, GRC. The affected person himself/herself or appointed agent such as local elected officials/legal advisors are to represent the complainants. The judgment made by GRC will be communicated to the concerned affected person mainly in writing, also will be made allowances for those that are illiterate to be able to access. If dissatisfied, and with the agreement of the GRC, the affected person may request a further review of the judgment of GRC by the Project-level GRC. In such cases, the case will be forwarded to the Convener of the project-level GRC with all documentations. If he/she remains unsatisfied, he/she can go to the formal court of law of accountability mechanism for SPS related grievances.

148. Through community meetings, notices and pamphlets in the local language (Bangla) and the GRC procedures and operational rules will be publicized widely, so that APs are aware of their rights and obligations, and procedure of grievance redresses.

149. GRC meetings will be held as agreed by the Committee, in the respective field offices of the contractors/PGCB or other location(s). If required, GRC members may carry out field visits to verify and review the issues at dispute, including titles/shares, the reason for any delay in payments or other relevant matters. Through the process described below the affected persons will address the complaints and grievances.

Table 8.2: Grievance Resolution Process

Step 1	Complaint relating to the environmental impacts such as construction site waste disposal, soil erosion to agricultural lands, access roads, and site preparation activities, fugitive dust and other emissions (e.g. from vehicle traffic, land clearing activities, and materials
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	stockpiles), noise from heavy equipment and traffic, materials and oil spills associated with heavy equipment operation and fueling activities will be entertained by the GRC
Step 2	▪ The contractor assists the aggrieved affected persons to produce a written complaint to the convener of GRC with stories and expectations. The contractor counsels the aggrieved persons on the mandate and procedure of grievance resolution. ▪ GRC scrutinize the case records and sort out cases to be referred to the Deputy Commissioner or the court of law and those to be resolved in GRC. ▪ Hearing is organized on cases with merit at the GRC secretariat or at Union Parishad/Municipality Offices at local level and resolution is given by the GRC in one month of receiving the complaints. ▪ Aggrieved APs satisfied with the resolution approach the executing agency for assistance under the provision of the EMP/ RP. The agreed resolution is forward to PGCB for approval by the Project Director. ▪ In case the resolution is not acceptable to the aggrieved person, he/she approaches the Project Director through the GRC convener with assistance from the contractor for further review. ▪ Aggrieved APs may opt to approach to the Court of Law, if the resolution at PGCB is not acceptable to him/her
Step 3	▪ The resolution accepted by the aggrieved persons at any level (local, PMU) is approved by the Project Director and forwarded back to the Conveners' office keeping records at his/her office.

EA = executing agency, DP = Displaced Person, GRC = grievance redress committee, NGO = non-governmental organization, PGCB = Power Grid Company of Bangladesh, PMU = Project Management Unit.

9 OCCUPATIONAL HEALTH AND SAFETY PLAN

154. Occupational Health and Safety Management Plan is a highly effective communication tool. It forms a critical part of the agreement between parties and outlines how health and safety will be managed on a job. A SSHSMP is developed by subcontractors and main contractors to make sure that all relevant site information is available and regularly updated and that health and safety is habitually and consistently monitored.

9.1 CHSMP objectives

155. The objectives of this Environmental, Health and Safety Plan for the construction of Design, Supply, Installation, Testing & Commissioning of Rampura- Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2) are as follows:

- Promote a safe work environment free from recognized hazards to workers, the environment and the public. Commit resources to detect hazards and ensure hazard correction.
- Achieve an incident-free project by advocating the belief that all incidents are preventable.
- To comply with applicable local health and safety legislation
- Encourage consultants and contractors selected to work on this project to share and promote that same belief.
- Verify that safety policies and procedures are in place to assure worker and public health and safety as well as to promote natural capital.
- Ensure waste management and clearness environment.
- Enlist employee involvement with project safety to improve the quality of safety and health. This includes brainstorming, inspecting, detecting and correcting, from project startup to project completion.
- Ensure that all employees, consultants, and contractors have the knowledge, awareness, and training to accomplish the task ahead.
- Implement emergency response plans and procedures.
- Provide effective project communication plans and equipment.
- The efficient application of risk-reduction strategies and safe work practices.
- Ongoing performance enhancements in terms of safety.
- To ensure women's access to employment in construction by creating a safe work environment.
- To assure a workplace free of HIV/STDs/STI.
- To create awareness among workers on road safety, GBV, STD, HIV, COVID-19, and other infectious diseases.

9.2 Purpose of the plan

156. The purpose of this Plan is to establish and maintain an effective health and safety management system. Furthermore, a health and safety plan's goal are to manage, prevent risks by functioning, and minimize losses by assuring their efficacy. To enhance the safety performance of the task and process and

control the potential dangers therein, the safety plan organizes the interdependent operations and related measures in an orderly manner.

9.3 Scope of the plan

157. This Health and Safety Management Plan (HSMP) has been developed to assist all team members, workers and visitors involved in the Construction of Underground Cable line in Rampura-Bashundhara Route. Any Person Conducting a Business or Undertaking (PCBU) must follow the requirements stipulated in this HSMP, while on the project and operated site. This HSMP contains the Health and Safety requirements of the Contractor.

9.4 Contractors Occupational Health and Safety System

158. The contractor Occupational Health and Safety Management System helps to develop a safety culture and educate everyone regarding the importance of rules and regulations, safety performance monitoring, and continuous improvement in the safety management system at the workplace. The establishment of the contractor safety management system minimizes incidents, limits liability, and creates an overall safer work environment. The Contractors Occupational Health and Safety System includes safe practices, procedures, and responsibilities to be followed at the project site/manufacturing/operation unit by all contract personnel including manpower of sub-contractors (EnviroCare International Ltd).

159. Contractors providing supplies and services that can impact operations, employees or reputation must perform work in a manner consistent with the organization's policies. Contractors shall have effective systems in place to ensure that Health and Safety policies, principles, values, and internal standards are applied to their work.

9.5 ADB's Safeguard Policy

160. ADB's Safeguard Policy Statement (SPS) is the comprehensive articulation of ADB's safeguard provisions in three areas: environment, involuntary resettlement, and indigenous peoples. Country safeguards systems (CSS) are composed of the policies, practices, legal frameworks and institutions that a country puts in place to avoid, minimize or mitigate potentially adverse environmental and social impacts of development activities. ADB believes that the application of CSS to development projects reduces transaction costs, enhances country ownership and helps ensure long-term sustainability of development efforts.

161. ADB's safeguard policy aims to help developing member countries address environmental and social risks in development projects and minimize and mitigate, if not avoid, adverse project impacts on people and the environment.

9.5.1 ADB's Environmental Safeguard Policy Principle

162. Sound environmental management is critical to sustainable development and poverty reduction in Asia and the Pacific. Without committed efforts to safeguard the environment, pressure will continue to build on the region's land, forests, water systems, wetlands, marine ecosystems, and other natural resources--assets many of the poor depend on for their livelihoods.

163. ADB's environmental safeguards aim to ensure the environmental soundness and sustainability of projects, and to support the integration of environmental considerations into the project decision-making process. The Safeguard Policy Statement (SPS) requires borrowers to identify project impacts and assess their significance; examine alternatives; and prepare, implement, and monitor environmental management plans. The SPS requires borrowers to consult people likely to be affected by the project and disclose relevant information in a timely manner and in a form and in languages understandable to those being consulted. Assessment reports are required depending on the project's impact. This is the OHS requirement for all ADB projects:

- Safe and Healthy working condition.
- Prevent accidents, injuries and disease.
- Preventive and emergency preparedness and response.

9.6 IFC Environmental, Health and Safety Guidelines

164. The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). When one or more members of the World Bank Group are involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. These General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines which provide guidance to users on EHS issues in specific industry sectors. The General EHS Guidelines of IFC are organized as follows:

1. Environmental

- Air Emissions and Ambient Air Quality
- Energy Conservation
- Wastewater and Ambient Water Quality
- Water Conservation
- Hazardous Materials Management
- Waste Management
- Noise
- Contaminated Land

2. Occupational Health and Safety

- General Facility Design and Operation
- Communication and Training
- Physical Hazards
- Chemical Hazards
- Biological Hazards
- Radiological Hazards
- Personal Protective Equipment (PPE)
- Special Hazard Environments
- Monitoring

3. Community Health and Safety

- Water Quality and Availability
- Structural Safety of Project Infrastructure
- Life and Fire Safety (L&FS)
- Traffic Safety
- Transport of Hazardous Materials
- Disease Prevention
- Emergency Preparedness and Response

4. Construction and Decommissioning

- Environment
- Occupational Health and Safety
- Community Health and Safety

9.7 Contractor HSE Policy and Plan

165. A HSE (Health, Safety and Environment) policy outlines the rules adopted by the contractor from time to time relating to safety, health, or the environment. The SHE plans is a documented plan which addresses the hazards identified and includes safe work procedures to mitigate, reduce or control the hazards identified.

166. Consistent with the signed corporate safety policy statement, management is committed to a safety program throughout the execution of work.

- Safe execution of work;
- Zero incident and accident goal;

Roles & Responsibilities of EHS Personnel

Our Environment, Health, and Safety (EHS) personnel play a critical role in our organization by ensuring compliance with regulations, promoting a safe work environment, and addressing environmental concerns. However, the roles and responsibilities of EHS personnel can vary depending on the industry and organization size, but here are common functions associated with these roles:

Developing and Implementing Safety Programs:

- Design, implement, and manage safety programs to prevent workplace accidents and injuries.
- Conduct risk assessments and ensure the implementation of appropriate safety measures.

Compliance Assurance:

- Stay informed about relevant safety, health, and environmental regulations.
- Ensure the organization complies with local, state, and federal laws and standards.

Training and Education:

- Develop and deliver safety training programs for employees.
- Provide guidance on proper equipment usage, emergency procedures, and hazard recognition.

Incident Investigation:

- Investigate accidents, incidents, or near misses to identify root causes and prevent future occurrences.
- Prepare and maintain incident reports.

Emergency Response Planning:

- Develop and implement emergency response plans.
- Conduct drills and exercises to ensure preparedness for potential emergencies.

Hazard Assessment and Control:

- Identify workplace hazards and assess associated risks.
- Recommend and implement controls to mitigate or eliminate hazards.

Environmental Compliance:

- Monitor and manage the organization's environmental impact.
- Ensure compliance with environmental regulations and standards.

Auditing and Inspections:

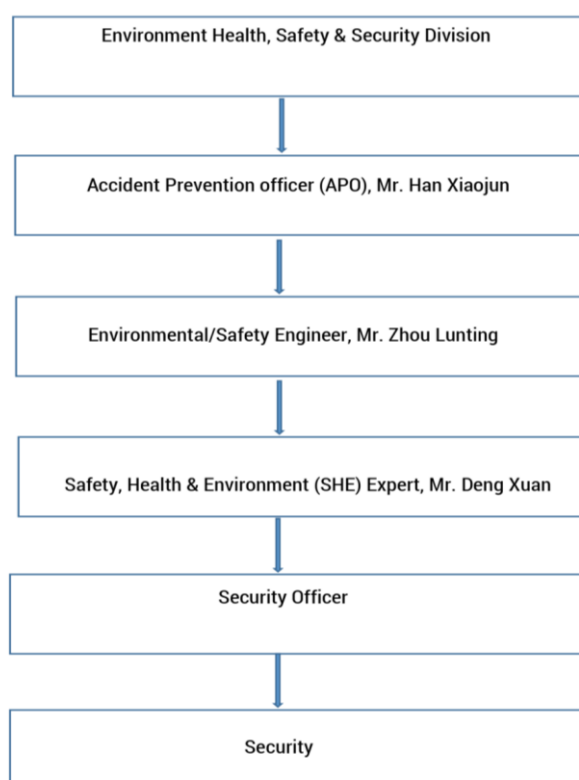
- Conduct regular safety and environmental audits and inspections.
- Identify areas of improvement and corrective actions.

Safety Communication:

- Facilitate communication between management and employees regarding safety expectations.
- Develop and distribute safety materials and information.

The contact details and Organogram of our Health & Safety personnel are provided below in a tabular form:

Name	Contact Number	E-mail
Han Xiaojun	+88 01781086146	hanxiaojun@tbea.com
Zhou Lunting	+88 01912605090	zhoulunting@tbea.com
Deng Xuan	+88 01977434746	dengxuan@tbea.com



9.8 Roles & Responsibilities

9.8.1 Project Manager

167. The project manager is responsible for the following duties and represents the upper levels of leadership on the project site:

- Ensuring the safety performance and accountability of subordinates.
- Ensure that the HS policy is understood and appreciated and the responsibilities are allocated to each grade.
- Increase and maintain safety values of the project.
- Coordinate with the HS Manager and act on his recommendation.
- Issue memo of concern when goals are missed.
- Include safety as part of each project meeting.
- Visibly demonstrating to the organization that personal commitment to safety is a number one priority.
- Maintain working methods in accordance with the HS regulations
- Review all accident / incident investigation reports.
- Coordinate with the subcontractors working on site and ensure that they comply with established safe working practices
- Ensure implementation of the Clients approved project-specific safety program.
- Participation in Risk Assessment Analysis and Review activities

9.8.2 Deputy Project Manager

- Assist the Project Manager on the above
- Assume the role of the Project Manager in this absence
- Ensuring that all employees are receiving required training to their work.
- Enforce the disciplinary program
- Monitor toolbox meetings.
- Ensure the quality of his respective site employee's safety performance.
- Participate in incident investigations.
- Planning safety into work activities.

9.8.3 Site / Construction Manager Report to the Project Manager / Assistant Project Manager

- Implementing the Company Environmental, Occupational Health & Safety practices.
- Carrying out a review with the Principal Contractor's project team to assist in the identification of further risk reduction control measures.
- Coordinate with the HSE Manager / HSE Officer to promote a safe working environment in the project.
- Stimulating a high level of safety awareness at all times.
- Identifying safety-training needs.
- Ensuring safe equipment and plant is provided and maintained.

- Implementing on correct and safe work procedures/practices at all times.
- Assisting in the identification and preparation of safe work procedures/practices.
- Reviewing safety reports and inspections and initiating rectification where necessary.
- Participating in accident/incident investigations.
- Participating in safety meetings and programs.
- Participation in Risk Assessment Analysis and Review activities.

9.8.4 Environment, Health & Safety (EHS) Manager

- Assists the project team to ensure that the quality, safety, health and environment aspects of the management system are implemented in the project.
- Preventing injury to personnel, damage to plant and equipment and fires
- Monitor the safety performance of the project.
- Legal and contractual requirements affecting safety, health, and welfare of workers.
- Provide monthly safety report with safety indices such as AFR (accident frequency rates) and incidents to management.
- Carrying out site surveys to see that only safe work methods are in operation, health and safety requirements are being observed and welfare and first aid facilities are adequate and properly maintained.
- Participation in Risk Assessment Analysis and Review activities.
- Prepare & submit the site environmental control programme before work commences.
- Implement any other ad-hoc Environmental control programs as the project progresses.
- Assist in conduct safety & health inspection and follow up actions to ensure safety compliances.
- Assist to conduct various emergency drills with demonstration of practicing safe working conditions by experienced safety instructors
- Providing training of employees at all levels.
- Monitor the condition and supply of safety equipment and replace it when supply depletes.
- Monitor Environmental, Occupational Health & Safety equipment maintenance and testing.
- Maintain Environmental, Occupational Health & Safety records.
- Ensure corrective and preventive action is taken promptly.

9.8.5 Site Engineer/Site Supervisor

- Implement the company Occupational Safety & Health procedures
- Organize the project site and other places of work so that all operations are carried out to the required standards with minimum of risk to workers, equipment and property.
- Ensure that all construction regulations and other legal requirements are complied.
- Ensure that all personnel employed are suitable for the jobs for which they have been recruited.
- Check that all machinery, plant, and equipment are maintained in good condition and that all guards and other appropriate safety devices are properly fitted and functional.
- Co-operate with the Safety & Health Officer and act on his recommendations.

9.8.6 Accident Prevention Officer (APO)

168. The Accident Prevention officer will work under the direction of Safety Manager. The accident prevention officer will support the development of OSH policies and program. Advise and instruct on various safety related topics. Conduct risk assessment and enforce preventive measures. Evaluate, review and recommend safe work methods and practices based on guidance from supervisor. Facilitate the assessment of exposure hazards such as dust, chemicals, radiation, confined spaces, ergonomics and other physical hazards. Review existing policies and measures and update accordingly. Provide professional support in the development and maintenance of the Emergency Response Procedure (ERP). Participate in exercises of the ERP and Execute specified role in the ERP.

