

Design, Supply, Installation, Testing and Commissioning
of

230/132/33kV GIS Substation at Rupsha And
132/33 kV GIS Substations at Phultola,
Monirampur, Maheshpur, Meherpur on
turnkey basis



CESMP

CONSTRUCTION
ENVIRONMENT &
SOCIAL
MANAGEMENT
PLAN

Dhaka and Western
Zone Transmission
& Grid Expansion
Project
(Package-7)



CMEC-CNEEC Joint Venture

October 2022

**Dhaka and Western Zone Transmission Grid Expansion
Project (DWZTGE)
(Package-P7)**

**Asian Infrastructure Investment Bank (AIIB) project with Power
Grid Company of Bangladesh Ltd (PGCB)**

on

**Design, Supply, Installation, Testing and Commissioning of
230/132/33 kV GIS Substation at Rupsha and 132/33 kV GIS
Substations at Phultola, Monirampur, Maheshpur, Meherpur on
turnkey basis (Package-7)**

[PGCB/AIIB/L0272A/DWZTGEP/GIS/P7]

**CONSTRUCTION ENVIRONMENT & SOCIAL
MANAGEMENT PLAN (CESMP)**

Submitted to

Power Grid Power Grid Company of Bangladesh Ltd

Submitted by

Joint venture of

**China Machinery Engineering Corporation (CMEC) &
China National Electric Engineering Co., Ltd. (CNEEC)**

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CESMP/SUB/PGCB/AIIB/DWZTGEP/GIS/P7

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Abbreviation

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ASTM	American Standard and Testing Method
AAS	Atomic Adsorption Spectrophotometer
AHs	affected households
ARIPO	Acquisition and Requisition of Immovable Property Ordinance
BAB	Bangladesh Accreditation Board
BOD5	Biological Oxygen Demand for 5 days
BCSIR	Bangladesh Council for Scientific Industrial Research
BWDB	Bangladesh Water Development Board (BWDB)
BLL	Bangladesh Labour Law
BNBC	Bangladesh National Building Code
BLR	Bangladesh Labour Rule (BLR)
BS	British Standard
BDT	Bangladesh Taka
BMPs	Biodiversity Management Plans
BSRM	Bangladesh Steel Rolling Mills
CESMP	Construction Environmental Management Plan
CESMMP	Construction Environmental Management and Monitoring Plan
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
DG	Director General
DPHE	Department of Public health & Engineering
DWZTGEP	Dhaka and Western Zone Transmission Grid Expansion Project
DoE	Department of Environment
DOF	Department of Forest

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DEPC	Department of Environmental Pollution Control
DSC	Construction Supervision Consultant (DSC)
EQS	Environmental Quality Standard
ECA	Environment Conservation Act
ECR	Environmental conservation Rules
EC	Electrical Conductance
EHS	Environment Health & safety
ECP	<i>Environmental Compliance Program</i>
ECOP	Environmental Code of Practice (ECOP)
EIA	Environmental Impact Assessment
EMF	Electric and Magnetic field
EMP	Environmental Management Plan
ESU	Environmental and Social Unit
EHSMS	Environment, Health and Safety Management System
ESHS	environment, social, health, and safety (ESHS)
FIDC	Forest Industries Development Corporation (FIDC)
GIS	geographic information system
GDP	Gross Domestic Product
GRC	Grievance Redress Committee
GBV	Gender-based violence
GPS	Global Positioning System
GRM	Grievance Redress Mechanism
GVWR	Gross vehicle weight rating
GMTL	Gross Minimum Threshold Level

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HH	House hold
HFO	Heavy fuel oil
HSE	Health and Safety Executive
CNEEC	China National Electric Engineering Co., Ltd
CMEC	China Machinery Engineering Corporation
IoL	Intraocular Lens
IRRI	International Rice Research Institute
INGO	International non-governmental organization
IVM	integrated vegetation management
IFC	International Finance Corporation
ISO	International Standardization organization
KPIs	Key Performance Indicators
LAR	land acquisition and resettlement
LILO	Line in Line out
LGI	Local Government Institutions
LTI	Lost Time Incident
LFO	Light Fuel Oil
$\mu\text{g}/\text{m}^3$	Micro-gram per cubic meter
MDGs	Millennium Development Goals
MoEFCC	Ministry of Environment, Forest & Climate Change
MSR	Monthly Safety Report
MOHFW	Ministry of Health and Family Welfare
MTI	Medical Treatment Injury
MTL	Minimum Threshold Level

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NC	Non-conformity
NEMAP	National Environment Management Action Plan
NEP	National Energy Policy
NCS	National Conservation Strategy
NIOSH	National Institute of Occupational Safety & Health
NEDA	N-(1– naphthyl)-ethylenediamine di-hydrochloride
NAAQS	National Ambient Air Quality Standard
NGOs	non-governmental organizations
NTS	Non-Technical Summery
OHSA	Occupational Health & Safety Administration
OHTL	overhead transmission line
OHS	Occupational Health & Safety
OP	Operation Policy
PD	Project Director
PM10	particulate Matter 10 micron
PAPs	Project affected persons
PM2.5	particulate Matter 2.5 micron
PDB	Power Development Board
PGCB	Power grid company of Bangladesh
ppm	Parts per million
PPE	Personal Protective Equipment
RAP	Resettlement Action Plan
ROW	Right of way
REB	Rural Electrification Board

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SPM	Suspended particulate Matter
SEP	Stakeholder Engagement Plan
SWMS	Standard Work Method Statement
SST	Site Safety Tours
SS	Substation
TDS	Total Dissolved Solid
TSP	Total suspended
TSS	Total Suspended Solid
TL	Transmission Line
TBT	Tool Box Talk
USEPA	United States Environmental Protection Agency
USD	United States Dollar
UNO	UpazilaNirbahi officer
WB	World Bank
WFMP	Work Force management Plan
WM	winch machine
WHS	workplace health and safety
WHO	World Health Organization

Glossary

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Adverse impact: An impact that is considered undesirable.

Ambient air: Surrounding air.

Aquatic: Growing or living in or near water.

Bangla: Bengali language.

Baseline (or existing) conditions: The 'baseline' essentially comprises the factual understanding and interpretation of existing environmental, social and health conditions of where the business activity is proposed. Understanding the baseline shall also include those trends present within it, and especially how changes could occur regardless of the presence of the project, i.e. the 'No-development Option'.

Bazar: Market.

Beel: A 'back swamp' or depression. Can be either perennial or seasonal.

Beneficial impacts: Impacts, which are considered to be desirable and useful.

Biological diversity: The variety of life forms, the different plants, animals and microorganisms, genes they contain and the ecosystems they form. It is usually considered at three levels: genetic diversity, species diversity and ecological diversity.

Char: Newly accreted land: Land, sometimes islands, within main river channels and nearby mainland or in the estuary, subject to erosion and accretion.

Ecosystem: A dynamic complex of plant, animal, fungal and microorganism communities and associated non-living environment interacting as an ecological unit.

Emission: The total amount of solid, liquid or gaseous pollutant emitted into the atmosphere from a given source within a given time, as indicated, for e.g., in grams per cubic meter of gas or by a relative measure, upon discharge from the source.

Endangered species: Species in danger of extinction and whose survival is unlikely if the existing conditions continue to operate. Included among those are species whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to suffer from immediate danger of extinction.

Environmental effects: The measurable changes, in the natural system of productivity and environmental quality, resulting from a development activity.

Environmental impact assessment (EIA) / Environmental assessment: The systematic, reproducible, and interdisciplinary identification, prediction and evaluation, mitigation and management of impacts from a proposed development and its reasonable alternatives, sometimes known as environmental assessment.

Environmental Impact: An estimate or judgment of the significance and value of environmental effects for natural, socio-economic and human receptors.

Environment Management Plan (EMP): A Plan to undertake an array of follow-up activities which provide for the sound environmental management of a project/ intervention so that adverse environmental impacts are minimized and mitigated; beneficial environmental effects are maximized; and sustainable development is ensured.

Environmental Management: Managing the productive use of natural resources without reducing their productivity and quality.

Erosion: Process in which wind and water removes materials from their original place; for instance, soil washed away from an agricultural field.

Evaluation: The process of looking back at what has been really done or accomplished.

Fauna: A collective term denoting the animals occurring in a particular region or period.

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Field Reconnaissance: A field activity that confirms the information gathered through secondary sources. This field study is essentially a rapid appraisal.

Flora: All of the plants found in a given area.

Habitat: The natural home or environment for a plant or animal.

Household: A household is identified as a dwelling unit where one or more persons live and eat together with common cooking arrangement. Persons living in the same dwelling unit having separate cooking arrangements constitute separate household.

Important Environmental Component (IEC): These are environmental components of biophysical or socio-economic importance to one or more interested parties. The use of important environmental components helps to focus the environmental assessment.

Initial Environmental Assessment / Evaluation: Preliminary analysis undertaken to ascertain whether there are sufficient likely significant adverse impacts to warrant a 'full' EIA. In some countries, use of initial assessment forms a meaning of "screening" proposed projects.

Khal: Small Channel, canal.

Land use: Types include agriculture, horticulture, settlement, pisciculture and industries.

Mauza: A Bangla word for the smallest government administrative area corresponding to village revenue unit.

Mitigation: An action, which may prevent or minimize adverse impacts and enhance beneficial impacts.

Negative Impact: Negative change from the existing situation due to the project.

Public involvement / Public consultation: A range of techniques that can be used to inform, consult or interact with stakeholders' affected / to be affected by a proposal.

Reversible impact: An environmental impact that recovers either through natural process or with human assistance (e.g. cutting off fish migration by an embankment might be reversible at a later stage if a proper regulator is built).

Stakeholders: Those who may be potentially affected by a proposal, e.g. Local people, the proponent, government agencies, NGOs, donors and others, all parties who may be affected by the project or to take an interest in it.

Taka: Unit of Bangladeshi currency.

Terrestrial: Living on land.

Thana: Sub-district level of government administration, comprising several unions under district.

Union: Smallest unit of local self-government comprising several villages.

Upozila: Sub-district name. Upozila introduced in 1982.

Zila: Bengali word of district.

Power: supply (a device) with mechanical or electrical energy

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Executive Summery

The project entitles “Design, Supply, Installation, Testing and Commissioning of 230/132/33 kV GIS Substation at Rupsha and 132/33 kV GIS Substations at Phultola, Monirampur, Maheshpur, Meherpur on turnkey basis (Package-7) will construct under the supervision of PGCB and ADB. The finance partner of the project is Asian Development Bank and the total engineering supervision partner is the consultant of ADB and AIIB& Power Grid Company of Bangladesh (PGCB). The contractor of the project is Joint venture of **China Machinery Engineering Corporation (CMEC) & China National Electric Engineering Co., Ltd. (CNEEC)**, both are experience Chinese organizations for the overall supply of substation machinery and construction of substation. **CMEC-CNEEC JV** will responsible to ensure that all activities of substation follow the policy of construction environmental social management plan (CESMP), and during the construction phase of the substation project, environmental monitoring will be done by guideline of ECR 1997 and IFC EHS guideline. The CESMP will be the part of the contract documents and will use as a monitoring tool for compliance. Violation of the compliance requirements will treat as non-compliance leading to the corrections or otherwise imposing penalty on the **CMEC-CNEEC JV**. A Standard Environmental Code of Practice (ECOP) is prepared as a guideline for environment management of different components of construction of five substations which will be followed by **CMEC-CNEEC JV**.

CESMP is a living and site-specific plans to manage or avoid or minimize the negative impacts during the construction period for the construction of five substations works [civil work for control building, boundary wall, gantry, transformer foundation, cable drain, substation tower, tower erection and stringing]. To perform the work, **CMEC-CNEEC JV** must hire at least one Environment, Health, and Safety supervisor for each subproject. The Environmental and Social supervisor or specialist will look after the environmental and social issues, impact assessment (adverse) and give the right mitigation measure of negative impacts. **CMEC-CNEEC JV will** prepare and also submit an environmental and social safeguard report which will be reviewed by PGCB as per contract document with PGCB. The project will have ESHS of **CMEC-CNEEC JV unit** for the smooth construction of the five substations. To be an environmentally acceptable unit, **CMEC-CNEEC JV will** have its environmental monitoring unit with trained manpower with the necessary equipment and other logistics along with the required budget. During the construction phase, **CMEC-CNEEC JV will** take responsibility for the majority of the environmental and social mitigation and monitoring actions. In the monitoring actions, the cost for air quality monitoring as per ECR,1997 at the project sites, monitoring of in-situ noise level, surface and groundwater quality parameters as per ECR 1997. The laboratory cost for environmental samples (air, water, noise) and third-party inspection of welding, crane, site generator emission, and concrete basement column will include in the cost schedule. The environmental monitoring (air, water, soil, noise, EMF) will be attached in above all reports. As per package **DWZTGEP P7**, five substations will construct as per PGCB guidelines.

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Grievance Redress mechanism, PGCB and consultant of World Bank will be formed a non-judicial body with a member of PGCB that acts independently, impartially and objectively in evaluating the process followed by the PGCB guideline

During the tender stage PGCB has done the preliminary survey to locate tower locations on the ground conforming to the approved profile substation locations. The coordinates of all the tower locations shall also be recorded using GPS/DGPS of positional accuracy less than 3m for easy relocating. The position of substation locations shall be marked in the final digitized drawing with relative distances from any permanent benchmark area.

The following scope and area will conduct through the construction of new five substations, which will be done by **CMEC-CNEEC JV**

SN	Name of the Substation	GPS	Land area
1	230/132/33 kV GIS Substation at Rupsha	22.77076 N 89.61685 E	5.35
2	132/33 kV GIS GIS Substation Phultola	22.92388N 89.48595E	2
3	132/33 kV GIS GIS Substation Monirampur	22.97617N 89.22928E	3
4	132/33 kV GIS GIS Substation Maheshpur	23.3422317N 88.9123916E	3.03
5	132/33 kV GIS GIS Substation Meherpur	23.79119N 88.6796798E	3

It will responsible to ensure all construction activities of construction of substation project follow the policy provisions specified in the project's CESMP. There will be no physical or economic displacement of people. The entire proposed construction of the substation project will be built through land acquisition which has been completed by PGCB.

Power Grid Company of Bangladesh (PGCB) is the sole electric power transmission organization in Bangladesh. It is a government company that owns and operates the power grid in Bangladesh. It is a subsidiary of the Power Development Board (PDB). Power Grid Company of Bangladesh Ltd. (PGCB) was formed under the restructuring process of the Power Sector in Bangladesh with the objective of bringing about a commercial environment including increase in efficiency, the establishment of accountability, and dynamism in accomplishing its objectives. PGCB expanded its network and capacity manifold and operating those efficiently and effectively for the distribution of power all over Bangladesh.

The development of socio-economic profile is of the project area and the main social, economic, cultural, ethnic and political features of the substation project area, as well as the key issues considered under project preparation.

- ✓ Identify broadly adverse environmental & social impacts under the project and determine which would Bank policies (involuntary resettlement-2013) triggered under the project and will recommend the approach for planning as required by the PGCB policies;

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- ✓ Develop the required planning instruments to meet the power development board of Bangladesh, Bangladesh Government requirements for appraisal, particularly on involuntary resettlement and indigenous people; and
- ✓ Carry out public consultations in the project areas to feed their concerns and recommendations into the project design
- ✓ GRM boxes are open for the surrounding public along with the substation project locations
- ✓ Any grievance of public will be solved by the help of social specialist and project personnel

Environmental monitoring compliance is essential in today's construction project. It supports in producing safe way installation of a line in national (Environmental Act 1995, ECR 1997,) with international standards and guidelines (Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution, 30 April. 2007). Needed of effective monitoring is important that the management and the employees/workers are aware of the regulations and standards for the project. After all, the quality of instruction line environments is directly linked to the surrounding environment and components (air, water, noise) of the environment. Environmental monitoring may be assisting the implementation of project safe and reduce waste and minimize environmental impacts.

Priority should be given to the avoidance of impacts at source, whether through the re-design of a project or by regulating the timing or location of activities. If it is not possible to avoid significant negative impacts, consideration should be given to ways of minimizing the impacts by changes to design, timing, or working practices, ideally to the point that they are no longer significant. These measures should be designed to meet specific ecological objectives that will deliver measures that specifically address the negative impacts that are predicted. Offsetting measures carry a degree of uncertainty. Furthermore, even when they are effective, there may be a temporary or permanent loss of ecological value due to a time lag between damage occurring and new habitats becoming fully functional and/or species becoming established. Forward planning is essential in order to have compensating habitats in place as soon as possible. Follow-up monitoring will require establishing the level of success of compensation. **CMEC-CNEEC JV** will collect water samples (both surface and groundwater) from the project locations. The results are in the report with attaching the standard limit of ECR 1997 both island surface water and drinking water. **CMEC-CNEEC JV** will collect ambient air and analyzed it by a specific method. The results of ambient air quality and standard limit of Ambient Air Quality Standard 2022 and IFC/WB have been mentioned in the report for comparison. **CMEC-CNEEC JV** will also be monitoring ambient noise levels at the five locations where ambient air qualities are measured. The air, noise soil and water samples will collect at pre-construction stage as a base line study of the five project locations. The environmental monitoring for air, noise, soil and water samples will continue at the five substation project site quarterly. The quarterly report will be made by **CMEC-CNEEC JV** where the results of the environmental monitoring (air, noise,

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soil and water) will be included. The comparable any deviation or variation between two results of environmental monitoring will give idea to PGCB for further modification.

The monitoring will do at day time as per the standard way of IFC and ECR 1997. The results of ambient noise will give in the environmental & social compliance report for ESU, PGCB. The GPS coordinate for air and noise level monitoring photos will also be included in the reports. As the project is classified as ORANGE-B as per amended ECR'97 (2017) all the necessary protocols will be followed accordingly.

During the construction period of the substation, labor camp is the important component of the substation in remote rural areas. A temporary labour camp will construct at the substation project site with all facilities of living. Total labor camp management, traffic congestion, and its management plan, site vehicles management plan, stockholder management plan will include in CESMP

The objective of the Health, Safety Plan is to ensure that the operation phase of the substation do not result in occupational hazards and also in all conditions the plant is ready to face any emergencies with minimal loss of life and property. The Health, Safety Plan covers possible occupational hazards and emergencies such as falls, exposure to high noise levels and collapse of structures, fires, & explosions. The plan is to be achieved by continuous monitoring of work standards at site, incident statistics, implementation of recommendations and mitigation measures made in this report in respect to occupational hazards and ensuring the conditions subjected to occupational hazards. In the project operation, there is no incident and accident event that occurred for five substations. **CMEC-CNEEC JV** will keep follow-up and right instruction to the project counterpart. Site engineers, site supervisor labors and workers have been operated the project smoothly. Labour camp and workplace non-hygienic sanitation system. **CMEC-CNEEC JV** will use vehicles for carrying the construction materials. **CMEC-CNEEC JV** will use appropriate safe and decent transportation mode to transport workers to project sites, during the construction phase.

Based on an approach to community action, **CMEC-CNEEC JV** considered two groups of human resources: Human Resources from officials (engineers, HR, administration, official) and Human Resources from the hiring labour must make sure that the policies of human resource management being consistent with tenant companies with its own policies, the Bangladesh legislation and the ILO, labour law, of Bangladesh policies and will be invited by the company (**CMEC-CNEEC JV**). The project personnel will include to the project.

The project implementation unit (PIU) of **CMEC-CNEEC JV** will be first notified to the landowners, tree owners at the substation project.

Local traffic near the substation project will be managed by PIU of **CMEC-CNEEC JV**. Appropriate traffic management will take for road and rivers. Environmental and Social specialists use their knowledge of the natural sciences to protect the environment and human health from the adverse impacts from the construction of substation projects. They may clean up polluted areas, advise policymakers, or work with a project to reduce waste. Understanding the

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objectives and scope of works, the Environmental & Social experts started the services with the following management approaches:

Determine data collection methods for research projects, investigations, and surveys

- ✓ Collect and compile environmental data from samples of air, soil, water, and other materials for scientific analysis
- ✓ Analyze samples, surveys, and other information to identify and assess threats to the environment
- ✓ Develop plans to prevent, control, or fix environmental problems, such as land or water pollution;
- ✓ Provide information and guidance to environmental impacts and also possible to reduce the environmental hazards and adverse impacts;
- ✓ Prepare technical reports and presentations that explain their project of the construction the substation project;
- ✓ The selection of those methods and technologies tested and proven to be the best and successful in running and past projects will show their Environmental & Social aspects;
- ✓ The socially and culturally acceptable grassroots level plans will plan for the substation projects;
- ✓ Environmental & Social specialist will coordinate and coordinate with clients and all relevant authorities;
- ✓ Social specialist will coordinate with the knowledge of technical, financial management and accounting, gender and social development and institutional aspects deeply.
- ✓ Collect and compile environmental data from samples of air, noise, water, and other materials for scientific analysis at the project sites (Rupsha, Phultola, Monirampur, Maheshpur, Meherpur)

A social expert will need to know the available and relevant reports, guidelines, the use of maps, maps and drawings, approved relevant standards and practices, to implement the proposed substation and other relevant information, which is useful for implementing for the construction of substation project. Selection of suitable project team members and timely assembly will be arranged in SS areas. Under the strict loyalty of the working schedule of the substation project, a social expert will determine the obvious difference between the role and responsibilities of each member of the team strict adherence to the work schedule of substation project. In regard to the compensation and associated budget issue (RPF & ESMP) the guidelines from the IEE and RAP of the DWZTGEP project will be followed accordingly.

Procedural monitoring of both process and performance, concluding the proposed work is within the scheduled time frame. The work of a social expertis having a change of opinion and a lot of flexibility for a project.PMU (project management unit) of PGCB also take care imported goods for substation projects. Impact management issues will be kept in close monitoring and follow the approved IEE & RAP documents. As CESMP is a live document and in this regard all the

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necessary management protocols will be followed and will be highlighted in the project progress reports and monitoring reports as per contract.

It is applicable to all levels of employment of the organization including contractors working within our premises as well as at customers' sites. All employees of the substation project will retrain periodically on safety rules, policies and procedures, and when changes are made to the workplace safety manual. During construction, the management of impacts related to labour and accommodation conditions and OHS for **CMEC-CNEEC JV** labour (including sub-contractors and supply chain) will focus on the establishment of relevant policies and monitoring systems and corrective actions. On-site emergency plans will be prepared to protect the public health, safety, and environment on and off the Project site in the case of a major natural disaster or construction accident relating to or affecting the substation Project. The Applicant shall prepare the plans and be responsible for implementing the plan with its operations team in coordination with the local emergency response support functions. **CMEC-CNEEC JV** already has its own manual for the environmental project and safe work practice for the entire above project. **CMEC-CNEEC JV** has an awareness about safety issues for workers, grievance mechanism, wage control, hazardous materials controls; various traffic and driving regulations, solid waste, codes and restrictions; security, hygiene, ergonomics, medical and first aid information; etc. mentioned in the CESMP.

In the above circumstance, **CMEC-CNEEC JV** under Dhaka and Western Zone Transmission Grid Expansion Project (DWZTGE) is maintaining all environmental issues, potential negative impacts and their appropriate mitigation measure, labour rental house management and mentoring the occupational and community health of labours and stakeholders at the construction sites of substation projects. And the **CMEC-CNEEC JV** under Dhaka and Western Zone Transmission Grid Expansion Project (DWZTGE) will follow all the management protocols addressed in the EMP of IEE and RAP reports accordingly.

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1.0 Introduction

The Government of the People's Republic of Bangladesh has prioritized the power sector development and has taken massive initiative to build a country-wide power network (transmission & distribution) targeting to reach electricity for all by 2021. As per Power System Master Plan (PSMP- 2016), a transmission system capable of supplying 40000 MW electricity throughout the country is essential by 2030. With the aim of realizing Government's vision, Power Grid Company of Bangladesh Ltd. (PGCB) has undertaken numerous projects to strengthen the National Grid in order to meet the proliferating demand of electricity throughout the country.

The proposed project of entitled "Design, Supply, Installation, Testing and Commissioning of 230/132/33 kV GIS Substation at Rupsha and 132/33 kV GIS Substations at Phultola, Monirampur, Maheshpur, Meherpur on turnkey basis (Package-7)" aims to increase capacity of the transmission infrastructure for supplying uninterrupted and reliable power to western region of the Bangladesh.

Electricity demand of Khulna region is increasing rapidly. Khulna is mainly industrial area. Bangladesh Economic Zones Authority (BEZA) has already planned number of Economic Zones in this area. Adequate & reliable electricity supply is key input for industries. To fulfill electricity demand of the area PGCB has planned to establish a ring network around Khulna City and its adjacent area comprising 230 kV & 132 transmission lines and substations. The 230/132/33 kV GIS Substation at Rupsha, 132/33 kV GIS Substation at Phultola will increase capacity to supply power in Khulna region. The 132/33 kV GIS Substation at Monirampur, Maheshpur and Meherpur will fulfill to supply power at Meherpur district, and Monirampur & Maheshpur Upazilla under Jessore & Jhenaidha districts.

A gas insulated substation (GIS) is a high voltage substation in which the major conducting structures are contained within a sealed environment with a dielectric gas known as sulfur hexafluoride (SF₆) gas as the insulating medium. Traditionally, a gas-insulated substation (GIS) uses a superior dielectric gas, SF₆, at moderate pressure for phase-to-phase and phase-to-ground insulation. The high voltage conductors, circuit breaker interrupters, switches, current transformers, and voltage transformers are in SF₆ gas inside grounded metal enclosures. The design, specification, and construction of GIS SS have included details in the contract documents that are logical to construct or achieve the desired aesthetic result. Since the contract documents specifically define constructed methods and imply assembly techniques. The application of construction understanding during the early phases of GIS substations project design helps to improve design efficiency. The construction site of 5 substations may have significant environmental, social impacts for local people near the substation project and may have health and safety impacts of the workers and stakeholders during the period of constructions.

Substation sites have many procedures and conditions which will identify the sources that pose challenges to the health & safety of the workforce remains critical. Health and safety is a multi-step process that includes the workers at the substation construction site, nearby people,

supervisors, managers and also flora & fauna, etc. Effective management of activities and competent site supervision is essential in maintaining environmental, social & healthy and for their safe conditions. In construction activities especially, the greater the risk, the greater the degree of hazard control and supervision is required. Before the work starts, competent of construction procedure and EHS personnel should, this construction work will have to include;

- ✓ Identify and devise risks and their management strategy
- ✓ Ensure training – site specific and job-specific
- ✓ See that the workforce has access to PPEs and know how to use them
- ✓ Observe, inspection and report this agreed safe work methods will implement as site-wide range
- ✓ Labour management plan including hygienic food, pure water supply and give them in the hygienic environment
- ✓ Upon arrival at the site, employees, nearby people and visitors will receive information about the site hazards and steps taken to control those risks. Also, briefing them about the hazards, PPEs, welfare facilities and site rules can ensure that the work in progress is smooth and efficient.

Incorporating health and safety check-up can keep on the work progress and well-being. Risk assessments, health and safety training, corrective and preventive measures supply of PPE to labours, above all will part of the checklist of the construction of the substation project. As per contract CMEC-CNEEC JV will appoint ESHS group including project manager, construction manager, design engineer for GIS substation, civil engineer, health & safety (accident prevention) officer and site manager, chief supervisor for GIS/AIS substation environmental & social Specialist as well as skilled and unskilled labour forces to the substation project sites. CMEC-CNEEC JV will prepare a Construction Environmental Social Management Plan (CESMP) live document and submit to the PGCB. The Environmental Social Unit (ESU), PGCB will review the CESMP report. After approval of the CESMP report, CMEC-CNEEC JV will start the land filling and civil work as per instruction of PGCB

All managers and project implementation unit of CNEEC will follow the CESMP report in the purpose of work method statement, environmental code of practice, site safety, emergency plan, health & safety issue, wastewater treatment, safety training, dust mitigation measure, noise control etc. If the project manager does not under anything in CESMP, the Environmental specialist of CMEC-CNEEC JV will visit substation project sites and give a brief of all items of CESMP to the project Manager. Besides, the field people of substation project area will keep in contact with an environmental & social specialist. The mission of contributing to safe working conditions, environmental protection, participating in the detection of risk and danger is a matter for all; so labours and workers must also communicate hazardous conditions when they will engage with the construction work of substations.