9.8.7 First-Aider

- Render first aid treatment for the purpose of preserving life and minimizing the consequences of injury and illness until such help is obtained from a medical practitioner.
- Render treatment of minor injuries which do not need treatment by a medical practitioner or nurse.
- Assist to clearly identify every first-aid box or container placed in allocation that is well illuminated and easily accessible (ensure placed free of obstructed area).
- Check first aid box regularly and ensure every first-aid box or container is fully equipped and all the items in the box or container are usable.
- Replenish the contents of the first-aid box or container as soon as possible after use.
- Maintain record keeping system for all treatments and ensure availability of all first aid items.

9.8.8 Workers

- To use all personnel protective equipment (PPE) issued to them when carrying out their work.
- To observe all safety precautions and report all unsafe conditions.
- To attend safety training.
- To comply with the Site's in-house safety rules and regulations.
- Report to their Supervisors, any defects in plant or equipment.
- Maintain tools and equipment in good condition.
- All injuries, accident or dangerous or occurrence must be reported immediately to their supervisor.

9.9 Contractors and Subcontractors: Responsibilities

9.9.1 Contractor

169. Contractors are independent professionals or businesses that provide their services to other businesses or individuals. They may supply all the necessary labor and equipment to complete a project, or they may hire subcontractors or employees to do so.

- Negotiating contracts with clients
- Providing the required materials and labor for a project
- Hiring subcontractors for specialized projects
- Monitoring the day-to-day of a job site
- Monitoring a project's schedule, payments and cash flow

9.9.2 Subcontractor

170. A subcontractor is a contractor who works for another contractor. Contractors hire subcontractors to help them complete projects or provide services, such as construction work and maintenance.

- Comply with the terms of the subcontractor agreement.
- Frequently communicate with the general contractor and customer.
- Adjust to policy and procedure changes as needed.
- Perform labor and complete construction projects by their due dates.
- Stay within a set budget.

9.10 Safety Training and Safety Promotion

9.10.1 Safety Training

171. An effective safety management system must include training. The purpose of this is to ensure that employees and subcontractors, including new or transferred employees, receive adequate and proper safety training pertinent to their occupations, such as scaffold erection. The safety training program should cover all employees at all levels, including safety staff, managers, supervisors, front-line workers, and subcontractors.

172. Site personnel shall with establish procedures to ensure that all personnel are provided with Basic Safety Training. Some major Safety training courses include but not limited it's depending on the type of work criteria: -

- a) Safety Induction Course (Project familiarization training).
- b) Advanced Certificate in HSE/ OSHA/ IOSH/NEBOSH etc.
- c) Certificate in HSE.
- d) Environmental Control Supervisor Course.
- e) Workplace Safety & Health Coordinator / Supervisor.
- f) Scaffold Supervisor Course / Scaffold Erector Course.
- g) Lifting Supervisor Course.
- h) Signaller Course.
- i) Rigger Course.
- j) Crane Operator Course.
- k) Formwork Safety Course for Supervisor.
- l) Industrial First Aid Course.
- m) Confined Space Safety Assessors.
- n) SIC (Manhole) for Supervisor Course.
- o) Explosive Powered Tools Operator Course.15
- p) Working at Height.
- q) Excavation Safety.
- r) Working near water.
- s) Heavy Equipment Operation.

t) Basic Fire Fighting Training, etc.

u) Provide a trained firefighting team on site if required by Authority, to ensure the protection of life and property.

v) Provide training on the handling of emergency situations that may arise from the use of equipment in the Project.

9.10.2 Safety Promotion

173. Safety promotion includes incentive schemes that recognize, acknowledge and reward good OSH behaviors and performance either by individuals, teams, trades, departments or various worksites. Common safety promotional & motivational techniques include safety displays, poster, banners, videos and publications, etc. The objectives of safety promotion are to develop and maintain and reinforce employee's commitment to safety. Some of the promotional activities will include: -

a) Safety Notice Boards

174. Safety Boards are a robust solution to providing staff and visitors with easy access to health and safety information and equipment. Featuring essential signage, health and safety guidance and first aid equipment.

b) Work Related Specific Training

175. Work related specific training ensures that employees safely undertake their job. Such training, therefore, is a form of skill training and is often best provided on the site itself.

c) Behavioral Based Safety Training

176. Behavior-based safety acknowledges that workers often work in less-than-perfect conditions and will be forced to make choices between working safely or taking unsafe shortcuts. To combat this behavior-based safety training will be provided.

d) Safety Training Facilities

177. Safety training facilities are important to provide knowledge about safety practices in the site.

e) Health Safety Rewards

178. It is a way to encourage safety in the workplace, to offer prize for extended periods of incident-free workdays.

f) Display of safety policy

179. Safety policy will be displayed in local language in the worksite to provide reminder to the workers. Also, this helps in enforcing the policy.

- Safety banners and posters
- Safety handbooks and brochures.
- Participation in external safety activities.
- Conduct of in-house safety exhibition.
- Mass Safety Talks.
- Demonstration of first-aid drills.
- Conduct of emergency drills exercise and assembly point.
- Safety Conscious worker.

- Safety video shows

9.10.3 Safety Issues

180. UFO (Unsafe Flying Objects), FIFO (First in, First Out), and Lock Out & Tag Out - are related to safety procedures on a construction site.

Lock Out & Tag Out (LOTO) Procedure:

1. Definition:

- Lock Out & Tag Out is a safety procedure that would be used in our project site to ensure that dangerous machines and energy sources are properly shut off and not started up again before maintenance or repair work is completed.

2. Procedure:

- **Notification:** Notify all affected employees that a lockout is required and the reason for it.
- **Equipment Shutdown:** Turn off the equipment using the normal stopping procedure.
- **Isolation:** Identify and isolate the energy sources to the equipment, including electrical, mechanical, hydraulic, pneumatic, and gravitational sources.
- **Locking:** Apply locks to energy-isolating devices to ensure they cannot be operated. Each authorized employee should attach their personal lock.
- **Tagging:** Attach a tag indicating that the equipment is locked out and should not be operated. Tags should include information such as the reason for the lockout and the person who applied it.
- **Verification:** Ensure that the equipment is properly isolated by attempting to start it.
- **Work Completion:** Perform maintenance or repair work as needed.
- **Removal of Locks and Tags:** Only the person who applied the lock and tag should remove them once the work is completed.

3. Training:

- All employees involved in equipment maintenance or working in areas where lockout/tag out is performed should receive training on the procedure.
- Training should cover the purpose, importance, and steps of the lockout/tag out process.

4. Regular Review:

- Periodically review and update lockout/tag out procedures to ensure they remain effective and relevant.
- Conduct regular audits to ensure compliance with the procedure.

FIFO (First In & First Out) Procedure:

In the context of safety procedures on a construction site, FIFO (First In, First Out) would be applied to the use and rotation of certain safety equipment or materials in our project site.

1. Personal Protective Equipment (PPE):

- Usage Rotation: Ensure that PPE, such as hard hats, safety glasses, gloves, and hearing protection, is used on a "First In, First Out" basis. Older equipment may degrade over time, so using the older equipment first helps maintain its effectiveness.

2. Fall Protection Gear:

- Harnesses and Lanyards: Rotate the use of safety harnesses and lanyards based on their purchase or issue date. This helps ensure that the equipment is not only compliant with safety standards but also in good working condition.

3. Fire Extinguishers:

- Inspection and Replacement: Adhere to a FIFO system for fire extinguishers. Regularly inspect them and replace based on the manufacturing date or the date of the last inspection.

4. Emergency Response Kits:

- First Aid Supplies: Rotate and replenish first aid supplies in emergency response kits on a FIFO basis. This helps ensure that medical items are within their expiration dates and readily available in case of an emergency.

5. Safety Signage:

- Replacement of Warning Signs: FIFO can be applied to safety signage, especially warning signs. Replace or update signs based on their age, ensuring they remain clear and visible.

6. Traffic Control Devices:

- Reflective Equipment: Apply FIFO principles to reflective materials used for traffic control. Ensure that reflective vests, cones, and other devices are replaced in a timely manner to maintain visibility.

7. Chemical and Hazardous Material Storage:

- Inventory Control: If the construction site involves the use of hazardous materials, implement FIFO for the storage and use of these substances. This minimizes the risk of using expired or compromised materials.

8. Training and Certification:

- Employee Certification Renewal: FIFO can also be applied to employee training and certifications. Ensure that employees renew their safety certifications and receive updated training in a timely manner.

UFO Procedure:

1. Site Assessment:

- Conduct a thorough assessment of the construction site to identify potential sources of airborne objects or debris. This could include nearby construction activities, overhead work, or environmental factors.

2. Secure Tools and Materials:

- Ensure that all tools, equipment, and materials used on elevated surfaces are properly secured to prevent them from becoming airborne during work activities.
3. **Wind Monitoring:**
 - Implement a system to monitor wind conditions on the construction site. High winds can increase the likelihood of objects becoming airborne.
 4. **Exclusion Zones:**
 - Establish exclusion zones where certain construction activities or equipment operation is restricted during adverse weather conditions or when the risk of flying objects is high.
 5. **Communication:**
 - Maintain open communication channels among workers and supervisors to report and respond to potential airborne objects or debris.
 6. **Personal Protective Equipment (PPE):**
 - Provide appropriate PPE, such as hard hats and safety glasses, to workers to protect against potential hazards from airborne objects.
 7. **Emergency Response Plan:**
 - Develop and communicate an emergency response plan that includes procedures for addressing incidents involving airborne objects. This may involve evacuation procedures and communication protocols.
 8. **Training:**
 - Train workers on the risks associated with unidentified flying objects and the importance of following safety procedures to mitigate these risks.
 9. **Weather Monitoring:**
 - Regularly monitor weather conditions, especially during periods of high wind, storms, or adverse weather. Suspend work activities if conditions pose a significant risk.
 10. **Clear Work Areas:**
 - Keep work areas clear of unnecessary materials and equipment that could become projectiles during adverse weather conditions.
 11. **Equipment Maintenance:**
 - Regularly inspect and maintain construction equipment to ensure that it is in proper working condition, minimizing the risk of objects becoming dislodged during operation.

9.10.4 Right of Way (RoW) Issues

181. According to Electricity Act, 2020, The "right of way" (ROW) in a transmission line installation project refers to the legal right to pass over or use a strip of land for the construction, operation, and maintenance of the transmission lines and associated facilities. This strip of land typically extends beyond the physical boundaries of the transmission lines to ensure safe and unobstructed operation. Here are key considerations related to the right of way in a transmission line installation project:

1. Acquisition Process:

- **Negotiation:** The process often begins with negotiation between the project developers (or utility companies) and the landowners. Negotiations may involve compensation for the use of the land.
- **Easements:** Legal documents known as easements are often used to grant the right of way. Easements define the specific rights granted to the utility company and the responsibilities of both parties.

2. Width and Boundaries:

- **Width:** The width of the right of way depends on various factors, including the voltage of the transmission lines, the type of towers or poles used, and environmental considerations.
- **Boundaries:** Clearly defining the boundaries of the right of way is essential to avoid encroachment and potential safety hazards.

3. Environmental Impact:

- **Environmental Assessment:** Before acquiring the right of way, an environmental impact assessment is often conducted to identify potential impacts on flora, fauna, and ecosystems.
- **Mitigation Measures:** Implementing mitigation measures to minimize environmental impact, such as re-vegetation and habitat restoration.

4. Community Engagement:

- **Stakeholder Consultation:** Engage with local communities and stakeholders to address concerns, provide information about the project, and gather input.
- **Public Meetings:** Conduct public meetings to discuss the project and its potential effects on the community.

5. Regulatory Approvals:

- **Permitting:** Obtain necessary permits and approvals from regulatory authorities before starting the project.
- **Compliance:** Ensure compliance with local, state, and federal regulations governing land use and environmental protection.

6. Compensation:

- **Fair Compensation:** Landowners are typically compensated for granting the right of way. Compensation may include upfront payments, annual fees, or other agreed-upon arrangements.

7. Access for Maintenance:

- **Access Roads:** Design and establish access roads within the right of way to facilitate maintenance and emergency response.
- **Maintenance Obligations:** Clarify maintenance obligations and responsibilities in the easement agreement.

8. Safety Considerations:

- **Clear Zones:** Maintain clear zones within the right of way to prevent vegetation and structures from interfering with the transmission lines.
- **Safety Signage:** Install safety signage to alert individuals about the presence of high-voltage lines and the potential dangers.

9. Landowner Rights:

- **Residual Rights:** Clearly define the residual rights of landowners, ensuring that they retain certain property rights not granted to the utility company.

According to Electricity Act, 2020, The minimum safe distance from unscreened conductor while repairing a disconnected line is given below in a tabular format.

Voltage between Two Fes	The minimum safe distance from unscreened conductor [BS 7354 'Safety Working Clearance']	
	Meter	Feet
11 KV	2.60	8.5
33 KV	2.80	9
132 KV	3.80	12.5
230 KV	4.60	15
400 KV	6.40	21

Sl. No.	Voltage (Kilo Volt)	Right of Way (RoW) (m)	The minimum safe distance from unscreened conductor [BS 7354 'Safety Working Clearance']
1	11	2.50	2.50
2	33	3.50	2.80
3	132	14.00	3.80
4	230	20.00	4.60
5	400	23.00	6.40
6	765	43.00	10.3

9.11 Accident Investigation & Action

182. Accident investigation is the process of determining the root causes of accidents, on-the-job injuries, property damage, and close calls in order to prevent them from occurring again. Completing an accident investigation will be beneficial in determining safety hazards or safety training that will need to be addressed to reduce the risk of more injuries.

- STEP 1: Assess the injury
- STEP 2: Obtain medical treatment if necessary
- STEP 3: Interview injured employee and witness(es)
- STEP 4: Observe accident scene and analyze the facts
- STEP 5: File a workers' compensation claim
- STEP 6: Follow up
- STEP 7: Corrective action

9.11.1 Recommended actions in incident investigation

183. When incidents are investigated, the emphasis will be concentrated on finding the root cause of the incident so the authority can prevent the event from happening again. The purpose is to find facts that can lead to corrective actions, not to find fault. Always look for deeper causes.

a) Documentation: All incident and their investigation will be well documented so preventive measures can be taken.

b) Incident cause investigation and reporting:

184. When an incident occurs, the incident investigation and reporting process shall follow the steps mentioned below and Incident Investigation and Reporting Flow Chart. Incident categories

185. All incidents are classified according to the following categories to determine the level of incident inspection, investigation and reporting and report submission time required.

Category A- Fatal or serious (loss of body part) incident and dangerous occurrence (Reportable Incident).

Category B- Injury case that resulted in more than 3 days of medical leaves or 24hours hospitalization leave (Reportable Incident).

Category C- Injury case that resulted less than 3 days of medical leaves (Considerable Incident).

Category D - Other than the above (etc. Near-miss, fire incident &Property Damage Case).

186. The Contractor shall notify the Engineer immediately of any dangerous occurrence, robbery or incident that results in, or had the potential to cause, bodily injury.

c) Preventive Measure

187. Accident prevention involves identifying potential hazards, assessing the associated risks, and implementing appropriate measures to control or eliminate these risks. This process typically includes the following:

Education and training: Ensuring that individuals are aware of potential hazards and are equipped with the necessary knowledge and skills to work safely.

Engineering controls: Designing and maintaining facilities, equipment, and machinery to minimize the risk of accidents.

Administrative controls: Implementing policies, procedures, and guidelines to promote safe practices and behaviors.

Personal protective equipment (PPE): Providing appropriate protective gear for individuals to reduce the risk of injury when hazards cannot be entirely eliminated.

Emergency preparedness and response: Establishing procedures for dealing with accidents or emergencies to minimize harm and ensure a prompt and effective response.

9.12 Capacity Building

188. The laborers or workers will be capacitated regarding occupational health and safety. They will be informed what risks are being associated with their regular works and how it is to be mitigated or managed for making confirm more secured work environment.

Table 9.1: Sample Table for Conducting Training/Awareness Sessions

Types of Capacity building	No. of Participants	Topics	Date	Remarks
Training		Importance on using of PPE (Personnel Protective Equipment) during working at the site.		
Awareness		- Solid waste will be caused for accident in the work place if not properly managed. - If any accident occurs, how quickly victim will be sent to the nearest hospital or medical centre - Importance on using of First-Aid box which is available at site. - Using of masks, hand sanitizers or soap frequently and maintaining social distancing to reduce the risks of COVID-19 pandemic.		
Inspection		- Importance on using of hygienic latrines and clean drinking water. - Using soap after using latrine, before eating to ensure disease free workforce. - Importance on using of dustbin to keep household or other wastes and disposed of in a safe place, and - Discouraging of haunting or trapping of wild or domestic birds or animals to avoid social conflict etc.		