CMEC-CNEEC JV is a selected contractor for the project entitle “Design, Supply, Installation, Testing and Commissioning of 230/132/33 kV GIS Substation at Rupsha and 132/33 kV GIS

Substations at Phultola, Monirampur, Maheshpur, Meherpur on turnkey basis (Package-7)” at the western site of Bangladesh. The project has included 5 new GIS Substations at greater Khulna, Jessore, Meherpur and Jhenaidah districts. The new GIS substation projects will construct specifically at the fixed 5 different locations by the mitigation of social and environmental impacts. CMEC-CNEEC JV will follow all methodology documents (CESMP), site specific environmental management plan (SSEMP) outlines management measures to be implemented, and will have to mitigate social, environmental, health and safety impacts and risks associated with the construction phase of the substation projects. CMEC-CNEEC JV shall comply with the existing statutes and regulations of Bangladesh concerning the execution of works as per requirements of the Department of Environment (DoE), ECR 1997 (amendment), OSHA, NIOSH. Also, CMEC-CNEEC JV shall comply with the ADB’s anticorruption Policy (1998, as amended to date) requires as a borrowers (including beneficiaries of ADB-financed activity), as well as suppliers, and contractor under ADB-financed contract and, observe the highest standard of ethics during the procurement and execution of the 5 substation project under PGCB.

CMEC-CNEEC JV shall comply the ADB environmental and social safeguards document, the IFC /WB general EHS guidelines, as well as IFC/WB sector-specific EHS guidelines on power transmission and distribution. The higher authority (project management unit) of Power Grid Company of Bangladesh Ltd (PGCB) will approve the electrical and civil design of the substations of CNEEC and PGCB will also give a letter to CMEC-CNEEC JV for starting of the construction work. CMEC-CNEEC JV has given environmental policy for carrying out the construction of 5-substation projects. The both CMEC-CNEEC JV has given the environmental policy is attached in appendix A

It is recommended that all major contractors to be procured under the project will compliant with ISO 14001. This will be done by the PGCB imposing the requirements of ISO certification during the prequalification of contractors. These Contractors will prepare a ‘Construction Environmental Management Plan’ (CEMP) demonstrating the manner in which they will comply with the requirements of ECP and the mitigation measures proposed in the EMP. The CEMP will form part of the contract documents and it will use as a monitoring tool for environmental compliance. Violation of the compliance requirements will treat as non-compliance leading to the corrections or otherwise imposing penalty on the contractors (CMEC-CNEEC JV)

1.1 Project Background

The proposed 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 5-new substations and support the improvements of existing transmission network of PGCB. After completion of Padma Multipurpose Bridge Project, it is expected that huge industrialization may happen in Khulna region. Massive development activities are planned in

this region. In this regards Bangladesh Economic Zones Authority (BEZA) has already planned number of Economic Zones in the area. Such development activity will increase the power demand of this area. To meet up Khulna and Barishal zone's upcoming demand PGCB has planned to construct one 230 kv substation (Rupsa), one 132 kV substation at Khulna with associated 132 kV substation at Jhenaidah, Meherpur and Jasore district areas. After successful implementation of this projects power supply reliability of the Western region of Bangladesh, it will be highly enhanced through new 5 substations and associated transmission lines.

1.2 Objectives of the CESMP Study and Scope

CESMP will have reported in accordance with all issues of construction environmental social management plan guidelines and a view of national and integration laws and regulations along with health & safety aspects. This CESMP report will include an own environmental policy of CMEC-CNEEC JV and site project activities of GIS substations, national and international law & regulations (ECA 1995, ECR,1997) regards to environmental aspects, ILO, BLL (2006) regards to social aspects, health & safety regulation as per Health & Safety Manual of power grid company of Bangladesh, ADB' policy as project financier, OSHA guideline, IFC/WB Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution. The above laws and regulations will take the form of a project site-specific action plan defining a comprehensive, formalized, and coordinated framework for environmental management, which is appropriate to the environmental and institutional setting of 5 substation projects.

CESMP is a comprehensive and detailed process of proposed substation construction initiative, activities, environmental and social management plans, impact assessment, mitigation measures and monitoring to be conducted and operated. CESMP will carry out in relation to the legislative framework relevant to the environmental and social impact studies. Baseline environmental conditions around the project site will establish during this stage of the study. The CESMP is prepared based IEE of Dhaka and Western Zone Transmission Grid Expansion Project (June 2019). Initial Environmental Examination has been prepared by Power Grid Company of Bangladesh, Ministry of Power, Energy and Mineral Resources, Government of Bangladesh for the Asian Development Bank.

PGCB has made tender document, work specification, the guideline and basis of field study, field surveys, inspections, observations and discussions with stakeholders including community representatives and PAPs at important locations of the project and Project Influence Area (PIA) from got from IEE reports (June 2019) of the Dhaka and Western Zone Transmission Grid Expansion Project (DWZGEP). The main purpose of this approach is to obtain a fair impression of the people's perceptions of the substation project and its environmental impacts and possible mitigation during the construction of the 5-substation projects.

The Geographical Information Systems (GIS) is used as a specialized analysis and presentation tool. After commencing field investigations, spatial analysis of satellite imagery is used to

identify present administrative areas and other boundaries/constraints to be considered for both the environmental and social assessments. The administrative boundaries of Local Government areas are defined, and transport routes, traffic, settlement areas are identified.

Environmental monitoring is viewed as an essential tool to be used in environmental management, to assess the effectiveness of the benefit enhancement and mitigation measures, and to check that no unforeseen impacts are occurring. An environmental monitoring plan will have included in CESMP as per the guideline of ESU, Power Grid Company of Bangladesh Ltd, which is fully integrated with the management plan. The nature of the key impacts/associated with project implementation is likely to be such that instrumental monitoring, air, noise, soil, water parameters. Monitoring of health safety aspect at the project site that specified actions will take, coupled with visual observations on site. All monitoring recommendations will make for specific purposes, which are directly related to overall construction environmental management and the control of specific impacts for the substation project. CESMP is a living document where will include policy, project construction processes, E & S management plans and health safety instructions to carry out the substation project within the time frame. The Environmental policy including all-round Management System for Quality, Environment and Occupational Health and Safety Management of CMEC-CNEEC JV is incorporated in the CESMP report. After submission of IEE, Department of Environment (DOE) has given environmental clearance certificate (ECC) from DOE on 28/07/2020 which is renewed of ECC for the DWZGEP was 11/08/2021. The ECC and renewal ECC is attached in appendix B

Chapter 2.0

Construction Environmental and Social Management and Monitoring (CESMMP) Plan

CONSTRUCTION

Environmental
Management

& MONITORING PLAN

2.0 Construction Environmental and Social Management and Monitoring (CESMMP) Plan

During the construction of 5 substations as per term of conditions of Department of Environment through ECC, all parameters of effluent, gaseous emission, noise, solid waste, hazardous waste will be within the limits in the Environment Conservation Rules (ECR) 1997. In the case of non-coverage of ECR 1997 the ADB/AIIB Environment, health and Safety guideline will be adhered to the 5-substaion projects. The design, construction, installation, and rehabilitation of electricity works shall take into consideration environmental issues and concerns with the view of Environmental Code of Practice (ECOP). Factors to consider include, but are not limited to:

- the promotion of energy efficiency,
- the efficient use of non-renewable resources,
- the use of renewable resources,
- the social impact of new projects, and community concerns,
- the minimization of environmental damage, including visual impacts,
- tree management programs, and
- A reduction in and the correct disposal of waste products.

A Standard Environmental Code of Practice (ECOP) is prepared as a guideline for environment management of different components of construction of new substations. The main objective of an ECOP is to manage construction activities in harmony with the environment in an effort to contribute to the well-being of the community and the environment by: (a) minimizing pollution, (b) sustaining eco-systems, (c) conserving cultural heritage, and (d) enhancing amenity. The ECOP has designed to address all potential impacts during the construction of the substations by the PGCB and REB. The ECOP will be provided guidelines for best operating practices and environmental management guidelines to be followed by CMEC-CNEEC JV for sustainable management of all environmental issues. This ECP could be annexed in the general conditions of all the contracts carried out for the subprojects of the project. The list of ECOP, prepared for the subprojects of project is given below.

- ECOP-1: Project Planning and Design
- ECOP-2: Route Selection
- ECOP-3: Tower/Pole Erection
- ECOP-4: Overhead Power Cable Installation
- ECOP-5: Installation of Transformer on H-Pole
- ECOP-6: Substation Site Preparation,
- ECOP-7: Construction Camps
- ECOP-8: Topsoil Salvage, Storage and Replacement,
- ECOP-9: Borrow Areas, (10) Land Reclamation
- ECOP-10: Waste Management,
- ECOP-11: Water Bodies,

- ECOP-12: Water Quality,
- ECOP-13: Electromagnetic Field,
- ECOP-14: Public Health and Safety,
- ECOP-15: Material Storage, Transport & Handling,
- ECOP-16: Cutting/trimming of Trees,
- ECOP-17: Vegetation,
- ECOP-18: Natural Habitats,
- ECOP-19: Occupational Health and safety, and
- ECOP-20: Community Health and safety.

All above mentioned code of practice is the target and contents of management during the construction of substation. The monitoring of substation activities will come from all issues of code of practices. CMEC-CNEEC JV will follow above ECOP and CESMMP will base on above practice. The total environmental code of practices are attached an appendix C.

2.1 Target and content of the Construction Environmental and Social Management and Monitoring Plan (including Health and Safety)

In reality, the construction sector contributes to 23% of air pollution, 40% of drinking water pollution, and 50% of landfill wastes. These numbers are alarming. The construction sector is one of the largest exploiters of resources, with half of them being non-renewable. The Construction Environment and Social Management & Monitoring Plan (CESMMP) is a living and site-specific plan to manage or avoid or minimize the negative impacts during the construction period for the construction of substations. The social matters are included safety to local people and labours might be predicted.

The mitigation measures of impacts are included in this CESMP document, as well as it is equity agreements and conditions attached to project approval at the national level, depending on the jurisdiction. The CESMP is comprised of a series of policies, procedures, plans, programs, and standards that enable the CNEEC is to operate focusing on Environment & Social protection and a safe working environment.

The Construction Environmental and Social Management & Monitoring Plan (CESMMP) will have made to implement at the site in order to avoid or minimize environmental and social impacts. The CESMMP presents an overview of required measures and sub-plans(labour management plan, dust management plan, waste management plan etc.) and provides guidance for the development of the detailed environmental and social management and monitoring plan for the construction of the project. During the period of the substation construction work, the entire workforce will accommodate in temporary camps or in rental houses nearby the substations yard or out site of the substation yard. The accommodation of labour in substation yard will be approved by PGCB. Usually, the distance of substation project sites will be 1-2 km

from the substation yard. It is therefore anticipated that 5 camps will construct at the 5-new substation yards with the accommodation of the entire workforce.

The supervision team of PGCB will accompany for the inspection of substation construction work. The location will be selected by the sub-contractors who will take into account such aspects as access to construction site, access to services, access to materials etc. CMEC-CNEEC JV will enter into an agreement with the house owner for the establishment of construction camp as project time period basis. The rental house will have road commutation, less traffic, hygienic location, availability of water (drinking) and hygienic sanitation opportunity. The substation project is a fixed located project and PGCB has already been bought land as per the Acquisition and Requisition of Immovable property Act, 2017, Electricity Act 2018 and Electricity rules 2020.

CMEC-CNEEC JV will follow all logistic (construction procedure of control building as BNBC, erection & stringing work as per guideline of PGCB, environmental aspects/impacts, environmental monitoring, social, labour law 2006) of Bangladesh. CMEC-CNEEC JV will also include as per national and international logistics (ECR 1997, Labour Law, EHS - IFC/World Bank, OSHA, NIOSH, WHO etc.) in CESMMP; traffic management and waste management plan, air & noise quality monitoring and mitigation plan, soil and erosion management plan, watercourse management plan, hazardous materials management plan, emergency preparedness & response plan (fire safety plan) for public health and safety management plan, stakeholder engagement plan, local recruitment plan, code of conduct for the workforce and occupational health & safety management plan with the framework of World Bank guidance (Environmental & Social Standards) and resettlement policy framework.

CMEC-CNEEC JV will publish quarterly report for the Environmental and Social Unit (ESU) of PGCB which will include detailed information on the implementation of the CESMMP, including monitoring results and covering amongst other health & safety issues, incidents/accidents reports, needs for corrective measures, conflicts amongst construction workforce or with local residents, grievances of workforces or stakeholders, any other detail related to the social and environmental management and performance. Subcontractor-related issues will also include in the monthly report.

A Resettlement Action Plan (RAP) is a document drafted by the PGCB for resettlement, specifying the procedures it will follow and the actions it will take to properly resettle and compensate affected people and communities for the substation project. PGCB will check all activities at all times to ensure that adverse effects during the construction phase are avoided and the CESMMP is duly implemented.

PGCB has already feasibility studied for the Dhaka and Western Zone Transmission Grid Expansion Project of Bangladesh through Initial Environmental (IEE, 2019) and has taken site clearance from the Department of Environment (DOE). The feasibility study of the project has indicated environmental and social impacts and their mitigation measures plan. The possible

impacts and their mitigation measures from the substation construction have also been discussed in the IEE.

CMEC-CNEEC JV will responsible to ensure health, safety, environmental& social management plan for workers and site people at the substation sites. CMEC-CNEEC JV will provide Personal Protective Equipment (PPE) to all workmen and will also provide training, instructions about the usage and maintenance of the PPEs to its sub-contractors. Not only PPE, CMEC-CNEEC JV will also include the regulation for visitor's visit on the project site, license for equipment, equipment testing, EMF test after construction of the substation. Hazards including electric shock, personal/materials falling, and workmen, and damage to public properties, some precautions [lighting of at construction sites, sufficient sign & signal at the roadside of the project, spacing chairs of approved design, ensure PPE & body harness safety belts, will be taken up by CMEC-CNEEC JV.

During the construction phase of the substation, the following monitoring will be conducted by accredited laboratories approved by Bangladesh Accredited Board (BAB) using the instrument with calibrated and maintained equipment. Five substations projects of package P7 under DWZTGEP will be constructed by CNEEC. The progress report will give to ESU, PGCB in every three months after as quarterly reports. These five substations yard will fix location for air, noise, surface and groundwater sampling. During the total project period, the environmental monitoring will be done at the construction site of five substations [Rupsha, Phultola, Monirampur, Maheshpur, Meherpur] by CNEEC. The air noise and water samples will collect at pre - construction stage as a base line study of the five project locations. The air, noise and water samples will collect in same way during operation phase of 5 substations. The comparable any deviation or variation between two results of environmental monitoring will give idea to PGCB for further modification

Before environmental sampling, CMEC-CNEEC JV will be written an application for taking permission for date and sampling locations. As per instruction and date of Power Grid Company of Bangladesh, CMEC-CNEEC JV will be collected samples from the project locations by third-party laboratories.

As per EMP implementation, ambient air quality monitoring is being done by the measurement of some selected parameters (as per ambient air quality standard 2022) at five substation yard quarterly. Surface water will collect from pond water from Rupsha 230/132 substation and the pond is situated at the same site of this substation site (GPS 22°46'14.53"N 89°37'2.87"E). Quarterly Surface water will collect from canal water from Phultola 132/33 kv GIS substation and the canal is situated at the same site of this substation site (GPS 22°55'25.49"N 89°29'6.88"E). Quarterly Surface water will collect from canal water from Monirampur, 132/33 kv GIS substation and the pond is situated at the north side from this Monirampur substation (GPS 22°58'40.71"N 89°13'51.89"E).

Quarterly Surface water will collect from pond water from Maheshpur, 132/33 kv GIS substation and the pond is situated at the west side of this substation site (23°20'31.69"N 88°54'39.71"E).

Quarterly Surface water will collect from pond water from Meherpur132/33 kv GIS substation and the pond is situated at the south side of this substation site (23°47'28.42"N 88°40'41.84"E). Quarterly Ground water sample will collect from 5 new substation projects of their own ground water sources.CMEC-CNEEC JV will be boring for groundwater and this water will be tested for 5 substation project. The soilsamples will collect to see the fertility from cropland adjacent to the substation project in quarterly basis. Noise level will measure in quarterly during the construction period of DWZTGEP(P7). The ESU, PGCBwill review the environmentalmonitoring reports along with monitoring results of the five substation projects. The PGCB field level staff will carry out “Environmental and Social Screening” and “Analysis of Alternatives” of sub-projects with the support from individual consultant for first year and onward, following the guidelines has already mentioned in the IEE report.

CMEC-CNEEC JVwill responsible to implement the suggested mitigation measures and monitoring plan during the construction and operation stages of the project and the Design and Construction Supervision Consultant (DSC), engaged for the subprojects will responsible to monitor and supervise CMEC-CNEEC JV’s environmental activities to ensure that relevant environmental safeguard requirement is being properly followed or not. The DSC will report to the Project Implementing Unit (PIU) of CMEC-CNEEC JV will maintain reporting, information management, and liaison with ESU of PGCB, Head Quarter and Project Director (PD) in time and following structured procedures.

Keeping in mind the pollution factors, there will be a need to put in place elaborate and sound environmental management systems and mechanisms of monitoring on a continuous basis. Undertaking monitoring and auditing of key environmental parameters and putting in place all approved recommendations of the environmental management plan and conditions of the license will achieve this. The level standard of the environmental indicator will maintain during the implementation of CESMP. The ECR, 1997 for Bangladesh will follow-up at the time of monitoring of ambient air quality, noise, surface and drinking water, effluent from any treatment plant, drinking water at the construction site.

Environmental monitoring requires a set of indicators that could be conveniently measured, assessed, and evaluated periodically to establish trends of impacts. The indicators may be independent or maybe functionally related. The monitoring program, in view of the possible impacts as assessed earlier, should consider the indicators for the impact assessment related to the following issues as presented in the tables in the following pages. Monitoring will involve measuring, observing, recording, and evaluating of physical, socio-economic, and ecological variables within the project area and the neighborhood.

It is important for the facility management to set up regular monitoring programs to assess parameters of the environment as stipulated in ECR 1997. This monitoring program will help to identify changes in the environmental situations giving opportunities for adopting appropriate control measures. A comprehensive checklist must be developed for operational usage. The basic activities for a sound-monitoring program should at least include:

This would be the responsibility of the Environment Management cell.

- Collection and analysis of relevant environmental data of the project area;
- Preparation of proper effluent monitoring program; and
- Proper Risk Assessment programs

It is mentioned here that the monitoring program will such so that it can ensure compliance with national environmental regulations and standards. The importance of this monitoring program is also for ensuring that the project does not create adverse environmental changes in the area and providing a database of operations and maintenance, which can be utilized if unwarranted complaints are made. CMEC-CNEEC JV will do regular monitoring (as per EMP implementation) of the possible change in environmental parameters to be undertaken during the construction phase of the project. Dust suppression measures will be carried by spraying water on the substation yard (off-monsoon). Labour camps with facilities of water, sanitation, mosquito net and bins for collecting solid waste from the kitchen of labours camp will include in the environmental & social monitoring. Waste disposal facilities, health safety signboard, tree plantation (minimum 50 nos), portable toilet facilities will also be checked in the monitoring.

To be an environmentally acceptable limit, CMEC-CNEEC JV will have its own environmental monitoring unit with trained manpower with the necessary equipment and other logistics along with EMP implementation budget. The monitoring unit (or a third party) is discussed in the ESHS Resources in the next chapter. Hence, CMEC-CNEEC JV will undertake the activity of monitoring the water quality (potable water), ambient air quality, noise level etc. Regular monitoring of environmental parameters will carry - out to find out any deterioration in environmental quality and also to take corrective steps, if required, through respective internal departments or third party. The compliance department will also collect data about the health of workers etc.

The materials, supplies, equipment, and personnel requirements are largely guided by technical aspects of monitoring and such requirements thus, largely control the budget of the monitoring program. CMEC-CNEEC JV will arrange all kinds of equipment, accessories of substation-making items and engage technically efficient personals. CMEC-CNEEC JV will compare the air quality values with different standard levels (IFC/world bank, WHO) and also previous results of IEE report (June 2019). For the appropriate measurement, analytical methods should be used. Any deviations of results and wrong results have a risk for the total system of the factory. So approved methods (ASTM, USEPA, BS etc) should be used for the measurement of air, water, soil and noise level etc.

Table: 2 .1: checklist of issues/ impacts for construction environment & social management plan (CESMP) with action and Key Performance Indicator

Impacts/ Issues	Actions	Key Performance Indicator
Soil erosion; soil and water contamination (Construction workers camp establishment and operation)	Camp management plan will implement. Photographs will take to record the site conditions prior to the establishment of the camp. Land clearing, leveling and grading will be minimized and carried out in a manner to minimize soil erosion. Camp will have rainwater drainage arrangements. Camps will have to protection arrangements against soil erosion. Identification suitable sites for disposal of hazardous and non-hazardous waste. The selection will be done by the consultation with the PIU and the local municipal authorities. No waste disposal will carry out in khals, beels and rivers. Confinement of the contaminants Immediately after such accidental spillage. Collection of contaminated soils, treat and dispose them in environment friendly manner. All areas intended for storage of hazardous materials to be quarantined and provided with adequate facilities to combat emergency situations complying all the applicable statutory stipulation. The camp site area will completely	Results of water quality analysis. Number of related complaints.

	restored after completion of construction works.	
Vegetation loss; threat to wildlife and fauna	Clearing natural vegetation will avoid as far as possible. The camp will establish in a natural clearing to the extent possible. Complete record will maintain for any tree cutting. The camp staff will not indulge in any animal shooting, trapping, catching or killing activities. Include information on wildlife protection in all too box orientation briefings for camp staff. Contractor shall use lower wattage flat lens fixtures that direct light down and reduce glare and shall avoid use of flood lights. CMEC-CNEEC JV will also raise awareness about the protection of birds and other wildlife species among the work force to reduce impacts such as disturbance and poaching. To move the bird nest, make an alternate nest nearby and carefully move the hatchlings—not unhatched eggs which will be done by CMEC-CNEEC JV	Number of any non-compliance reports. Number of trees felled. Number of sighting of key wildlife species.
Community Health and Safety issues	Entry of the site personnel in the local communities will minimize to the extent possible / appropriate. OHS plan will be prepared and implemented by CMEC-CNEEC JV. Protective fencing to be installed around the Camp to avoid any accidents. The community will inform about the nature of construction activities and the associated health and safety risks; awareness rising of the communities will carry out for this purpose with the help of training sessions, posters, signage and other similar means.	Number of any non-compliance reports. Number of trainings conducted.

	Location and telephone numbers of the nearest hospital will display at appropriate places at work sites and in construction camps. If necessary, an ambulance can be made available at the site.	
Social and Gender Issues	Code of conduct will implement. Local norms and customs will respect. Camp crew will avoid entering the villages. No child labor will be employed in the camps by CMEC-CNEEC JV.	Number of non-compliance reports. Number of related complaints.
Sites of archeological, cultural, historical, or religious significance	In case any artifacts or sites of archeological, cultural, historical or religious significance are discovered during camp clearance, the works will stop, and the Archeological Department will inform. The distance between historic Mosque City of Bagerhat and, 230 kV GIS SSRupshais27 which is not fallen with area of historical and Ecologically Critical Area of Historic Mosque City	Number of non-compliance reports
Odor	Waste disposal sites will locate away from the communities. Regular maintenance of waste management facilities will undertake.	Number of related complaints.
Hydrocarbon and chemical storage and handling	Visual Inspection of storage facilities.	No leakages from the containers in the storage. Handling follows procedures to avoid spillages. Monthly report keeping.
Grievances	In the project area number of grievances must be registered and addressed.	Minutes of grievance redress meetings; number of grievances received; number of grievances resolved. Monthly record keeping.
Bird collision and electrocution data	Walk over surveys and interviews.	Zero mortality. Record keeping.
Electro-magnetic	Measurement through appropriate	WHO recognized

fields	equipment	standards maintaining. Yearly record keeping.
Air Quality	Water spraying will continuation at the project area for air dust pollution	The air quality parameters will keep within the limit of ambient air quality standard 2022 for Bangladesh
Noise Level	Noise level from work site will measure and level of noise will be kept as per different zones of ECR (salient, residential, mixed, commercial and industrial zones). The corona noise may be produced at time of straining of metal wire.	The high sound level which may be produced from the work site will not disturb the locality of substation site. The tension of stringing wire will be increased to reduce the corona noise from LILO line near substation
Water quality	CMEC-CNEEC JV will control water pollution from the 5 (Five) substation project. Effluent from pilling side will discharged before settling	Water quality will keep within the standard limit as per ECR 1997
Soil quality	CMEC-CNEEC JVwill reduce the soil contamination by diesel oil, lube oil from the project sides	Soil quality will be kept within the standard limit USEPA
Traffic Impact	CMEC-CNEEC JVwill be controlled traffic by managing road traffic, recruited a person who will be controlled site traffic at substation area.	The traffic control will reduce as rules of BRTA and Road Transport Act 2018 in Bangladesh (SRO No 333 Law/2019)

This would be the responsibility of the Environment Management cell. To be an environmentally acceptable unit, CMEC-CNEEC JV will have its environmental monitoring unit with trained manpower with the necessary equipment and other logistics along with the required budget. The monitoring unit is discussed in the ESHS Resources chapter. Hence, EMC will undertake the activity of monitoring the water quality (potable water), ambient air quality and, noise level etc. either departmentally or by appointing external agencies wherever necessary. Regular monitoring of environmental parameters will carry - out to find out any deterioration in environmental quality and also to take corrective steps, if required, through respective internal departments or third parties.

As per EMP of IEE report of DWZTGEP implementation of substation project (P7) and ESU, PGCB, the following environmental samples, monitoring parameters, frequency of sampling will carry out during the project period (24 months). High volume sampler will run 4 hours at a single location to collected ambient air selected location as per instruction of PGCB & ADB. CMEC-CNEEC JV will compare the air quality values with different standard levels (IFC/world bank, WHO). The water quality parameters will compare with island surface water schedule 10 rule 13 as per ECR 1997 and quality parameters of groundwater will be compared with island surface water schedule 3 rules 12, ECR 1997. The above-mentioned all environmental parameters (air, noise, soil, water) will compare with test reports of IEE report in DWZTGEP.

Table 2.2: Checklist of Environmental Monitoring Plan

Environmental Parameter	Monitoring Parameter	Standards/ Guidelines	Means of Monitoring	Frequency	Location	Implementing Agency	Monitoring Agency
Ambient Air Quality Parameters	SPM, PM10, PM2.5, SO _x , O ₃ , NO _x , Co & Pb- 24hr monitoring	EQS/DOE Standards	Sampling/laboratory analysis	Before construction & then quarterly	All the substation site	CMEC-CNEEC JV	ESU, PGCB & DOE
WM, diesel generator and diesel pump	NO _x , SO ₂ , SPM, CO, CO ₂ and O ₂ and GHG	EQS/DOE Standards	Sampling/laboratory analysis	During the construction period substation location	All the substation site	CMEC-CNEEC JV	ESU, PGCB
Noise and vibration level monitoring	Leq day and Leq night Ambient Noise Level	EQS/DOE Noise pollution control Rules, 2006	Measurement	Before construction & then quarterly	At the substation site	CMEC-CNEEC JV	ESU, PGCB & DOE
Surface Water Quality Monitoring	pH, Turbidity, BOD ₅ , COD, TDS, TSS, DO, Total Coliform, Ammonia-	EQS/DOE Standards	Sampling/laboratory analysis	Before construction & then quarterly	Near pond and canal of all the substation site	CMEC-CNEEC JV	ESU, PGCB & DOE

	Nitrogen, Oil and grease						
Ground Water Quality	pH, Turbidity, manganese , Iron, Arsenic, EC, Chloride	EQS/DOE Standards	Sampling/l aboratory analysis	Before constructio n & then quarterly	Groundwater sources from all the substation site	CMEC- CNEEC JV	ESU, PGCB & DOE
Soil Pollution	pH, Texture, Organic content, Lead, Copper, Chromium , Cadmium	EQS/DOE Standards	Sampling/l aboratory analysis	Before constructio n & then quarterly	Cropland from all the substation site	CMEC- CNEEC JV	ESU, PGCB

Table 2.3: Checklist of monitoring Plan for occupational health and safety issues, labor camp condition traffic congestion

Monitoring Aspect/issues/ activities	Monitoring Parameter	Standards/ Guideline s	Means of Monitorin g	Frequency	Location	Impleme nting Agency	Monitoring Agency
Labour Camp	Living arrangement, drinking water, cooking arrangement , Sanitation facilities, dust explosion,mosqu ito net and waste collection bin	-	Visual inspection	Monthly but it will report in quarterly	Five substation yard	CMEC- CNEEC JV	PGCB, ADB
Traffic condition	Local traffic near the substation near high- way/road	BRTA	Traffic congestio n	Daily	Five substation yard	CMEC- CNEEC JV	PGCB, ADB
Occupational health and safety issues	PPEs like hand gloves, spectacles for eye protection, helmets, masks, visible jacket, earplug, and	BLL, OHSA, NIOSH	Health and safety	Daily	Five substation yard	CMEC- CNEEC JV	PGCB, ADB

	safety boots						
Accident	Any incidental event	-	-	Daily	Five substation yard	CMEC-CNEEC JV	PGCB, ADB
Tree plantation	-	-	-	After completion of project	Five substation yard	CMEC-CNEEC JV	PGCB, ADB

In the above cost purposes, reporting, environmental monitoring with cost inherent for the test of air, water, noise and soil. To implement the project properly, environmental, social, health safety specialists will recruit in the project schedule. In the civil work, site fencing, land acquisition, compensate for agriculture goods, traffic safety, the rental cost of the labour camp at substation sites, awareness poster & program for labours and surrounding population, transportation coats of labour from worksite to the site of substation project. To mitigate the corrosion impact, resettlement of flora, fauna, tree plantation, cooking arrangement, retained biodiversity will include in the cost. During the construction phase, CMEC-CNEEC JV will take responsibility of the majority of the environmental and social mitigation and monitoring actions. In the monitoring actions, the cost for air quality monitoring as per ECR,1997 at the project sites, monitoring of noise level, surface and groundwater quality parameters as per ECR 1997. The monitoring of soil quality parameters will estimate as per ESU, PGCB requirement. The laboratory cost for environmental samples (air, soil, water, noise,) and third-party inspection of welding, crane, site generator emission, and concrete basement column will include in the cost schedule. To mitigate the soil erosion, transportation cost of land, soil, effluent sludge along tree plantation cost will list in the cost schedule.