9.13 Availability of First Aid Kit Box

189. A first aid kit or medical kit is a collection of supplies and equipment used to give immediate medical treatment, primarily to treat injuries and other mild or moderate medical conditions. In the event of an accident or injury, workers will be treated immediately to avoid further harm and to ensure a full recovery. The number of instruments those will be available in the first aid kit are as following-

- Salines
- Syringes
- Cotton Balls
- Gauge pads
- Pair of vinyl gloves
- Whistle
- Pbt Bandage
- Emergency blanket silver
- Tick remover
- Cleaning wipe
- Gauge sponge
- Soap wipe

- Per nails
- Sciss
- Adhesive taps
- Alcohol pads
- First aid medicine etc.

9.14 Supply or Availability of PPE (Personnel Protective Equipment)

190. The following PPE (Personnel Protective Equipment) will supply at the construction sites before commencing of works and it is to be ensured that every worker is using this PPE while they are working at the site. If anyone will not use it, he/she will be escaped from the site also.

Table 9.2: Availability of Personal Protective Equipment (PPE)

Name of PPE	Nos.	Date & locations	Remarks
Hard Helmet			
Hard Boot			
Safety Belt			
Jacket			
Hand Gloves			
Eye Protectors			
Air plug while working at the noisy construction site.			

9.15 General Requirements for the Workers' Health and Safety

191. The key salient features of the general requirements for the workers' health and safety stated are presented in **Table 9-3**.

Table 9.3: Sample Complaints Register

Issues	Requirements
Health and Hygiene	• Cleanliness at the site premises and workers living places and at the Labor Sheds; • Arrangement of the proper ventilation and temperature at the Labor Sheds; • Protection against dust and furnace by using of the nose masks and covering of the head and body; • Proper disposal of the wastes and effluents; • Introduce waste bins for the solid waste management system.
Safety and First Aid Box	• Using of the personal protective equipment (helmet, gloves, goggles, nose mask, safety boots); • Precautions during work on or near machineries in motion; • Head loads are prohibited; • First aid facilities will be provided and maintained; • The first aid kit should include adhesive bandages, regular strength pain medication, gauze, and low-grade disinfectant.

Issues	Requirements
Compensation for Accidents at Work	Contractors will bear medical treatment costs. If any severe accidents such as loss of hands, legs or loss of working ability or any case of death needs compensation (the amount of the compensation will be fixed considering the type of accidents).
Dust and Fumes	For any dust, fumes, or other impurities likely to be injurious to the workers, effective measures will be taken to prevent their accumulation and its inhalation by the workers.
Overcrowding	No labor room will be overcrowded.
Latrines and Urinals	- Sufficient latrines will be provided; - Latrines will be maintained in clean and sanitary condition; - Latrines will be adequately lighted and ventilated.
Disposal of Wastes and Effluents	- Proper disposal system for the solid waste and effluent is required; - Waste bins must be provided by the contractor at labor shed.

9.16 Site Emergency Response Plans

192. In the event of any emergency the Site Manager must be contacted to ensure the appropriate action is taken. Details about the nearest hospital, fire service and police station are given in Appendix.

Table 9.4: Site Emergency Response Plan

Potential Emergency	What to Do?	Relevant Authorities and Personnel
Injury caused by: - Fire - Explosion - Machinery accidents - Minor injuries	- For serious injuries call an ambulance. - Site authority should also have the contact details of the nearest doctor, Medical Centre and Hospital. - Immediately inform the site First Aid Officer. - Follow the procedures as detailed in the Site Safety plan. - For major injuries contact the Site Manager or Project Manager and EHS.	- Emergency Services - Nearest Doctor - Medical Centre - Site Manager /Supervisor - Project Manager
Fire - Fire at the diesel tank - Fire at any of the machineries - Fire caused by vandalism	- Evacuate all personnel to a safe area immediately. - Call the Fire Brigade (Emergency Services). - If the fire is likely to damage neighboring property inform the adjacent residents. - Follow the procedures as detailed in the project Site Safety plan. - For major fire emergencies, contact the Site Manager or Project Manager	- Emergency Services - Adjacent Residents - Medical Centre - Site Manager /Supervisor - Project Manager
Spills Management & Contaminated Soils - Spill or release of diesel fuel or oil - Spill or release of other hazardous	- For major spills, (defined as a spill that is likely to have direct environmental consequences.) - Immediately call the Fire Brigade and notify superintendent. - Identify the source of the spill.	- Emergency Services - Site Manager /Supervisor - Project Manager - EHS Officer

Potential Emergency	What to Do?	Relevant Authorities and Personnel
chemicals or Material	Refer to the Material Safety Data Sheet (MSDS) and evaluate the hazards of the material.	
Emergencies & Critical Incident	- Follow procedures as per site specific emergency/evacuation procedure, outlined in the induction presentation or SSEMP - Notify Superintendent	- Site Manager /Supervisor - Project Manager - EHS Officer
Discovery of items of conservation value (e.g. flora & fauna, heritage)	Fence off the area as “no go” zone and contact the Site Manager or Project manager and EHS immediately for further action.	- Site Manager /Supervisor - Project Manager - EHS Officer
Discovery of contaminated material on-site (e.g. underground fuel storage tanks)	Fence off the area as “no go” zone and contact the Site Manager or Project manager and EHS immediately for further action.	- Site Manager /Supervisor - Project Manager - EHS Officer

9.17 Site Inspection

193. The working sites will record the occupational accidents and make the corrective action plan to reduce the risks in future.

Table 9.5: Inspection to Be Conducted at the Site

Location	Fire safety is available at the site		PPE used by the labourers during construction?		Emergency preparedness is available at the site?		Hygienic latrine and clean water used by the labourers?		Remarks
	Yes	No	Yes	No	Yes	No	Yes	No	

9.18 Corona Effect and EMF Issues of the Transmission Tower

194. The term "**Corona effect**" in the context of power transmission refers to the phenomenon of corona discharge that occurs when high-voltage electricity ionizes the air surrounding a conductor. This phenomenon is more commonly associated with high-voltage transmission lines and is not related to the coronavirus. Here are some key points about the Corona effect in power transmission:

- Ionization of Air:** When the electric field around a conductor exceeds a certain threshold, it can cause the air surrounding the conductor to break down and ionize. This ionization creates a faint glow and a hissing or crackling noise, and it is known as corona discharge.
- Power Loss and Radio Frequency Interference:** Corona discharge can lead to power loss in the transmission line, as energy is dissipated in the form of ozone, nitrogen oxides, and other byproducts. Additionally, it can generate radio frequency interference (RFI) that may affect communication systems.

3. **Mitigation Measures:** Utilities take measures to minimize the corona effect. This can include using conductors with larger diameters, modifying the shape of conductors, or increasing the spacing between conductors. These measures help reduce the electric field strength and mitigate the corona discharge.
4. **Environmental Impact:** While the corona effect itself is a normal consequence of high-voltage transmission, the byproducts of corona discharge, such as ozone, can have environmental impacts. Ozone, when produced in significant quantities, may contribute to air pollution.

It's important to note that while the corona effect is a well-known phenomenon, it is typically managed and controlled to minimize its impact on power transmission systems and the environment. TBEA Co. Ltd. is committed to develop research and engineering practices continue to evolve to improve the efficiency and environmental sustainability of power transmission systems.

195. Power transmission towers and lines generate **electromagnetic fields (EMF)** due to the flow of electric current. These fields are associated with both electric and magnetic components. Concerns about the potential health effects of exposure to EMF from power transmission lines have been the subject of research and public discussion.
196. **According to the update in January 2022**, the scientific consensus, supported by organizations like the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and the World Health Organization (WHO), is that there is no conclusive evidence of adverse health effects at the levels typically encountered near power lines. However, Key points regarding EMF issues related to power transmission towers:
 1. **Strength of EMF:** The strength of EMF decreases rapidly with distance from the source. At typical residential distances from power lines, the strength of the EMF is much lower than levels considered to be of concern.
 2. **Regulations and Guidelines:** Many countries have established regulations or guidelines to limit human exposure to EMF. These regulations are based on scientific assessments of potential health risks. ICNIRP provides guidelines for limiting exposure to non-ionizing radiation, including EMF.
 3. **Research:** Ongoing research continues to investigate the potential health effects of long-term exposure to low-frequency EMF. However, the overall consensus, as of my last update, is that the evidence does not support a clear link between EMF from power lines and adverse health effects.
 4. **Mitigation Measures:** Utilities and regulatory bodies may implement measures to minimize EMF exposure, such as optimizing the design of power lines or using technologies that reduce EMF emissions. However, these measures are typically motivated by engineering considerations and public concerns rather than established health risks.

9.19 Safety Protocol

197. Safety protocols are established procedures and guidelines designed to ensure the well-being and security of individuals, equipment, and the environment in various settings. The specific safety protocols can vary depending on the context, such as in workplaces, laboratories, manufacturing facilities, healthcare institutions, and more. Here are some relevant safety protocols listed below:

9.19.1 Mosquito Borne Diseases

198. Mosquito-borne diseases can pose a risk on our construction sites, and it's essential to implement safety protocols to protect workers and prevent the spread of diseases. Here are some safety protocols specifically tailored to address mosquito-borne diseases on construction sites:

1. Risk Assessment:

- Identify areas with potential mosquito breeding sites, such as standing water.
- Assess the prevalence of mosquito-borne diseases in the region.

2. Mosquito Control Measures:

- Implement mosquito control measures to reduce breeding grounds, such as removing standing water, clearing debris, and using parricides.
- Consider the use of mosquito nets, screens, or other physical barriers in sleeping quarters or break areas.

3. Personal Protective Measures:

- Provide and encourage the use of insect repellent containing DEET or other recommended active ingredients.
- Ensure that workers wear long-sleeved shirts and long pants, especially during peak mosquito activity times.

4. Training and Awareness:

- Conduct training sessions to educate workers about the risks of mosquito-borne diseases and the importance of preventive measures.
- Raise awareness about the symptoms of diseases like malaria, dengue, and Zika.

5. Work Scheduling:

- Plan and schedule outdoor work to minimize exposure during peak mosquito activity times, such as dawn and dusk.
- Consider adjusting work hours to reduce the risk of exposure.

6. First Aid and Medical Support:

- Ensure that first aid kits are stocked with necessary supplies to treat insect bites.
- Provide information on local medical facilities and procedures in case of suspected mosquito-borne illness.

7. Site Maintenance:

- Regularly inspect and maintain the construction site to eliminate potential mosquito breeding sites.
- Keep the site clean and free from debris that can collect water.

8. Monitoring and Surveillance:

- Establish a monitoring system to track mosquito activity and disease prevalence in the area.
 - Stay informed about local health advisories and take appropriate actions based on the information.
- 9. Reporting and Response:**
- Implement a reporting system for workers to notify supervisors of any mosquito-related concerns.
 - Develop a response plan for suspected cases of mosquito-borne diseases, including isolation and medical evaluation.
- 10. Collaboration with Health Authorities:**
- Work closely with local health authorities to stay informed about disease trends and recommended preventive measures.
 - Follow any specific guidelines provided by health agencies for construction sites.
- 11. Communication:**
- Maintain open communication with workers about the importance of following safety protocols related to mosquito-borne diseases.
 - Display informational materials in common areas to reinforce preventive measures.
- 12. Continuous Review and Improvement:**
- Regularly review and update safety protocols based on feedback, changes in disease prevalence, and evolving construction site conditions.

9.19.2 Harmful Fauna

199. Our construction sites can pose risks of encounters with harmful fauna, such as venomous snakes, insects, or other wildlife. Implementing safety protocols to mitigate these risks is crucial to ensuring the well-being of workers. Here are some safety protocols for dealing with harmful fauna on construction sites:

- 1. Site Assessment:**
 - Conduct a thorough assessment of the construction site to identify potential habitats for harmful fauna.
 - Take into account local fauna, seasonal variations, and environmental factors.
- 2. Educational Programs:**
 - Provide training sessions for workers on recognizing and avoiding encounters with harmful fauna.
 - Educate workers about the local wildlife, including species that may pose a threat.
- 3. Protective Clothing:**
 - Require workers to wear appropriate protective clothing, such as sturdy boots, long pants, and gloves.
 - Consider the use of snake gaiters or other protective gear in areas with a high risk of encounters.
- 4. First Aid Training:**
 - Train workers in basic first aid procedures for bites, stings, or encounters with harmful fauna.

- Ensure that first aid kits are well-stocked with supplies for treating injuries caused by wildlife.
5. **Communication and Signage:**
- Clearly communicate areas with potential wildlife risks through signage.
 - Mark paths and zones where harmful fauna sightings have been reported.
6. **Emergency Response Plan:**
- Develop and communicate an emergency response plan for wildlife encounters.
 - Include procedures for notifying supervisors, providing first aid, and seeking medical assistance.
7. **Wildlife Removal and Exclusion:**
- Collaborate with local wildlife control services to remove or relocate harmful fauna if necessary.
 - Implement measures to exclude wildlife from construction areas, such as fencing or netting.
8. **Regular Site Inspections:**
- Conduct regular inspections of the construction site to identify changes in wildlife activity.
 - Respond promptly to any reports of harmful fauna sightings.
9. **No Feeding Policy:**
- Enforce a strict no-feeding policy for workers to discourage wildlife from approaching construction areas.
 - Discourage the presence of food waste that may attract wildlife.
10. **Collaboration with Local Authorities:**
- Work with local wildlife and environmental authorities to understand regional fauna and receive guidance on safety measures.
 - Obtain permits or approvals for any necessary wildlife control activities.
11. **Safe Shelter Areas:**
- Designate safe shelter areas where workers can seek refuge in the event of a wildlife encounter.
 - Provide clear instructions on where to go and what to do if wildlife is spotted.
12. **Record Keeping:**
- Maintain records of wildlife encounters, including the type of fauna, location, and any actions taken.
 - Use this information to improve safety protocols over time.
13. **Worker Reporting System:**
- Establish a reporting system for workers to promptly communicate any wildlife sightings or encounters.
 - Encourage a culture of reporting to enhance overall site safety.
14. **Continuous Training and Updates:**
- Conduct regular refresher courses and updates on wildlife safety protocols.
 - Stay informed about changes in local wildlife patterns or behaviors.

9.19.3 Transmitting Diseases

200. Community safety on and around our construction sites is crucial for preventing the transmission of diseases. Construction activities can impact both workers and the surrounding community. Here are some community safety issues related to disease transmission on construction sites and associated preventive protocols:

1. Dust and Airborne Particles:

- **Issue:** Construction activities can generate dust and airborne particles that may carry infectious agents.
- **Preventive Protocols:**
 - Use dust control measures such as water suppression, dust barriers, and covering materials.
 - Provide workers with appropriate respiratory protection.
 - Schedule activities to minimize dust generation during windy conditions.

2. Noise and Communication:

- **Issue:** Excessive noise from construction sites can disrupt the community and hinder communication about health and safety practices.
- **Preventive Protocols:**
 - Implement noise reduction measures, such as barriers and soundproofing.
 - Clearly communicate construction schedules and potential noise disruptions to the community.
 - Establish designated communication channels for community concerns.

3. Waste Management:

- **Issue:** Improper disposal of construction waste can attract pests and pose a health risk to the community.
- **Preventive Protocols:**
 - Implement proper waste segregation and disposal practices.
 - Secure waste containers to prevent access by pests.
 - Provide education to the community on proper waste disposal.

4. Vector-Borne Diseases:

- **Issue:** Construction sites may create breeding grounds for disease vectors such as mosquitoes, increasing the risk of diseases like dengue or malaria.
- **Preventive Protocols:**
 - Implement mosquito control measures, as mentioned in the previous response.
 - Regularly inspect and eliminate standing water on the construction site.
 - Collaborate with local health authorities to monitor vector-borne disease risks.

5. Traffic Management:

- **Issue:** Increased traffic around construction sites can lead to accidents and hinder emergency response efforts.
- **Preventive Protocols:**
 - Implement traffic management plans to reduce congestion and improve safety.
 - Clearly mark pedestrian and vehicle pathways.
 - Coordinate with local authorities to manage traffic flow.