Table 2.4: Probable cost for Environmental monitoring

Impact activity	Parameters	Cost in BDT	Cost in USD
Air pollution	NO _x , SO ₂ , SPM, CO , GHG and O ₂ as per IFC/WB & ambient air quality standard 2022 for three diesel engines (WC, generator & water pump)	150000	1800
	SPM, PM10, PM2.5, SO _x , NO _x , Co & Pb- 4-hr monitoring at Rupsha, Phultola, Meherpur, Monirampur and Mohespur substation during the 24 months project period	1,500,000	18000

Noise level	Sound level (Leq) at the substation sites (Rupsha, Phultola, Meherpur, Monirampur and Mohespur)	100000	1200
Surface Water	pH, Turbidity, BOD5, COD, TDS, TSS, DO, Total Coliform, Ammonia-Nitrogen, Oil and grease at the substation sites (Rupsha, Phultola, Meherpur, Monirampur and Mohespur)	1,200,000	14,200
Ground Water Quality	pH, Turbidity, manganese, Iron, Arsenic, EC, Chloride at the substation sites (Rupsha, Phultola, Meherpur, Monirampur and Mohespur)	1,200,000	14,200
Soil Pollution	pH, Texture, Organic content, Lead, Copper, Chromium, Cadmium at the substation sites Rupsha, Phultola, Meherpur, Monirampur and Mohespur)	1,500,000	18000

Basis cost of environmental monitoring will environmental sampling collection and analysis. Department of Environment and Bangladesh Accreditation Board (BAB) laboratories or DPHE (Tongi and Mohakhali) and BCSIR, Dhaka are the right people for environmental monitoring and inspection of environmental parameters (air, noise, soil, water). But air samples collection for 4 hours for the Department of Environment (DOE) is not agreed to such type of monitoring and it is a time being matter. The cost of sampling and cost of analysis is important issues for the basis of the basic cost of environmental monitoring. CMEC-CNEEC JV will engage with a private laboratory for such environmental monitoring.

2.2 ADB Safeguard Policy Statement (SPS) 2009

For any ADB operation requiring involuntary resettlement, resettlement planning is an integral part of project design of the substation, to be dealt with from the earliest stages of the project cycle. The Safeguard Policy Statement (2009) of ADB sets guidance and requirements for resettlement planning, as well as the follow-up.

The ADB's Policy objectives on involuntary resettlement are to (i) avoid involuntary resettlement wherever possible; (ii) minimize involuntary resettlement by exploring project and design alternatives; (iii) enhance or at least restore the livelihoods of all DPs in real terms relative to pre-project levels; and (iv) improve the standards of living of the displaced poor and other vulnerable groups.

The Involuntary Resettlement Safeguard covers physical displacement (relocation, loss of residential land, or loss of shelter) and economic displacement (loss of land, assets, access to assets, income sources, or means of livelihoods) as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas. It also covers whether such losses and involuntary restrictions are full or partial, permanent or temporary. The following Involuntary Resettlement Policy Principles are followed by ADB, these are

- Screen early to identify involuntary resettlement impacts and risks and determine the scope of resettlement planning through a survey and/or census of DPs, including a gender analysis, specifically related to resettlement impacts and risks.
- Carry out meaningful public consultations with DPs and affected local communities. Inform all DPs of their entitlements and resettlement options and ensure their participation in various stages of the project especially vulnerable and poor groups. Establish a GRM to receive and facilitate resolution of the AP's concerns. Support the social and cultural institutions of DPs and their host population.
- Improve, or at least restore, the livelihoods of all DPs through (i) land- based resettlement strategies when affected livelihoods are land based where possible or cash compensation at replacement value for land when the loss of land does not undermine livelihoods, (ii) prompt replacement of assets with access to assets of equal or higher value, (iii) prompt compensation at full replacement cost for assets that cannot be restored, and (iv) additional revenues and services through benefit sharing schemes where possible.
- Provide physically and economically DPs with needed assistance, including the following: (i) if there is relocation, secured tenure to relocation land, better housing at resettlement sites with comparable access to employment and production opportunities, integration of resettled persons economically and socially into their host communities, and extension of project benefits to host communities; (ii) transitional support and development assistance, such as land development, credit facilities, training, or employment opportunities; and (iii) civic infrastructure and community services, as required.
- Improve the standards of living of the affected poor and vulnerable group to at least national minimum standards. In rural areas provide them with legal and affordable access to land and resources, and in urban areas provide them with appropriate income sources and legal and affordable access to adequate housing.
- Develop procedures in a transparent, consistent, and equitable manner if land acquisition is through negotiated settlement to ensure that those people who enter into negotiated settlements will maintain the same or better income and livelihood status.
- Ensure that DPs without titles to land or any recognizable legal rights to land are eligible for resettlement assistance and compensation for loss of non-land assets.

- Prepare a DRP elaborating on DPs' entitlements, the income and livelihood restoration strategy, institutional arrangements, monitoring and reporting framework, budget, and time-bound implementation schedule.
- Disclose both the BRP and DRP in a form and language understandable to DPs and other stakeholders.
- Conceive and execute involuntary resettlement as part of a development project or program. Include the full costs of resettlement in the presentation of project's costs and benefits. For a project with significant involuntary resettlement impacts, consider implementing the involuntary resettlement component of the project as a stand-alone operation.
- Pay compensation and provide other resettlement entitlements before physical or economic displacement. Implement the DRP under close supervision throughout project implementation.
- Monitor and assess resettlement outcomes, their impacts on the standards of living of DPs, and whether the objectives of the DRP have been achieved by taking into account the baseline conditions and the results of resettlement monitoring.

Safeguard Policy Statement is a document drafted by the PGCB or PDB for resettlement, specifying the procedures it will follow and the actions it will take to properly resettle and compensate affected people and communities. PGCB may check all activities at all times to ensure that adverse effects during the construction phase are avoided and the CESMP are duly implemented. For the construction period, CMEC-CNEEC JV will comply with the requirement of the CESMP as part of his contractual obligations, which covers all aspects of the project. It will further require to customize the overall CESMP and to develop as it and works specific Construction Environmental Social Management Plan (CESMP) including all necessary sub-plans as indicated in the CESMP.

As per the Acquisition and Requisition of Immovable Property Act, 2017, Section 2(1) for the substation project, Power Grid Company of Bangladesh Ltd has already paid for buying fixed land of 5 substations.

2.2.1 Process of Compensate as per the Electricity (Amendment) Act 2018

For the purpose or the interest of the public, the Government of Bangladesh can acquire other's property by paying compensation. It may be for the temporary or permanent basis. If it is taken over for permanently but afterward if it is not used, the government does not bind to return it. However, lands used for graveyards, places of cremation, religious or educational institutions are usually not taken over. On the basis of duration, taking over is of two kinds. Government, non-government or semi-government private agencies or departments carry out development works for the purpose or interest of public. Development works may be carried out in their own lands or in lands taken over by the government with due compliance of some definite processes

or rules. This process is generally called as acquisition of land. Development works are generally permanent nature and are carried out directly or indirectly on or over the land which is taken over by way of acquisition. the newly enactment Act, The Acquisition and Requisition of Immovable property Act, 2017, Section 2(1) defines the term as follows: “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.” The new law states that lands of worship can also be acquired now only if it is indispensable in public interest. The bill proposes increasing compensation of the affected people as the previous law lacked the provisions. The new law provides for an additional 200 percent compensation on the market rate if any land is acquired for the government project and the compensation willan additional 300 percent if the land is for any non-governmental organization. It also provides for the appointment of joint district judge level officials as the arbitrator in this type of cases. But the appeal, if there is any, will be heard by district judge level officials. The purpose of a substation is to ‘step down’ high voltage electricity from the transmission system to lower voltage electricity so it can be easily supplied to homes and businesses through our distribution lines. As per Electricity Act, 2018 (S.R.O. No. 28-Law/2019) Government of Bangladesh shall make necessary arrangements for the development and reformation of power generation, transmission, supply and distribution systems, introduction of advanced technology and sale and purchase of power and relevant work. As per public interest and for continuously distributing electricity, Govt. of Bangladesh has taken land for substation at Rupsha, Phultola, Meherpur, Monirampur and Mohespur through the appropriate compensate of the land. All documents of land acquisition for the five substations are preserved by PGCB of the project “Dhaka and Western Zone Transmission Grid Expansion Project”. The status of compensation or compensate of affected persons (APs) will include in the baseline study of Environmental & Social Safeguard Compliance Report through the public consultation. If any grievance will outcome from the affected person near the substation area regarding land acquisition, all APs can be able to complain through GRM form at the five substation areas.

2.3 Stockholder Engagement Plan (SEP)

ADB’s Safeguard Policy Statement requires ADB’s borrowers/clients to carry out meaningful consultation processes in all projects financed by ADB. For policy application, ADB will require borrowers/clients to engage with communities, groups, or people affected by proposed five substation projects, and with civil society through information disclosure, consultation, and informed participation in a manner commensurate with the risks to and impacts on affected communities. For projects with significant adverse environmental, involuntary resettlement, or Indigenous Peoples impacts, ADB project teams will participate in consultation activities to understand the concerns of affected people and ensure that such concerns are addressed in project design and safeguard plans.

The ADB's Safeguard Policy Statement emphasizes requirements for establishing a grievance mechanism that receives and facilitates the resolution of affected people's concerns, complaints, and grievances about a Project's environmental and social performance. The grievance mechanism should be scaled to Project risks and adverse impacts, address affected people's concerns and complaints promptly. It should also ensure the process is understandable and transparent, gender responsive, culturally appropriate and readily accessible to all segments of affected people. It should also not impede access to judicial or administrative remedies. The grievance mechanism should be delivered to the affected people in appropriate manner..

The ADB Public Communications Policy 2011 promotes greater transparency and accountability by enabling ADB's stakeholders—especially people affected by development activities—to better participate in the decisions that affect them. ADB-assisted activities are expected to consider the right of people to seek, receive, and impart information and ideas, and consider feedback from its stakeholders, including affected people. Information shall be given to affected people early enough for them to provide meaningful inputs into project design and implementation.

Stakeholders are people, groups, or institutions, which are likely to be impacted by the proposed Project or benefitted by the Project interventions, or those who can influence the project. In this project, the primary stakeholders include all directly affected persons such as title owners losing land, physically displaced people living on their land, sharecroppers, and indirectly affected persons and communities/ host villages. The secondary stakeholders are NGOs, community-based organizations, community development projects, government agencies, development partners, media, community leaders, civil society, traders, construction laborers, and consultants in the substation project area

To ensure transparency and access to information relating to the project, CMEC-CNEEC JV will take the following measures for the implementation of a stakeholder engagement plan:

- The company's website: the company's website will be available to all project partners, and will be used by CMEC-CNEEC JV for making available information on the project, basic assessments, reports, etc. The website will provide information concerning such issues as improvement of the road quality, and the construction details. Access to the feedback on the project, and the grievance mechanism, will ensure.
- Bulletins will be prepared and made available in the project office and the municipality office. The Bulletins will include important information on the project, any possible inconveniences to the inhabitants and the traffic during the construction. They will also provide information on the contact with CMEC-CNEEC JV, as well as details of the possibility of access to the Grievance Mechanism.

- Participation in events in the municipality to ensure involvement in all local occurrences and initiatives.
- Public consultation and direct meetings with stakeholders.
- Public meetings – such as the organization of the ceremonial inauguration of the terminal, and other special events.
- Notice boards, on which the most up-to-date information on the project developments, and the possible inconveniences to the local population, will display.
- Project/site office, in which an opportunity to submit comments/complaints, as well as access to the Project documentation, will provide.
- Communication through employees and contractors – information meetings about the most important risks and impacts.
- Placing of information signs concerning the existing risks associated with the project implementation.
- Reports of the post-development analyses and monitoring will publish and/or forwarded to appropriate authorities / institutions following national and international regulations.
- Grievance mechanism – implementation of the internal and external grievance mechanism.
- Supporting local measures associated with the improvement of the quality of living and the environment through, inter alia, co-financing of educational institutions, or participating in the costs of environmental projects.

2.3.1 Stakeholder engagement schedule

Stage of the Project	Schedule	Measures
Preparation and obtaining of permits	Implementation of the stakeholder engagement plan As from the submission of documentation – on an ongoing basis	Making publicly available of the SEP Launching the grievance mechanism Informing of the course of proceedings as regards Environmental Impact Assessment and obtaining the building permit
Construction	A minimum of 30 days prior to the commencement of construction work Commissioning and hand-over to operation	Information for municipalities, enterprises and inhabitants prior to the commencement of construction work, and reminding of the contact details and the grievance procedure – information in local newspapers. Establishing rules for submitting comments for the construction firm employees. Information for municipalities and inhabitants, information in

		local newspapers.
Operation	Post-development environmental monitoring	Forwarding the results to the competent authorities – in accordance with the existing regulations – and publishing of relevant information on the website

The CMEC-CNEEC JV is responsible for sitting and designing a project to avoid significant adverse impacts on cultural heritage. The environmental and social risks and impacts identification process should determine whether the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations. In such cases, as part of the CMEC-CNEEC JV's CESMP, the client will develop provisions for managing chance finds through a chance find a procedure that will apply in the event that cultural heritage is subsequently discovered. The client will not disturb any chance to find further until an assessment by competent professionals is made and actions consistent with the requirements of this Performance Standard are identified.

2.4 Management plan for archeological, culture, historical site

The development of the Management Plan for the World Heritage properties is required according to Article 5 of the Convention Concerning the Protection of the World Cultural and Natural Heritage (1972), with the aim "to adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community, and to integrate the protection of that heritage into comprehensive planning programs". This Heritage Management Plan for Bangladesh needs to map out the efforts of the public and private institutions in developing capacities in implementation of the measures to protect the cultural resources and heritage within the boundaries of the country. A "Cultural Heritage Management Plan" (CHMP) is an instrument to manage the sustainable preservation of historic sites and their cultural heritage to balance the cultural heritage needs as development assets with the needs of the (manifold) "users" of the historic sites and the responsible governmental institutions. The protection of cultural heritage has the potential to support a sustainable development through the transmission line. Therefore, it demands an integrated approach and management system including appropriate multi-sectoral policy, strategy, objectives, actions and management structures. This integrated and multispectral approach would address multiple objectives: (1) The protection of cultural heritage values of Bangladesh; (2) manage the needs of the tangible cultural heritage involving all relevant public and private stakeholders; (3) coordinating sectoral policies, concepts, plans, actions, etc. which are directed or affect historic sites and their cultural heritage; (4) manage and balance conflicting uses/ functions of heritage sites; and (5) develop and ensure attractive, competitive and multifunctional heritage sites. Many historical and archaeological sites are located in the Khulna district. Khan Jahan Ali's Tomb situated at Bagherhat under Khulna division is the only monument in Bagerhat that still retains its original cupolas (domed ceilings). The cenotaph at the

entrance is covered with tiles of various colours and inscribed with Quranic verses, but it is usually covered with a red cloth embroidered with gold threads. The single-domed Dargah Mosque is enclosed within the same complex by a massive wall, with short towers at each corner and archways to the front and rear. The mausoleum is a popular pilgrimage site and therefore has a little more colour and flair than some of the other monuments in the region. During the annual Urs celebrations in early December, marking the anniversary of the saint's death, the complex sees thousands of visitors turning up to pay their tributes and partake in fete-like festivities. The Sixty Dome Mosque (ShatGombujMoshjid) more commonly known as Shait Gambuj Mosque or Saith Gunbad Masjid), is a mosque in Bagerhat, Bangladesh. It is a part of the Mosque City of Bagerhat, a UNESCO World Heritage Site. It is the largest mosque in Bangladesh from the sultanate period (1352–1576). It was built during the Bengal Sultanate by Khan Jahan Ali, the governor of the Sundarbans. It has been described as "one of the most impressive Muslim monuments in the whole of South Asia. This is the birthplace of great Bengali poet Michael Modhushudôn Dutta. He is famous for his Bengali sonet. He is famous for his Bengali sonet. His birthplace is now a museum displaying his life history. The Kopotakkho River where the poets sits & write his most poems is very close to his residence. But the museum is in a bad shape due to poor maintenance. Kushtia is the birthplace of many historical figures including Mir Mosharraf Hossain (1847–1912), Bagha Jatin (1879–1915) and Lalon (1774–1890). Nobel laureate poet Rabindranath Tagore lived his early life at Shelaiddaha.

2.5 Grievance Redress Mechanism

Grievance Redress is a very important part of resettlement project implementation. Therefore, this project will follow the specific grievance redress mechanism to ensure that the voices of the APs merge with implementation decisions. Affected people and communities will set their arguments to the grievance redress committee (GRC) consistent with the grievance redress method. The structures, processes, and outcomes are described in the following sections. Environmental, social and public health concerns may be raised by the affected persons and their communities in the period of project involvement and construction activities. Transparency is a demand of communities and affected people in procurement and maintaining the quality of construction. They may also be paying attention to construction activities. Complaints and grievances may, therefore, range from land acquisition, resettlement, procurement, and quality of works on site. A dispute over ownership and inheritance of the acquired lands of affected persons and assets missed by the census, joint verification, and valuation of affected assets, compensation payment, and the like may arise in the process of resettlement.

To solve the resettlement related disputes and make the project accountable to the affected people and their community, a complaint and grievance mechanism will work. Based on “extra-legal” method the Grievance Redress Committee (GRC) will be officially recognized community to resolve disputes arising out of various matters related to land acquisition, resettlement, environment, safety, and other social concerns.

If any of project affected person want talk about grievance related issue, s/he can contact with PD of Dhaka and Western Zone Transmission Grid Expansion Project (DWZTGEP) through the local representation of Power Grid Company of Bangladesh. .The fundamental objectives of this mechanism are to resolve any resettlement-related grievances locally in consultation with the aggrieved party to facilitate smooth implementation of the social and environmental action plans. Democratizing the development process at the local level and to establish accountability to the affected people are the main objectives of the grievance redress system.

Complaints and Grievance Mechanism

Affected people may appeal any disagreeable decision, practice, or activity arising from land and assets and from construction related activities to the grievance redress committee. APs will fully informed of their rights and of the procedures for addressing complaints, whether verbally or in writing during consultation, survey, and time of compensation. The project planning and implementation will careful enough and provide advance counseling and technical assistance to the APs in the land acquisition and compensation collection process to prevent grievances. This will ensure through careful land acquisition and resettlement (LAR) design and implementation, by ensuring full participation and consultation with the APs, and by establishing extensive communication and coordination between the affected communities, the PGCB, and local government bodies.

2.5.1 Grievances Redress Committees (GRCs)

A three-tier bottom up GRC system will establish in this substation project. ESU of PGCB shall the designated person as the key specialist for grievance redress (1st tier) and other member will be come from the project sites of substations (union/municipality level).

The second GRC will consist of the following persons: (i) project director; (ii) representative of city ward; (iii) representative of the affected persons; (iv) representative of the local deputy commissioner's office (land); and (v) representative of the Department of Environment (DOE) for environmental related grievances. A hearing will call with the GRC, if necessary, where the affected person can present his or her concerns and issues. The process will facilitate resolution through mediation. In the event that a grievance cannot be resolved directly by the PIU (first tier) or GRC (second tier), the affected person can seek alternative redress through the city ward committees or in appropriate courts. The APs will be informed through public consultation that they have a right to have their grievances redressed by the local committees as well as by the project management or project implementation units. The APs can also call upon the support of the implementing Upazila Chairman/ representative engaged to implement the RAP to assist them in presenting their grievances or queries to the GRC. Other than disputes relating to ownership right under the court of law, the GRC will review grievances involving all resettlement assistance and other support. The local GRCs (at the union/Upazila/municipal level) will hear the grievances first. Only unresolved cases will forward to the next tier – Project level GRC for further review and

resolution. Grievances will redress within a month from the date of lodging the complaints. GRC decisions will on a majority basis and will disclose and available for review by the stakeholders. If any disputant is unhappy or unsatisfied with the outcome of the Project level GRC, he/she may file cases in the court. GRCs at the union/Upazila/municipal level will form with representatives from PGCB, Representative of RAP implementation consultants, local elected members. There will one GRC at the local level by the project to make it accessible to affected people both in terms of distance and time.

The member secretary of GRCs will regularly available and accessible for APs to address concerns and grievances. One representative of the affected people (male or female) will participate in the grievance redress sessions when the complainants will a female. The GRC processes (both local and Project levels) in terms of legal and other interpretation matters.

Table 2.5: Three levels GRC for the substation project of package P7

GRC of the DWZTGEP			
Sl No	Name & Designation	Name of the office	Status in Committee
1	DPD of package 7	DWZTGEP, PGCB	Convener
2	Executive Engineer of package 7	DWZTGEP, PGCB	Member
3	Manager Account & Admin	DWZTGEP, PGCB	Member
4	Sub-divisional engineer/ Assistant Engineer of package 7	DWZTGEP, PGCB	Member
5	Project manager of CMEC-CNEEC JV	CMEC-CNEEC JV	Member
6	Representative of RAP implementation consultants	RAP implementation consultants	Member
7	Local Union Parishad Member	Union Parishad	Member
Rupsha, Phultola, Monirampur, Maheshpur, Meherpur			

2.5.2 Scope and Jurisdiction of GRC

The scope of work and jurisdiction of GRC are:

- The GRC shall evaluate, consider, and resolve grievances, related to social/resettlement and environmental mitigations during implementation, received by the committee.
- Any grievances presented to the GRC should ideally be resolved on the first day of the hearing or within a period of one month, in cases of complicated cases requiring additional investigations.

- Grievances of indirectly affected persons and/or persons affected during project implementation will also be reviewed by GRC.
- The GRC will not engage in any review of the legal standing of an “awardees” other than in direct losses or distribution of shares of acquired property among the legal owners and associated compensation or entitlement issues.
- GRC decisions should ideally be arrived at through consensus, failing which resolution will base on majority vote. Any decision made by the GRC must be within the purview of RAP and entitlements.
- The GRC will not deal with any matters pending in the court of law.
- A minimum three (3) members shall form the quorum for the meeting of the GRC.

2.5.3 Filing Grievance Cases and Resolution Process

The persons interested will able to file their grievances without any fear and intimidation. Where required, the GRC will assist the people in drafting the grievances. All grievances must be submitted in writing to the Chairman, GRC at the local level. The complaints may be represented by the AP him/herself or through the appointed agent such as locally selected official/legal advisor. The judgment made by GRC will communicate to the concerned aggrieved person in writing. If dissatisfied with the agreement of the GRC, the concerned aggrieved person may request through the convener at the local level GRC, a further review of the judgment of GRC by the Project-level GRC. In such cases, the case will forward to the Convener of the project-level GRC with all documentations by the local level GRC. If the disputant remains unsatisfied, he/she can go to the formal court of law. Through community meetings, notices and pamphlets in the local language (Bangla), and the GRC procedures and operational rules will publicize widely so that affected people are aware of their rights and obligations, and procedure of grievance redresses.

GRC meetings will be held in the respective Field Office of PGCB or other location(s) as agreed by the Committee. If needed, GRC members may undertake field visits to verify and review the issues on dispute, including titles/shares of the land parcel, land occupancy, or other relevant matters. Resolution of complaints will finish within 7 working days. Investigation of grievances will involve site visits and consultations with relevant parties (e.g., affected persons, contractors, traffic police, etc.). Grievances documents and personal details (name, address, date of complaint, etc.) will include, unless anonymity is requested. Local GRC will suggest corrective measures at the field level and assign clear responsibilities for implementing its decision within 15 working days. CMEC-CNEEC JV will have observer status on the committee. If unsatisfied with the decision, the existence of the GRC shall not impede the complainant's access to the government's judicial or administrative remedies. Initial grievance sheet (including the description of the grievance) with an acknowledgement of receipt handed back to the complainant when the complaint is registered at the filed level site office of substation projects. Closure sheet, one copy of which will hand to the complainant after he/she has will be agreed to the resolution and signed off. Grievance monitoring sheet, mentioning actions taken

(investigation, corrective measures) will inform to affected persons. The updated register of grievances and complaints will be available to the public at the SEC office, substation construction site, and other key public offices along the project area. Should the grievance remain unresolved, it will elevate to the second tier or third tier. The complaints and grievances from the aggrieved persons will be addressed through the process described below.

2.5.4 Grievance Resolution Process

Step 1	The GRC on behalf of PGCB informs person-interested and counsels them about the project goals, objectives, role of people and project authority in project implementation, land acquisition and resettlement policy, compensation and entitlement modalities, entitlement packages, and eligibility and process to obtain the entitlements, etc. during consultation meetings and on regular personal contact. People with clear understanding of the approach to GRC and PGCB for solution of the problems and compensation under law and assistance (in case of acquisition) as applicable. People-interested with confusion and valid complaints on land acquisition and resettlement process, entitlements or any other issues related to project implementation approach GRC for resolution. The aggrieved persons may also opt to produce their grievances directly to the Deputy Project Director (DWZTGEP, PGCB)
Step 2	The implementing agency assists the aggrieved PAPs to produce a written complaint to the convener of GRC with stories and expectations. The GRC 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 DC or the court of law and those to be resolved in GRC. Hearing is organized on cases with merits at the GRC secretariat at local level and resolution is given by the GRC within one month of receiving the complaints. Aggrieved persons satisfied with the resolution approach PGCB for quick implementation of the decision under the provision of the RAP. The agreed resolution is forward to PGCB central office for approval by the Deputy Project Director before execution of the decision. In case, the resolution is not acceptable to the aggrieved person, he/she approaches the Deputy Project Director of DWZTGEP, PGCB(project level GRC) through the local level GRC convener with assistance from the implementing agency for further review.
Step 3	Cases with all proceedings are placed with the Deputy Project Director of DWZTGEP, PGCB for review. The DPD with assistance from the GRC members will review and take decision. If found necessary, field investigation is carried out and the resolutions are given within one month of receiving the complaints. The resolution will send to the Conveners office of the local level GRC to communicate to the aggrieved persons for acceptance. The resolution accepted by the

	aggrieved person is then approved by the DPD. In case the resolution is not acceptable to the aggrieved person, he/she approaches the court of law for resolution.
Step 4	The resolution accepted by the aggrieved persons at any level (local or project level) is approved by the Deputy Project Director and forwarded back to the Conveners' office keeping records at his/her office. Based on the approved grievance resolution, the implementing agency processes his/her entitlements and assists PGCB in quick execution of the resolution.

The total GRMprocess resolution and approved GRC and GRM form are attached Appendix D

2.5.5 Approval of GRCs and Entitlements of GRC Members

All the decisions and proceedings of GRC meetings at any level will finally approved by the Deputy Project Director, PIU, and PGCB. According to the agenda of the resettlement plan, the approved GRC decisions will implement in a particular location.

Affected people will exempt from all administrative and legal fees, according to the RAP proposes. Complainants to the court will also have the right of free legal representation. The detailed procedures for redress of grievances and the appeals process will widely publicize among the parties involved.

All GRC members will attend a training and orientation meeting earlier, to commence of their work. Project staff and consultants/resettlement Specialists will conduct the training.

Grievances will be heard once a month by GRC. Before starting project construction work the resettlement process has to be completed, the GRC may meet more than once in every 30 days depending upon the number of such cases. Within 15 days of the hearing of the grievances the GRC will inform the concerned aggrieved persons of their decision.