6. Community Access and Security:

- **Issue:** Construction sites can pose security risks to the community if not properly managed.
 - **Preventive Protocols:**
 - Restrict unauthorized access to the construction site.
 - Implement security measures to prevent theft and vandalism.
 - Communicate construction site security protocols to the community.
7. **Community Engagement:**
- **Issue:** Lack of communication and engagement with the community can lead to misunderstandings and concerns.
 - **Preventive Protocols:**
 - Establish community liaison officers to facilitate communication.
 - Conduct regular community meetings to address concerns and provide updates.
 - Share information about construction-related health and safety measures.
8. **Zoonotic Risks:**
- **Issue:** Construction sites near natural habitats may increase the risk of zoonotic diseases.
 - **Preventive Protocols:**
 - Conduct ecological assessments to identify potential zoonotic risks.
 - Implement measures to prevent contact between construction workers and wildlife.
 - Educate the community about potential risks and preventive measures.
9. **Occupational Health and Safety Training:**
- **Preventive Protocols:**
 - Provide construction workers with training on occupational health and safety practices.
 - Include community members in safety awareness programs.
 - Promote a culture of safety and responsibility among workers.
10. **Pandemic Preparedness:**
- **Issue:** Construction sites may be vulnerable to the spread of infectious diseases, including pandemics like influenza or respiratory viruses.
 - **Preventive Protocols:**
 - Develop and implement pandemic preparedness plans.
 - Enhance hygiene practices, such as handwashing stations and sanitation measures.
 - Encourage vaccination and health monitoring among workers.

10 Site Specific Plan of Clearing Vegetation Issue

201. A site specific plan of clearing vegetation issue is a comprehensive plan prepared for a specific construction site that outlines the scope of work on a project, identifies risks of clearing vegetation, and details company policies and preserving vegetation practices to follow. Creating a site-specific plan for clearing vegetation requires careful consideration of environmental impact, legal requirements, and the specific goals for the cleared area.

10.1 Objectives

202. The objective of this site-specific plan for clearing vegetation is to ensure that the removal of vegetation is carried out in a responsible, sustainable, and environmentally sensitive manner. The primary goals include:

1. Compliance with Regulations:

- Ensure adherence to local, state, and national regulations regarding vegetation removal.
- Obtain the necessary permits and approvals to comply with environmental protection laws.

2. Environmental Preservation:

- Minimize the impact on the local ecosystem by carefully assessing the ecological value of the vegetation and considering the potential effects on wildlife.
- Implement measures to protect and preserve any endangered or protected species.

3. Safety and Infrastructure Development:

- Create a safe environment by clearing vegetation that poses a threat to public safety or property.
- Provide space for the development of infrastructure, such as buildings, roads, or utilities, in a planned and organized manner.

4. Mitigation of Environmental Impact:

- Implement measures to mitigate the environmental impact of vegetation removal, including erosion control, sedimentation barriers, and replanting native species.
- Aim to balance the need for clearing with the preservation of the natural environment.

5. Community Engagement and Communication:

- Foster positive communication with the local community and stakeholders by transparently sharing the reasons for vegetation clearing and addressing concerns.
- Seek input and feedback to incorporate community perspectives into the planning process.

6. Effective Resource Utilization:

- Optimize the use of resources during the clearing process, minimizing waste and promoting responsible waste management practices.
- Consider recycling or repurposing materials derived from cleared vegetation where possible.

7. Rehabilitation and Restoration:

- Develop strategies for the post-clearing rehabilitation of the site, including soil stabilization and replanting native vegetation.
- Aim to restore the site to a condition that supports ecological balance and resilience.

8. Emergency Preparedness:

- Develop an emergency response plan to address unforeseen issues or emergencies that may arise during the vegetation clearing process.
- Ensure that the plan includes measures to minimize any potential negative impacts on the environment.

9. Documentation and Accountability:

- Maintain comprehensive records of the planning, permitting, and implementation phases.
- Establish accountability for compliance with regulations and the successful execution of the vegetation clearing plan.

10.2 Performance Indicator

203. Performance indicators are essential for assessing the effectiveness of a site-specific plan for clearing vegetation. These indicators help gauge whether the objectives are being met and whether the plan is being implemented successfully. Here are some key performance indicators (KPIs) for evaluating the performance of a vegetation clearing plan:

1. Compliance with Regulations:

- Percentage of required permits obtained.
- Number of regulatory violations incurred during the vegetation clearing process.

2. Environmental Preservation:

- Preservation rate of identified endangered or protected species.
- Success rate of implemented measures to protect wildlife during and after vegetation clearing.

3. Safety and Infrastructure Development:

- Reduction in the number of safety incidents related to vegetation.
- Progress in achieving planned infrastructure development milestones.

4. Mitigation of Environmental Impact:

- Effectiveness of erosion control measures, measured through soil erosion rates.
- Percentage of replanted native vegetation that successfully establishes itself.

5. Community Engagement and Communication:

- Level of community satisfaction based on feedback surveys.

- Number of community concerns addressed and resolved during the planning and implementation phases.
6. **Effective Resource Utilization:**
 - Percentage of recycled or repurposed materials from cleared vegetation.
 - Reduction in waste generated compared to initial estimates.
 7. **Rehabilitation and Restoration:**
 - Success rate of post-clearing rehabilitation efforts, including soil stabilization.
 - Percentage of the site restored to its pre-clearing ecological state.
 8. **Emergency Preparedness:**
 - Response time to address unforeseen issues or emergencies.
 - Effectiveness of emergency response measures in minimizing environmental impact.
 9. **Documentation and Accountability:**
 - Completeness and accuracy of documentation throughout the planning and implementation phases.
 - Adherence to established accountability measures, including compliance with regulations.
 10. **Cost Efficiency:**
 - Comparison of actual costs to the budgeted costs for the vegetation clearing plan.
 - Return on investment for any implemented sustainability or mitigation measures.
 11. **Timeframe Achievement:**
 - Adherence to the planned timeline for vegetation clearing activities.
 - Identification and mitigation of delays in the implementation process.

10.3 Guideline to implement the management plan

204. Here is a general outline to guide the project personnel in developing a comprehensive plan:

1. **Purpose and Objectives:**
 - Clearly state the purpose of clearing vegetation (e.g., construction, development, fire prevention).
 - Outline specific objectives, such as creating space for new structures, improving visibility, or enhancing safety.
2. **Site Assessment:**
 - Conduct a thorough site assessment to identify the types of vegetation present, including any endangered or protected species.
 - Evaluate the ecological value of the vegetation and its impact on the local ecosystem.
 - Consider topography, soil types, and drainage patterns.
3. **Legal and Regulatory Compliance:**

- Research and understand local, state, and national regulations regarding vegetation clearing.
 - Obtain necessary permits and approvals from relevant authorities.
 - Ensure compliance with environmental protection laws.
4. **Consultation with Experts:**
- Seek input from environmental experts, ecologists, and botanists to assess the impact of vegetation removal.
 - Consult with local conservation groups or government agencies for guidance.
5. **Develop Clearing Methods:**
- Choose appropriate methods for vegetation removal (e.g., manual removal, mechanical clearing, controlled burns).
 - Consider the seasonality of vegetation and the impact on wildlife.
6. **Mitigation Measures:**
- Implement measures to minimize environmental impact, such as erosion control, sedimentation barriers, and replanting native species.
 - Plan for the relocation of any endangered or protected species.
7. **Waste Management:**
- Develop a plan for handling and disposing of cleared vegetation.
 - Consider recycling or repurposing materials where possible.
8. **Community Engagement:**
- Communicate the plan with the local community and stakeholders.
 - Address concerns and gather feedback.
9. **Timeline and Monitoring:**
- Develop a realistic timeline for the vegetation clearing activities.
 - Implement monitoring measures to assess the success of the clearing plan and adjust as necessary.
10. **Documentation:**
- Maintain detailed records of the vegetation clearing process, including permits, consultations, and compliance measures.
 - Document any unexpected findings or changes to the plan during implementation.
11. **Emergency Response Plan:**
- Develop a plan for addressing unforeseen issues or emergencies during the vegetation clearing process.
12. **Post-Clearing Rehabilitation:**
- Implement a strategy for restoring the site after clearing, including soil stabilization and replanting native vegetation.

10.4 Monitoring and Evaluation

205. Monitoring and evaluation are crucial components of a site-specific plan for vegetation clearing. They help assess the plan's effectiveness, identify any deviations from the intended outcomes, and facilitate adaptive management. Here's a guide on how to monitor and evaluate such a plan:

1. Establish Monitoring Protocols:

- Define clear and measurable objectives for vegetation clearing.
- Develop specific indicators and metrics for each objective to facilitate monitoring.

2. Regular Site Inspections:

- Conduct regular on-site inspections to observe the progress of vegetation clearing.
- Verify compliance with the approved plan, including safety measures and environmental protection protocols.

3. Data Collection:

- Collect relevant data on vegetation types, quantities removed, and any unexpected findings.
- Use technology such as GPS, drones, or satellite imagery to assist in data collection.

4. Wildlife Monitoring:

- Implement wildlife monitoring programs to track the impact on local fauna.
- Monitor changes in animal behavior, nesting sites, or migration patterns during and after vegetation clearing.

5. Erosion Control Monitoring:

- Regularly assess the effectiveness of erosion control measures.
- Measure soil erosion rates and the stability of exposed surfaces.

6. Community Feedback:

- Solicit feedback from the local community regarding the vegetation clearing process.
- Establish channels for community members to report concerns or observations.

7. Adaptive Management:

- Use monitoring data to make informed adjustments to the vegetation clearing plan.
- Modify strategies based on unexpected findings or changing circumstances.

8. Documenting Progress:

- Maintain comprehensive records of monitoring activities, including photographs, observations, and data.
- Compare actual progress against planned milestones to identify any discrepancies.

9. Environmental Impact Assessment:

- Regularly assess the ecological impact of vegetation clearing.
- Monitor the health of the ecosystem and the success of rehabilitation efforts.

10. Emergency Response Drills:

- Conduct emergency response drills to test the effectiveness of emergency measures.
- Evaluate the response time and the ability to mitigate unforeseen issues.

11. Community Engagement Evaluation:

- Assess the level of community satisfaction through surveys and public meetings.
- Consider the effectiveness of communication strategies in addressing community concerns.

12. Budget and Resource Monitoring:

- Track expenditures against the allocated budget for vegetation clearing.
- Evaluate the efficiency of resource utilization.

13. Timeline Adherence:

- Monitor adherence to the planned timeline for vegetation clearing activities.
- Identify and address any delays promptly.

14. Post-Clearing Rehabilitation Assessment:

- Evaluate the success of rehabilitation efforts in restoring the site.
- Assess the establishment and growth of replanted native vegetation.

15. Regulatory Compliance Audits:

- Conduct regular audits to ensure ongoing compliance with relevant regulations.
- Address any non-compliance issues promptly.

16. Performance Reporting:

- Generate regular reports summarizing monitoring findings and evaluations.
- Share results with relevant stakeholders, regulatory bodies, and the community.

11 CONCLUSIONS

206. The benefits of the project will be realized primarily at the level of national economy. The project will increase the contribution of the power supply sector. From the CESMP, it is observed that the proposed sub-project might have some temporary impacts on the environment which would be overcome with proper mitigation and enhancement measures. There is no ecologically sensitive area, reserve forest, national park in the proposed project sites. There is no significant irreversible adverse impact.

207. The CESMP is a live document and will be frequently updated to reflect the changing site conditions and environmental issues. Required mitigation measures have been introduced in the previous chapter which need to be implemented properly to avoid such environmental pollutions. Besides, regular monitoring during the construction activity needs to be ensured. Need to take corrective actions also as according to the mitigation measure. To achieve this, the contractor will implement the CESMP by undertaking frequent inspection, verification/checking, monitoring and internal auditing.

ANNEXES

Annex 1: Rapid Environmental Assessment (REA) Checklist

Sub-Project Title	Design, Supply, Installation, Testing & Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)		
Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		√	
▪ Protected Area		√	There is no protected area along the project area
▪ Wetland		√	No wetland was found surrounding the project area
▪ Mangrove		√	No mangrove species was found
▪ Estuarine		√	
▪ Buffer zone of protected area		√	No protected area near the project site.
▪ Special area for protecting biodiversity		√	
B. Potential Environmental Impacts Will the Project cause...			
▪ Encroachment on historical/cultural areas; disfiguration of landscape by embankments, cuts, fills, and quarries?		√	No encroachment on historical/cultural areas are required for implementation of this project
▪ Encroachment on precious ecology (e.g. sensitive or protected areas)?		√	No national parks, wildlife sanctuaries or similar eco-sensitive areas along the project route.
▪ Alteration of surface water hydrology of waterways crossed by project area, resulting in increased sediment in streams affected by increased soil erosion at construction site?		√	
▪ Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?		√	Adequate measures for sanitary and construction related waste such as chemicals will be taken to prevent contaminating local water resources.
▪ Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	√		Local air pollution level is likely to be increased for short duration during construction period.
▪ Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation during project construction and operation?	√		Construction activities could cause accidents and health risks to workers. Occupational health and safety measures will be mandatory for the contractor.

Screening Questions	Yes	No	Remarks
▪ Noise and vibration due to blasting and other civil works?	✓		Ambient noise level is expected to increase due to various construction activities, maintenance of instrument. All stationary noise making equipment will be installed with acoustic enclosures. Timings of noise construction activities will be regulated near sensitive receptors. So, potential impact would be minimal.
▪ Dislocation or involuntary resettlement of people?		✓	No resettlement is required.
▪ Dislocation and compulsory resettlement of people living in right-of-way?		✓	None
▪ Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	No vulnerable groups are affected by the project implementation
▪ Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		✓	No major impacts anticipated. However, efforts will be made to minimize air pollution through appropriate measures such as wet spraying, covering of trucks and other stationary equipment's away from settlement areas and others.
▪ Hazardous driving conditions where construction interferes with pre-existing condition?		✓	Proper safety measures such as barricades, flagman, sign boards etc. will be placed to prevent accidents.
▪ Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?	✓		Proper provisions for sanitation, health care and solid waste disposal facilities will be available in the contract documents to avoid such possibility. Workers will be made aware about communicable disease regularly.
▪ Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		✓	
▪ Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?	✓		Adequate safety measures will be adopted as per Traffic Management Plan to avoid such conditions.

Screening Questions	Yes	No	Remarks
Increased noise and air pollution resulting from operation of construction equipment and excavation works?	✓		Increase in noise and air pollution is expected during construction phase because of the construction activities specially excavating related works. Adequate mitigation measures will be adopted to minimize them. During operation phase, the main source of noise and air will be traffic.
Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using?		✓	EMP recommendations are designed to mitigate water pollution due to construction related activities.
Social conflicts if workers from other regions or countries are hired?		✓	
Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?	✓		Workers will be mostly from local. Worker from remote places will be provided with adequate facility. The ratio of local and outside workers will be such balanced that there is minimum burden on existing social infrastructures and services.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	✓		EMP will outline such anticipated risks and recommend necessary mitigation measures to avoid them
Community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning.	✓		Adequate measures have been adopted to mitigate such risks. All construction sites will be secured by fenced to maintain local community safety (no entry possible).

Climate Change and Disaster Risk Questions	Yes	No	Remarks
The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.			
Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes		✓	The project does not fall under the risk zone of cyclone and natural hazards.

▪ Could changes in temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (e.g., increased erosion or landslides could increase maintenance costs, permafrost melting or increased soil moisture content could affect sub-grade).		✓	The project will be able to withstand with future changes of various climatic parameters.
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g., high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?		✓	There is no potential impact identified in the project area yet.
▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., by encouraging settlement in areas that will be more affected by floods in the future, or encouraging settlement in earthquake zones)?		✓	There will be no potential climate vulnerability of the surrounding area due to the interventions of the project.