2.5.6 Grievance Redress Monitoring

The Project Manager of PIU will keep records of all the grievances and their redress in monthly cumulative formats, which will be provided by the INGO and to be signed by the convener of the Grievance Redress Committee. The format will contain information on the number of grievances received with nature, resolved, and the number of unresolved grievances.

2.5.7 Land Acquisition information & GRC issue:

The procedural steps of resolving grievances will have some terms of references (TOR) about land acquisition and GRC at the five substation sites. GRC procedures and operational rules will publicize widely through community meetings and pamphlets in the local Bangla language so that project affected persons (PAPs) are aware of their rights and obligations, and procedure of grievance redress. All local GRC documents will be maintained by the CMEC-CNEEC JVfor review and verification by Construction Supervision Consultant (CSC), [RAP implementation consultants, ADB], development partner (ADB) and any external reviewers. The PGCB Field Office(s) will act as the secretariat to the local GRCs. As a result, the records will up-to-date and easily accessible on-site.

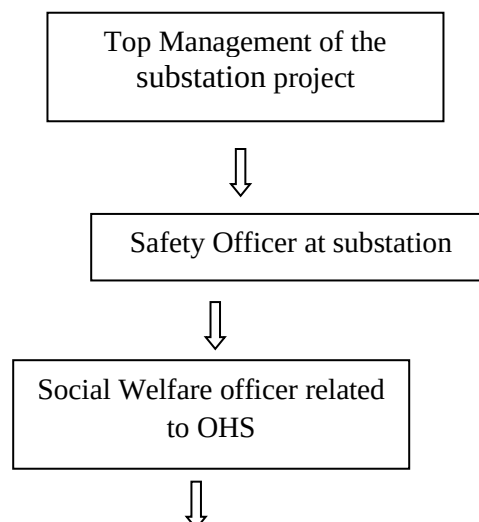
Step-1	PGCB, through the project implementation Contractor (CMEC-CNEEC JV), informs the PAPs of their losses and entitlements in writing and through personal contact. If satisfied, the PAPs claim compensation payment from the PGCB. If confused,
Step-2	The PAPs approach to the CMEC-CNEEC JV for clarification on the provisions, loss and entitlements. If satisfied with the clarification, the PAPs claim compensation payment from the PGCB. If not satisfied,
Step-3	The PAPs approach to the GRC. CMEC-CNEEC JV staff assists the PAPs in producing the complaints and organize hearing within 30 days from the date of complaints being lodged.
Step-4	GRC sessions are held with the aggrieved PAPs. The minutes are recorded and duly considered. If the matter is resolved, the Project Director gives approval. If not resolved,
Step-5	The aggrieved person may accept the GRC decision or can bring the case to the court of law for settlement.
Step-6	The minutes of the GRC sessions, approved by the Project Director, are sent to the concerned officials for arranging payment. The final verdict is communicated to the aggrieved PAPs, who then claim their compensation payment from the PGCB through CMEC-CNEEC JV

Land acquisition information has disclosures to local public during the stakeholder consultation and participation is a key aspect of resettlement projects according to the ADB RAP policy. Participation in consultation meeting is ensured by using Participatory Rapid Appraisal (PRA) approach. Both primary and secondary stakeholders of the project are informed through personal contact, informing the land owners, phone communication, etc. The key objectives of the consultation meetings are to - (i) disclose both positive and negative impacts of the project to the community and stakeholders; and (ii) ensure inclusion of views and opinions from the project affected persons about project impacts in their livelihood and social wellbeing (iii) land owners are known that their land will use for the construction of substations project. The informal meetings has arranged with land owners as they are the most prominent groups for the

substations project. In addition, opinions from local respectable persons, vulnerable and disadvantaged groups has taken into consideration and comprehensively gathered during the consultation meetings. After public consultation, PGCB is sent notice to the land owners of substation areas for their land acquisition. Project affected person is met with respective DC office for their land compensation. The deputy commissioner is then under obligation to determine compensation in accordance with the guidelines mentioned in Electricity Act 2018. He is then required to offer compensation money to the owners and make payment before taking over possession. After acquisition of the substation lands, registered lands then taken over by PGCB. All registration of land and their respective papers & documents will hand to the PMU, PGCB

2.6 Health and Safety Plan for substation project

CMEC-CNEEC JV will recruit health safety officer and site project managers who will monitor and look after the health & safety matter of the labour and workers as well as safety for the project adjacent community. CMEC-CNEEC JV will hang a contact list of emergency units of the nearest health complex, district hospital, clinic, medical college and also ambulance services. The safety plan will also include PPE of workers, site visitors, engineers, high officials of PGCB and others. As per Schedule IV (2) Bangladesh Labour Rule (BLR), ‘When organizing health and safety, top management should consult with the Safety Committee to define targets, organization, responsibilities, etc. These decisions are put in writing in one document called the Company Health & Safety Policy so that they can easily be communicated in the company and to stakeholders. The Health & Safety policy also contains the commitment of top management to ensuring Health & Safety. In addition, the Safety Committee drafts an OSH Guideline which defines procedures on various aspects such as emergencies, accident investigation, risk assessment, and responsibilities of the Safety Committee etc’. In the view of labour rules of Bangladesh, CMEC-CNEEC JV will make a safety policy for the construction of substation. This policy will implement during project performance.



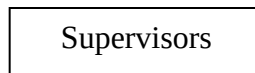


Fig-2.1: Proposed Health & Safety Organ gram of substation project

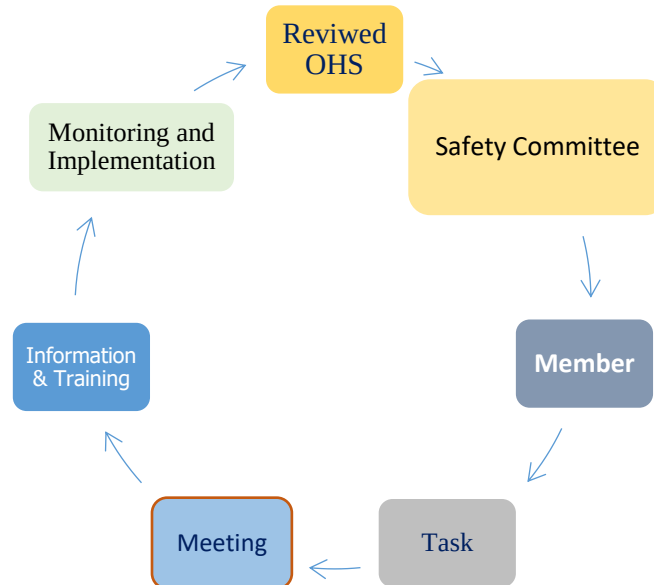


Fig 2.2: Health & Safely Planning of substation project

2.6.1 Health and Safety Reporting

During the construction of substation, work procedure, occupation safety guide, PPE for the workplace, residence of labours, labour law, sanitation facilities at labour camp and workplace, drinking water for labour, personal hygiene of labour, an awareness program for labours and the nearby public will maintain. Occupational Health and Safety officer will give all instructions for the work of way. All information, data, photographs of workplace will collect by the Occupational health and safety officer, for further reporting. The civil work, safety issues will be monitored by the site engineers of Power Grid Company of Bangladesh (PGCB). The report will be made with the following component by CMEC-CNEEC JV.

- The project description
- Work progress
- Health & safety regulations
- Standard Work Method Statement (SWMS)
- PPE for construction of substation tower and stringing of wiring
- Work schedule along with health & safety issues
- Impacts related to health & safety issues
- Mitigation measure of the above impacts
- Monitoring of to health & safety issues about health, safety and accident or incident
- Monitoring of work standard of substation project

- Emergency Preparedness and Response Plan Occupational Health and Safety issues
- Communication system of health & safety
- Further recommendation for health & safety issues

2.6.2 Accident Reporting Procedure

When an employee witness or is involved in an incident they must report it to their immediate supervisor, Health & Safety department (personally, in writing or by phone if the accident occurred remotely) or through an online system if applicable, within one week. If the employee anticipates an accident due to perceived negligence or inadequate safety, they must notify their supervisors or Health & Safety department as soon as possible so the accident can be prevented. Depending on the incident, official forms may have to be completed and submitted. The accident and any sustained injuries must be recorded to an accident database or file. The officials responsible must initiate an investigation or request an investigation from authorities if appropriate. The employee who reported the accident has to cooperate if called in for questioning to provide details needed. As a general rule, the employee must provide information in the incident report as accurately as possible on the following:

- The place of the accident
- The date and time of the accident
- The people involved or injured.
- Their position or involvement in the accident.
- Their actions immediately after the accident

CMEC-CNEEC JV will take further necessary actions if any incidental occurrence will happen during the construction of substation project. The form of incident/accident template is attached an appendix E

2.7 Implementation plan for Five substations

An implementation plan for the five substations at different locations is a document that outlines the steps where PMU of PGCB will give plan to project implementation unit (PIU) of **CMEC-CNEEC JV** will take to accomplish a shared goal or initiative. An implementation plan, also called a strategic plan or strategic implementation plan outlines requisite steps for the execution of a strategy, tactic or change within an organization, or project. The implementation plan is the step-by-step guide for PGCB's and ADB's goals will be achieved by CMEC-CNEEC JV. An implementation plan is a project management tool that facilitates the execution of a strategic plan for a company or a project by breaking down the implementation process into smaller steps while defining the timeline, the teams and the resources this will need. In this case, **CMEC-CNEEC JV** will give plan to PGCB for each component of substation project; PGCB will see the plan accordingly and given schedule of construction of substation. Scheduling the substation project milestones is an important step in the planning process because these checkpoints help to

progress during execution of SS project. Milestones serve as metrics—they are a way to measure how far come in your project and how far you have left to go. To visualize project milestones and keep entire team on track, use a Gantt chart. CMEC-CNEEC JV will give plan with Gantt chart of project milestones for substation component (Land filling, boundary wall, control building, cable drain, transformer platform etc.)

Table 2.6: Gantt chart for the construction of five substations under package P7

30 months	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 5	Quarter 6	Quarter 7	Quarter 8	Quarter 9	Quarter 10
Civil work										
Land filling										
boundary wall										
control building										
Cable drain										
transformer platform										
Internal Road & concrete culverts										
Erection										
Erection of tower										
Cabling										
Stringing										
Line stringing among towers in SS										

Chapter 03

Environmental Social Health & Safety (ESHS) Resources



3.0 Environmental Social Health & Safety (ESHS) Resources

CMEC-CNEEC JV management will identify and communicate to all persons working under the control of PGCB. This person(s) will have specific responsibility for environment, social, health, and safety (ESHS) with clear and defined roles and authority for:

- Ensuring that an environment, health and safety management system is established, implemented and maintained in accordance with the requirements of this standard,
- Defining roles, allocating responsibilities and accountabilities, and delegating authorities to facilitate an effective and efficient environment, health and safety management system. Roles, responsibilities, accountabilities, and authorities shall be documented and communicated,
- Ensuring that reports on the performance of CMEC-CNEEC JV its environment, health and safety management system are presented to appropriate CMEC-CNEEC JV top management for review, including recommendations for improvement, and used as a basis for improvement of its environment, health and safety management system.

All those with the environmental, social, health and safety management responsibility shall demonstrate and document their commitment to the continual improvement of environmental, social, health and safety performance. CMEC-CNEEC JV shall require that all persons working under its control take responsibility for the identified environmental, social, health, and safety aspects/risks in their workplace and adhere to CMEC-CNEEC JV applicable environment, social, health, and safety requirements.

3.1 Human Resources

The human resource division of a company is focused on activities relating to employees. These activities normally include recruiting and hiring new employees, orientation and training of current employees, employee benefits, and retention. Human resources are the people who make up the workforce of an organization, business sector, or economy. "Human capital" is sometimes used synonymously with "human resources," although human capital typically refers to a more narrow effect (i.e., the knowledge the individuals embody and economic growth). Likewise, other terms sometimes used include "manpower," "talent", "labour", "personnel", or simply "people".

Based on an approach to community action, CMEC-CNEEC JV considered two groups of human resources: Human Resources from officials (engineers, HR, administration, official) and Human Resources from the hiring labour must make sure that the policies of human resource management being consistent with tenant companies with its own policies, the Bangladesh legislation and the ILO, labour law of Bangladesh policies.

Table 3.1: ESHS unit of CMEC-CNEEC JVwith contact details

Sl No	Name	Designation	Contact Number	Plans implemented during construction of SS
1	Ge Wenbo	Contractor's Representative, Project Manager		ESHS Manager
2	Yang Wanli	Deputy Project Manager, Electrical Engineer	+8801938976465	ESHS Supervisor
3	Wang Chuhan	Civil Director	+8801941053642	WorkforceManagementPlan, StakeholderEngagementPlan
4	Kazi Mahadi Hassan	Project Advisor	+8801785083000	ESHS Supervisor
5	Su Zheng	HSE ESHS	--	ESHS
6	Guo Xiaohong	Site Supervisor		ESHS Supervisor
7	Mohd Nur E Alam Siddique	Environmental and Social Manager	+8801755671491	Environmental & Social Specialist

Table 3.2: PIU of CMEC-CNEEC JVwith SS project

Sl No	Name	Designation	Contact Number
1	Hafiz-al masud	Electric Manager, Dhaka Office	01913634690
2	Md. Shohanur Rahman	Project coordinator Dhaka Office	01671117817
3	Md. Main Uddin	Site Engineer Rupsha 230/132/33kVSubstation	01740469823

4	Md. Tarequzzaman	Site Engineer, Mohespur 132/33kV Substation	01772786560
5	Md. Shahjalal	Site Engineer, Monirampur 132/33kV Substation	01751111595
6	Md. Hasibul Hossain	Site Engineer Meherpur 132/33Kv Substation	01765397596
7	Md. Babar Ali	Site Engineer Phultola 132/33Kv Substation	01737273662

3.2 Health & Safety Responsibility

Health and safety is the responsibility of all; however, people in managerial and supervisory roles carry additional responsibilities which must be properly carried out in order that the lower officers can demonstrate their duty of care. Each Manager is responsible for his personal safety and that of all personnel under his or her authority, including others who may be affected by the CMEC-CNEEC JV's activities.

- Understand and implement CMEC-CNEEC JV safety policy
- Specific legal duties are defined under legislation;
- Tasks and activities can be delegated through the management chain, but accountability cannot;
- Care should be taken when delegating tasks that the person one is delegating to is equipped with the level of competency to discharge those tasks appropriately. Similarly, the same care should be taken during the selection and recruitment of managers and supervisors;
- The enforcing authority (Health and Safety Executive) can and do prosecute individuals in certain circumstances;
- Demonstrating due Diligence is an important responsibility of management;
- Training and development to ensure health and safety knowledge is maintained at an appropriate level is critical.
- Appreciate the responsibilities of personnel under their authority and ensure that each employee knows his responsibility and are equipped to play their part.
- Conduct Risk Assessments on activities within their department ensuring that the methods and systems of work are safe. Also that the necessary procedures, rules and regulations designed to achieve this are formulated, published and applied.

- Provide written instructions of work methods outlining potential hazards and precautions, and ensure they are complied with Ensure accident and near-miss reporting procedures are
- Understood and complied with, and assist with accident investigations where appropriate. Ensure all employees and sub-contractors are suitably trained/competent to carry out the prescribed task and that the necessary licenses/certificates of competence are in force and appropriate.
- Ensure the Statutory Notices, the Safety Policy, Insurance Certificate and the names of Appointed First Aiders are displayed and maintained in prominent locations. Ensure that all new employees in the company are provided with a copy of the policy statement, receive such induction training as may be laid down in procedures, are issued with personal protective equipment as required and their personal responsibilities as set out in this manual.
- Reprimand any employee for failing to discharge their health and safety responsibilities.
- Set a personal example with regard to health and safety matters.

The objective of CESMP is to inform managers and supervisors of their responsibility and accountability for health and safety, and their legal duties towards those either directly or indirectly under their charge, and towards those who may be affected by their acts or omissions. It also sets out the good principles of relevant legislation and provides information on where more specific guidance can be found. Appreciate the responsibilities of personnel under their authority and ensure that each employee knows his/her responsibility and is equipped to play their part. Ensure that all written schemes and procedures identified in Part 3 of this document are prepared, contain sufficient detail for each task to be critically analyzed, and fully comprehensible to all required to use them. Prepare and maintain a scheme that identifies work equipment requiring inspection by competent persons and ensuring that the equipment is easily identifiable and available for inspection on the date required. Prepare and maintain suitable records of all inspections. These records identify precisely what was inspected, how, who by, when, any defects found, remedial action taken, and the date/time of the next inspection.

Stakeholder engagement and stakeholder management are arguably the most important ingredients for successful project delivery and yet are often regarded as a fringe activity or one that can be outsourced to business-as-usual functions. Project managers depend on people to respond to the outputs and benefits that they deliver. People will only respond if they are engaged. The phrase —stakeholder management" implies that these people can be made to respond positively to a project, but the truth is that a project manager frequently has no formal power of authority and therefore has to rely on engagement to achieve his/her objectives. The above-mentioned person will compensate the land acquisition

3.3 Logistics & Communications:

Globalization has made speed, efficiency, and flexibility necessities for logistics companies looking to prosper in the 21st century. A common denominator among these characteristics is

effective logistics communication, which has become increasingly difficult as managing supply chains have become easier.

With regard to overhead electric transmission, environment, social, health and safety aspects/hazards, and its management system, CMEC-CNEEC JV shall establish, implement, and maintain a procedure(s) for:

- a. internal communication among the various levels and functions of CMEC-CNEEC JV communication with labour, workers and other visitors to the workplace,
- b. Receiving, documenting, and responding to relevant communication from external interested parties.
- c. CMEC-CNEEC JV shall decide whether to communicate externally about its significant environment, health and safety aspects/hazards, and shall document its decision. If the decision is to communicate, CMEC-CNEEC JV shall establish and implement a method(s) for this external communication.

The first set of ambient air quality standards for Bangladesh was defined in the Environment Conservation Rules of 1997. These ECR 1997 standards were recently replaced by a new set in July 2005 based on the proposal of the World Bank-funded AQM Project which reviewed the old standards. The new standards for NO₂, SO₂, CO, and ozone (O₃) are the same as the Ambient Air Quality standards set by US EPA and the standard for Pb is equivalent to the guideline value set by WHO. The standards for CO, NO₂, SO₂, and O₃ are seen to be more lenient than the guidelines set by WHO. The basis for discussion of air quality has been the data collected from the Air Quality monitoring Network stations under DoE. The data have been quality controlled and the air pollution levels have been compared to the Bangladesh Ambient Air Quality Standard as adopted in 2005. Table 1.10 represents the current and approved air quality standards for Bangladesh.

Table 3.3: Ambient Air Quality Standards for Bangladesh (2022).

Pollutants	Standard level	Average time
SO ₂	80 µg/m ³	24 Hours
CO	5 mg/m ³	8 Hours
NO _x	80 µg/m ³	24 Hours
O ₃	100 µg/m ³	8 Hours
PM _{2.5}	65 µg/m ³	24 Hours
PM ₁₀	150 µg/m ³	24 Hours
Pb	0.5 µg/m ³	24 hours

3.3.1: Standard for Combustion and Point Sources Emissions

During the operation period of substation, Combustion of diesel will use for making power at the generators. According to the guideline of World Bank group 1998, for power producing plant or generator, PM emissions (all sizes) should not exceed 50 mg/ Nm³. However, In addition, the concentration of sulfur dioxide in flue gases or stack emission of a generator should not exceed

2,000 mg/Nm³. The specific emissions limits for nitrogen oxides are 460 mg/Nm³ (225 ppm) oil-fired (HFO/LFO) thermal power plants or generator. DOE has not specific pollutants standard level for stack point emission of HFO fuel consuming power plant. Bangladesh has gas fuel thermal or turbine power plants. IFC/WB has not given a limit of standard for above mentioned power plants. In 2007 and 2008, the World Bank's commercial finance arm, the International Finance Corporation (IFC), published new environmental, health and safety guidelines. These guidelines are applicable in all cases where financing is based on World Bank conditions, such as financing by development banks, or where financing is supported by export credit agencies. Many countries have also adopted the World Bank guidelines into their local emission regulations. The World Bank guidelines categories power plants based on the fuel used – gas, liquid or bio fuels. Within each category, emission levels are set according to the power plant's size. The larger the power plant, the more stringent the emission limits. It should be noted that the World Bank emission guidelines are guidelines only and do not have the power of law. In other words, they are a flexible instrument: emission limits may be adjusted higher or lower for a specific project, if justified by an environmental assessment study.

Table 3.4: Stack Emissions Guidelines (in mg/Nm³ or as indicated) for Power generator or diesel engine

SN	Sample Description	Name of the Parameters					
		SPM	NO _x	SO ₂	CO	CO ₂	O ₂
	Unit	mg/Nm ³	ppm	mg/Nm ³	V/V	v/v	v/v
	Duration of sampling (Minutes)	30	30	30	30	30	30
1	Bangladesh (DoE) Standard (less than 200 MW)	350	30 ppm (Gas Fuel Power Plant)	NYS	NYS	NYS	NYS

NYS= Not yet set

As per the IFC-Environmental, Health, and Safety General Guidelines, Projects with significant sources of air emissions, and potential for significant impacts to ambient air quality, should prevent or minimize impacts by ensuring that: · Emissions do not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards by applying national legislated standards, or in their absence, the current WHO Air Quality Guidelines, or other internationally recognized sources; · Emissions do not contribute a significant portion to the attainment of relevant ambient air quality guidelines or standards. As a general rule, this Guideline suggests 25 percent of the applicable air quality standards to allow additional, future sustainable development in the same airshed.

Table 1.1.1: WHO Ambient Air Quality Guidelines ^{7, 8}		
	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 minute	500 (guideline)
Nitrogen dioxide (NO ₂)	1-year	40 (guideline)
	1-hour	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)

3.3.2: Noise and Vibration

Noise is known as unwanted sound. The difference between sound and noise depends upon the listener and the circumstances. Noise is one of the most common occupational health hazards. Noise at the workplace that exceeds the exposure standard and is not controlled is a major cause of hearing loss to workers. A significant loss of hearing contributes to social isolation and reduced quality of life, career prospects, increased absenteeism, worker turnover and lowered work performance. It can also be a contributing factor to workplace injuries and accidents. In order to determine the existing work place sound level at before, during and after construction by measuring with a Sound Level Meter.

Table 3.5: Standards for Sound

SN	Category for sound	Standards determined (dBA unit)	
		Day	Night
a.	Silent Zone (Sensitive areas such as parks, school, hospitals and mosques)	45	35
b.	Residential areas	50	40
c.	Mixed areas(mainly residential area, and also simultaneously used for commercial and industrial purposes)	60	50
d.	Commercial areas	70	60
e.	Industrial areas	75	70

Source: Schedule 4, Environmental Conservation Rules, 1997

Notes:

1. The time from 6 a.m. to 9 p.m. is counted as daytime.
2. The time from 9 p.m. to 6 a.m. is counted as night time.
3. Area up to a radius of 100 meters around hospitals or educational institutions or special institutions/ establishments identified/to be identified by the Government is designated as Silent Zones where use of horns of vehicles or other audio signals, and loudspeakers are prohibited.

As per ECR 1997, noise levels are categorized in 5 (five) zones. 230/132 kV Rupsha GIS SS will situate at the semi-rural area, GPS picture of this substation is indicated as Silent Zone (Sensitive areas such as parks, school, hospitals and mosques). The traffic noise of Khulna-Mongla road may be contributed traffic noise on the substation. The impact of traffic noise for Khulna city bypass Road on 132/33 kV Phultola GIS SS, the impact of traffic noise for Jessore -Sathkira high way at Monirampur substation, the impact of traffic noise for Mohespur-Jadobpur road at 132/33 kV GIS Maheshpur SS, the impact of traffic noise for Kustia-meherpur high -way at 132/33 kV Meherpur substation. However, the five substations are in semi-urban area. It will assume these the zones of the sub-station area may be within silent Zone residential areas and mixed areas.

3.1.2.1 IFC Standard Limit of Ambient Noise

Noise abatement measure should achieve either the following level or a maximum increase in background level of 3 dB (A). Measurements are to be taken at noise receptor located outside the project property boundary. As the population of Bangladesh increases, so do the processes of industrialization and urbanization. The number of vehicles is also increasing. Manufacturing

plants are multiplying to meet the growing needs of the population. The result is an increased threat of noise induced hearing loss, annoyance and other adverse effects on the health and well-being of the population. According to dependence on time, noise may be classified as steady, non-steady, fluctuating, intermittent impulsive, quasi-steady, ambient, etc. steady noise is a noise with negligible small fluctuations of level within the period of observation. Non-steady noise is a noise whose level shifts significantly during the period of observation. Fluctuating noise is a noise whose level varies continuously and to an appreciable extent during the period of observation. Intermittent noise is a noise whose level suddenly drops to the level of the background noise several times during the period of observation, the time during the level remains at a constant value. Impulsive noise is a noise consisting of one or more bursts of sound energy.

Table 3.6 IFC Standard Limit of Ambient Noise:

Maximum Allowable Leq (hourly), in dB(A) IFC		
Receptor	Daytime 7.00-22.00	Nighttime 22.00-7.00
Residential; Institutional; Educational	55	45
Industrial	70	70

A study was recently in the cities of Dhaka, Chittagong and Khulna by DOE, sponsored by World Health Organization (WHO), to measure the extent of sound pollution, types of noise, and sources of noise and exposure of noise. It specifies sensitive localities of the three cities of Bangladesh where public health is liable to be affected by noise pollution. Classification of the surveyed areas of the three cities on the basis of the level of noise pollution, comparison of observed noise level of the surveyed localities to the noise level permissible for those areas by the government of Bangladesh leading to identification of severe, moderate, mild red zone areas and green zone areas have been mentioned in the survey reports. Noise pollution will happen due to the construction activities of substation civil work. Two or more diesel engines will have run at the substation location during civil work. This noise will be transmitted to the local people area with a higher level as per ECR, 1997. The local people may receive high level noise from the workplace.

3.2.1.2 Workplace Noise

OSHA sets legal limits on noise exposure in the workplace. These limits are based on a worker's time weighted average over an 8 hour day. With noise, OSHA's permissible exposure limit (PEL) is 90 dBA for all workers for an 8 hour day. The OSHA standard uses a 5 dBA exchange rate. The noise level is 95 dBA, the working will half of time weight average (8 hours). The NIOSH Recommended Exposure Limit (REL) for occupational noise exposure is 85 decibels, A-weighted, as an 8-hour time-weighted average (85 dBA as an 8-hr TWA) using a 3-dB exchange rate. Exposures at or above this level are considered hazardous for any work place like substation project. The work place people may receive high level noise as part of occupational noise. The PEL of noise will keep within the limit 90 dBA as per OHSA and 85 dBA as per NIOSH.

3.3 Soil quality Standard

Acid mine drainage is an extreme case of metals contamination that results in visible evidence. When acid mine drainage mixes with the higher pH water of a receiving stream, the metal salts precipitate from the water column as a floc that coats the stream or river bed. This floc can smother organisms and their benthic habitat. While metal precipitation removes much metal from the water column, the water still may carry toxic metal concentrations downstream. If floc occurs in the watershed, metals may be present in elevated concentrations in associated streams. It is very essential heavy metals to measure heavy metal in the soil sample from topsoil (0-30 cm). The construction activity of substation project may be polluted the nearby crop/agriculture land. Oil (diesel) is the soil contaminated pollutant. Erosion and corrosion of metal, it can be polluted cropland through heavy metals. Soil fertility depends on many parameters. Texture is indicated mesh size of the soil quality and small size of soil particles can retain water in between the soil. International standards for heavy metals of the river bed materials are given table 3.7

Table 3.7: USA EPA, 2000 Standard Value of Heavy Metals of River Bed Materials (Sand)

Sl No	Name of the Parameters	Unit	US EPA Standard 2000 (river bed)
1	Soil pH	-	7.7 to 8.5
2	Organic matter,	%	NF
3	Lead	mg/Kg	128
4	Copper	mg/Kg	144
5	Chromium	mg/Kg	111

6	Cadmium	mg/Kg	4.98
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Source: IEE of PGCB Project, page 36, December, 2019

3.4 Solid Waste

No material is to be abandoned on the site. CMEC-CNEEC JV will be responsible for all expenses involved in collecting, moving, cleaning and disposal of waste. Receptacles must be placed around the site for collection of waste materials.

Waste Minimization measures include: -

- Obtaining construction materials, paints, lubricants and other liquids in reusable packaging or containers
- Segregating and recycling solid wastes generated by construction activities, offices
- Collecting lubricating oil from the construction vehicle fleet and sending it to be recycled or appropriate agencies who are handling the same.
- Any solid, liquid, semi-solid, or contained gaseous material, resulting from industrial, commercial, mining or agricultural operations which are discarded. This is usually an incidental by-product of the operation. Discarded material must be treated as follows:
 - Disposed of, and not used, reused, reclaimed, or recycled
 - Burned or incinerated, except where the material is being burned as a fuel for the purpose of recovering usable energy
 - Physically, chemically, or biologically treated (other than burned or incinerated) in lieu of or prior to being disposed off.

For proper handling and disposal, wastes shall be well defined at source and the definition transmitted along with the wastes to the final disposal points. Basic information that must be provided as a minimum for adequate definition of wastes include: Waste type identification-The major categories of wastes envisaged from the substation are outlined as follows:

Solid wastes: - These include felled vegetation/trunks, obsolete transformers, CBs, CTs, etc, woods from crates, metals, papers, printer cartridges and other office equipment scraped which are due to be removed during site clean-up, domestic waste (waste generated from camp kitchens, packing materials, boxes and plastics).

Liquid wastes: - These include non-hazardous operational waste generated from work construction sites e.g. lubes, lubricants, sanitary water, paints etc.

Gaseous wastes: - These include combustion products from construction engines, welding gas, natural gas leaks etc.

Hazardous waste: - any gaseous, liquid or solid, which due to quantity, physical, chemical or infectious characteristics have the potential to harm human health, environment when improperly handled, stored, disposed, transported or treated e.g. acids, lead phenols, etc.

Waste minimization implies reduction to the greatest extent possible of the volume or toxicity of waste materials. The four principles of waste minimization -- reduce, reuse, recycle and recover - - shall be adopted as applicable. The key elements of the four waste minimization/management principles practices are outlined.

Minimization. Definition Reduce Process modification / design change Material Elimination Inventory control and management Material substitution Improved housekeeping Reuse - Chemical /Oil containers Recycle / Recover - Recycle scrap materials, Recycle paper, Waste lubricating oil for energy recovery

Waste segregation and characterization shall be carried out on wastes that are similar and may be combined to simplify storage, treatment, recycling and effective implementation of appropriate waste disposal methods. Wastes shall be segregated, preferably at source into clearly designated bins at strategic locations. Particular attention shall be given to the work area where a variety of wastes including packet packaging shall be generated. The site H & S Coordinator of **CMEC-CNEEC JV** shall be responsible for maintenance of the waste segregation scheme at the site.

All debris, spoilt materials, and other wastes shall be cleared regularly from the site and disposed at approved dump sites operated by designated waste disposal authorities. Instructions on material safety handling sheet shall be strictly adhered to and shall form the basis for the disposal of wastes related to such products. Wastes in transits shall be accompanied and tracked by waste disposal notes. The note shall contain such information as date of dispatch, description of wastes, waste quantity, container type, designated disposal site and method, consignee name, means of transport and confirmation of actual disposal time and date. Special attention will accord to transformers removed from the sites and also drums of transformer oil that might contain PCBs; these are to be transported to a site designated **CMEC-CNEEC JV** for safe storage and subsequent testing prior to disposal Waste management audit of facilities shall be carried out in consultation, and findings shall be properly documented and followed up. Accommodation, catering services areas and work site shall maintain acceptable standard of hygiene and good house-keeping.

Color-coded containers are based on the country laws set by DOE. Yellow Bin - Waste for Incineration/ Secured Landfill Disposal Human anatomical waste, microbiological, pathological, cytotoxic and discarded medicines Red Bin - Waste for Non-incineration Treatment Disposal Infected plastics, syringes, tubings, catheter, gloves, blood bags, urine bags, cotton dressings, etc. Green Bin - Waste requiring no Treatment Vegetables, fruit peels leftover food, leaves and garden wastes, etc. **CMEC-CNEEC JV** might be produced solid waste which may be belonging to yellow and green color code.

The main solid waste of the substation project are wood, sludge from piling area, bamboo, house keep materials, iron road, solid waste from kitchen from labour rental house/labour camp, wastage papers, poly-ethylene, plastic materials, packaging materials of Al-wire etc. All solid waste of this project has economic value. Nature and amount of solid waste is not possible to measure in the planning period. The solid waste will store in the site storage area at specific

locations. Collected solid waste will sell at open tenders to approved vendors, who have valid trade license and DOE approved solid waste management approval/clearance certificate. In this case, final disposal of solid waste will be maintained by vendor through approval process of DOE. Sludge will be main solid waste where effluent will settle down near at the construction site. When effluent will settle down, the sludge will remove and transport to another place of low-land for fill-up. Bangladesh Standards and Guidelines for Sludge Management (2015) is described various methods of sludge treatment and disposal.

3.4.1 Hazardous Construction Wastes Materials Management

Hazardous materials of all kinds used during the construction of the Project shall be stored and handled to avoid loss and to allow containment and recovery in the event of a spill in accordance with all applicable legislation. These include, but are not limited to, explosives, fuels and oils required for construction of substations.

- Site personnel shall be adequately trained in the handling and transportation of hazardous materials of all kinds used during construction.
- Hazardous Waste generated in the course of construction activities shall be disposed of in compliance with all applicable legislation and the Hazardous Waste Regulation under the Environmental Management Act. Hazardous Wastes include, but are not limited to asbestos, oils, greases, lubricants, solvents, batteries, PCBs, paints and used spill cleanup materials.
- Hazardous materials including, but not limited to, fuels, bitumen's, cement, paints, solvents, cleaners, dust suppressants, used fuel and oil filters, and other construction materials shall be stored and handled to minimize loss and allow containment and recovery in the event of a spill.
- Onsite areas required for the transfer and limited temporary storage of hazardous and potentially hazardous materials and wastes shall be designated, clearly labelled and appropriately controlled.
- EDL may inspect designated area(s) at any time and may require the prompt removal of any—Dangerous Goods or —Controlled Products which are not in active use.

Concrete, cement, mortars, grouts and other Portland cement or lime-containing construction materials are basic or alkaline and are highly toxic to fish. Isolation of concrete works is needed so that the pH value in any surrounding water-bodies does not become more alkaline during construction. During concrete work within 20 meters of any watercourse or wetland, pH shall be monitored in any surrounding water-bodies and best practices shall be implemented to meet the requirements of applicable legislation:

Concrete, cement, mortars and other Portland cement or lime-containing construction materials shall not be deposited into or near any watercourse or wetland. So that concrete materials remain inside formed structures, all forms shall be examined by the Environmental Monitor prior to concrete pours to verify they are tight.

- Providing containment facilities for the wash-down water from concrete delivery trucks, concrete pumping equipment, and other tools and equipment
- Completely isolate all concrete work from any water.
- Where work occurs within 30 meters of any watercourse or wetland, frequently monitor the pH immediately downstream of the work site until completion of the concrete work. Emergency measures shall be implemented if downstream pH has changed more than 1.0 pH unit, measured to an accuracy of ± 0.2 pH units from the background level, or is recorded as below 6.0 or above 9.0 pH units.
- Preventing any water that contacts uncured or partly cured concrete during activities like exposed aggregate wash-off, wet curing, or equipment washing from directly or indirectly entering any water-body.
- Maintain complete isolation of cast-in-place concrete and grouting from fish-bearing waters for a minimum of 48 hours.

3.4.2 Oil-filled Equipment Management

The following measures are applicable to work involving oil-filled equipment. Also refer to the sections above for general requirements related to Material Storage, Handling, and Waste Management. Oil, lubricant, and grease may be used in engines at the work site. It may contaminate the topsoil of cropland. The equipment which will use at the project site, it will wash to another side where there will not be a chance to contamination of topsoil

3.4.3 Fuelling, Fluid Handling and Transfers

The following steps shall be followed during oil transfer from/to transformers and other oil filled equipment:

- Inspect all temporary and permanent oil storage tanks to verify there are no potential leaks prior to, during and after filling.
- Wrap hose connections with sorbent material to catch any leaks and drips during oil transfer to/from the storage tanks. If a leak is observed from any equipment while on-site, stop the equipment and place drip trays and/or sorbent matting under the leak immediately. Repair the leak.
- Do not fill tanks to the top. Leave adequate head-space so that overfilling does not occur.□

3.4.4 Transportation

Contractors shall inspect all equipment prior to transportation to verify it is free of waste oil. They shall provide fully stocked Spill Kits adequate to deal with emergencies on the road, including provision of Spill Kits within vehicles used for the transport of equipment, waste, and hazardous materials. An experienced / licensed waste contractor shall transport Hazardous Wastes such as Waste Oil. Both the shipper (consignor) and the carrier (driver) of Dangerous Goods and Hazardous Wastes should be qualified, experienced, and/or certified.

3.4.5 Disposal

All used insulating oil, if generated, shall be sent to an approved location for recycling. Oil destined for recycling and/or waste oil is considered Hazardous Waste, and should have an appropriate Hazardous Waste Manifest and labeling. CMEC-CNEEC JV shall properly contain, label and secure all materials being transported for offsite disposal.

3.4.6 Temporary Storage of Oil Filled Equipment and Tanks

If oil filled equipment and/or tanks must be temporarily stored on-site, they shall be stored in designated areas where oil containment is already provided or in temporary storage areas constructed with a heavy-grade, ultraviolet resistant polyethylene liner adequately beamed at the sides to provide containment. Containment areas shall be protected from weather by covering with a tarp to avoid rainwater accumulation. All containment basins shall be inspected daily for leaks and wear points. Containment basins shall be cleaned regularly and any accumulated water shall be removed. Contaminated water shall be removed via pump truck or other means which meet the water quality guidelines contained in this CESMP. Where leaks and/or wear points are found, they shall be repaired promptly to restore full containment.

3.4.7 Management of sulfur hexafluoride (SF₆) from GIS Substations

Gas-insulated switchgear (GIS) is a very compact form of switchgear. Because of the use of SF₆ (sulfur hexafluoride) insulation, the size of the switchgear reduces drastically. This product is normally used in medium and high-voltage applications. GIS is more safe, compact and maintenance-free as compared to AIS. Substation project has used SF₆ in circuit breakers, gas-insulated substations and other switchgear used in the transmission system to manage the high voltages carried between generating stations and customer load centers. Disconnections and ground switches use SF₆ primarily for insulation, and individually, they contain only slightly less SF₆ than a circuit breaker. These devices are used to isolate portions of the transmission system where the current flow has been interrupted (using a circuit breaker). Gas-insulated substations also use a significant amount of SF₆, and GIS installations house SF₆-insulated circuit breakers, bus bars and monitoring equipment. The largest use of SF₆ occurs in high-voltage circuit breakers, where, in addition to providing insulation, SF₆ is used to quench the arc formed when an energized circuit breaker is opened. Sulfur hexafluoride (SF₆) is a synthetic fluorinated compound with an extremely stable molecular structure. Because of its unique

dielectric properties, electric utilities rely heavily on SF6 in electric power systems for voltage electrical insulation, current interruption, and arc quenching in the transmission and distribution of electricity. Yet, it is also the most potent greenhouse gas known to date. Over a 100-year period, SF6 is 22,800 times more effective at trapping infrared radiation than an equivalent amount of carbon dioxide (CO₂). SF6 gas leakage may be an important concern on numerous levels including the environmental effects, degradation of the GIS insulation system integrity and gas cost. The use of sulfur hexafluoride in the substation project should have taken care of it's used and check the leakage in switchgear, circuit breaker etc.

3.5 Occupational Health and Safety

Occupational safety and health (OSH), also commonly referred to as occupational health and safety (OHS), occupational health, or workplace health and safety (WHS), is a multidisciplinary field concerned with the safety, health, and welfare of people at work. These terms also refer to the goals of this field, so their use in the sense of this article was originally an abbreviation of occupational safety and health program/department etc.

The goals of occupational safety and health programs include fostering a safe and healthy work environment. OSH may also protect co-workers, family members, employers, customers, and many others who might be affected by the workplace environment.

In common-law jurisdictions, employers have a common law duty to take reasonable care of the safety of their employees. Statute law may in addition impose other general duties, introduce specific duties, and create government bodies with powers to regulate workplace safety issues: details of this vary from jurisdiction to jurisdiction.

CMEC-CNEEC JValready has developed an Occupational Health and Safety Policy [1st April 2017]. This policy is reviewed and revised. This will enable the company put in place appropriate measures that will ensure that the health, safety and welfare of all employees; together with the health requirements of the local community in which the company is conducting business. The policy should highlight on the following, among others:

- Safety measures for all machines and equipment to be used;
- Appropriate safety and rescue equipment to be availed in all work places;
- Emergency procedures and actions;
- Risk minimization of accidental damage to employees, community and environment;
- Machine maintenance and machine operator proficiency; and
- Training in safety

There should be (and the authority may conduct awareness campaign to make employee believe) believe within employees that no business objective will take priority over health and safety. The following health and safety aspects will consider for all occupants

- ✓ All injuries and incidents are preventable.
- ✓ No task is so important or urgent that it cannot be done safely.
- ✓ Without diminishing management's obligations, the responsibility and accountability for health and safety rests with every individual.
- ✓ Best practice in health and safety management should be encouraged.

- ✓ Maintain and continuously improve the Environment, Health and Safety Management System (EHSMS) across the organization.
- ✓ Provide a balanced focus on the management of health and wellbeing, personnel and process safety.
- ✓ Proactively pursue the identification of all hazards and eliminate or, if not possible, manage the risk to as low as reasonably practicable
- ✓ Consult with and promote active participation of employees in the management, of their own and other's health, wellbeing and safety.
- ✓ Provide resources to achieve a systematic approach to health, personnel safety and process safety management to ensure continuous performance improvement.
- ✓ Identify performance measures, set improvement targets, measure and report performance at all levels.
- ✓ As a minimum comply with relevant legal and other requirements
- ✓ Develop a culture where all employees and contractors are constantly aware of safety hazards around them and act accordingly at and away from work.
- ✓ Include health and safety performance in the appraisal of employees and contractors and recognize accordingly.
- ✓ Steward the health and safety performance of Joint Venture activities operated by others

3.6 Community Health and Safety

Community Health and Safety items include public health and safety concerns that may affect employees during work activities, and may also impact time away from work. Recently COVID19 is a burning issue for the community people as paramedic. Our efforts strengthen health and safety issues, and prevent disease and promote healthy and safe living. Community Health and Safety issues may arise at any stage of a project life cycle and can have an impact beyond the life of the project. Drinking water sources, whether public or private, should at all times be protected so that they meet or exceed applicable national acceptability standards or in their absence the current edition of WHO Guidelines for Drinking-Water Quality. Air emissions, wastewater effluents, oil and hazardous materials, and wastes should be managed according to the guidance provided in the respective sections of the General EHS Guidelines with the objective of protecting soil and water resources. Waterborne and air borne diseases may have attacked by the workers. To maintain social distance among the working people to the substation project site.

Besides this, hazards posed to the public while accessing project facilities may include:

- Physical trauma associated with failure of building structures
- Burns and smoke inhalation from fires
- Injuries suffered as a consequence of falls or contact with heavy equipment
- Respiratory distress from dust, fumes, or noxious odours
- Exposure to hazardous material

CMEC-CNEEC JV will ensure pure drinking water quality at substation project site and where the officers, engineer, supervisor will live in. To avoid the water borne diseases, ground tube-well water is act as drinking water. About 95% of Bangladeshi people drinking tube-well water. But if the construction site will remote areas from the locality, then CMEC-CNEEC JV will ensure potable and pure water for the workers as well officers

Disease Prevention

Effective controls protect workers from workplace hazards; help avoid injuries, illnesses, and incidents; minimize or eliminate safety and health risks; and help employers provide workers with safe and healthful working conditions. The processes described in this section will help employers prevent and control hazards identified in the previous section.

To effectively control and prevent hazards, employers should:

- Involve workers, who often have the best understanding of the conditions that create hazards and insights into how they can be controlled.
- Identify and evaluate options for controlling hazards, using a "hierarchy of controls."
- Use a hazard control plan to guide the selection and implementation of controls, and implement controls according to the plan.
- Develop plans with measures to protect workers during emergencies and non-routine activities.
- Evaluate the effectiveness of existing controls to determine whether they continue to provide protection, or whether different controls may be more effective. Review new technologies for their potential to be more protective, more reliable, or less costly
- Using mask and check body temperature before starting the daily work at the site of the substation project for protecting COVID19.
- Washing hand of all the labours, workers and stakeholders at the work place to project COVID 19
- CMEC-CNEEC JV will also give safety training on the prevention of diseases.

3.7 Traffic Safety

The government of Bangladesh has recently implemented New Traffic Rules [Road Transport Act, 2018]. Traffic is one of the issues that everyone is facing daily. Traveler's and foot travelers' safety in the roads is currently a burning issue in Bangladesh. The Government imposed the new rules on the roads and highways were seen being lenient on travelers, and pedestrians. Police were present at the busy intersections, and roundabouts – but not all of them. BRTA who are the head of the transport sector enlisted instruction to support the new law's implementation. The authorities also lack the technical support which required tracking random dope tests, valid driving license, for drivers. CMEC-CNEEC JV will recruit a driver with a valid driving license. Transportation of materials will be done by the different types of vehicles of the above project. Most of the roads of the above areas are in good condition. The project of the substation is a temporary type of work. The substation materials (distribution transformer, cable, circuit breaker, lightning arrester, air break (AB) switches / Isolator, busbar, capacitor Bank and

Earthing wire will convey to substation locations from sea-port (Chattogram and Mongla Sea-port). The materials from the seaport will transport to Rupsha, Phultola, Monirampur, Maheshpur, Meherpur substation projects.

The project may require large quantities of construction materials such as cement, sand, and metal, substation materials, wires and aggregates during construction. It is desirable to locate storage and loading areas away from the areas of frequent pedestrian activity (community foot paths and agricultural land areas)

The area that has been identified for the storage of aggregates will have to be reviewed in the light of its close proximity to human activities such as agriculture, play areas and areas used by the pedestrians.

The following measures are to be followed:

- a) All deliveries of stocks should be carefully planned and suppliers should be advised as to the time and location at which these will have to be delivered. All vehicles will transport at night time.
- b) The traffic signal will maintain at loading point to fix red color light of night time and signal point will have to maintain a day time
- c) They should inform in advance the site stores keeper the delivery of such stocks so that traffic and transportation can be properly managed.
- d) The frequent presence of trucks can add to increased traffic, sound (excessive noise) and smoke pollution through exhaust emission.
- e) Avoid as far as possible the peak traffic hours such as school hours in order to reduce the risk of any children/traffic accident/incidents.
- f) In the event that spills of aggregates occur, (substation materials) all the roads should be cleaned after the deliveries are made. The drivers should be made aware of this requirement.
- g) Ensure that allowable axel weight is not exceeded when the deliveries are brought by the suppliers using the fort portal main highway.
- h) All the drivers employed by the CMEC-CNEEC JV must be fully sensitized about the speed limits and the need for strict compliance to the safety rules.
- i) Regular sensitizing sessions are carried out by the Site administration officer and the Environment/Health & Safety Manager of CMEC-CNEEC JV
- j) In case of transporting of friable materials and spoils, adequate protection will ensure when transporting them. All materials will transport in closed trucks or by using tarpaulin sheets to cover materials.

A temporary warehouse and vehicle parking will locate near to substation project, so that; it is easy way for loading. The materials come from the sea-port (possible Mongla &Chittagonj sea port). Chattogram Sea- port will better of all the projects area ofRupsha,Phultola, Monirampur, Maheshpur, Meherpur.

3.7.10operation of heavy machinery plant and vehicles:

Experienced drivers/operators should be engaged in driving all types of vehicles in the fleet. In case of construction machinery operators (Crane, heavy trucks, rollers, excavator operators etc.) competency for such work should be proved through accepted permits licenses. A copy of the license or driving permit or a permit to handle heavy duty equipment should be retained by the Administration Manager of CMEC-CNEEC JV. All equipment operators should possess valid permits issued by the traffic authorities or construction authorities of the Government of Bangladesh. The vehicle and machinery used for the construction purposes of the site should be inspected regularly by the Site Transport & Store Manager of CMEC-CNEEC JV employed for regular servicing, safety of Tires, repairs oil and hydraulic vacuum. Stickers of different colors may be introduced to recognize the vehicles and machinery used by contractors and sub-contractors.

The Admin personnel of CMEC-CNEEC JV should also:

- Ensure that all the drivers comply with traffic and transport guideline disciplines;
- Ensure that vehicle parking space is provided away from the towns carrying stocks.
- Ensure that the vehicles carrying stocks and construction materials roads
- Ensure that vehicle road worthiness certificates are received for all in the site,
- Ensure that all the vehicles have updated insurance coverage.

Make sure that warning devices are fitted to the vehicles and machine when maneuvering in public roads and the work sites. Flashing orange lights should be mounted on all the vehicles and construction equipment Heavy duty machinery should be fitted with reversing alarms or in the absence should have a banks-man to guide the driver/operator. Signaler should be engaged enabling the operators to safely operate their machinery. Ensure that drivers and signalers are in constant communication during operations of heavy machinery.

3.7.2 Public Awareness about substation project

CMEC-CNEEC JV shall undertake to increase the level of public awareness prior to commencement of the works to advise all road users of the impending construction work at the

substation project. CMEC-CNEEC JV will make temporary boundary wall at the perimeter of project and install message signs (sign posting) to warn possible traffic congestion at work area. CMEC-CNEEC JV will restrict entry to the substation project and security gate will be made, where one or two security guard will monitor the public entry and awareness.

A pre-warning road side sign board is erected before each of the hump in keeping with traffic management procedures. There is a necessity to maintain all the existing road signage and other traffic control methods adopted by the traffic police. Therefore, CMEC-CNEEC JV will consult with the traffic police and with the ESHS Manager about their vehicles movement.

3.7.3 Traffic Safety plan

In order to alleviate traffic congestion at the substation site where there are near or over-saturated conditions, it is recommended to introduce a type of traffic response signal system. It is applicable for all traffic conditions, from under-saturation to over-saturation. As part of the advanced adopted traffic control system, this new signal control system will develop. The concept of control, system configuration and the effects of traffic at work site of the substation will be controlled by traffic response signal system. One has to stand with red –flag in hand where crossing the road. Alternatively the stick with red –flag has to place on the ground near the road crossing of the substation. The Khulna-Mongla high-way road is passed in west side 230/132 kV Rupsha substation area, Khulna city bypass road is passed west side to Phultola substation area, Jashore –Sathkir road passed at east side 132/33 kV GIS Monirampur, Kustita-Meherpur high-way passed north –west side of Meherpur 132 kV GIS SS, Hasdah-Mohespur and Mohespur-Jadobpur high-way passed near Maheshpur 132 kV GIS SS. CMEC-CNEEC JV will inform to the local traffic control room of Chandpur, Comilla and Naokhalidistrict office for controlling the local high-way traffic during stringing of metal wire. Comparatively less traffic road such as Chaindina, Lasksham, Laximpur, Kachua road, it may not be needed to inform local traffic office. The site location (road traffic) and Layout plans / sketches of site arrangements (labour camp, storage area, toilet, site office, water pump) is attached in appendix F

3.8 In situ noise, air soil and water measuring methodology

Only portable equipment or different meter should be used for in situ monitoring for air and noise level at the selected substation locations. Only calibrated noise meter may be used for measurement of noise level. An expert who can be easily measured sound and it's mapping in situ noise and can give information its implementation at the substation areas. In situ sound mapping will need because sound propagation distance is an important part of noise pollution.

Noise monitoring may be carried out for the purposes of establishing the existing ambient noise levels in the area of the proposed or existing facility, or for verifying operational phase noise levels. Noise monitoring programs should be designed and conducted by trained specialists.

In general, the noise level limit is represented by the background or ambient noise levels that would be present in the absence of the facility or noise source(s) under investigation. During the construction period and as per price schedule (contract document) two time noise and air quality in each of the substation locations.



Fig: 3.1. Noise Level Monitoring Meter

A calibrated vibration meter will use for vibration level monitoring with a data record system. Sampling duration will each station two hours, one hour is in day time, and other is in night time.

Air pollution is an important environmental aspect. Department of Environment, Govt. of Bangladesh has given standard pollution level of certain parameters. Particulate matter and gaseous pollutants will be measured in situ location where the substation will construct. **Ambient Noise Quality Monitoring**

Noise is an important environmental pollutant. A survey by the U S. Federal Council of Science and Technology has revealed that noise is a technology generated problem and that the overall loudness of environmental noise doubles every ten years in pace with our social and industrial progress. This geometric progression wise growth of noise could be mind-boggling in view of the ever-increasing pace of technological growth. According to Robert Koch a Nobel Prize winner German bacteriologist “A day will come when man will have to fight merciless noise as the worst enemy of health.” According to him “Noise like smog, is a slow agent of death.”

Measurement of noise—Noise is a combination of intensity and frequency and can be measured in decibels. Decibel is a unit of sound, named after Alexander Graham Bell.

The level of sound is usually expressed in terms of the Sound Pressure Level (SPL) in decibels, which is defined as:

$$\text{SPL} = 20 \log_{10} P / P_0 \text{ dB}$$

Where P is the pressure variation measured in N / m^2 and P_0 is the standard reference pressure taken as $2 \times 10^{-5} \text{ N} / \text{m}^2$

Noise quality has been measured instantly on the site by Noise level meter. At each location 10 to 12 times reading were taken over a short period of time. Three measurements such as maximum, minimum and mode were recorded. At the time of measurement, whenever there was an interfering effect like mike noise, human voice from house and bazaar, vehicular sound, sound of machine and tool from workshop etc., will also record.

Particulate Matter Monitoring (SPM, PM₁₀ and PM_{2.5})

Particulate monitoring is accomplished with a High Volume sampler, which is a vacuum type device that draws air with particulate matter through a filter paper. Particles within the range of 100 to 0.1 microns diameter are ordinarily collected on glass fiber filter. The instrument sucks the ambient air with a blower at a flow rate that allows suspended particles to pass to the filter surface. This sampling filter paper is dried up in the laboratory and the weight difference is the amount of SPM, PM₁₀ or PM_{2.5} content measured in micro grams per cubic meter of air collected over a period of 24 hours. If particulate level is high, a satisfactory sample may be obtained in 6 to 8 hours or less.



Fig: 3.2 Laboratory Equipment

The aerosol mass for both the PM_{2.5} and PM₁₀ were determined by weighing the filters before and after the exposure with OHAUS (USA) analytical 4 digit balance, model no. AR1140. Particles larger than PM₁₀ was determined from initial and final weight of the dust cup vial using the same balance.

Air is drawn through a size-selective inlet and through a 20.3 X 25.4 cm (8 x 10 inch) filter at a flow rate which is typically 1.15 to 1.20 m³/min for PM₁₀. Particles with aerodynamic diameter less than the cut point of the inlet are collected by the filter. The mass of these particles is

determined by the difference in filter weights prior to and after sampling. The concentration of PM₁₀ in the designated size range is calculated by dividing the weight gain of the filter by the volume of air sampled.

Calculation of PM_{2.5} PM₁₀, and SPM (Gravimetric Method)

$$(W_f - W_i) \times 10^6$$

$$PM_{10} (\mu g/m^3) = \frac{\quad}{\quad}$$

$$V$$

Where,

PM₁₀ = Mass concentration of particulate matter less than 10 micron diameter in $\mu g/m^3$

W_i = Initial weight of filter in gm

W_f = Final weight of filter in gm

V = Volume of air sample in m³

10⁶ = Conversion of gm to μg

Same formula was used for the determination of particle larger than PM₁₀. SPM was calculated from the addition of result PM₁₀ and particle larger than PM₁₀ which was collected in dust cup vial. For PM_{2.5} the total volume of air was calculated from the initial and final dry gas meter reading (m³). Same formula was used for the determination of PM_{2.5}.

Sulfur Oxides (SO₂)

Sulphur dioxide from air is absorbed in a solution of potassium tetrachloro-mercurate (TCM). A dichlorosulphitomercurate complex, which resists oxidation by the oxygen in the air, is formed. Once formed, this complex is stable to strong oxidants such as ozone and oxides of nitrogen and therefore, the absorber solution may be stored for some time prior to analysis. The complex is made to react with pararosaniline and formaldehyde to form the intensely colored pararosanilinemethylsulphonic acid. The absorbance of the solution is measured by means of a suitable spectrophotometer. Concentration of sulphur dioxide in the range of 25-1050 $\mu g/m^3$ can be measured under the conditions given are measure concentration below 25 $\mu g/m^3$ by sampling larger volumes of air, but only if, the absorber efficiency of the particular system is first determined and found to be satisfactory. Higher concentration can be analyzed by using smaller gas samples of a suitable aliquot of the collected sampler. Beer's law is followed through the working range from .03 to 1.0 absorbance unit. This corresponds to 0.8-27 μg of sulfite ion in 25 ml of final solution calculated as sulphur dioxide. The lower limit of detection of sulphur dioxide in 10 ml absorbing reagent is 0.75 $\mu g/m^3$ based on twice the standard deviation, which represent a concentration of 25 $\mu g/m^3$ in air sample of 30 liters.