Annex 2: Sample Environmental Monitoring Checklist

No.	Aspects of Environmental issues	Compliance Status*			Remarks (i.e. specify location, good practices, problem observed, possible cause of nonconformity)	Corrective/ Prevention Actions (To address the non-compliance issue, if identified)
		FC	PC	NC		
General						
1.	Legal working hours approval					
2.	Employment Record keeping arrangement					
Occupational Health and Safety						
1.	First-Aid Box availability at work sites					
2.	Provision of personal protection equipment's (PPEs)					
3.	Workers complains taken care of by the supervisor					
4.	Children below 15 employment					
Dust Control						
1.	Construction vehicles and machineries maintained properly to reduce emissions					
2.	Proper storage of materials and regular watering.					
Noise Pollution						
1.	Movement of vehicles at desired hours					
2.	Noise Level Monitoring at sites					
3.	Noise control measures at sites					

No.	Aspects of Environmental issues	Compliance Status*			Remarks (i.e. specify location, good practices, problem observed, possible cause of nonconformity)	Corrective/ Prevention Actions (To address the non-compliance issue, if identified)
		FC	PC	NC		
4	Proper noise control measures for cultural sites					
Water Pollution						
1.	Wastes, cement, effluents and junks not disposed in water					
Flora and Fauna						
1.	Trees and bushes outside the construction area preserved from damages					
2	Aquatic species of the sub-project area preserved for demolition					
Waste Management						
1.	Construction wastes are removed off site regularly					
2.	Chemical wastes, if any, collected and disposed of properly					
3.	Hazardous, General and Liquid waste management location					
Environmental documents at Field Office and Project sites						
1.	Field Office possesses copies of EMP, contract document and Technical Specifications					
2.	Heavy equipment maintenance records					

*Note: FC-Full Compliance; PC-Partial Compliance; NC-Non-Compliance

Annex 3: Sample Health and Safety Monitoring Checklist

No.	Aspects of Environmental issues	Compliance Status*			Corrective/ Prevention Actions (To address the non-compliance issue, if identified)
		FC	PC	NC	
Working Environment					
1	Is there proper and adequate ventilation?				
2	Are all lights working and is there sufficient lighting?				
3	Are security systems (CCTV cameras, radios, alarms) in place and working?				
4	Is there enough working space for employees?				
5	Are floors and floor coverings, e.g. carpets, in good condition?				
6	Are walkways free from foreseeable trip/slip hazards?				
7	Is fire equipment available, serviced and in working order?				
8	Are emergency exits available and easily accessible?				
9	Are all important and legally required signs available in your workplace?				
10	Are they compliant with the standards and in the correct position? (E.g. emergency exit, first aid kit location, prohibited areas etc.)				
Health and Hospitality					
1	Is there an easily accessible and adequately stocked first aid boxes?				
2	Are there suitable and sufficient toilet facilities?				
3	Are suitable washing facilities available?				
Working Equipment's					
1	Is all working equipment/machinery in a safe and sound manner?				
2	Is machinery security features (guards, sensors) in place and working condition?				
3	Is the Personal Protective Equipment being used of the required standards?				
5	Is excess PPE available for any visitors who may require to enter into hazardous areas in your premises?				
Social Aspects					
1	Disruption of livelihood?				
2	Are Noise control measures properly applied?				
3	Any conflicts of interest among the local people?				

*Note: FC-Full Compliance; PC-Partial Compliance; NC-Non-Compliance

Annex 4: Record Register**Accident/Incident Report Form for Construction Sites**

Site Name and References		Site Address	
--------------------------	--	--------------	--

<u>Details of Person Completing the Form</u>			
Name			Date
Job Title			

Accident	Dangerous Occurrence	Near Miss	Illness
-----------------	-----------------------------	------------------	----------------

<u>Details of the Injured Person</u>			
Name of the Injured Person			Age
Address of Injured Person			
Telephone			Occupation
Employers Name			
Site Engineers Name			Telephone
Address			

<u>Accident/Incident Details</u>	
Location of Accident/Incident	
What work was occurring at the time of accident/incident	
Summary of the Accident/Incident and the Injury caused (Parts of Body and Severity) (attached additional pages if necessary)	

Health & Safety Report Form for Construction Sites

Site Name and References		Site Address	
--------------------------	--	--------------	--

<u>Details of Person Completing the Form</u>		
Name		Date
Job Title		

<u>Details of the Injured/Sick Person</u>		
Name of the Injured/sick Person	Age	
Address of Injured/sick Person		
Telephone	Occupation	
Employers Name		
Site Engineers Name	Telephone	
Address		

<u>Health & Safety Details</u>
What happened? Report any details that may have contributed to the incident (i.e., poor lighting). Use additional paper as necessary and attached to the form
Describe the outcome: harm/health effects/damage.
Describe corrective measures taken to address immediate hazards related to incident

Visitor Register Form for Construction Sites

Sl. No.	Date	Name	Reason for Visit	Time in	Time out	Signature
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
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25						
26						
27						
28						
29						

First Aid Register Form for Construction Sites

First Aid Box No:	
Site Name:	
Site Address:	
Inspected by:	

Date of Inspection	Bandage Roller	Band Aid	Cotton	Scissor	Antiseptic Solution	Adhesive Tape	Antiseptic Tape	Antiseptic Ointment	Eye Drops	Remarks
Prepared by						Approved by				

Vehicle Register Form for Construction Sites

Serial No.	Name of the Car	Purchase year	Insurance Information	Fuel Log	Service Logs	Remarks (Expenses)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
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22						
23						
24						
25						
26						
27						
28						
29						
30						

Store Register Form for Construction Sites

Serial No.	Date	Time	Store Name	Provider Name	Receiver Name	Product Name	Number of Products	Signature	Remarks
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
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Annex 5: Traffic Management Plan

Principles

Traffic Management Plans are also included in the Dhaka and Western Zone Transmission Grid Expansion Project (DWZGEP). It is one of the primary objectives of this TMP to ensure the safety of all road users in the work zone. The document addresses the following issues:

- ✓ Safety considerations for pedestrians, bicyclists, and motorists in construction zones;
- ✓ Work crews must be protected from traffic hazards;
- ✓ Mitigation of adverse impacts on road capacity and delays;
- ✓ Maintaining access to adjoining properties; and
- ✓ Identify and resolve issues that may delay the project.

Performance Indicator for Traffic Management Plans

For the Dhaka and Western Zone Transmission Grid Expansion Project (DWZGEP), the performance indicators for traffic management and control could encompass a range of factors to evaluate the effectiveness of the project in managing transportation flow, ensuring safety, and minimizing disruptions. Here are specific performance indicators tailored to DWZGEP:

1. **Traffic Volume at Key Junctions:** Monitoring the number of vehicles passing through critical junctions and corridors affected by the project to understand traffic patterns and changes in volume before and after the expansion.
2. **Travel Time Reduction:** Measuring the reduction in travel time along the expanded transmission grid routes to assess the impact on easing congestion and improving transportation efficiency.
3. **Congestion Levels:** Analyzing congestion levels during peak hours or at critical points to evaluate the project's success in alleviating traffic congestion in Dhaka and the Western Zone.
4. **Average Traffic Speed:** Monitoring the average speed of vehicles along the expanded grid routes to ensure smooth flow and assess if the project contributes to maintaining or improving traffic speed.
5. **Emergency Response Time:** Evaluating the time taken by emergency services to respond to incidents along the expanded grid to ensure efficient incident management and minimal disruptions.
6. **Environmental Impact Assessment:** Analyzing the project's impact on air quality, emissions, and noise levels in affected areas to ensure compliance with environmental standards and identify potential mitigation measures.
7. **Public Perception Surveys:** Conducting surveys among commuters, residents, and businesses in the project-affected zones to gather feedback on the project's impact, satisfaction levels, and any concerns regarding traffic changes.
8. **Safety Metrics:** Tracking the number of accidents and safety-related incidents along the expanded grid to assess improvements in road safety and identify areas for further safety measures.

9. Mode Share and Public Transport Usage: Monitoring changes in mode share, such as increased usage of public transport or alternative modes of transportation, to evaluate the project's effectiveness in promoting sustainable transportation options.

10. Economic Impact: Assessing the economic impact, including cost savings in travel time, increased productivity, or potential revenue generation from improved transportation infrastructure.

These performance indicators will assist in evaluating the success of the Dhaka and Western Zone Transmission Grid Expansion Project in optimizing traffic flow, enhancing safety, reducing congestion, and ensuring overall efficiency in the transportation network within the affected regions.

Developing a comprehensive Traffic Management Plan (TMP) for the Dhaka and Western Zone Transmission Grid Expansion Project (DWZGEP) is crucial to ensure the smooth execution of construction activities while minimizing disruptions to traffic flow, ensuring public safety, and maintaining accessibility in the affected areas.

Here's an outline of a potential Traffic Management Plan:

1. Traffic Impact Assessment:

- Conduct a thorough assessment to identify potential traffic impacts caused by construction activities, including road closures, lane reductions, detours, and increased congestion.

2. Stakeholder Engagement:

- Engage with local authorities, transportation departments, community representatives, and stakeholders to communicate the project's timeline, potential traffic disruptions, and mitigation measures.

3. Traffic Control Measures:

- Implement temporary traffic control measures such as signage, road markings, traffic signals, and barriers to guide motorists and pedestrians safely around the construction zones.

- Establish clear detour routes and diversions to redirect traffic away from construction areas, ensuring minimal impact on regular traffic flow.

4. Construction Schedule:

- Coordinate construction activities to minimize peak traffic hours, prioritizing work during off-peak hours to reduce congestion and inconvenience to commuters.

5. Emergency Services Access:

- Ensure unimpeded access for emergency services by designating clear emergency routes and maintaining access points throughout the project area.

6. Public Awareness Campaign:

- Launch an extensive public awareness campaign using various communication channels (signage, social media, local media outlets) to inform the public about construction schedules, traffic changes, and alternative routes.

7. Traffic Monitoring and Adjustment:

- Regularly monitor traffic conditions in and around construction zones to assess the effectiveness of traffic control measures. Modify plans if needed to optimize traffic flow and safety.

8. Contractor Training:

- Provide comprehensive training to construction personnel and contractors involved in traffic management protocols, emphasizing safety measures and adherence to traffic regulations.

9. Coordination with Authorities:

- Maintain close coordination with local traffic authorities and law enforcement agencies to ensure compliance with traffic regulations and swiftly address any issues or emergencies.

10. Evaluation and Feedback:

- Periodically evaluate the effectiveness of the Traffic Management Plan through feedback from stakeholders, traffic data analysis, and on-site observations. Implement improvements based on this feedback.

The Traffic Management Plan for DWZGEP aims to strike a balance between the project's construction needs and the community's traffic mobility and safety requirements. It should prioritize safety, minimize disruptions, and maintain efficient traffic flow while accommodating the expansion project's construction activities.

An overview of TMP's operating policies

Dhaka and Western Zone Transmission Grid Expansion Project (DWZGEP) is designed to provide safe and efficient movement for all road users (motorists, bicyclists, pedestrians, and people with disabilities) in and around work zones while ensuring reasonable protection for workers and equipment. The project has implemented several safety measures to ensure the protection of workers and equipment. These measures include the construction of temporary road closures and barriers, signage and visual cues to warn drivers of upcoming work zones and the implementation of traffic control devices such as traffic lights and flaggers. Additionally, workers are required to wear personal protective equipment and undergo safety training to ensure their own well-being during the project. Further safety measures that could be implemented include regular inspections of work zones to identify and address any potential hazards, the implementation of buffer zones between workers and oncoming traffic, and the use of heavy machinery during non-peak hours to minimize the risk of accidents. Furthermore, providing ongoing safety education and awareness campaigns for road users and workers can help promote awareness and compliance with safety protocols. Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.

Analise the impact due to street closure

Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

- (i) approval from the ULB/CMC/Public Works Department (PWD) to use the local streets as detours;
- (ii) consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;

- (iii) determining of the maximum number of days allowed for road closure, and 3 incorporations of such provisions into the contract documents;
- (iv) determining if additional traffic control or temporary improvements are needed along the detour route;
- (v) considering how access will be provided to the worksite;
- (vi) contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
- (vii) developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the detour Street or public opposition, the full closure can be restricted to weekends with the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

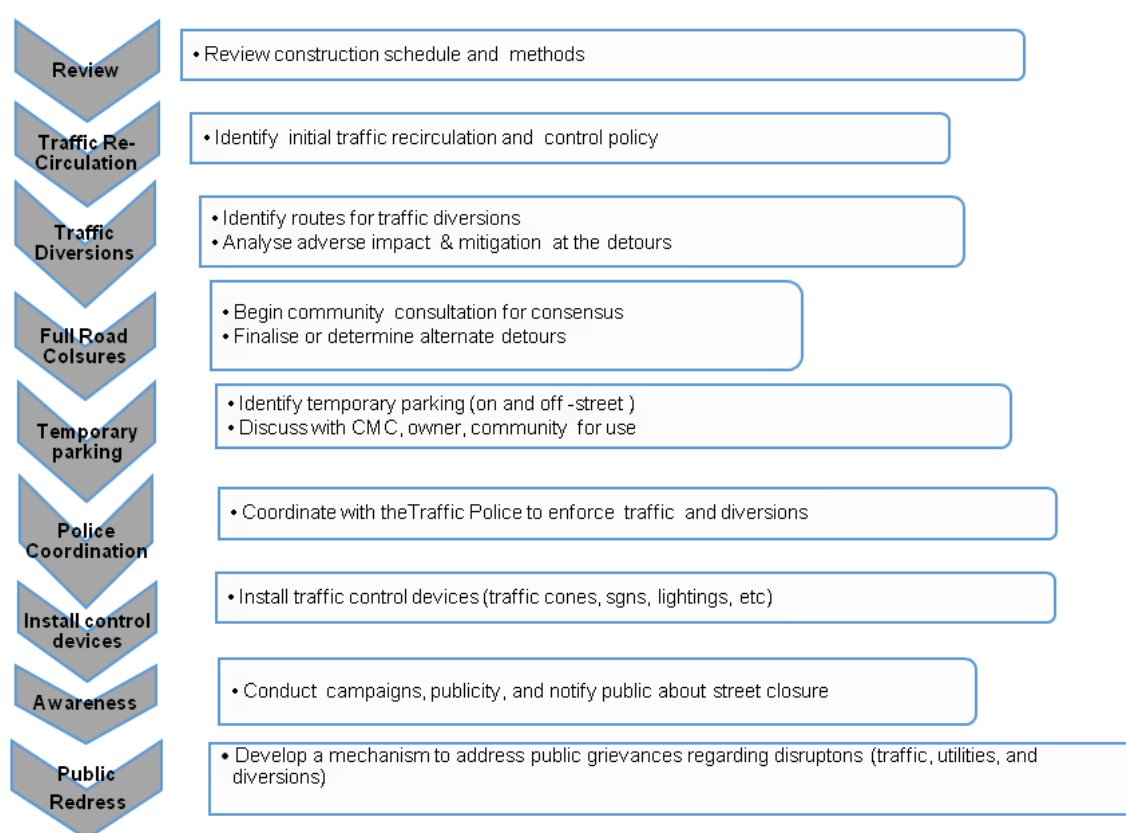


Figure 1: Policy Steps for the TMP

Public awareness and notifications

As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions

take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices ward level meetings and city level meeting with the elected representatives.

The PIU will also conduct an awareness campaign to educate the public about the following issues:

- traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
- defensive driving behaviour along the work zones; and
- reduced speeds enforced at the work zones and traffic diversions.

It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centres. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

- explain why the brochure was prepared, along with a brief description of the project;
- advise the public to expect the unexpected;
- educate the public about the various traffic control devices and safety measures adopted at the work zones;
- educate the public about the safe road user behaviour to emulate at the work zones;
- tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
- indicate the office hours of relevant offices.

Install traffic control devices at the work zones and traffic diversion routes

The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary "STOP" and "GO").

Figure 4 to Figure 5 illustrates a typical set-up for installing traffic control devices at the work zone of the area, depending on the location of work on the road way, and road geometrics:

- Work on shoulder or parking lane
- Shoulder or parking lane closed on divided road
- Work in Travel Lane
- Lane closure on road with low volume
- Lane closure on a two-line road with low volume (with yield sign)
- Lane closure on a two-line road with low volume (one flagger operation)
- Lane closure on a two-lane road (two flagger operation)
- Lane closure on a four-lane undivided Road
- Lane closure on divided roadway
- Half road closure on multi-lane roadway
- Street closure with detour

The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flaggers/ personnel should be equipped with reflective jackets at all times and have traffic control batons for regulating the traffic during night time.

In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

Recommendation

This TMP is a live document which can be updated as per requirement @ one-month interval.

Annex 6: Labour Management Plan

Introduction

The Labour Management Plan (LMP) is developed by Contractor to manage risks associated during the construction and operational phase. To comply the objectives of the ADB safeguard policy statement 2009 and Bangladesh Labour Rules 2015 and Act 2006. It aims to ensure the management and control of activities that may pose labour-related risks. This Plan sets out potential impacts and consequences and describes how they will be mitigated.

Scope of LMP

The Labour Management Plan (LMP) for TBEA Group Ltd.'s Dhaka and Western Zone Transmission Grid Expansion Project aims to ensure a conducive workplace environment, emphasizing fair labor practices and employee welfare. This project-specific LMP focuses on laborers engaged directly by TBEA or through contracted services.

The plan encompasses stringent compliance measures with local and international labor laws, with a particular emphasis on the unique needs and nuances of the Dhaka and Western Zones. It delineates comprehensive requirements and expectations concerning compliance, reporting, roles, supervision, and training, particularly focusing on labor and working conditions within the project's scope.

This LMP extends its coverage across all stages of the grid expansion project, including planning, construction, and operation phases. It emphasizes the provision of safe working conditions, adherence to ethical labor standards, and the implementation of robust health and safety protocols.

Moreover, the LMP outlines strategies for effective contractor management, recognizing the varying degrees of control and influence TBEA may exercise over these contracted services. By ensuring a comprehensive approach to labor management, TBEA reaffirms its commitment to fostering a workplace environment that values employee well-being and ethical labor practices throughout the Dhaka and Western Zone Transmission Grid Expansion Project.