This methodology has been adopted as a BS method (WSL. 1966) and by the OECD (OECD, 1964). The USEPA¹ has previously adopted the pararosaniline method of determination (USEPA

1971) where SO₂ is absorbed from sampled air by a solution of potassium tetrachloromercurate and a dichlorosulphitomercurate complex is formed.

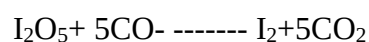
Oxides of Nitrogen (NO_x)

Nitrogen oxide (NO_x) is collected by bubbling air through a solution of sodium hydrogen and sodium arsenite. The concentration of nitrite ion (NO₂) produced during sampling is determined calorimetrically by reacting the nitrite ion with phosphoric acid, sulfanilamide and N-(1-naphthyl)-ethylenediamine di-hydrochloride (NEDA) and measuring the absorbance of the highly colored azo-dye at 540 nm. This is a rapid, simple, selective, sensitive, and Chemiluminescent analyzer (Colorimetry) method for the spectrophotometric determination of nitrite in air samples. It is a Colorimetry-USEPA Method. This method is adopted by Association of London Chief Environmental Health Officers and Greater London Council Scientific Services Branch (1985/86).

CO and O₃

The samples will transport to the laboratory for analysis. The content of these samples will measure in micro grams per cubic meter/ppm. The CO will be analyzed by electrochemical sensor method/Colorimetric method. The manufacture's instruments will follow carefully. The air is passed through the tube by aspirator provided. After the sampling, the color of the fixed portion of the tube is matched with the given chart value and then concentration is calculated. Any water losses by evaporation during sampling is replaced by de-ionized water and mixed thoroughly. The absorbance is measured at 352 nm against the blank reagent by using Spectrophotometer. From the Calibration curve, concentration of O₃ in the absorbing reagent is measured. Then the concentration of O₃ in the air is measured by using the following calculation. Samples for Ozone analysis will carry out impinge containing solution of KH₂PO₄, Na₂HPO₄, and KI. Stack air has been passed through the above-mentioned solution. Any water losses by evaporation during sampling is replaced by de-ionized water and mixed thoroughly. The absorbance is measured at 352 nm against the blank reagent by using Spectrophotometer. From the Calibration curve, concentration of O₃ in the absorbing reagent is measured. Then the concentration of O₃ in the air is measured by using the following calculation.

The samples will transport to the laboratory for analysis. The content of these samples will measure in micro grams per cubic meter. The method finally selected will be the iodine-pentoxide method as modified by Teague,' which depends on the oxidation of carbon monoxide to carbon dioxide by iodine-pentoxide, and the accurate determination of the liberated iodine. It is based on the following reaction:



The iodine freed is absorbed in a potassium iodide solution and titrated with 0.01 N thiosulfate solutions from a micro burette, a few drops of starch solution being added towards the end of the

titration. 1 cc of 0.001 N thiosulfate solution is equivalent to 0.056 cc of carbon monoxide in air at 0 ° C and 760 mm Hg.

Stack Emission Monitoring

Testo 340 combustion tuning analyzer is the ideal tool for measuring the concentration of pollutants from engines stack of the substation project. It provides the information about the flue gases conditions which is produced by the diesel burning engines of the project site. Thermocouple probe, sensors for O₂, CO, NO, NO₂, draft and flow, engine probe, DC power adapter with Lithium Ion battery, filters are attached with in Testo 340.

CMEC-CNEEC JV will use small diesel machine running generator as an alternative of power supply at different the substation sites and also workforce camp or rental house. The operation of this diesel engine results emission of exhaust gases. **CMEC-CNEEC JV** will help third party for the inspection in situ stack emission of the diesel engines

Water quality Parameters

A lot of water quality parameters have to quantify its level. The results also be cooperated with standard limit of different agencies (WHO, EPA, ECR 1997). Different methods have been used for the same parameters. But the physico- chemical parameters (pH, TDS, EC, salinity, turbidity, TSS), collected water first filter with Whatmann (no 42) filter paper to measure total suspended solid (TSS). Then pH electrode is used for measuring pH value, Then EC electrode is used for measuring EC value, Then TDS electrode is used for measuring TDS value from the water. Dissolve oxygen, BOD₅ (at 20 ° C) COD, Alkalinity, Hardness as CaCO₃, Iodometric titration with thiosulfate is used for DO [DO estimation by Winkler's method] and BOD, by using starch indicator. Phenolphthalein indicator is used in Alkalinity measuring, E Black T for Hardness as CaCO₃, mixed indicator for Chloride (free), Mohr Method uses silver nitrate for titration of the determination of chloride ion in water samples. Organic and oxidizable inorganic substances in the sample are oxidized by potassium dichromate in 50% sulfuric acid solution at reflux temperature. Silver sulfate is used as a catalyst and mercuric sulfate is added to remove chloride interference. The excess dichromate is titrated with standard ferrous ammonium sulfate, using orthophenanthroline ferrous complex as an indicator for measuring COD.

Oil & Grease: Partition gravimetric method. This method involves the extraction of dissolved or emulsified oil and grease from water by using an extracting solvent.

AAS – with air acetylene flame is used for the metal ion (Pb) determination in air after digestion of filter paper

Coliform in water: Agar bed method will use for this test

Effluent (wastewater) quality parameter:

As per Department of Environment, GoB, is considered only 5 parameters for inlet and outlet water of any effluent treatment plant (ETP) or waste water treatment plant (WWTP). But DO, BOD₅ and COD is complex matter to test in the field level. pH and TDS are the important parameters for any kind of water. The abnormalities of these two parameters which might affected to another water quality parameters. TDS and pH will be done by **CMEC-CNEEC JV** for effluent at the field level of the substation project



Fig 3.3: TDS and pH meters

Soil quality parameters; metal ions

Soil test results are an important component in a nutrient management plan as they will be a driver in determining if a nutrient application is needed and if so what quantity of nutrients should be applied. As per ESU, PGCB, selected metal ions will measure from the topsoil from the substation project area. The sand filling is the important aspect of the substation project. But the soil sample will collect from the project area cropland/agriculture land, so that substation project activities do not contaminate the zonal area land. The soil sample will collect from 15 cm depth from the sub-surface of the cropland/agriculture land nearby the substation project area in polyethylene bag and bag will air-proof. The results will express in dry weight basis.

Soil Digestion for metal ions: soil samples are first weighted initially and finally to determine water content at the constant position. Then dried soil samples are digested by nitric acid and perchloric acid (3:2) with a gentle heat on the hot place for 3-4 hours. After digestion, filter it by Whatmann filter paper (No 42) and then it will be ready for metal ions. AAS – with air acetylene flame is used for metal ions, AAS – with hydride vapor generator for arsenic.

3.8.1 Person Analysis laboratory used

EnviroCare International Limited (visited the lab by PGCB at 15 Oct 2019) is one of the Bangladesh Accreditation Board (BAB) certified productive third party environmental testing laboratory in Bangladesh, offering a full range of environmental inspection, testing, assessment and consultancy services for attaining beautiful eco-friendly world. Our portfolio of services

includes providing detailed environmental solutions and testing using state-of-the-art instrumentation and an experienced team of lab analyst as per standard, customer-supplied, and in-house validated methods. The following personal will involve in the in situ air water and noise monitoring at the P5 substation projects of CMEC-CNEEC JV. All instruments of EnviroCare International Limited are duly calibrated and the calibration certificate of all instruments and BAB certificate are attached at appendix G

SL	Name	Designation	Specialty
1	Mohd Nur E Alam Siddique	Chief Lab & Environmental specialist , EnviroCare International Limited	Analytical & Environmental Chemist
2	Sanjoy Mondol	Technical Manager, EnviroCare International Limited	Environmentalist
3	Ariful Islam	Technical Officer, EnviroCare International Limited	Asstt. Environmental Engineer

3.9 Minimum Wage

The term minimum wage is not defined by the Labour Act 2006 rather it sets a procedure for fixing industry wise minimum wage rates. Minimum wage rates are declared by the Government on an industry basis following recommendations by the Wages Board, a specialist tripartite board established under article 138 of the Labour Act 2006. In making its recommendation, the Wages Board takes into consideration cost of living, standard of living, cost of production, productivity, price of products, business capability, inflation rate, economic and social conditions of the country and of the locality concerned and other relevant factors. The Minimum Wages Board (MWB) is obliged to revise its recommendations if any of the aforementioned criteria change (within one to three years). The minimum rates of wages for any industry may be re-fixed after every six years as may be directed by the Government.

According to the Minimum Wage Board there is no specific Minimum Wage Act, however there is a specific labour act which is known as Bangladesh Labour (Amendment) Act 2013. The Minimum Wage board was established in 1959 under the Ministry of Labour & Employment, Bangladesh, to govern and fix minimum wages. Bangladesh has a government-mandated minimum wage, and no worker in Bangladesh can be paid less than this mandatory minimum rate of pay. Employers in Bangladesh who fail to pay the Minimum Wage may be subject to punishment by Bangladesh's government. Bangladesh's Minimum Wage is the lowest amount a worker can be legally paid for his work. Most countries have a nation-wide minimum wage that all workers must be paid. The Bangladesh minimum wage is 1,500 taka per month for all economic sectors not covered by industry-specific wages (in the garment industry the minimum

wage is 5,300 taka per month). The minimum wage is set nationally every six years by the National Minimum Wage Board in a tripartite forum industry by industry. Bangladesh's minimum wage was last changed in 1-Dec-2013. Wages in Bangladesh increased to 13258 BDT/Month in 2017 from 12897 BDT/Month in 2016. Wages in Bangladesh averaged 12549.33 BDT/Month from 2013 until 2017, reaching an all-time high of 13258 BDT/Month in 2017 and a record low of 11493 BDT/Month in 2013. CMEC-CNEEC JV will follow Bangladesh National Wage Board Rule and Bangladesh Labour Law (BLL).

Chapter 04



EHS Operational Inspection Resources

4.0 EHS Operational Inspection Resources:

Prior to the construction & operational phase of the Project, CMEC-CNEEC JV will establish and begin to implement a substation location wise plan for construction of control building cable trench, under the direction and design specification of power Grid Company of Bangladesh (PGCB).

Before moving a new location for construction activities following points to be checked, a pre-mobilization checklist could use by CMEC-CNEEC JV Concerned Site in-charge along with ESHS Officer will check below parameters: -

- ❖ Suitable approach road/access to reach over there
- ❖ Condition of soil and area nearby the location
- ❖ Tree/house or any other infrastructure available
- ❖ Topographical situation of the substation project are
- ❖ Availability of Water nearby
- ❖ Any other issue may affect social and environment

If any major issue may affect Environment and Social parameters, then project manager & ESHS Manager visit the location to resolve the issue. If required, the matter may escalate to PGCB and consultant.

After mobilization at location following parameters will be checked by site engineer
Gang/Workers are competent & experience for planned construction activity sufficient amount of required quality PPEs are available with the gang equipment, tools/tackles & other infrastructure are available and fit for operation Materials are available and properly kept at site as per plan Source of water and other infra available and have owner consent to use them Proper waste box and waste management system available known to gang emergency No & Support available nearby displayed in local language availability of drinking water, rest shed, first aid arrangement, fire safety arrangement, etc.

During construction work following points to be checked and ensured their compliance

By Safety Supervisor/Officer

- Workers/Supervisor Competency check
- Safety Induction process compliance (for all workforce)
- PPEs compliance
- Display of ESHS Posters/Emergency Information availability
- Monitoring all Environmental Parameters – Noise, Water, Air, Soil, Stack RH, and Temperature etc.

By Site Supervisor/Engineer

- Use of Fit and Approved Tools and Plants
- Gang follow safe working practice
- Observe unsafe act and condition and resolve the issue from root
- Escalate Critical ESHS Observations if not resolve at site level
- Provide or ensure Tool Box Talk daily morning
- Ensure all emergency support are available and effective
- First Aid, Drinking Water, Attendance Register, Rest Shed, Site Toilet etc. are available and effective
- Inform Higher Management about any major Incident/Accident if happened
- Ensure local people should not enter inside working zone

By Project Manager/Site Manager

- ✓ Visit the location at least once (construction phase) to ensure all ESHS parameter complied
- ✓ Provide PEP Talk to all workforce at site for team motivation
- ✓ Observe UA/UC and resolve the issue or escalate to higher management
- ✓ Review the Site ESHS status with site team and guide team to improve the performance
- ✓ Organize site Motivation Program

4.1 Site Tracking Procedure

A passive GPS tracking system will monitor location and will store its data on journeys based on certain types of events. So, for example, this kind of GPS system may log data such as where the device has traveled in the past 12 hours. The data stored on this kind of GPS tracking system is usually stored in internal memory or on a memory card, which can then be downloaded to a computer at a later date for analysis. In some cases the data can be sent automatically for wireless download at predetermined points/times or can be requested at specific points during the journey. An active GPS tracking system is also known as a real-time system as this method automatically sends the information on the GPS system to a central tracking portal or system in real-time as it happens. This kind of system is usually a better option for commercial purposes such as fleet tracking or monitoring of people, such as children or elderly, as it allows a caregiver to know exactly where loved ones are, whether they are on time and whether they are where they are supposed to be during a journey. This is also a useful way of monitoring the behavior of employees as they carry out their work and of streamlining internal processes and procedures for delivery fleets. CMEC-CNEEC JV already has GPS locations of the five substations.

When the safety of personnel is at stake – especially in remote or dangerous regions – it needs a reliable way of staying connected. Any tracking system is used for location tracking and messaging when standard means of communication are not available. The personal tracker provides a means of communication for workers who complete dangerous or hazardous tasks in remote areas where cellular or radio coverage isn't always available. Remote workers need to have access to reliable two-way communication and SOS Alerting – and those who are in charge of their safety need to be able to quickly locate their employees in case of an emergency. The current advice from the Health and Safety Executive (HSE) is that no work should bring employees back into the workplace unless it is safe to do so. The challenge for businesses, however, is to define on what constitutes “safe” and “COVID-19 secure” based on the unique specifications of their organization. There will be no one-size fits all approach, a project will have different considerations when it comes to factors including sector and geography.

4.2 Non-conformity handling and detection procedure:

Non-conformity is a process or activity which doesn't fulfill its intended purpose of project work, procedure of working process of the substation. This could be because there has been a failure to follow the procedures outlined in the management system of any construction project and workers. It may cause of the documented procedures that are not fit for purpose. On their own, non-conformities can lead to a bad workers, wrong procedure and incomplete planning and experience for an individual, but if left untreated, can also lead to a cascade of bad experiences for a group of participated in the project. This is why it is important to not only identify these areas but address them in good time and adequately. Our approach to measuring process conformance is to identify a partial set of nonconformities; that is a subset of all occurring process nonconformities.

For Organizations with a Management System of PGCB in place, will identifying any non-conformity will see several purposes:

- Ensuring adherence to procedure – asking the team member of the project to actively look for and identify when a non-conformity occurs shows that is aware of the processes
- Ensuring the effectiveness of the construction work of the substation project – by observing processes and recognizing non-conformities it can easily see areas where procedures will n't quite working as planned, giving the chance to address this and improve the effectiveness of the Management System overall.
- Providing information for management reviews – the results of any raised non-conformities should be documented so they can be reviewed and analyzed at management reviews, providing evidence for use in corrective action programs and performance measurement.
- Identifying opportunities for improvement – recurring non-conformities are a sure sign of a problem, observing such trends helps a business to highlight key procedure or process changes that are required to improve performance and productivity.
- Driving continual improvement – by addressing the non-conformities it is driving improvement; from improving the process itself, to reviewing how that change affects other areas and possibly changing them too during a Management Review.

4.3 Management of data on tracking and non-conformities:

Management of data on tracking and non-conformities the design and use of the most current technology is core to our service model. Our multi-disciplinary team of project managers, IT professionals, civil engineers, and agents collaborate to develop and implement tools and processes that improve information flow, facilitate analysis, assess project costs and expedite project completion.

Data Management: Utilizing our proprietary, trademarked information system, source, manage and access intellectual content vital to establishing Right of Way corridors of overhead power line project.

GIS Solutions;by capturing and integrating land rights data with powerful digital maps, a clear picture of the subject area emerges. Our Custom GIS Applications and Geo-database Modeling services provide information critical to selecting a route or site at a significant cost savings and far more expeditiously than traditional methods.

Project Tracking: Our suite of technical tools, managed by experienced staff, facilitates real time Project Tracking, 24/7. As a result, issues are identified and resolved as expeditiously as possible, communication is optimized, and budgets are achieved.

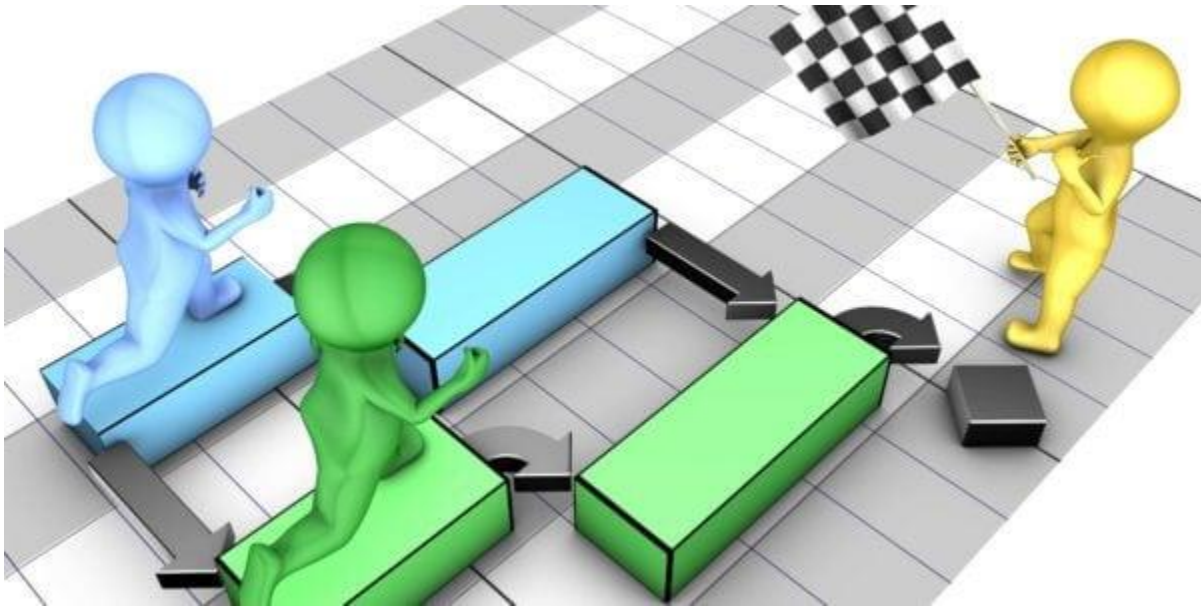
A successful substation asset management program has many components with civil work, control building, electrical equipment. The primary purpose of the inspection herein will develop best practices guidelines against which electric utilities could benchmark their current inspection programs and make appropriate adjustments both for civil and electrical arrangement. The main inspector of the substation project is PGCB; both of them will observe whole project activities from civil work to operation phase of the substation. Any objection might be given against CMEC-CNEEC JV after inspection. At the case, CMEC-CNEEC JV will take initiative measure for their specific objections or Non-conformity of construction work of the substation project.

4.4 Non-conformity handling and detection procedure

Any non-conformity noticed during site visit or escalation from site team need to address in ESHS system. CMEC-CNEEC JV different management have to discuss the issue of non-conformity and try to resolve with their level, but if not due to resource and financial problem non-conformity observation should be escalated to next management level. Detection of non-conformity may at by site personnel or during the visit of ESHS Officer, Project Manager, Site Manager, Regional Manager and next level of hierarchy.

As per CMEC-CNEEC JV ESHS system every management level has their own site visit schedule and they have to submit their visit observation where they may raise non-conformity for any issue. Also CMEC-CNEEC JV has Cross Regional and Corporate Audit to check the ESHS Compliances.

Chapter 05



Substation Project Activity

5.0 Substation Project Activity

CMEC-CNEEC JV provides a full scope of Engineering Procurement, Construction for Design, Supply, Installation, Testing and Commissioning of 230/132 kV GIS SS at Rupsha, 132/33 kV at Phultola, Monirampur, Maheshpur, Meherpur GIS Substations for the Dhaka and Western Zone Transmission Grid Expansion Project (DWZTGEP) (Package-P7). Rupsha and Phultola SS areas

are situated at Khulna district. Monirampur are situated at Jashoredistrict, Maheshpur is Jhenaidah district and Meherpursubstation is under Meherpur district.CMEC-CNEEC JV has prepared CESMP report as per requirement of PGCB and ADB. After approved the CESMP, all project planning, initial and final designs, material procurements, execution of the projects till final commissioning are handled by qualified and experienced teams of engineers and professionals, using state of the art equipment, latest technologies and essential soft-wares. Various stages of the substation projects from preliminary survey till final hand over to the respective clients are very closely monitored by an independent cell giving high priority to the safety and security concerns, during project executions and achieving the desired targets. The company is having a qualified team of engineers, supervisors and skilled workers sufficiently equipped with full range of tools, machinery, equipment, vehicles etc is possessed by the division to produce quality work for due and proper project implementation, in accordance with the client requirements and international practices. All big and small project activities are executed by the company own specialized groups, including but not limited to the following.

CMEC-CNEEC JV Services provided Include:

Engineering and Design works

- ✓ Preliminary survey the substationlocations and optimization studies.
- ✓ Procurement and delivery of material and equipment to sites.
- ✓ Construction and installation works for the substation project.
- ✓ Installation of Equipment, Towers and others in the substation yard.
- ✓ Stringing of phase conductors and optical fiber cables for the substation project.
- ✓ Testing & commissioning of the projects and final hand over to the Clients (PGCB)

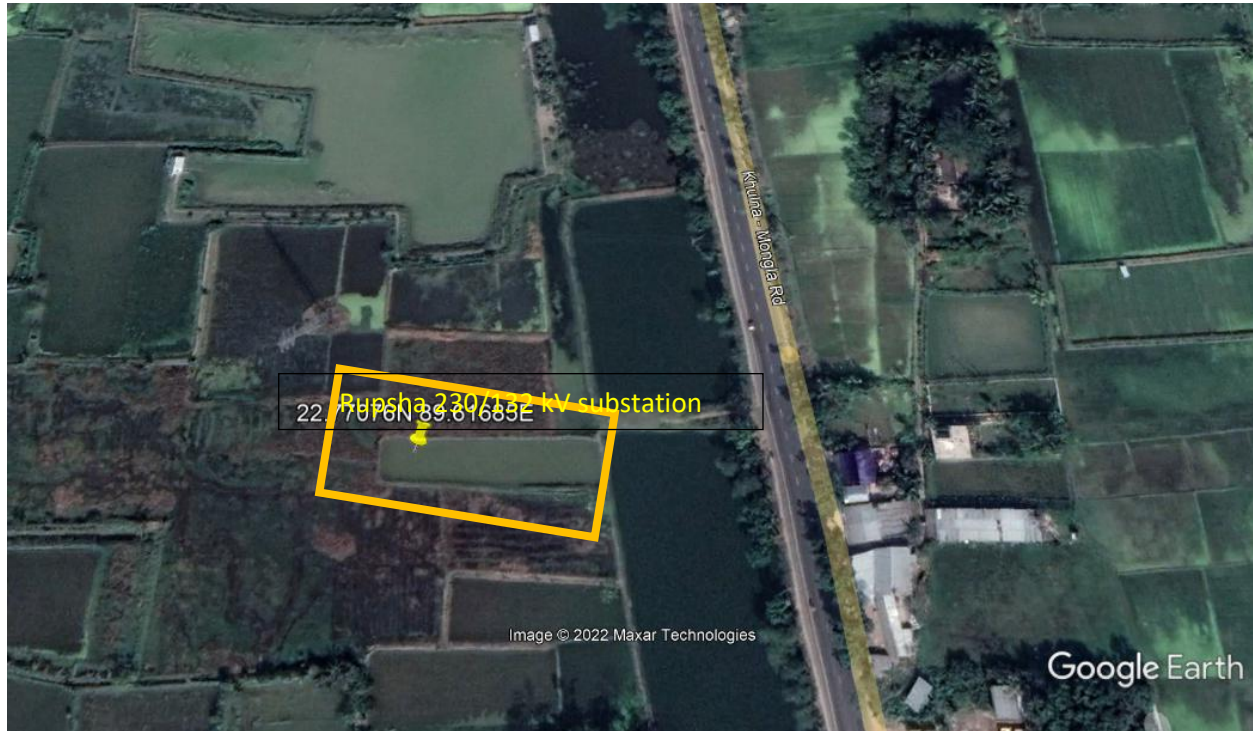
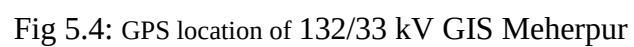
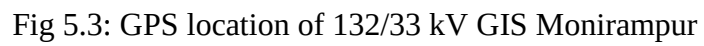


Fig 5.1: GPS location of 230/132/33 kV GIS Substation at Rupsha



Fig 5.2: GPS location of 132/33 kV GIS Phultola



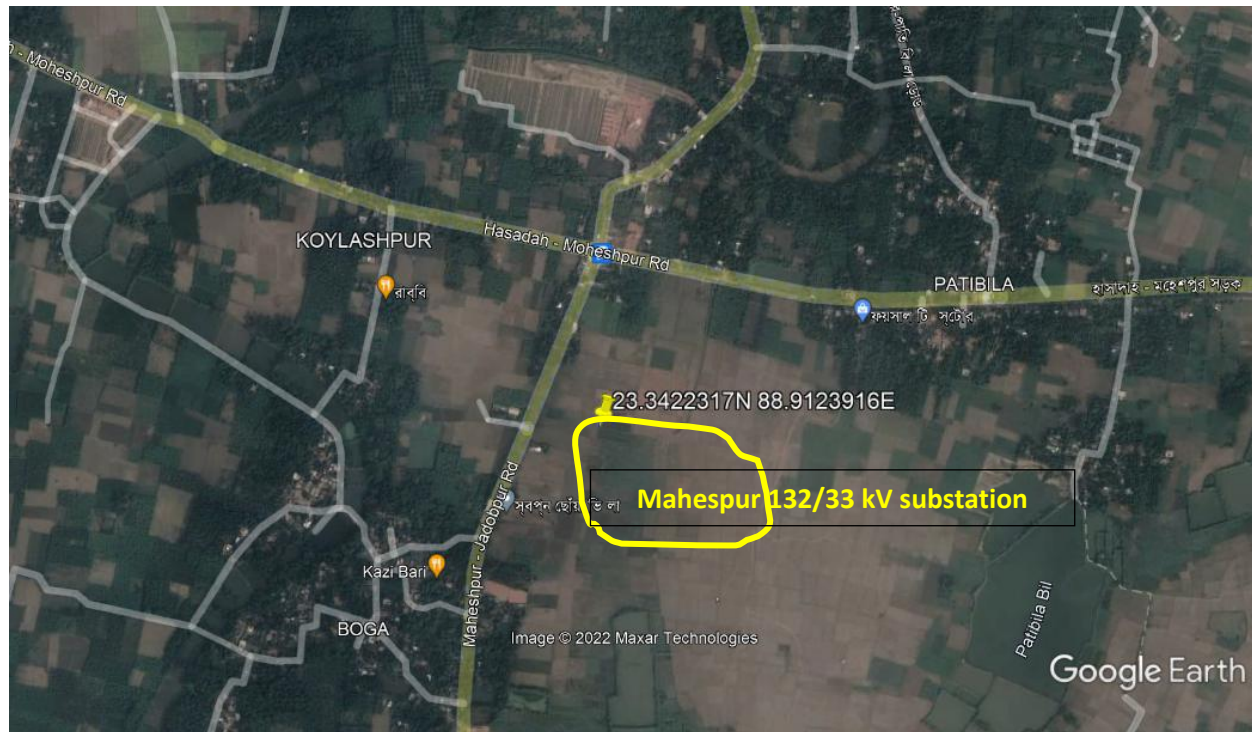


Fig 5.5: GPS location of 132/33 kV GIS Maheshpur

5.1 Project Activities:

The project activities are following at the fixed substations location

5.1.1 Substation Area clearing and land filling

After receiving the final permit/clearance from PGCB, it may require to clear the substation area requires clearing or trimming trees or bushes to provide the construction crews and their equipment a safe access to workplace and also enough clearance to carry out the job safely. After cleaning the substation area, land will fill-up to existing substation area. The height of land filling will be 12 inches high from the road surface.

5.1.2 Making Temporary Boundary Wall

Bamboo made or tin made temporary boundary wall will make for the substation area security, mitigation measure of wild life as well as awareness for the local people. When the permanent boundary wall will complete, temporary boundary wall will shift elsewhere and materials will be sold as the solid waste by CMEC-CNEEC JV.

5.1.3 Structure Foundation Installation

The next step in the construction process is to drill foundations for the control building structures. The foundation plan and other engineering designs will be given by PGCB. This involves drilling holes, which are then typically filled with concrete foundations for control building, boundary wall, cable drain, transformer foundation etc.

5.1.4 New Structure Installation

Once the foundation is cured, structure installation can begin. Steel poles often come in sections that are assembled on or near the foundation for the cable arrangement of substation project. Cranes and/or bucket trucks are used to lift the poles and set them into position on the foundations. Construction crews will assemble or "lace" lattice structures at the site. The structure components are delivered to the substation area well in advance of this installation process. Generally, it takes one to three days to assemble and erect each new structure. After installation, the structure is grounded for safety purposes.

5.1.5 Wire Stringing

With the new structures in place, the next step is to install the wire ("conductor"). The wire-stringing operation requires equipment at each end of the section that is being strung. Wire is pulled between these "pulling sites" through stringing blocks (pulleys) at each structure. These pulling sites are set up at various intervals in the substation yard, typically one to three miles apart. Specific pulling sites are determined close to the time the stringing activity takes place. Once the wire is strung, the stringing blocks are removed and the wire clipped into its final hardware attachment.

5.2 Implementation & Operation

5.2.1 Training and Awareness,

CMEC-CNEEC JV has procedure for identifying the training education and experience needs of all employees and non-employees, including sub-contractors, whose work may involve hazards and risks to the health and safety of employees and non-employees within the substation yard and also to ensure that they have received the appropriate training. A record of such training will be maintained by CMEC-CNEEC JV.

The substation has procedures to make employees and non-employees aware of:

- The importance of conformance to all aspects of the Health and Safety management system.
- The potential or actual risks that a hazard may create and the safety aspects of improved personal performance.
- Their roles and responsibilities in achieving conformance to all aspects of the Health and Safety management system, including the preparedness and response for dealing with hazardous situations should they arise.
- Potential consequences of departure from the specified processes or operating procedures.

5.2.2 Consultation and Communication

The substation will have procedure for dealing with internal and external communication of Health and Safety issues for employees and non-employees. The procedures include inductions, receiving, documenting, and the responding to relevant interested parties. Employees are aware of the health and safety coordinators, and through them, they are represented in the management system.

The division considers process for external communication on significant Health and Safety issues and records its decisions. CMEC-CNEEC JV will monitor environmental samples (air, water, and noise level) at the selected site prior to approval from PMU, Dhaka and Western Zone Transmission Grid Expansion Project (DWZTGEP) and ESU, PGCB. CMEC-CNEEC JV will be communicated with PMU, Dhaka and Western Zone Transmission Grid Expansion Project (DWZTGEP) by letter for environmental sampling. The date and sampling time will mention in the letter. As per date and time, CMEC-CNEEC JV will finish the environmental sampling at the substation area. The data sheet of environmental sampling is attached an appendix H

5.2.3 Documentation

The Substation project personnel's will maintain a documented system for detailing the core elements and the interactions and providing direction to the related documentation. The minimum requirements for documented procedures are:

- Risk assessments and control
- Incident reporting and investigation
- Emergency Preparedness and Response
- Monitoring and measuring performance
- Responsibilities register
- Training register
- Relevant work procedures and instructions
- Process checklist
- Induction training sheet
- Site safety survey report

5.2.4 Document and Data Control

For the substation project, maintaining all procedures for controlling all documentation required by the Health and Safety management system. The procedures ensure that documentation can be:

- Located.
- Reviewed, revised, and approved by authorized personnel.
- Latest issues are available at all appropriate locations.
- Prompt withdrawal of obsolete documentation.
- Retention of obsolete documents for legal and/or knowledge preservation purposes.

Documented procedures are maintained for the creation and modification of documentation. All procedures and work instructions carry issue level indication and issue dates. All forms carry issue status and reference code.

5.3 Operational Control

CMEC-CNEEC JV will identify activities for the substation project this will associate with the project risks where control measures need to be applied. Documented procedures and work instructions will be maintained to stipulate operating criteria on all those activities, deviation from which can lead to unacceptable risks to the concerned people. Where activities associated to identifiable hazardous conditions are related to contractors, documented procedure No. is maintained for communication and control.

5.4 Checking & Corrective Action

5.4.1 Performance Measurement & Monitoring

The project ESHS will monitor and measure Occupational Health and Safety performance on a regular daily basis. Performance measures are based on the recording of information of relevant activities and conformance to the established objectives and targets. Incidents are recorded and provisions introduced to prevent any recurrence. All PPE are checked for adequacy, operating conditions and useful life by the site in charge. CMEC-CNEEC JV are appointed for carrying out material handling are also responsible for periodic calibration and maintaining records of all T&P' and material handling equipment. Calibration records are to be retained for the period of work by the concerned contractor. Site in charges / managers are responsible for compliance of the calibration.

As per Environmental and Social Unit (ESU), PGCB and ADB, the monitoring parameters are felling of trees and clearing of vegetation, fauna (wildlife), drainage congestion/flooding, noise pollution, dust Pollution, surface water quality, groundwater/drinking water quality, pollution due to wastes, traffic congestion/road accident, occupational health and safety and community health and safety in the construction phase and tree replantation, drainage congestion, community health and safety and safety & security of substation & workers in the operation phase. The frequency of monitoring Community health and safety will daily. The monitoring frequency of PPEs, Fire protection, welding machine, winch machine, public protection, materials quality, traffic control, dust flow, health & safety issues, Accident/incident, ESH Training, Wild life, Public protection /Awareness poster in the daily basis environmental monitoring (air, water soil quality and poise level) in the quarterly basis.

5.4.2 Incidents, Non-conformances, Corrective and Preventive Action

CMEC-CNEEC JV will maintain procedure for dealing with non-conformances.

These identify responsibility and authority for:

- a) Investigation of incidents and non-conformities.
- b) Initiating Corrective / Preventive action and monitoring effectiveness.

Action taken is focused on the elimination of the root cause of the non-conformance and will appropriate to the magnitude of the problem. Steps will take to mitigate the effect of any incident or non-conformity. CMEC-CNEEC JV will also maintain a register of all incidents associated with the Health and Safety management within each of the substation site. The incident events will publish in the quarterly Environmental & Social Compliance Report.

5.4.3 Records and Record Management

CMEC-CNEEC JV maintains procedure for identification, maintenance, and disposition of records relating to the health and safety management system.

These include audit reports, management reviews, incident reports etc. All records held whether hard or soft copy are to be legible and traceable to the relative activity or process and are to be readily retrievable. Records are to be protected from deterioration or loss for the defined retention periods. The retention periods are recorded within the division's standard documentation procedures. Where necessary the retention periods that are legal requirements are to be strictly adhered to.

5.4.4 Health and Safety Management System Audit

Health and safety personnel of CMEC-CNEEC JV will maintains an internal audit program for the assessment the health and safety management system. The audits are used to determine:

- a) Conformance to the CMEC-CNEEC JV Health and Safety management system
- b) Correct implementation and maintenance
- c) Conformance to the current internal procedures and the assessment of those procedures.

The results of the audits provide information for the management team. Audit programs are based on:

- a) The risk profile and risk experience of the particular activities.
- b) The results of the previous audits.

Audit procedure to addresses the full audit scope, frequency, and methodology together with defined responsibility for conducting and reporting audits.

5.4.5 Management Review

Management reviews will conduct periodically keeping in mind both internal and external matters. The agenda will include the following minimum points:

- Review of safety policy.
- Confirmation of continuing stability, adequacy, and effectiveness of OHS management system.
- Status of OHS objectives and targets.
- Any other topics relating to health and safety management system.
- Training needs.
- Legal compliance.
- Incidents / near misses.
- Corrective and Preventive actions.
- Audit results.
- External / Internal communication.
- Continuous improvement.

The meeting shall be attended by the senior management team and the safety head at the appropriate level and should be chaired by the division head. An agenda should be issued prior to the meeting and minutes are to be recorded and maintained.

5.5 Hazard Identification, Risk Assessment, and Risk Control

This procedure describes the process to identify hazards and associated risks, to apply methods for rating the significant risks and implement the controls required to ensure the risks are reduced to a level that is reasonably practicable. Project Managers are to carry out risk assessment in their area of responsibility to ensure that all hazards are identified and associated risks are controlled by suitable and sufficient methods.

5.5.1 Hazard identification

Safety hazards will identify through a review that includes the following areas:

- ✓ Inspection and observation of ongoing work activities.
- ✓ Results of physical inspections and audits.
- ✓ Legal and other requirements.
- ✓ Health and Safety policy.
- ✓ Monitoring data.
- ✓ Incident investigation.
- ✓ Activities of contractors.
- ✓ Non Conformances.
- ✓ Communication with employees and other interested parties.
- ✓ Information from safety officers.
- ✓ Information on best practices.
- ✓ Planned changes to the projects / processes.

5.5.2 Risk Assessment

- ✓ **Identifying risks**
- ✓ Risks pertaining to the recorded hazards are to be identified. Where several risks are associated with a particular hazard, all of them are to be recorded.
- ✓ **Rating risks**
- ✓ Assessment of the risk is made using the 'Probability' and 'Severity' matrix on a scale of 5x5 as follows:

a. Probability

Very high	Event is likely to occur very frequently, maybe several times a day.
High	Event is likely to occur very frequently, maybe once a day.
Medium	Event is likely to occur frequently, maybe once a week.
Low	Event is likely to occur rarely maybe once a month.
Very low	Event is likely to occur very rarely, maybe once a year.

b. Severity

Extremely harmful: Imminent danger exists. Hazard capable of causing death.

Very harmful	: Imminent danger exists. Hazard can result in permanent disability.
Harmful	: Serious danger exists. Hazard capable of causing serious injury.
Less harmful	: Danger exists. Hazard capable of causing Lost Time Injury.
Slightly harmful	: Danger exists. Hazard capable of causing Medical Treatment Injury

5.5.3 Procedure for Risk Assessment

Project Manager along with the site in charge shall conduct the Group Risk Assessment of their respective sites with the support of the safety officer or any other authorized representative. The Group Risk Assessment is carried out. Proper records of the same are to be maintained by the Project Managers.

The Risk Assessment is to be carried out before commencement of work on the project. The contractors are to be issued a copy of the Risk Assessment and their signature obtained as receipt of the same. Records of the same are to be maintained by the Project Managers.

5.5.4 Identifying Control Measures

If the existing control measures are not sufficient, an action plan will be implemented by initiating management program to bring down the risk to acceptable levels. Use best judgment and experience to set suitable and attainable control measures or seek advice from Safety Officer.

Control measures must be considered in the following order of preference

- Eliminate the hazard - engineer it out.
- Substitute the hazard with a lesser hazard.
- Enclose - people or process.
- Develop safe systems of work.
- Training.
- Personal Protective Equipment.

5.5.5 Review

Risk assessments will review and updated if any activity or process changes significantly and in the event of an incident. Risk assessments are to be reviewed and updated as a minimum once every six month's even if there is no change of activity or process. Control measures will be approved by the Project Manager and verified by the Safety Officer of **CMEC-CNEEC JV**.

Chapter 06

Environment, Legal & Other Requirement



6.0 Environment, Legal & Other Requirement:

The Environment Conservation Act of 1995 establishes the requirement for an environmental assessment in Bangladesh. Any proposed "industrial unit or project" must obtain prior approval from the Department of Environment (DoE). The act has classified projects to be assessed by the DoE in four categories (Green, Amber A, Amber B, and Red). Electrical infrastructure projects involving transmission lines longer than 50 km are categorized as Orange B category, which triggers an automatic requirement for an IEE. The DoE issues an authorization for the project to proceed subject to a satisfactory review of the environmental assessment. The authorization consists of two parts, one is a "site clearance", which gives approval to the sites proposed for the project and the other is an "environmental clearance", which approves the content of the project. Project site operations are covered under state environmental regulations under whose jurisdiction the site is located along with applicable DOE legislations.

PGCB, as the project proponent, is responsible for carrying out the IEE study of the proposed project. Therefore, PGCB has the responsibility to administer the environment assessment process with the consultants, review the findings, and submit the documents to the DoE for review. A key requirement of the IEE for projects classified in the Orange B category is an EMP. The function of the EMP is to enable PGCB to show the DoE how it will deliver the environmental performance assessed in the IEE (for which DoE approval is sought). The EMP should describe the management responsibilities, mitigation measures as well as the institutional arrangements, and explain how monitoring will be carried out. Possession of a "clearance" from the DoE does not relieve the developer of a project from the requirement to comply with other environmental regulations. The Bangladesh National Environment Quality Standards for industrial effluents have been set and compliance with them is mandatory. There are also statutory instruments that are applicable to power development projects, which are not primarily environmental but to mitigate environmental impacts. Compliance with such statutory instruments is mandatory. Organization related with Enforcement of Environmental Standards: The roles and responsibilities of different ministries and departments related with the enforcement of environmental requirements are briefly described below:

6.1 Ministry of Environment Forest & Climate Change (MoEFCC), Bangladesh

The Ministry of Environment, Forest & Climate Change (MoEFCC) and climate change 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 MoEFCC was created by replacing the Ministry of Agriculture in 1989 and is at present a permanent member of the Executive Committee of the National Economic Council. This group is the major decision-making body for economic policy issues and is also responsible for approving all public investment projects. The MoEFCC oversees the activities of the following technical/implementing agencies:

- ❖ Department of Environment (DoE)
- ❖ Forest Department (FD)
- ❖ Forest Industries Development Corporation (FIDC)

6.2 Department of Environment (DoE)

In order to expand the scope of environmental management and to strengthen the power for achieving it, the Government adopted the Environmental Pollution Control Ordinance in 1977. The ordinance provided for the establishment of an Environmental Pollution Control Board, which was assigned with the responsibility of formulating policies and proposing measures for their implementation. In 1982, the Board was renamed as the Department of Environmental Pollution Control (DEPC). Six divisional offices were established in Dhaka, Chittagong, Khulna, Barisal, Sylhet and Rajshahi. A special presidential order again renamed the DEPC as the Department of Environment (DoE) and placed it under the newly formed MoEFCC in 1989.

The DoE is a department of the MoEFCC and is headed by a Director General (DG). The DG has complete control over the DoE. The power of the DG, as given under the Act, may be outlined as follows: The DG has the power to close down 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. The DG has the power to declare an area affected by pollution as an ecologically critical area. The DoE governs the type of work or process, which can take place in such an area. Before undertaking any new development project, the project proponent must take an Environmental Clearance from the DoE. The procedures to take such clearance are in place. Failure to comply with any part of the Environment Conservation Act (ECA) 1995 may result in punishment by a maximum of 5 years' imprisonment or a maximum fine of Tk. 100,000, or both.

6.3 Forest Department

This Department under the Ministry of Environment Forest and Climate Change is responsible for the protection and management of all reserve forests of the country. The personnel of the department extend down to the union level in areas where there are reserve forests. It has recently started some agro forestry programs. The Forestry Department officers are also responsible for the protection of wildlife in the forests.

6.4 Related Other Organizations

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

- a) Ministry of Land: Land Reform and Land Acquisition Directorate
- b) Ministry of Water Resources: Bangladesh Water Development Board (BWDB)
- c) Ministry of Fisheries and Livestock: Directorate of Fisheries

Relevant National Policies and Legislation Relevant to Environment

- a. National Strategies, Policies, Acts and Rules related with the environment include the following:
- b. Environment Pollution Control Ordinance, 1977.
- c. Environmental Quality Standards for Bangladesh, 1991
- d. National Conservation Strategy (NCS) 1992
- e. National Environment Policy (2018)
- f. National Environment Management Action Plan (NEMAP) 1995
- g. Environment Conservation Act (1995)
- h. Environment Conservation Rules (1997)
- i. The 1997 rules were formed gradually leading to the strategy that was developed in 1992. The policy was enunciated based on the strategy. The NEMAP followed the policy. The Acts and rules naturally followed the plan through legislative actions.

6.4.1 The Bangladesh Wildlife Preservation Order (1973; amended to Act in 1974)

The Bangladesh Wildlife (Preservation) Order of 1974 provides for the preservation, conservation and management of wildlife in Bangladesh. The earlier legislations on wildlife preservation, namely, the Elephant Preservation Act, 1879, the Wild Bird and Animals Protection Act, 1912, and the Rhinoceros Preservation Act, 1932 have been repealed and their provisions have been suitably incorporated in this law.

6.4.2 The National Forest Policy (1994)

The National Forest Policy of 1994 is the amended and revised version of the National Forest Policy of 1977 in the light of the National Forestry Master Plan. The major target of the policy is to conserve the existing forest areas and bring about 20% of the country's land area under the forestation program and increase the reserve forest land by 10% by the year 2015 through coordinated efforts of GO- NGOs and active participation of the people.

6.4.3 The Electricity (Amendment) Act 2018

The Electricity (Amendment) Act 2018 to consolidate the laws relating to generation, transmission, distribution, supply, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalization of electricity tariff, ensuring transparent policies regarding subsidies, promotion of energy security, promotion of efficient and environmentally benign policies, constitution of Central Electricity Authority

The electricity generation from wind, small hydro, solar, biomass, biogas, bio fuel, any kind of waste including municipal and solid waste, geothermal, hybrid power system or such other sources as may be notified by the Central Government from time to time for end use at or near the place of generation; This act have "dedicated transmission lines" means any radial electric supply-line for point to point transmission which are is required for the purpose of connecting electric lines or electric plants of a captive generating plant referred to in section 9 or generating

station referred to in section 10 to any transmission lines or distribution system or sub-stations or switching station or any other captive Generating Plant or generating stations, or the load center, as the case may be, dedicated for evacuating the electricity generated from such Captive Power Plant or Generating Station and shall not be used for any other purpose subject to the condition that such line shall not form a loop with the grid and shall not be shared except with the prior approval of the Appropriate Commission, except where authorized for additional connections for redundancy purposes or improved transmission. The conveyance of electricity by use of distribution system and the expression “distribute” shall be construed accordingly.

6.4.4 Electricity Rules 2020 (S.R.O. No.-410-Law/2019)

These Regulations may be called the Bangladesh Energy Regulatory Commission (Electricity Grid Code) Regulations, 2019. The grid code is applicable to distribution system improvement, quality consumer service; system loss reduction and bill collection improvement become possible due to close monitoring of the utilities. As per grid code, the component; electricity transmission planning, connection conditions, outage planning, schedule and dispatch, frequency and voltage management, contingency planning, cross boundary safety, operational event or accident reporting, protection, metering, communication and data acquisition, testing, numbering and nomenclature, data registration, performance standard for transmission, financial standards and all other matters relating to the electricity system of Bangladesh.

The Grid Code is a document that governs the boundary between the Licensee and Users and establishes procedures for operations of facilities that will use the Transmission System. The Grid Code specifies criteria, guidelines, basic rules, procedures, responsibilities, standards and obligations for the operation, maintenance and development of the Electricity Transmission System of Bangladesh to ensure a transparent, non-discriminatory and economic access and use of the Grid, whilst maintaining a safe, reliable and efficient operation of the same to provide a quality and secure electricity supply as reasonably as practicable. Specifying the coordination responsibility and minimum standards of protection that are required to be installed by Users of the Transmission System is specifying the minimum operational and commercial metering to be provided by the Single Buyer, the Licensee and Users, Communication requirements, Data acquisition. Specifying the technical & Performance standards, uniform accounting system and financial standards and reporting indices in these respects to be implemented by the Licensee.

It should be noted that the Grid Code is not concerned with the detailed design and operation of Power Stations and Distribution Systems, provided that their overall compatibility with the Transmission System needs is assured. Specifying the conditions under operation which the Licensee, System Operator shall operate the Transmission System and other Users of the Transmission System shall operate their plant and/or systems for the generation and distribution of electricity in so far as necessary to protect the security and quality of supply and safe operation of the Licensee's Transmission System under both normal and abnormal operating conditions.

In the operation phase of the Grid generally covers:

- Frequency and Voltage Management

- Contingency Planning
- Cross Boundary Safety
- Operational Event and Accident Reporting
- Tests
- Numbering and Nomenclature
- Data Registration.

Bangladesh is to take initiatives to build a country wide power network (transmission and distribution), aiming to utilize full generation capacity and to provide reliable electricity to all by 2021. PGCB is responsible for operation, maintenance, and development of transmission system all over Bangladesh. At present, power generated in different power plants is transmitted to the national grid through 400 kV, 230 kV and 132 kV transmission lines. Two organizations and four public sector companies are responsible for electricity distribution namely- Bangladesh Power Development Board (BPDB), Bangladesh Rural Electrification Board (BREB), Dhaka Power Distribution Company Ltd. (DPDC), Dhaka Electric Supply Company Ltd. (DESCO), West Zone Power Distribution Company Ltd. (WZPDC) & Northern Electricity Supply Company Ltd. (NESCO). DPDC, DESCO, WZPDC, and NESCO have been formed after power sector reform and restructuring to create business friendly environment, transparency, and dynamic to provide electricity to all as per vision 2021.

As per electricity rule 2020 issues guidelines for payment of compensation to Right of Way (RoW) for transmission lines for land as well crop of APs as per electricity rule 2020. The land value is given for tower footing of transmission system of above 66 kV. Compensation towards diminution of land value in the width of Right of Way (RoW) Corridor due to lying of transmission line and imposing certain restriction would be decided by the States as per categorization or type of land in different places of state. The compensation will be determined by PGCB, CMEC-CNEEC JV and land owner. The compensation of crop damage will be decided CMEC-CNEEC JV and land owner with help of Upazila Agriculture extension officer and present price values of different crops. As per construction schedule SS, CMEC-CNEEC JV will communicate with land owners for negotiation and fixed up the value of crop damage for their land owners. Compensate will be paid first by CMEC-CNEEC JV after filled up the prescribed format of PGCB. Land owner will give land owner certified documents, NID card, signature in the appropriate location of the compensate format. PGCB will approve the above compensation and CMEC-CNEEC JV will reimburse the money from PGCB after verification of compensation. If any grievance from the compensation, land owners will give complain to PGCB as per section -53. If the tower will be at area of household or other infrastructures, CMEC-CNEEC JV and PGCB will fix this land of household or other infrastructure area.

Regardless of their title and tenure status to the lands used for transmission lines, the PAPs/households will eligible for compensation and assistance. According to the design of the substation and transmission lines, no structures will be affected by the project. But if there is any structure affected during the construction phase of the project the **CMEC-CNEEC JV** will pay

compensation at replacement cost and along with transfer and reconstruction grants. Compensation for trees affected at substations and transmission lines will be paid at current market price to be assessed by PVAC. Trees owners will allow fell and taking away the trees free of cost. Compensation for fruits will also be paid @ 30% of timber value for fruit bearing trees. Compensation for standing crops and transitional allowance for one year will pay at substations while compensation for crops will assess based on the damage of standing crops or for loss of access to cultivate the crops in the transmission lines. Owners of an affected business, agricultural, fisheries, and other activities on leased-in government land, where lessees (formal or informal) stipulate compensatory conditions in cases where lands are taken back or acquired before lease expiration. Where local communities and groups are likely to lose income earning opportunities or access to crucial common property resources used for livelihood purposes.

CMEC-CNEEC JV in compliance with the provision stated in the Electricity Act 2018, the Acquisition and Requisition of Immovable Property Act 2017, the ADB's will be the basis to implement impact mitigation measures. The project resettlement policy has also been benefited from the experience in the resettlement of similar other projects within PGCB and other infrastructure agencies of the GoB. The GoB laws and ADB requirements and as well as past experience from Project implementation, confirms the following principles for this Project. Substation Project related information including entitlements to affected persons will disclose in a timely manner and will make available in places easily accessible to them and in local languages. Consultations will carry out with the affected persons and their communities to elicit their views and suggestions on project design and implementation procedures, and to ensure their participation in project planning, implementation and monitoring.

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

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

6.4.5.1 The Power Policy, 1995

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 adopt for the project.

6.4.5.2 The Energy Policy (updated 2004)

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 programs 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.

6.4.5.3 The Industrial Policy (2010)

The Industrial Policy-2010 aims at achieving the Millennium Development Goals (MDGs) and, reducing unemployment and the proportion of the population afflicted by poverty and hunger to less than half by 2017 through the adoption of short, medium and long-term programs to help build a modern and vibrant industrial sector. Industrial Policy-2010 also pledges that no effort will be spared in raising the growth rate of the Gross Domestic Product (GDP) to 8 percent by 2013, further to 10 percent between 2017 and 2021, and thereby to elevate Bangladesh to the cherished rank of 'middle-income country'. Achieving the recently-announced Digital Bangladesh goal by 2021 and creating employment opportunity for at least one person from each household in order to reduce poverty and unemployment loom large among the central policy objectives of the government.

6.4.6 Mineral Gas Safety Rules (1991)

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.

6.4.7 Petroleum Policy, 1993

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.

6.4.8 Bangladesh National Building Code (BNBC)

The main purpose of the BNBC is to establish minimum standards for design, construction, quality of materials, use and occupancy, location and maintenance of all buildings within Bangladesh in order to safeguard, within achievable limits, life, limb, health, property and public welfare. The installation and use of certain equipment, services and appurtenances related, connected or attached to such buildings are also regulated herein to achieve the same purpose.

Chapter-3, part -7 of the BNBC has clarified the issue of safety of workmen during construction and with relation to this, set out the details about the different safety tools of specified standard. In relation with the health hazards of the workers during construction, this chapter describes the nature of the different health hazards that normally occur in the site during construction and at the same time specifies the specific measures to be taken to prevent such health hazards. According to this chapter, exhaust ventilation, use of protective devices, medical checkups etc. are the measures to be taken by the particular employer to ensure a healthy workplace for the workers.

Chapter-1, part-7 of the BNBC, states the general duties of the employer to the public as well as workers - “All equipment and safeguards required for the construction work such as temporary stair, ladder, ramp, scaffold, hoist, run way, barricade, chute, lift etc. shall be substantially constructed and erected so as not to create any unsafe situation for the workmen using them or the workmen and general public passing under, on or near them”.

Chapter -1, Part-7 of the BNBC clearly sets out the constructional responsibilities according to which the relevant authority of a particular construction site shall adopt some 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, the terms of contract between the owner and the contractor and between a consultant and the owner shall be clearly defined and put in writing. These however will not absolve the owner from any of his responsibilities under the various provisions of this BNBC and other applicable regulations and bye-laws. The terms of contract between the owner and the contractor will determine the responsibilities and liabilities of either party in the concerned matters, within the provisions of the relevant Acts and Codes (e.g.) the Employers' Liability Act, 1938, the Factories Act 1965, the Fatal Accident Act, 1955 and Workmen's Compensation Act 1923”. (After the introduction of the Bangladesh Labor Act, 2006, these Acts have been repealed).

To prevent workers falling from heights, the BNBC in chapter 3 of part 7 sets out the detailed requirements on the formation and use of scaffolding. According to section 11.2 of the same chapter, “every temporary floor openings shall either have railing of at least 900 mm height or shall be constantly attended. Every floor hole shall be guarded by either a railing with toe board or a hinged cover. Alternatively, the hole may be constantly attended or protected by a removable railing. Every stairway floor opening shall be guarded by railing at least 900 mm high on the exposed sides except at entrance to stairway. Every ladder way floor opening or platform

shall be guarded by a guard railing with toe board except at entrance to opening. Every open sided floor or platform 1.2 meters or more above adjacent ground level shall be guarded by a railing on all open sides except where there is entrance to ramp, stairway or fixed ladder. The precautions shall also be taken near the open edges of the floors and the roofs”.