Overview of Labor Use in this Project

The LMP applies in to all Project workers whether full-time, part-time, temporary, seasonal workers.

- People employed or engaged directly by TBEA Group Ltd. to work specifically in relation to the project;
- People employed or engaged by TBEA Group Ltd. contractors to perform work related to core function of the project, regardless of location;
- People employed or engaged by TBEA Group Ltd.'s primary suppliers.

Labour Requirement: Dhaka and Western Zone Transmission Grid Expansion Project

Additional staffing may require during Project implementation. However, Dhaka and Western Zone Transmission Grid Expansion Project (DWZGEP) has capacity, because the team has number of existing staffs who will provide support to the project.

Direct Worker: Direct workers would likely include project managers and supervisors who are (DWZGEP)'s Permanent employees including compliance officer, administrative officer, maintenance worker, etc.

Contracted Worker: Contracted workers would be hired for design and civil works, and for design and electromechanical works. Multiple contractors for the various sub- projects, would be engage. Each contractor might need engagement of subcontractors. The subcontractors' workforces will also be considered to be contracted workers.

Migrant Worker: It is expected that the project will require a combination of local workers from nearby villages, workers from other parts. The "internal migrants" would be workers who already have experience working on major infrastructure projects.

Workforce Characteristic

Taking into account the nature of the project workforce (mostly unskilled and semiskilled construction labour) and characteristics of the labour force market, it is likely the workforce, especially the lower-skilled workers, will be predominantly male. It is estimated that women would represent only about 10-20 percent of the workforce, and those would likely be technical (e.g. engineering) and/or staff working in the project office (maids, cooks, cleaners etc.). All workers will be over 18 and will probably average 25-40 years old.

Brief Overview of Labour Legislation: Terms and Conditions

The Bangladesh Labour Act, 2006 and Bangladesh Labour Rule, 2015, is the main legislations in Bangladesh which regulate the terms and conditions of employment. The Labour Act, 2006 provides for the basic conditions of employment with a view of improving the status of employees in Bangladesh. The Act makes it mandatory for employers to furnish employees with written particulars of employment stating, hours of work, wages, leave entitlements, job description, grievance procedure, benefits if any etc.

Work Place Safety	No authority shall engage any worker in work without providing him with personal safety equipment and the employer shall maintain ensuring uses thereof and a record book in this behalf in the prescribed manner. Bangladesh Labour Act, 2006 S 78(a)
	If any personal safety equipment is supplied but not used, the worker concerned shall be liable. Bangladesh Labour Act, 2006 S 78(a)
Training on Health and Safety	Every worker shall be made aware of the hazards of work through training in order to ensure the protection and safety of his professional health in the place of work. Bangladesh Labour Act, 2006 S 78(a)
Safety Work Place	Every establishment shall be kept clean and free from effluvia arising from any drain, privy or any other nuisance, and in particular (a) the dirt and refuse shall be removed daily by sweeping in a suitable manner from the floors, work-rooms, staircases and passages of the establishment;
	(b) the floor of every work-room shall be washed at least once in every week and, if necessary, disinfectant shall be used in washing;
	(c) where any floor becomes wet in the course of any manufacturing process to such an extent that drainage is required thereof, effective means of drainage shall be provided and maintained; Bangladesh Labour Act, 2006, s51
	Lighting at the workplace is sufficient to allow: Sufficient and suitable lighting, natural or artificial, or both, shall be provided in every part of an establishment where workers are working or passing. In every establishment, all glass windows and skylights used for the lighting of the work-room shall be kept clean on both surfaces, and free from obstruction as far as possible.

	In every establishment, effective measures shall be taken for the prevention of: (a) glare either directly from any surface of light or by reflection from any polished surface, or (b) the formation of shadows to such an extent as to cause eye strain or risk of accident to any worker Bangladesh Labour Act, 2006 s.57
Toilet and Washroom	Toilets and washrooms. In every establishment (a) sufficient number of sanitary toilets and washrooms of the type prescribed by rules shall be provided at the suitable places so that the workers employed therein at the time of work may use easily; (b) such toilets and washrooms shall be provided separately for male and female workers; (c) toilets and washrooms shall be adequately lighted and ventilated and water shall be provided at all times; and (d) such [toilets and washrooms] shall be maintained in a clean and sanitary condition at all times with suitable detergents and disinfectants. Bangladesh Labour Act, 2006 s.59
	Rest room, etc. (1) In every establishment where more than 50 (fifty) workers are ordinarily employed, adequate and suitable number of rest rooms shall be provided and maintained for use of the workers, and a suitable lunch room with arrangement for drinking water. Bangladesh Labour Act, 2006, s93
Potable water	(1) In every establishment, arrangements shall be made at a suitable point to supply sufficient purified potable water for all workers employed therein. (2) All water supply points shall be legibly marked with "Potable water" in Bangla. (3) Where two hundred fifty or more workers are ordinarily employed in an establishment, provision shall be made for cooling the potable water during the summer. (4) Where dehydration occurs in the body of workers due to work near machineries creating excessive heat, oral re-hydration therapy shall be provided to those workers. Bangladesh Labour Act, 2006 s.58
First Aid Facility	First aid equipment has been provided for the workplace and is accessible to each worker. Bangladesh National Building Code, 2006 Part7 S.1.2.4 & Bangladesh Labour Act, 2006 S. 89
	An adequate number of workers have been trained to administer first aid. Bangladesh National Building Code, 2006 Part7 Sect 1.2.4 Bangladesh Labour Act, 2006 S.89

Responsible Staff

Responsible staff will overview and oversight different activities of the project. The responsible staff including the PMU has the overall responsibility to oversee all aspects of the implementation of the LMP, in particular to ensure contractor compliance. The risk related to the civil construction activity is associated with the risk of falling from height when building (office building, dormitories or other similar types of activities). Contractor will address all LMP aspects as part of procurement for works as well as during contractor induction.

Key responsibilities of the staffs are:

- Implementing this labour management plan

- Ensuring that contractors who are working prepare labour management plan that comply with this labour management plan, and also prepare Occupational Health and Safety Plans for PMU of approval before mobilizing to the field. PMU will approve the procedures and plans before issuing notices to proceed with construction works
- Monitoring to verify that contractors are meeting obligations toward contracted and subcontracted workers as required Bangladesh Labour Act, the General Conditions of Contract, the Special Conditions of Contract, and the relevant ADB Standard Procurement Documents
- Monitoring contractors' implementation of their approved Labour Management Plan
- Monitoring compliance with occupational health and safety standards at all workplaces in line with Bangladesh Labour Act, 2006
- Monitoring training of project workers
- Ensuring that the grievance redress mechanism for project workers is established and implemented and that workers are informed of its purpose and how to use it
- Monitoring implementation of the Worker Code of Conduct.
- Reporting to the ADB on performance on at least a quarterly basis.

The contractor is subsequently responsible for management in accordance with contract specific Labour Management Plan, implementation of which will be supervised by DWZGEP's Project Management Unit on a monthly basis or at shorter intervals as defined by specific Plans. Construction contractors will be responsible for the following:

- Supervising subcontractors' implementation of labour management procedures and Occupational Health and Safety Plans.
- Maintaining records of recruitment and employment of contracted workers.
- Communicating job descriptions and employment conditions to all workers.
- Developing and implementing the Worker Grievance Redress Mechanism, including ensuring that grievances received from their own and subcontractor employees are resolved in a timely manner, and reporting the status of grievances and resolutions on a monthly basis
- Having a system for regular review and reporting to corporate management on labour and on occupational safety and health performance
- Providing induction (including social induction) and regular training to employees in labour protection requirements, including training on their rights under Labour Act, 2006, on the risks of their jobs, and on measures to reduce risks to acceptable levels
- Ensuring that all contractor and subcontractor workers understand and sign the Code of Conduct prior to the commencement of works, and supervise compliance with the Code.

Policy and Procedures

Most environmental and social impacts of subprojects resulting from activities directly under the control of contractors will be mitigated directly by the same contractors. As a consequence, ensuring that contractors effectively mitigate project activities related impacts is the core of the Project's approach. PMU will incorporate standardized environmental and social clauses in the tender documentation and contract documents.

As a core contractual requirement, the contractor is required to ensure all documentation related to environmental and social management, including the LMP, is available for inspection at any time by the PMU appointed agents. The contractual arrangements with each project worker must be clearly defined in

accordance with Environmental Conservation Act (1995), Environmental Conservation Rule (1997) and Bangladesh Labour Act (2006).

A full set of contractual requirements related to environmental and social risk and impact management will be provided in the Projects' Environmental and Social Impact Assessment. All environmental and social requirements will be included in the bidding documents and contracts in addition to any additional clauses, which are contained, in the Projects environmental and social instruments.

Under no circumstances DWZGEP, the Borrower, Contractors, suppliers or sub-contractors will engage forced labour. Forced labour that includes bonded labour (working against an impossible debt), excessive limitations of freedom of movement, excessive notice periods, retaining the worker's identity or other government-issued documents or personal belonging, imposition of recruitment or employment fees payable at the commencement of employment, loss or delay of wages that impede the workers' right to end employment within their legal rights, substantial or inappropriate fines, physical punishment, use of security or other personnel to force or extract work from project workers, or other restrictions that compel a project worker to work in a non-voluntary basis.

Age of Employment

Bangladesh Labour Act, 2006 prohibits anyone under 18 from performing "unhealthy or heavy" and there are special requirements for leave, work hours, and other conditions of employment. Contractor will ensure that no construction workers under 18 years are employed unless they are hired for office work. Contractors will be required to verify and identify the age of all workers. They will require workers to provide official documentation, which could include a birth certificate, national identification card, or Passport or medical or school record. If a child under the minimum age is discovered working on the project, measures will be taken to immediately terminate the employment or engagement of the child in a responsible manner, taking into account the best interest of the child.

Grievance Mechanism

This section sets out details of the grievance mechanism that will be provided for direct and contracted workers, and describes the way in which these workers will be made aware of the mechanism. If any, community workers are engaged in the project, details of the grievance mechanism for these workers is follow the Grievance Redressed Mechanism (GRM) of the Project. For DWZGEP's worker's current working procedures will remain effective for PMU staff. For Contractors there will be required to present a worker grievance redress mechanism which responds to the minimum requirements in this LMP. The Project Management Unit's Social Officer will review records on a monthly basis. Where worker concerns are not resolved, the Bangladesh Labour Act (2006) will be used as set out in the section, but the Project Management Unit will keep abreast of resolutions and reflect in quarterly reports to the ADB.

Contractor Management

Contractor will use the for solicitations and contracts, and these include labour and occupational, health and safety requirements. As part of the process to select the contractors who will engage contracted workers, contractor may review the following information:

- Information in public records, for example, corporate registers and public documents relating to violations of applicable labour law, including reports from labour inspectorates and other enforcement bodies
- Business licenses, registrations, permits, and approvals
- Documents relating to a labour management plan and occupational health and safety system (e.g. HR manuals, safety program)
- Identification of labour management, safety, and health personnel, their qualifications, and certifications
- Records of labour-related litigation
- Workers' certifications/permits/training to perform required work
- Records of safety and health violations, and responses
- Accident and fatality records and notifications to authorities
- Records of legally required worker benefits and proof of workers' enrollment in the related programs
- Worker payroll records, including hours worked and pay received
- Identification of safety committee members and records of meetings

Construction and other contracts will include provisions related to labour and occupational health and safety as provided in the ADB Policy and Bangladesh Labour Act, 2006. This project will use the ADB documents for construction contracts, and these contracts include remedies for noncompliance with labour and other requirements. Remedies include withholding payment, termination of the contract, and forfeiture of all or part of an ESHS (Environmental, Social, and Health and Safety) performance security.

PMU will manage and monitor the performance of contractors in relation to contracted workers, focusing on compliance by contractors with their contractual agreements (obligations, representations, and warranties) and labour management plan. This may include periodic audits, inspections, and/or spot checks of project locations and work sites as well as of labour management records and reports compiled by contractors. Contractors' labour management records and reports that may be reviewed would include: representative samples of employment contracts or arrangements between third parties and contracted workers, records relating to grievances received and their resolution, reports relating to safety inspections, including fatalities and incidents and implementation of corrective actions, records relating to incidents of non-compliance with national law, and records of training provided for contracted workers to explain occupational health and safety risks and preventive measures.

Gender Based Violence

No female labor was recruited by the contractor during the construction phase of the project. Therefore, Contractors do not address the risk of gender-based violence issue in the LMP.

Training and Awareness

A qualified safety officer will be appointed to provide all types of safety trainings to the workers. The safety officer will provide instructions to contractor staff. will procure for training to address risks associated with labour influx and will provide a schedule for trainings required. The contractor will be obligated to make staff available for this training, as well as any additional mandatory trainings required as specified by the contract. Prior conduct any trainings need assessment is required.

Annex 7: Hazardous Material Management Plan

Introduction

Hazardous materials are defined as any item or agent (biological, chemical, or radiological), which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors

Relevant Legislations

The applicable legislation applicable for waste management are given below;

- National 3R Strategy for Waste Management, 2010;
- Solid Waste Management Rules 2021;
- Hazardous Waste Management Rules, 2011

Purpose and Scope

The key objectives of the HMMP are to proper use, handling and storage practices and procedures to be followed by people working with hazardous materials anywhere in the project to assist in protecting them from potential health and physical hazards presented by hazardous materials present in the workplace, and to keep chemical exposures.

Types of Hazardous Waste

- Mineral oil
- Oi and Grease
- Flammable liquid
- Underground storage tanks
- PCBs

Potential Receptor

Potential receptors are as follows-

- Project staff
- Workers
- Local people
- Flora and fauna

Hazardous Waste Handling

Once solid waste is identified as hazardous waste by the generator, it must be handled in accordance with the HMMP. Hazardous waste must not be: disposed of or recycled with other forms of trash or waste, burned or allowed to evaporate into the air, disposed of or diluted in water (i.e., down the drain), nor disposed of on or buried in the land.

An appropriate, compatible container (bottle, jar, drum, etc.) must be used to accumulate waste. It must be properly labeled. Hazardous waste containers must be kept closed except when adding or transferring waste and the contents of the containers must be compatible with the container.

Transporting hazardous waste by vehicle on campus shall be conducted by the EHS department (contracted waste hauler, etc.).

Hazardous Waste Storage and Labelling

A chemical container must be labeled as hazardous material / waste at the time that its content is designated as a hazardous material / waste. When a hazardous waste is added to a container, the container must be labeled as hazardous waste and dated at the time the first amount of hazardous waste is added to the container. Labels can be obtained through the EHS department.

Hazardous Waste Management

Disposal of solid waste (this includes gas and liquid) is regulated by various federal and state agencies. Hazardous materials very often include hazardous chemical, biological, or radiological materials. Thus, proper disposal of hazardous material waste is not only prudent, it is mandatory. Environmentally sound disposal methods prevent harm to the water, land, and air and by extension, to people as well. Proper disposal techniques also protect waste handlers from harm

Recordkeeping

All waste management activities shall be documented. The following are documentation requirements:

- All hazardous waste documentation related to transportation, shipment, regulatory reporting, and land disposal records, etc.
- Hazardous Material / Waste tags.
- Satellite Accumulation Area Monthly Inspections (retained for a minimum of three years)
- Initial / Annual hazardous waste management training. (Training conducted by departments separately – send a copy of the training roster to EHS.)
- All other hazardous materials documentation. All waste management documents will be maintained by EHS for a minimum of seven years, unless otherwise indicated.

Training

Training is required for any the employee that generates or handles hazardous materials. Generators and/or handlers of hazardous waste must receive, at a minimum. Additional training should be received by generators and handlers of waste. This training shall consist of emergency procedures, emergency system, and a review of the hazardous materials regulatory requirements set forth by Hazardous management rules, 2011.

All training records must include the dates of training sessions, contents or a summary of the training session, names and qualifications of persons conducting the training, and names of persons attending the training session.

Annex 8: Nearest Hospital, Police Station and Fire Service Details

S/L	Name	Lat.-Long	Contact No.
Nearest Fire Services			
1	Fire Service & Civil Defense Station, Baridhara	23°47'52.65"N, 90°25'26.63"E	02-8833000
2	Kurmitola Fire Station	23°49'35.11"N, 90°24'17.88"E	01730-002232
Nearest Police Stations			
1	Vatara Police Station	23°47'51.04"N, 90°25'26.23"E	01769-058055
2	Khilkhet Police Station	23°49'40.71"N, 90°25'10.93"E	01320-041535
Nearest Hospitals			
1	Nagorik Specialized Hospital Limited	23°45'49.59"N, 90°26'1.84"E	09677-454545
2	Bashundhara Eye Hospital & Research Institute	23°48'59.88"N, 90°26'9.67"E	01775-559977
3	Farazy Hospital - Banasree	23°45'45.11"N, 90°26'10.49"E	09606-990000



Picture of Nearest Hospital, Police Station and Fire Service along the project corridor

Annex 9: Sample for Labelling Wastage

Label 1
Explosive Substances
(Waste)



Label 2
Inflammable Liquids
(Waste)



Label 3
Inflammable Solids
(Waste)



Label 4
Solid: Spontaneously
Combustible (Waste)



Label 5
Solid: Dangerous When
Wet
(Waste)



Label 6
Oxidizing Substances
(Waste)



Label 7
Organic Peroxides (Waste)



Label 8
Toxic Substances (Waste)



Label 9
(Infectious Substances
(Waste)



Label 10
Corrosive Substances
(Waste)



Label 11
Mixture of Miscellaneous
Dangerous Substances
(Waste)



Annex 10: Tentative Format of the Quarterly Environmental Monitoring Report

Executive summary

1.0 Introduction

1.1 General

1.2 Scope of Works

1.3 Project Description

1.2 Project Components

1.4 Project Construction Activities during the Reporting Period

2.0 Environmental Activities, Performed During the Reporting Period

2.1 Implementation of Mitigation Measures for the Environmental Aspects/Issues

2.1.1 Mitigation Measures for the Qualitative Environmental Aspects

2.1.2 Monitoring Activities (EQS) for the Quantitative Environmental Aspects

3.0 Climates

4.0 Health and Safety Activities, Performed During the Reporting Period

5.0 Site Visits and Meetings

6.0 Conclusions

Annexes

Annex 11: TBEA's Code of Conduct

The Code of Conduct for TBEA outlines the ethical and professional standards that individuals and entities involved in construction projects are expected to adhere to. This Code of Conduct helps them to maintain integrity, transparency, and fairness in business practices. The components of their Code of Conduct are outlined below:		
Sl. No.	Components	Tasks
01.	Compliance with Laws and Regulations	- Adherence to all applicable local, state, and federal laws and regulations. - Commitment to obtaining and maintaining all necessary permits and licenses.
02.	Ethical Behavior	- Upholding high ethical standards in all dealings with clients, suppliers, subcontractors, and other stakeholders. - Avoidance of conflicts of interest and disclosure of any potential conflicts.
03.	Quality and Safety Standards	- Commitment to delivering work that meets or exceeds industry standards for quality and safety. - Adherence to safety protocols and regulations to ensure the well-being of workers and the public.
04	Environmental Responsibility	- Compliance with environmental regulations and a commitment to minimizing the environmental impact of construction activities. - Implementation of sustainable and eco-friendly practices whenever possible.
05	Fair Competition	- Avoidance of anti-competitive practices and commitment to fair competition. - Transparency in bidding processes and accurate representation of capabilities and qualifications.
06	Transparency and Integrity:	- Open and honest communication with clients, subcontractors, and other stakeholders. - Avoidance of deceptive or misleading practices.
07	Confidentiality	- Protection of confidential information obtained during the course of the project. - Agreement not to disclose proprietary information belonging to clients or other contractors.
08	Labor Practices	- Adherence to fair labor practices, including fair wages, reasonable working hours, and safe working conditions. - Compliance with labor laws and regulations, including those related to discrimination and harassment.
09	Payment and Billing Practices	- Honest and transparent invoicing practices, with accurate representation of work completed. - Timely payment to subcontractors and suppliers in accordance with contractual agreements.
10	Subcontractor Relationships	- Fair treatment of subcontractors and commitment to fostering positive working relationships. - Assurance that subcontractors adhere to the same ethical and legal standards.
11	Professional Development	- Commitment to ongoing professional development and staying informed about industry best practices. - Encouragement of employee training and skill development.
12	Community Engagement	- Contribution to the communities where construction projects are undertaken. - Consideration of local interests and concerns.

13	Conflict Resolution	- Establishment of procedures for resolving disputes and conflicts in a fair and transparent manner.
14	Social Responsibility	- Recognition of the social impact of construction activities and efforts to contribute positively to society.
15	Continuous Improvement	- Commitment to continuous improvement in processes, safety practices, and ethical standards. - Regular review and update of the Code of Conduct to reflect changing industry norms and regulations.

Annex 12: Environmental Clearance Certificate

Government of the People's Republic of Bangladesh
Department of Environment
Head Office, Paribesh Bhaban
E-16 Agargaon, Dhaka-1207
www.doe.gov.bd

Memo No: 22.02.0000.018.72.055.20.95

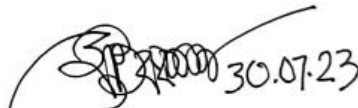
Date: 30/07/2023

Subject: Renewal of Environmental Clearance for Dhaka and Western Zone Transmission Grid Expansion Project of Power Grid Company of Bangladesh Ltd.

Ref: Your application dated 10.07.2023

With reference to your above application, the Department of Environment hereby renews the Environmental Clearance in favor of Renewal of Environmental Clearance for Dhaka and Western Zone Transmission Grid Expansion Project of Power Grid Company of Bangladesh Ltd. The terms and conditions stated in the Environmental Clearance of the above project issued on 28.07.2020 vide memo no. 22.02.0000.018.72.055.20.160 shall remain valid for the renewed period.

2. This renewal is valid up to 27 July, 2024. For further renewal an application along with a) the renewal fees (as per the ECR, 2023) b) VAT on renewal fees (in separate Treasury Chalan) and c) all associated documents shall be submitted to the Head Office of DoE at least 30 days ahead of expiry date.


(Masud Iqbal Md. Shameem)
Director (Environmental Clearance)
Phone # 222218342

Project Director (Chief Engineer)
Dhaka and Western Zone Transmission Grid Expansion Project
Power Grid Company of Bangladesh Ltd. (PGCB)
PGCB Bhaban, Avenue-03, Jahurul Islam City
Aftabnagar, Badda, Dhaka.

Copy Forwarded to :

1. Director, Department of Environment, Dhaka Regional/Rajshahi/Khulna/Barishal/Rangpur Divisional Office, Dhaka/Bogura/Khulna/Barishal/Rangpur.
2. Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

Annex 13: Copy of Payment for Compensation



পাওয়ার গ্রিড কোম্পানি অফ বাংলাদেশ লিঃ
POWER GRID COMPANY OF BANGLADESH LTD.

(An Enterprise of Bangladesh Power Development Board)



Ref: 27.21.0000.453.14.002.23.809

Date: 26/07/2023

JV of TBEA and TBEA Luneng, China

House No- 32, Road No-11,
Baridhara Diplomatic Zone.
Dhaka, Bangladesh.

Attention: Mr. Li Xiaoliang, Project Manager.

Subject: Payment for compensation cost to the stakeholders under

'Design, Supply, Installation, Testing & Commissioning of Rampura-Bashundhara 132kV
Underground Cable Line on Turnkey Basis (Package-2)
(Contract No- PGCB/ADB/3853-BAN/DWZTGE/UGTL/P2; Dated: 16/10/2022)'

Reference: (1) SPL-ADMINISTRATION/PROJECT/03/2022; Date: 19-07-2023 (Swadesh
Properties Ltd Letter)
(2) 27.21.0000.453.14.002.23.683; Date: 25.06.23 (PGCB Letter)
(3) 27.21.0000.453.14.002.23.440; Date: 30.04.23 (PGCB Letter)

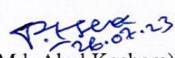
Dear Sir

With reference to the above subject letters please be informed that the authority of Swadesh Properties Ltd has submitted their Cable Route Plan and subsequently provided an estimate for compensation amounting BDT 123,623,916.00 with an addition of refundable BDT 10,000,000.00 as security deposit (Attached).

You are aware that the Authority of Eastern Housing Ltd and East West Property Development Ltd have already provided their compensation estimate which have already been shared with you. Delay in payment may cause unwanted complexities.

Therefore, you are requested to take necessary steps accordingly.

Thanking You


(Md. Abul Kashem)
Project Director (Chief Engineer)
DWZTGE Project, PGCB.

Copy to (not according to seniority):

1. Executive Director (P&D), PGCB
2. Deputy Project Director (SE), DWZTGE Project, PGCB
3. Executive Engineer-1/3, DWZTGE Project, PGCB
4. Office Copy

PGCB Bhaban, Avenue-3, Jahurul Islam City, Aftabnagar, Badda, Dhaka-1212

Web: www.pgcb.gov.bd. PARX: +88-02 55046731-35 Fax: +88-02 55046722 E-mail: info@pgcb.gov.bd





ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 00121E32432R4L/6500

We hereby certify that
TBEA Co.,Ltd.

No.189 South Beijing Road,Changji City,Xinjiang,China.

by reason of its

Environmental Management System

has been awarded this certificate for compliance with the standard

GB/T 24001-2016 / ISO 14001:2015

The Environmental Management System Applies in the following area:

The development,design,manufacturing and service of a series of products,including transformers and relevant components,reactors,instrument transformers,wires and cables,monocrystalline silicon& poly silicon and its byproducts,as well as the development,design, manufacturing and service of solar power generating equipments(solar battery components,inverters,junction box,power distribution cabinet),as well as design,manufacturing and service of solar PV and thermal power system, General contract of electric power project construction within the scope of qualification; Power engineering construction within the scope of qualification

Certified since: November 23, 2010 Valid from: June 24, 2021 Valid until: July 19, 2024

After a surveillance cycle, the certificate is valid only when used together with an Acceptance Notice of Surveillance Audit issued by CQC.
Please access www.cqc.com.cn for checking validity of the certificate.

This certificate and its relevant information can query in the website of Certification and Accreditation Administration of the People's Republic of China (www.cnca.gov.cn).



中国认可
国际互认
管理体系
MANAGEMENT SYSTEM
CNAS C001-M

陆梅
Signed by: Lu Mei



CHINA QUALITY CERTIFICATION CENTRE

Section 9, No.188, Nansihuan(the South Fourth Ring Road) Xilu(West Road), Beijing 100070,China
<http://www.cqc.com.cn>

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2018年版



OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 00121S31850R4M/6500

We hereby certify that

TBEA Co.,Ltd.

No.189 South Beijing Road,Changji City,Xinjiang,China.

has been awarded this certificate for compliance with the standard

GB/T 45001-2020 / ISO45001:2018

The Occupational Health and Safety Management applies in the following area:

The development,design,manufacturing and service of a series of products,including transformers and relevant components,reactors,instrument transformers,wires and cables,monocrystalline silicon& poly silicon and its byproducts,as well as the development,design, manufacturing and service of solar power generating equipments(solar battery components,inverters,junction box,power distribution cabinet),as well as design,manufacturing and service of solar PV and thermal power system, General contract of electric power project construction within the scope of qualification; Power engineering construction within the scope of qualification

Certified since: November 23, 2010 Valid from: June 24, 2021 Valid until: July 22, 2024

After a surveillance cycle, the certificate is valid only when used together with an Acceptance Notice of Surveillance Audit issued by CQC.
Please access www.cqc.com.cn for checking validity of the certificate.

This certificate and its relevant information can query in the website of Certification and Accreditation Administration of the People's Republic of China (www.cnca.gov.cn).



陆梅
Signed by: Lu Mei



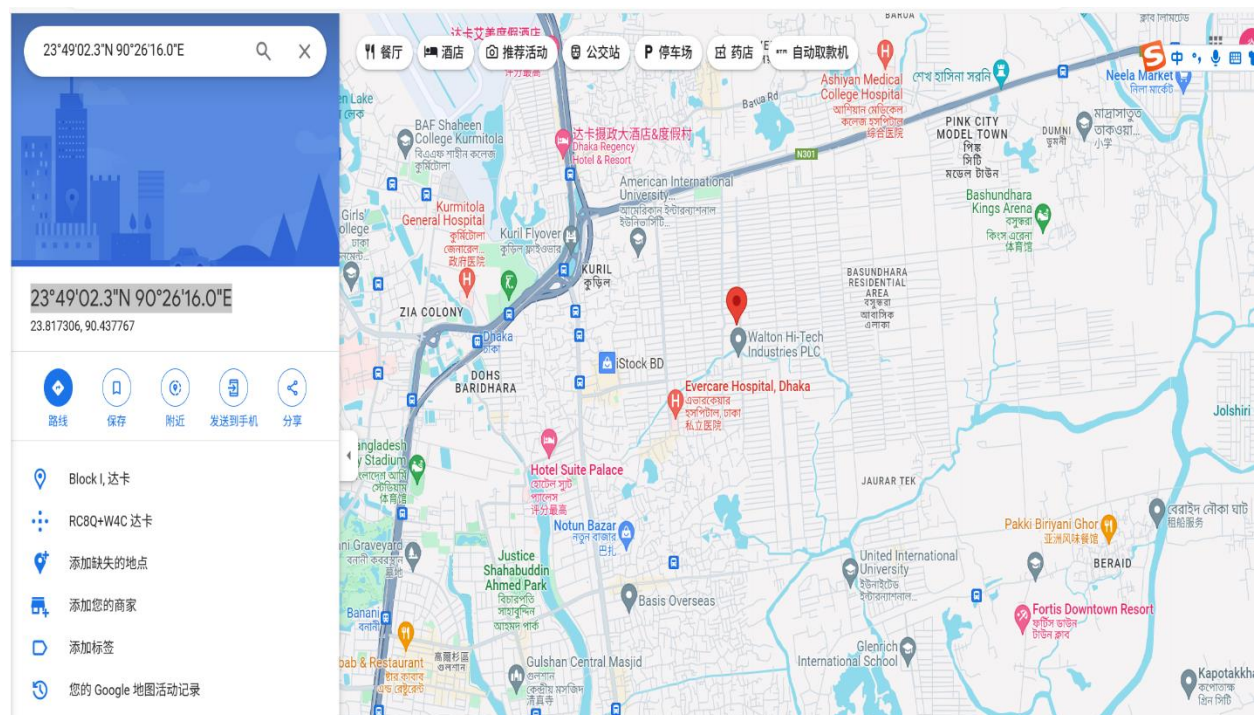
CHINA QUALITY CERTIFICATION CENTRE

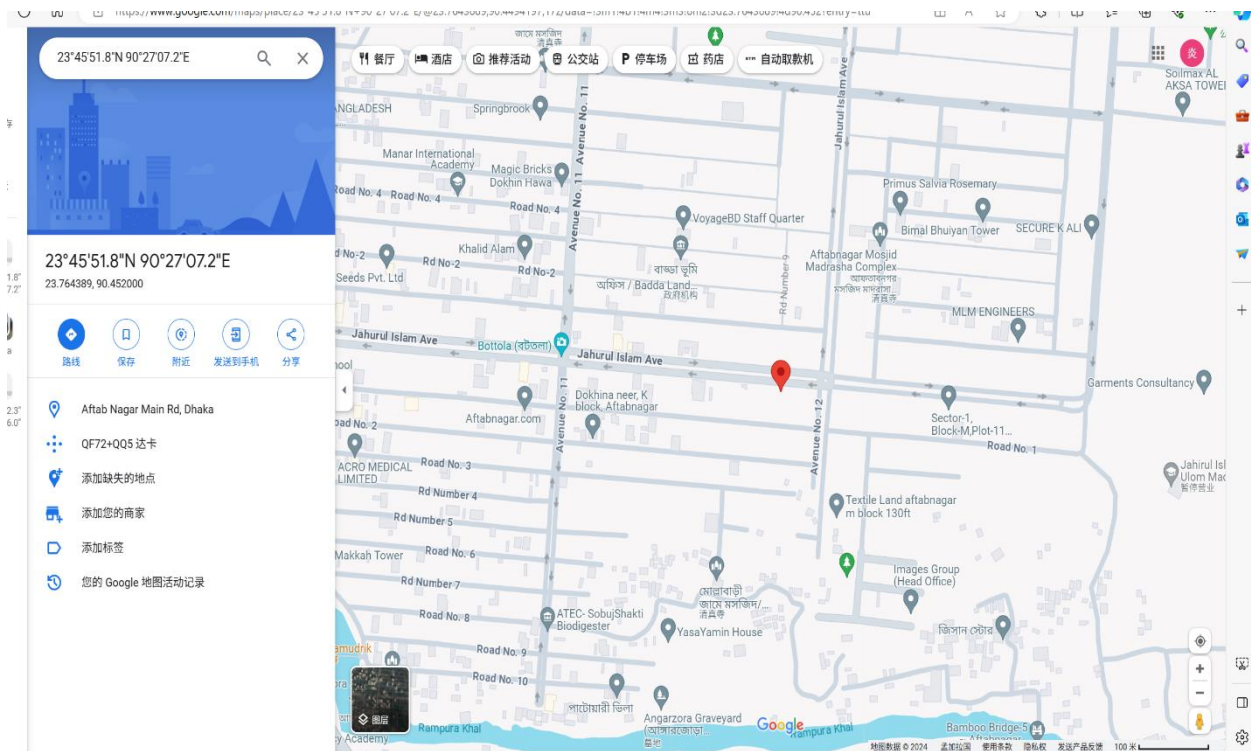
Section 9, No.188, Nansihuan(the South Fourth Ring Road) Xilu(West Road), Beijing 100070,China
<http://www.cqc.com.cn>

B 0035832

2018年版

TBEA is strongly committed to provide the best facilities of accommodation for their labors and staffs. This amenities facilities are under implementation process. However, the location of their amenities are provided below in the Google Map & Google Earth Pro:





Annex 15: Comments Response Matrix

Construction Environmental and Social Management Plan (CESMP)

Comments Response Matrix

S/L	PGCB Comments	Response
01	An executive summary is needed to be added in the report.	Executive summary has been added as you instructed
02	The report is not adequately detailed. Please add specific details this report considering scope of works.	The report is revised accruing to site specific details
03	Please add Executive Summary in this report.	Executive summary has been added as you instructed
04	Please incorporate scope of work in tabular format including interventions related to the project activity with proper maps & coordinates, land size, type of land, land usage issue etc.	Tabular format scope of project has been incorporated in Section 3.2
05	Present figures regarding project scope and location in color format (current site condition).	Project location figure has been added as Figure 3-1.
06	Incorporate GPS coordinates appropriately for all of the scope of works and also highlight important components (environmental & social) in the relevant maps accordingly.	GPS coordinates has been included and Environmental & Social hotspot has been added in Section 4.6.
07	In Subject section the report is mentioned as Updated CESMP. Please clarify the status (revised or not) of this submission of CESMP.	It was wrongly mentioned here and rephrased accordingly

S/L	PGCB Comments	Response
08	Please provide primary data on parameters regarding air, soil, water and sound (if possible) and updated secondary data covering site area.	Primary data of environmental parameters will be collected after approval of CSEMP. However secondary data covering site areas has been added in Section 4.3
09	Please assert statement related to submitting baseline environmental monitoring data (as per IEE) with analytical reports before construction as per EMP and contract document.	Assessed accordingly in Section 4.3.
10	Please add all relevant applicable rules and regulation involved with project implementation and addressed in IEE with proper details	Chapter 2 has been rephrased with relevant rules and regulations of IEE.
11	Please clarify asserting 'red category' in table 2.1.	Clarified accordingly as per ECR, 2023, in table 2.1.
12	Please clarify how the project involves activities of water supply and sanitation in page no. 7.	This section has been deleted
13	Please justify the relevancy of mentioning section 2.4.	This section has been deleted
14	Please check the reference for Table 2.6. Also check the table formatting.	Reference has been added in Table 2-6.
15	Please check the first column of fifth row for table no. 2.7 as it is kept blank.	Reformatted accordingly.

S/L	PGCB Comments	Response
16	Please justify the mentioning of Vatara and Badda as sub-districts of Dhaka in para 42.	Rephrased accordingly.
17	Please justify the relevancy of mentioning construction details in section 3.3 & 3.4.	Section 3.4 has been deleted and section 3.3 has been kept same as this project is related to underground cable.
18	The term 'tower footings' is mentioned in Potential Impact for the issue of Soil Quality in page no. 31. Please clarify this as this is an underground TL project. Also justify these control measures for this section.	Tower footing has been deleted and soil pollution control measures has been rephrased in line with IEE report (see Table 5.4).
19	Please clarify regarding Solid Waste Management Rules, 2023 in Table 6.3.	Rephrased as Solid Waste Management Rules, 2021
20	Please justify 'Maximize rehabilitation success' in Table 6.4.	This sentence has been deleted.
21	Traffic Management Plan is not appropriate. Please add detail plan.	Detail traffic management plan has been added in Annex 5 & Chapter 6, Table 6.7
22	Please mention the reference for environmental monitoring cost in Table 6.9.	reference has been added.
23	Figure 7-1: Organization Chart is not up to the mark. Please provide clear chart.	New Organization chart has been added in Figure 7.1.
24	Please clarify SSHSMP in Chapter 9.	Rephrased accordingly.

S/L	PGCB Comments	Response
25	Please provide reference for Environmental Monitoring Checklist.	Environmental monitoring checklist has been prepared in line with IEE.
26	Traffic is mentioned as the main source of noise and air in page no. 67. Please clarify why excavating equipment is not included.	Rephrased accordingly.
27	Tick mark is given as No for Community safety risk in page no. 68. Please check.	Tick mark is revised as YES with proper remarks.
28	Please add Site Clearance and updated Environmental Clearance in Annex.	ECC has been incorporated in Annex 12 and Site Clearance has not been issued yet, TBEA will resolve this problem before initiating the construction activities.
29	Please add baseline Environmental Monitoring data in the report.	Baseline monitoring will be conducted after approval of CSEMP. However, secondary data of environmental monitoring has been added in 4.1 & 4.2
30	Please incorporate site specific Fire Management Plan, Hazardous Materials Handling and Storages issues in the report.	Detailed Fire management plan has been included in Chapter 6. Hazardous Materials Handling and Storages issues has been incorporated in Table 5.4
31	Please incorporate site specific Labor Management Plan.	Detailed labor management plan has been included in Annex 6 & Chapter 6.
32	Please incorporate Tree Management Plan.	Tree management plan has been added in Chapter 6.
33	Please add Disaster Management Plan.	Disaster management plan has been added in Chapter 6.

S/L	PGCB Comments	Response
34	Please incorporate number of PAP's. Also incorporate compensation details.	According to the IEE report, the benefits/advantages of PAPs from the project are incorporated briefly in the subsection 4.5.3 but the exact number is not outlined in the IEE report.
35	Add a section regarding presenting list of project machinery and vehicles in tabular format.	Construction machinery details has been added in Section 3.4.
36	Please include issues related first aid kit box for the site and present list of items to be included in the kit box in annex.	First aid kit box and PPE details has been added in 9.13 and 9.14.
37	Please include list of PPE in annex.	Sample PPE table has been added in 9.14.
38	Please add details regarding EHS personnel.	All has been incorporated in the section 9.7
39	Please incorporate list of record register. Also provide sample in annex.	All record register has been already listed and added in details in section 5.3 & Annex 4.
40	Please mention details regarding nearest Hospital, Fire Station, Police Station.	Nearest Hospital, Police Station and Fire Service Details in Annex 8.
41	Every chapter is needed to be started in a new page (i.e. chapter 4, 10).	Reformatted accordingly.
42	Please add details of methodology associated with instruments in tabular format for the measurement of air, water, noise, soil etc.	Details methodology has been added in Section 4.3.

S/L	PGCB Comments	Response
	quality. Also present the schedule for testing and associated standard as per ECR (considering EMP & contract document).	
43	Mention land acquisition details/status highlighting compensation aspect and also with loss of assets details.	No land acquisition is required for this project. See section 4.5.4. However, no compensation aspect and loss have not been provided from TBEA.
44	Please incorporate details if the project site encompasses the protected habitats of endangered species designated by the country's laws or international treaties and conventions. If not then write clearly about the issue in relevant section.	Asserted accordingly in Section 4.4.
45	Please incorporate site specific labor management plan with Covid- 19 and transmitting disease context covering gender concern issue. The labor management plan must focus on the safe drinking water providing, H&S and sanitation plan details which shall follow the guidelines of donor policies (e.g. ADB, AIB) also.	Detailed Labor management plan has been added in Annex 6 & chapter 6
46	Please incorporate a comprehensive site specific Traffic Management Plan how contractor will manage this plan for the community for road crossing.	Detailed Traffic management plan has been incorporated in Annex 5 & Chapter 6.
47	Please incorporate site specific Fire Management Plan, site specific waste management plan, site specific Hazardous Materials	Incorporated accordingly in Chapter 6 and annexure.

S/L	PGCB Comments	Response
	& Handling and Storages issues. The plans discussed in the report are not presented with adequate details with site specific concern. Please check this issue.	
48	Please incorporate site specific Bio-diversity Management Plan with Integrated Pest Management Plan (IPMP).	Incorporated in Chapter 6 (Table 6.12)
49	Please assert information as per mitigation plans and EMP from the approved IEE/ESIA of the project. Also incorporate issues including management perspectives as per pre-construction and construction stages separately.	Assessed accordingly. Also, the management and monitoring plan has been developed in line with IEE report.
50	Please incorporate the site specific plan of clearing of vegetation issue in a separate chapter and SOP for the issue in the appendix (if possible).	Site specific plan of clearing of vegetation issue has been added in chapter 10.
51	Please incorporate Compensation process in detail.	Copy of payment for Compensation has been incorporated in Annex 13
52	Site specific EMP should be incorporated which must follow the approved EMP of IEE/ESIA report of the project.	Site specific management and monitoring plan has been included in Chapter 6 In line with IEE.
53	Please provide checklist for environmental monitoring plan.	Environmental monitoring checklist has been added in Annex 2.
54	In the H&S plan, contact details (cell phone no) of Health and Safety officials with Organogram should be provided.	All has been incorporated in the section 9.7

S/L	PGCB Comments	Response
55	Site Emergency Plan (detailed) should be provided as an appendix.	Site emergency response plan has been added in Section 9.16.
56	Accommodation plan should provide layout drawings/sketches showing location of amenities.	This has been incorporated in Annex 15 with a statement.
57	Please incorporate list of PPE which will be used in a single section in accordance with specific work or equipment handling (if possible).	List of PPE has been added.
58	Please check asserting table 6.10 as this table is not found in the report (page 45).	Revised accordingly.
59	Provide basis of cost addressed in table 6.9.	Reference added in Table 6.15.
60	Check that the table 6.8 page 43 is in line with the approved IEE of the project.	Checked and revised accordingly in line with IEE report.
61	Check the status of DSC in regard to implementation of CESMP.	Check and revised.
62	Please incorporate list of hazardous materials as per the construction activity.	Hazardous materials handling and storage issue has been asserted in the report. Also, a detail Hazardous material management plan has been added in Annex 7.
63	Please incorporate project specific list of hazardous material in a single section in tabular format with the associated usage for the specific scope of works.	

S/L	PGCB Comments	Response
64	Site specific Hazardous Materials Management Plan (detailed) should be provided as an appendix mentioning specific SOPs and sites/locations for waste storing and disposal. Where will underground storage tanks (USTs) be sited and how many will be constructed? How will these be decommissioned when construction work finishes?	A detail Hazardous material management plan has been added in Annex 7.
65	Please incorporate the tree plantation plan/ tree management plan as per specific scope of works for this package. The plan should contain the following information: ✓ Number and species of trees to be cut off ✓ Type and amount of crops to be affected ✓ Amount of land required for the construction of Substation ✓ Tree plantation ratio, methodology and schedule Tentative budget for compensation etc.	A detailed tree plantation plan has been added in Chapter 6 accordingly.
66	Please check the GRC committee structure as per IEE/ESIA for the project and add details in flowchart format with associated timeline.	GRC committee structures and the whole chapters has been rephrased in line with IEE report (see Chapter 8)
67	The report should contain detail crop/ land compensation flowchart including GRM procedure.	The statement of Crop/land compensation is added in the subsection 4.5.5.1 & GRM process is added in section 8.4

S/L	PGCB Comments	Response
68	Please incorporate stakeholder engagement schedule and associated measures in tabular format.	Stakeholder engagement schedule and associated measures have been incorporated in the 4.5.6.1 section
69	Present budget for the implementation of the CESMP as per EMP with proper breakdown.	Environmental monitoring budget has been presented in line with IEE.
70	Please re-organize the report with associated chapter and all the chapters are needed to be started on a separate page with a page break. Please check that all the chapters of the report begin with a new page with proper demarcation for the revised submission.	The report has reorganized accordingly.
71	In the appendix of the report please add proof of compliance for OHS AS 18001, ISO 14001 and ISO 9001 by the contractor.	All ISO Certification documents have been incorporated in Annex 14.
72	Copy of latest DoE Environmental Clearance Certificate can be provided in Appendix.	The copy of ECC has been incorporated in Annex 12.
73	Please attach NOCs from the respective authorities in the appendix.	NOCs has not been issued yet but TBEA will resolve this before initiating the construction activities.
74	Incorporate Corona effect and EMF issues in H&S plan with proper management protocol (if needed).	This has been updated and detailed as Corona Pandemic Response in 9.18 in Chapter 9.

S/L	PGCB Comments	Response
75	Highlight social issue management perspective in the report as per EMP. And also present detailed management aspect by considering pre-construction and construction stage separately.	Social management issue has been added/highlighted in line with IEE.
76	Please include issues related first aid kit box for the site and present list of items to be included in the kit box in appendix.	Added in Chapter 9.
77	Incorporate issues regarding following UFO/FIFO/LOCK OUT & TAG OUT procedure for associated safety issues in the report.	All of these procedure have been incorporated in the subsection 9.10.3
78	Sample for labeling wastage should be attached in appendix.	Sample waste labelling has been added in Annex 9.
79	Check status of wet land intervention issue and add specific assertion regarding that.	Specific intervention about wetland has been asserted.
80	Provide standard regarding RoW issue.	This has been cooperated in the section 9.10.4
81	As this package is regarding UG cable line installation there needs specific procedure of work related details to be presented with associated impact management aspect.	According to the IEE, Procedure of work on UG Cable (HDD) and its management aspects are incorporated in 6.2.1
82	Check involving HDD procedure or any other construction procedure and add details in regard to those.	TBEA is only applying HDD procedure and this is added in in 6.2.1
83	Please incorporate the status of nearby river basin area with distance and issues of intervention (if any).	No river basin is observed nearby the project site.

S/L	PGCB Comments	Response
84	Please add copy regarding "Code of conduct" in annexure with local language also.	TBEA's Code of Conduct has been cooperated in Annex 11
85	Please give definitive statement regarding "critical habitat, ECA etc.".	Statement regarding ECR, protected habitat has been asserted.
86	Add list of receptor's as per scope for "Sensitivity of Receptor".	A list of Environmental & Social Hotspot with GPS coordinates and maps are incorporated in chapter 4.6. These hotspots are also considered as "Sensitivity of Receptor".
87	Add specific assertion regarding changes in landscape and highlight management approach accordingly (if needed).	Similar type of statement has been asserted and detailed in 4.5.7
88	Add safety protocol for mosquito borne diseases, harmful fauna and preventive measures issue.	This section has been cooperated in section 9.19
89	Add community safety issues related to transmitting diseases and associated preventive protocols.	This section has been cooperated in section 9.19
90	Please give specific details of environmental monitoring program related to environmental parameters with approximate timelines in tabular format in the report.	Specific details of environmental monitoring have been added 6.13 and 6.14.
91	Add definitive statement regarding ethnic communities and reserve/social forest area.	Such type of statement has been asserted in Section 4.5.

S/L	PGCB Comments	Response
92	Checklists added in the annexure are needed to be usable during construction considering risk factor, H&S, grievances, social aspect, interventions etc. Please address the checklist accordingly.	Checklist has been added in Annexure.
93	Chapter 9 is needed to be addressed with proper details and the contents are needed to be in line with the heading.	Chapter 9 has been revised accordingly.
94	Figure 8.1 regarding GRM process needs to be checked as per project scope of works and approved formation from PGCB.	GRM process has been updated in line with IEE report.
95	Please add reference for data presented in section 4.1 (para 72).	Reference has been added.
96	Add associated explanation with reference regarding geological description in section 4.1 (para 74).	Relevance reference has been added in section 4.1 & 4.2
97	Please add justification for selection of location regard to table 4.1-4.6. Add location map accordingly.	Technical justification for location selection has been incorporated.
98	Add specific details regarding types of underground cable usage and associated methodology in the report. Address procedures also accordingly.	Types of UG cable and associated description has been added in Chapter 4 (Project description)
99	Please justify details regarding section 3.4 (grid substations).	Grid substation has been deleted,
100	Check section 3.4.1.2 (raising the land) as per scope of works.	deleted this section,

S/L	PGCB Comments	Response
101	Please justify the back filling with local sand in section 3.4.1.4. page 21.	deleted this section,
102	Please check relevance regarding section 3.4.1.5-3.4.2 as per scope of works.	deleted this section,
103	Please check table 3.2 in regard to scope of works.	Rephrased this section.
104	Add comment response matrix for further submission indicating the changes with section number, page number and chapter.	Comments response matrix has been added.