6.5 Other Relevant National Environmental Acts, Policies, and Rules

In addition to the above National rules and regulations FECL in its operational phase must comply with other national acts, policies and rules, some of those are as follows:

6.5.1 Environment Conservation Rules 1997 (Amendment 2017)

The Environment Conservation Act of 1995 establishes the requirement for an environmental assessment in Bangladesh. Any proposed "industrial unit or project" must obtain prior approval from the Department of Environment (DoE). The act has classified projects to be assessed by the DoE in four categories (Green, Amber A, Amber B, and Red). Electrical infrastructure projects involving transmission lines longer than 50 km are categorized as Orange B category, which triggers an automatic requirement for an IEE. The DoE issues an authorization for the project to proceed subject to a satisfactory review of the environmental assessment. The authorization consists of two parts, one is a "site clearance", which gives approval to the sites proposed for the project and the other is an "environmental clearance", which approves the content of the project. Bangladesh law applicable for environmental approval for this project is Environmental Conservation Rules 7(2), which was amended on 24 -12-2017. As per SRO No. 349-Law-2017 4 (ga) 71, electricity transmission lines longer than 50 km fall under ‘Orange B’ category. According to the provision of Orange B category, an IEE with an Environmental Management Plan (EMP) is the only requirement to obtain the site clearance and the environmental clearance certificate from Department of Environment (DoE).

PGCB, as the project proponent, is responsible for carrying out the IEE study of the proposed project. Therefore, PGCB has the responsibility to administer the environment assessment process with the consultants, review the findings, and submit the documents to the DoE for review. A key requirement of the IEE for projects classified in the Orange B category is an EMP. The function of the EMP is to enable PGCB to show the DoE how it will deliver the environmental performance assessed in the IEE (for which DoE approval is sought). The EMP should describe the management responsibilities, mitigation measures as well as the institutional arrangements, and explain how monitoring will be carried out.

6.5.2 Amendment of acquisition & Requisition of immovable property ordinance (2017)

In 2017, the parliament of Bangladesh has passed the Acquisition and Requisition of Immovable property Act, 2017. Infrastructural developments are growing up day by day. For infrastructural developments, the main ingredient is land. But, if we look upon the present situation of the owner of the land specially those who are farmers, they suffer a sorrowful situation because of acquisition of land. Article-42 of our Constitution provides the fundamental right for right to

Property, Article-42(1) provides some privileges but 42(2) impose some of the restrictions. Acquisition of the private land by the government for the public purpose is the first condition for infrastructural development. For the purpose or the interest of the public, the Government can acquire other's property by paying compensation. It may be for the temporary or permanent basis. If it is taken over for permanently but afterward if it is not used, the government does not bind to return it. However, lands used for graveyards, places of cremation, religious or educational instructions are usually not taken over.

On the basis of duration, taking over is of two kinds

(a) Acquisition and

(b) Requisition.

Government, non-government or semi-government private agencies or departments carry out development works for the purpose or interest of public. Development works may be carried out in their own lands or in lands taken over by the government with due compliance of some definite processes or rules. This process is generally called as acquisition of land. Development works are generally permanent nature and are carried out directly or indirectly on or over the land which is taken over by way of acquisition. the newly enactment Act, The Acquisition and Requisition of Immovable property Act, 2017, Section 2(1) defines the term as follows: "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."

The new law states that lands of worship can also be acquired now only if it is indispensable in public interest. The bill proposes increasing compensation of the affected people as the previous law lacked the provisions. The new law provides for an additional 200 percent compensation on the market rate if any land is acquired for the government project and the compensation will be an additional 300 percent if the land is for any non-governmental organization. It also provides for the appointment of joint district judge level officials as the arbitrator in this type of cases. But the appeal, if there is any, will be heard by district judge level officials.

It is necessary to mention that under section 50 of newly enacted Act any act done or any measure taken under the foregoing Ordinance shall be deemed to be done under this Act. Further, all notices, notifications, orders, compensation or award made under the previous ordinance shall be deemed to be made under this Act, and all applications and appeals pending before any authority, Arbitrator or Arbitration Appellate tribunal under the previous ordinance shall be continued as if this Act had not been promulgated.

6.5.2.1 Acquisition procedure under the Acquisition and Requisition of Immovable Property Act, 2017

The purpose of an acquisition and requisition law is to empower the acquiring authority to acquire land only for a public purpose affecting proprietary right of citizens. Article 42(1) of our Constitution states subject to any restrictions imposed by law, every citizen shall have the right to acquire, hold, transfer or otherwise dispose of property, and no property shall be compulsorily acquired, nationalized or requisitioned save by authority of law.' The idea of this provision is

that a citizen shall not be deprived of his land otherwise than in accordance with law and if he is deprived of for public purposes, compensation at the market rate is given to him. No beneficial object of the acquisition can exonerate the government from the restrictions imposed by law and payment of compensation at the market rate. Further, the law is required to be expounded liberally in favor of the citizen whose land is acquired and strictly against the Government. When constitutional rights of an exceptional character have been created the conditions prescribed by the statute for exercise of such rights should be strictly fulfilled.

Before the Act of 2017, the authority of the Ordinance of 1982, there were two levels or land allocation committee dealing with the acquisition of land, namely, the upper Land Allocation Committee and the lower Land Allocation Committee. Any rule or manual has been gazetted after the newly enactment Act. So, it can be said that when there is no conflict between the new Act and the previous rule or manual, the previous rule can be followed until there is a new gazette notification from the Government.

The upper Land Allocation Committee is at the national level and consists of 22 members headed by the Minister of Land. The lower Land Allocation committee is at the district level and consists of 10 members headed by the Deputy Commissioner. The areas included within the jurisdiction of the upper Land Allocation Committee are: City Corporation of Dhaka and its vicinity, City Corporations of Chittagong, Rajshahi, Khulna, Barisal, Sylhet, Rangpur, Narayaganj and Comilla.

Without those areas, all areas of each district are included within the jurisdiction of the District Land Allocation Committee.

The acquisition law gives the Deputy Commissioner power to acquire property situate either in the central zone or in district zone in two likely situations. At first, if the property is needed and secondly, if the property is likely to be needed. A property is either needed or it is likely to be needed for public purpose or public interest, but while acquiring a property the Deputy Commissioner cannot keep both the alternatives in his pocket. He has to choose between the two, if he keeps both the options open, then he does not know whether the property is needed for immediate use or it likely to be needed for some future use. The use of both these alternative ways in the notice under section 3 [of the 1982 ordinance] is indicative of a lack of application of mind and the notice under section 4 is liable to be struck down on that ground as well.

When any action is taken or proceeding is initiated with *mala fide* intention without formation of any opinion as to the purpose of the acquisition the entire proceeding should be vitiated and, as such, the acquisition proceedings should be declared to be without any lawful authority.

6.5.2.2 Proceedings and application of Land Acquisition in Bangladesh:

As per Acquisition procedure under the Acquisition and Requisition of Immovable Property Act, 2017, the proposal of acquisition is from the governmental, semi-governmental, or autonomous body and passes all the tests, the Deputy Commissioner will start acquisition proceedings. However, section 4(2) of the newly enactment Act provides that in case of acquisition of

immovable property for any non-governmental person or organization whatever be the quantity, prior sanction of the government must be taken before the starting of the acquisition proceedings. The proposal of the requiring body or organization, be it governmental or any non-governmental person or organization, approved by the upper or lower Land Allocation Committee or by the Ministry of Land wherever application has to be entered in the register separate with a separate file for each proposal with number/s. Under section 4(1) of the Act of 2017 a preliminary notice has to be published at the well-known places on or near the property proposed to be acquired.

The Deputy Commissioner, under sub section (1), before the serving of notice, in the prescribed manner and form, shall record the real nature, condition and infrastructures built therein, crops and trees of the proposed immovable property in video or still picture or any other technology and thereafter prepare a report accordingly. This statutory provision has actually covered the previous proactive of forming the land allocation committee, application to the Committee and field verification.

After the serving of notice, in the prescribed manner and form, the Deputy Commissioner shall prepare a joint list of requiring persons of organizations and persons interested. If the nature of land is changed in reality from its recent record of right, the Deputy Commissioner, at the time of preparation of the joint list, shall decide about the change of the nature of the land. The Deputy Commissioner shall mention in the joint list, in the prescribed manner, if any house or infrastructure in built or is being built in the proposed immovable property for acquisition, in contravention of public purpose for illegal gain.

The term purpose for obstructing the implementation of section means of purpose for obstructing the implementation of the project, creating hindrance or doing anything that retards the implementation of a project or doing something to get monetary benefit by compensation.

The list prepared sub-section 3(b) of this Act shall be affixed in the notice board of the local land office and in the convenient place of the project. The Deputy Commissioner shall not record the change of the nature of land in the joint list, if after the initiation of proceeding under sub-section 3 (a), the nature of the land is changed by building houses or infrastructures in bad motive.

Previously under the 1982 Ordinance and the Rules framed there from, within 3 days of serving the notice, the representatives of the Deputy Commissioner and the requiring body or organization require starting the field verification and preparing field verification book with the following columns:

- Serial. No.
- Plot No.
- Class
- Amount of the Land
- Name of the Owner
- Particulars and Numbers of the Houses
- Particulars of the Ponds
- Particulars of the Trees
- Particulars of the Crops

- Particulars of the Standing Crops
- Other important information
- Important Remarks.

Section 10(f) of the Act says that after serving the notice any alteration or improvement in, or disposal of, the property to be acquired, made or affected is of no effect. If any person is not satisfied by the decision of the Deputy Commissioner under 4(7) of the Act, he may apply to the Commissioner within the next 7 working days. The Commissioner, in the prescribed manner, shall hear the hearing under subsection 8 and shall provide with the decision within next 15 working days and in case of an important project, shall provide with the decision within the next 10 working days. The decision of the Commissioner under sub-section 9 shall be deemed to be final. If there is any disposal of dispute under sub-section 9 or no appeal is preferred within the prescribed period in sub-section 8, within the next 24 hours, the concerned persons shall in his own cost remove the houses or infrastructures from the proposed immovable property, otherwise the Deputy Commissioner shall take steps to eradicate those in accordance with the concerned of law.

The Deputy Commissioner may, after choosing the place for important project, by order, impose restrictions over the sale of plots and building of infrastructures thereon. Mainly religious places, graves or crematoriums cannot be taken into acquisition. However, if it is essential in public purpose or public interest, by relocating and rebuilding, in the own money of the requiring persons or organizations, it may be taken into acquisition.

Under section 5(1) of this Act, Any person concerned may file an objection against the acquisition proceeding to the Deputy Commissioner within 15 working days. The Deputy Commissioner shall, under section 5(2), speedily hear the objection filed in the presence of the appellant or an agent, after hearing all such objections and after making such further inquiry, if any, as he thinks necessary, prepare a report within-thirty working days, and in case of a nationally important project within 15 working days, following the expiry of the period specified under sub-section (1) containing his opinion on the objections.

Under section 5(3) the Deputy Commissioner-

- (a) If the property exceeds 50 [fifty] standard *bighas* (or 16.5 acre) of land, shall submit the record of the proceedings held by him, together with his opinion, for the decision of the Ministry of Land; and
- (b) If the property does not exceed 50 [fifty] standard *bighas* (or 16.5 acre) of land, shall submit the record of the proceedings held by him, together with his opinion, for the decision of the Commissioner:

If no objection is raised within the period specified in sub-section (1), the Deputy Commissioner shall, instead of submitting the records of the proceedings to the Divisional Commissioner, make a decision within ten days of the expiry of the aforesaid period, or within such further period but not exceeding thirty days, as the Divisional Commissioner orders to Deputy Commissioner in writing and in case of a nationally important project within 15 days, about the acquisition of the property and such decision of the Deputy Commissioner shall be final.

In addition, at the time of proceeding, the Deputy Commissioner or his representative will make sure whether the alternative venue if chosen will not hamper the proposed project and if he thinks necessary, he will make further enquiry or verification and prepare a report containing his opinion on the objections.

The Government will, on receiving the record of the proceedings along with the report submitted by the Deputy Commissioner, within next 60 days, and the Commissioner will, on receiving the record of the proceedings along with the report submitted by the Deputy Commissioner, within next 15 days, make a final decision about the acquisition of the property and return the proceedings to the Deputy Commissioner.

When the Government, the Divisional Commissioner or the Deputy Commissioner makes a decision about the acquisition of the property, such decision made therein shall be conclusive evidence that the property is needed for a public purpose or in the public interest.

6.5.2.3 Compensation for Acquisition

Compensation awarded under this Part, take measures to give to pay the According section 11 of this section, the Deputy Commissioner shall, before taking possession of the property, pay the compensation awarded by him to persons entitled thereto within sixty days from the date of deposit by the requiring person.

If the persons entitled to compensation but do not consent to receive it, or if there be no person competent to receive the compensation, or if there be any dispute as to the title to receive the compensation or as to the apportionment of it, the Deputy Commissioner shall keep the amount of the compensation in a deposit account in the Public Account of the Republic which shall be deemed payment for the purpose of taking over possession of the property without any prejudice to the claim of the parties to be determined by the Arbitrator. Further, any person admitted to be interested may receive such payment under protest as to the sufficiency of the amount. However, no person who has received the amount otherwise than under protest shall be entitled to make any application under section 30. Deputy Commissioner shall, realizing the compensation from the recipient, who may have received the whole or any part of the same to the person lawfully entitled thereto. In addition, when the property acquired contains standing crops cultivated by *bargadar*, such portion of the compensation as may be determined by the Deputy Commissioner for the crops shall be paid to the *bargadar* according to section 12 of this Act

Acquisition of land by the government for public purpose is a well-known practice in all over the world. Acquisition of private land is made for the purpose of establishment of public institution, autonomous institution, educational institution and so on as the government deems fit. The Acquisition and Requisition of Immovable Property Act, 2017 operates the functions regarding land acquisition in Bangladesh. This Article finds that in most of the acquisition, the rights of the land owner are violated and neglected. Practice is far different and many important duties and responsibilities are not prescribed by this Act. The Acquisition and Requisition of Immovable Property Act 2017 should be implemented properly and effectively.

6.5.2 The Protection and Conservation of Fish Rules (1985)

These are a set of rules in line with the overall objectives of the Fish Act. Section 5 of the Rules requires that "No person shall destroy or make any attempt to destroy any fish by explosives, gun, bow, and arrow in inland waters or within coastal waters". Section 6 of the Rules states that, - "No person shall destroy or make any attempt to destroy any fish by poisoning of water or the depletion of fisheries by pollution, by trade effluents or otherwise in inland waters."

6.5.3 Forest Policy (1994)

The National Forest Policy of 1994 is the amended and revised version of the National Forest Policy of 1977 in the light of the National Forestry Master Plan. The major target of the policy is to conserve the existing forest areas and bring about 20% of the country's land area under the forestation Program and increase the reserve forest land by 10% by the year 2015 through coordinated efforts of GO-NGOs and active participation of the people.

Amendments of the existing laws (acts, rules and regulations) relating to the forestry sector and creation of new laws for sectoral activities have been recognized as important conditions for achieving the policy goals and objectives. The Forestry Policy also recognizes the importance of fulfilling the, responsibilities and commitments under International Conventions, Treaties and Protocols (ICTPs).

6.5.4 Bangladesh Water Act, 2013

The Water Act 2013 is based on the National Water Policy, and designed for integrated development, management, extraction, distribution, usage, protection and conservation of water resources in Bangladesh. As per this Act, all forms of water (e.g. surface water, ground water, sea water, rain water and atmospheric water) within the territory of Bangladesh belong to the government on behalf of the people. The private landowners will be able to use the surface water inside their property for all purposes in accordance with the Act. A worthwhile initiative is the requirement for permits/licenses for large scale water withdrawal by individuals and organizations beyond domestic use. Without prior permission issued by the Executive Committee, no individuals or organizations will allow to extract, distribute, use, develop, protect, and conserve water resources, nor they will allow to build any structure that impede the natural flow of rivers and creeks. Construction of the substation and transmission lines may deteriorate the water quality. However, it should be ensured that water usage for other purposes in surrounding areas are not hampered by taking mitigation measures.

6.5.5 National Environmental Policy (NEP) 2018 (Bangladesh)

In 2018, the National Environmental Policy (NEP) was drawn up with the aim of providing protection and sustainable management of the environment. The objectives of the Policy include:

- Land Resources Management

- Water Resources Management
- Air Pollution Control
- Safe Food and Water
- Agriculture
- Public Health and Health Services
- Accommodation, Housing and Urbanization
- Education and Mass Awareness
- Forest and Wildlife
- Biodiversity, Ecosystem Conservation and Biosafety
- Hill Ecosystems
- Fisheries and Livestock
- Coastal and Marine Ecosystem
- Ecotourism
- Industrial Development
- Energy and Mineral Resources
- Communication and Transportation
- Human Resources Management)
- Climate Change Preparedness and Adaptation)
- Disaster Management)
- Science, Research, Information and Communication Technologies)
- Management of Chemical Substances
- Other Pollution Control
- Environment Friendly Economic Development, Sustainable Production and Consumption
- Legal Frame
- Organizational Set-up
- National Environment Policy Compliance

6.6 Other Environmental Related Rules and Policies

In addition to the environmental policies and regulations, the following rules and regulations, listed in Table 3.2 will check for compliance to help maintain a sustainable environment and safe working conditions during project construction and operation.

Table 6.1: Relevant Key Policies

Policy	Brief Description	Responsible Agency
The National	• Protection and restoration of water resources; • Protection of water quality including strengthening	MOWR

Water Policy (1999)	regulations concerning agro-chemicals and industrial effluents; • Sanitation and potable water;	
National Land use Policy (2001)	The policy deals with land uses for several purposes including agriculture, housing, forestry, industrialization, railways, and roads. The plan identifies land use constraints in these sectors.	MOL
National Fisheries Policy, 1998	Preservation and management of inland open water fisheries	MOEFCC
National Forest Policy and Forest Sector Review (1994, 2005)	• Afforestation of 20% land; • Bio-diversity of the existing degraded forests; • Strengthening of agricultural sector; • Control of global warming, desertification, control of trade in wild birds and animals; • Prevention illegal occupation of the forestlands, tree felling and hunting of wild animals.	MOEFCC
National Biodiversity Strategy and Action Plan (2004)	• Conserve, and restore the biodiversity of the country; • Maintain and improve environmental stability of ecosystems; • Ensure preservation of the unique biological heritage of the nation for the benefit of the present and future generations; • Guarantee safe passage and conservation of globally endangered migratory species, especially birds and mammals in the country; • Stop introduction of invasive alien species, genetically modified organisms and living modified organisms.	MOEFCC
Bangladesh Climate Change Strategy and Action Plan	Establishment of six strategic pillars for action, including: (1) food security, social protection and health, (2) disaster management, (3) protective infrastructure, (4) research and knowledge management,	MOEFCC

(2008)	(5) decreased carbon development, and (6) Capacity building and institutional strengthening.	
National Land-use Policy, 2001	The Government of Bangladesh has adopted national Land use Policy, 2001. The salient features of the policy objectives relevant to the proposed are as follows: ➤ To prevent the current tendency of gradual and consistent decrease of cultivable land for the production of food to meet the demand of expanding population; ➤ To ensure that land use is in harmony with natural environment; ➤ To use land resources in the best possible way and to play supplementary role in controlling the consistent increase in the number of land less people towards the elimination of poverty and the increase of employment; ➤ To protect natural forest areas, prevent river erosion and destruction of hills; ➤ To prevent land pollution; and ➤ To ensure the minimal use of land for construction of both government and nongovernment buildings.	

Table 6.2 presents an outline of the other national legal instrument that will have relevance to the project with respect to the social and environment considerations. The environmental report is prepared in compliance with these national policies

Act/Rule/Law/Ordinance	Key Features-Potential Applicability	Responsible Agency
Environment Court Act, 2000 and subsequent amendments in 2002	The aim and objective of the Act is to materialize the Environmental Conservation Act, 1995 through judicial activities. This Act established Environmental Courts (one or more in every division), set the jurisdiction of the courts, and outlined the procedure of activities and power of the courts, right of entry for judicial inspection and for appeal as well as the constitution of Appeal Court.	Ministry of Environment, Forest and Climate Changes

Public Procurement Act (PPA), 2006 and Public Procurement Rule (PPR), 2008	This rules or acts shall apply to the Procurement of Goods, Works or Services by any government, semi-government or any statutory body established under any law. The rule includes the adequate measure regarding the “Safety, Security and Protection of the Environment’ in the construction works. This clause includes mainly, the contractor shall take all reasonable steps to (i) safeguard the health and safety of all workers working on the Site and (ii) protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others.	Ministry of Finance
The Brick Burning (Control) Act, 1989 The Brick Burning (Control) Amendment Act, 1992 and 2001	➤ Control of brick burning; ➤ Requires a license from the MOEFCC for operation; ➤ Restricts brick burning with fuel wood.	Ministry of Environment, Forest and Climate Changes
Water Supply and Sanitation Act, 1996	Management and control of water supply and sanitation in urban areas.	Ministry of Local Government, Rural Development and Cooperatives
Bangladesh Wildlife Preservation Order 1973 and Revision 2008 (Draft)	Restricts people from damaging or destroying vegetation in wildlife sanctuaries and hunting and capturing of wild animals	Ministry of Environment, Forest and Climate Changes
National Forest Policy and Forest Sector Review (1994, 2005)	➤ Afforestation of 20% land; ➤ Bio-diversity of the existing degraded forests; ➤ Strengthening of agricultural sector;	Ministry of Environment, Forest and Climate

	➤ Control of global warming, desertification, control of trade in wild birds and animals; and ➤ Prevention illegal occupation of the forest lands, tree felling and hunting of wild animals.	Changes
The Forest Act 1927, Amendment 2000 (Protected, village Forests and Social Forestry)	➤ Declare any forests land or wasteland as protected forests; ➤ May stop public or private way or watercourse in the interest of preservation of the forest; ➤ Declare a reserved forest area as village forests; and ➤ Declare an area as Social forests or launch a social forestry programme in Govt. land or private land with permission.	Ministry of Environment, Forest and Climate Changes
Bangladesh Climate Change Strategy and Action Plan (2008)	Establishment of six strategic pillars for action, including: 1. food security, social protection and health 2. disaster management 3. protective infrastructure 4. research and knowledge management, 5. decreased carbon development, and capacity building and institutional strengthening.	Ministry of Environment, Forest and Climate Changes
Wetland Protection Act 2000	➤ Advocates protection against degradation and resuscitation of natural water-bodies such as lakes, ponds, beels, khals, tanks, etc. affected by man-made interventions or other causes; ➤ Prevents the filling of publicly-owned water bodies and depressions in urban areas for preservation of the natural aquifers and environment; and	MOWR

	➤ Prevents unplanned construction on riverbanks and indiscriminate clearance of vegetation on newly accreted land.	
Vehicle Act 1927 and Motor vehicle ordinance 1983	➤ Road/traffic safety; ➤ Vehicular air and noise pollutions; and ➤ Fitness of vehicles and registration.	Bangladesh Road Transport Authority (BRTA)

6.7 The Bangladesh Labor Act, 2006 and Amendment 2013

Terms and Conditions of employment are guided by **The Bangladesh Labor Act, 2006 and Amendment 2013** that illustrate the basic conditions of employment which are materially consistent with ESS 2. 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. This Act also contains:

- Contracts of employment
- Leave entitlements, i.e. annual leave, sick leave, maternity leave and compassionate leave
- The protection of wages (prohibition against unlawful deductions)
- Retrenchment procedures
- Fair and unfair reasons for termination of employment
- Grievance mechanism

The Bangladesh Labor Act 2006 (**Safety**) specifically details the safety and working condition of the assigned workers. The salient aspects that this chapter illustrates are:

- ✓ **Safety of building and machinery.** It details the inspection requirement of these installations and actions to be taken if these are found unsafe for workers.
- ✓ **Precautions as to fire.** Illustrates fire safety requirement, equipment needed as well as actions to be taken in case of fire
- ✓ **Fencing of machinery, machinery in motion, automatic machines.** Details the fencing and safety requirement to be set around dangerous machinery.
- ✓ **Floors, Stairs and Passages.** Sets out the construction and setup requirement for safe access and ease of use.
- ✓ **Excessive weights.** Illustrates that no excessive weights to be lifted by any worker.
- ✓ **Dangerous fumes and explosive and flammable gas.** Details courses of action in case dangerous and explosive gases and fumes are in work area.
- ✓ **Personal protective equipment (PPE).** Makes it mandatory to supply workers with PPE

Special Provision Relating to Health, Hygiene and Safety) details:

- ❖ **Dangerous operations.** All potential dangerous operations to be declared and women and children to be barred from such operations.
- ❖ **Notice on accident.** Makes it mandatory to report any accident in workplace.
- ❖ **Notice on diseases.** If any worker is infected with any disease listed in the Second Schedule of the Act, it is mandatory to notify and the employer is obligated to treat the worker.
- ❖ **Restriction to Employ Women Worker.** Lists specific assignments where women may not be employed.

6.8 Compliance with ADB Safeguard Policy Statement, 2009

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.

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.

The key safeguard areas which must be addressed are (i) environmental; (ii) involuntary resettlement; and (iii) indigenous peoples

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.

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.

6.8.1 ADB's Environmental Safeguard Requirements – Policy Principles

Environmental assessment incorporates the following policy principles:

- Projects are screened and assigned to one of the following categories described in Error! Reference source not found as soon as possible.
- Conduct an environmental assessment for each proposed project. Assess potential trans-boundary 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.

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. The project will also address the World Bank/IFC EHS guidelines as they apply to transmission lines and associated infrastructure (such as the substations).

6.8.2 IFC Environmental, Health and Safety Guidelines

The Environmental, Health and Safety (EHS) Guidelines of the World Bank Group (WBG)/International Finance Corporation (IFC), 2008 is the safeguard guidelines for environment, health and safety for the development of the industrial and other projects. They contain performance levels and measures that are considered to be achievable in new facilities at reasonable costs using existing technologies. When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures than those provided in these EHS Guidelines are appropriate, in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment.

The EHS Guidelines for Electric Power Transmission include information relevant to power transmission between a generation facility and a substation located within an electricity grid, in addition to power distribution from a substation to consumers located in residential, commercial, and industrial areas. This ESH document is organized according to the following sections: The following issues has been included in the project of World Bank

- Industry-Specific Impacts and Management Section
- Performance Indicators and Monitoring Section
- References and Additional Sources
- General Description of Industry Activities

The following above section provides a summary of EHS issues associated with electric power transmission and distribution that occur during the construction and operation phases of a facility, along with recommendations for their management. Additional recommendations for the management of environmental issues during the decommissioning phases of power transmission and distribution systems are provided in the General EHS Guidelines. Examples of the impacts addressed in the General EHS Guidelines include:

- Substation site waste generation;
- Soil erosion and sediment control from materials sourcing areas and site preparation activities;
- Fugitive dust and other emissions (e.g. from vehicle traffic, land clearing activities, and materials stockpiles) from the substation yard;
- Noise from heavy equipment and truck traffic;
- Potential for hazardous materials and oil spills associated with heavy equipment operation and fueling activities

For all other transmission line the existing PGCB's/REBs design shall be used. The 230/132/33 kV GIS SSIs designed by the CMEC-CNEEC JV with specification of tender document. PGCB shall provide structural drawings of, available drawings & bill of materials of all type of substation equipment as required to CNEEC after placement of award, in sequence, suiting the project requirement. The copies of proto type load tested towers structural drawings and available shop drawings will be provided to the CMEC-CNEEC JV by the PGCB. However, if the CMEC-CNEEC JV needs to prepare any additional structural drawings or make any correction of existing drawings, that have to be prepared by the CMEC-CNEEC JV without any additional cost. Bidders are requested to inspect the available drawings in the Design Dept. of PGCB to satisfy them regarding the extent of available drawings. Bidders are required to propose the substation materials from a manufacturer who will use the same material standard as mentioned in the tower drawings.

6.8.3 Compliance with PGCB Health Environment and Safety Requirements

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.

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.

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) shall be conducted prior to all new activities and facility developments, or significant modifications of existing ones."

6.9 Compliance with International Requirements

Bangladesh has signed most international treaties, conventions and protocols on environment, pollution control, bio-diversity conservation and climate change, including the Ramsar Convention (Iran), the Bonn Convention on migratory birds, the Rio de Janeiro Convention on

biodiversity conservation and the Kyoto protocol on climate change. An overview of the relevant international treaties and conventions signed by GOB is shown in Table 2.4.

Table 6.3: Relevant International Treaties, Conventions, and Protocols Signed by Bangladesh

Treaty or Convention	Year	Brief description	Responsible Agency
On protection of birds (Paris)	1950	Protection of birds in wild state	DOE and DOF
Occupational safety and health in working environment (Geneva)	1981	Prevent accidents and injury to health by minimizing hazards in the working environment	Ministry of Health and Family Welfare (MOHFW)
Occupational health services (Geneva)	1985	To promote a safe and healthy working environment	Ministry of Health and Family Welfare (MOHFW)
International convention on climate changes (Kyoto Protocol)	1997	International treaty on climate change and emission of greenhouse gases	DOE/MOEFCC

This provides a framework for agreements between countries important to the migration of species that are threatened. CMEC-CNEEC JV will follow the above rules and regulation for the construction of substation at the selected locations of the project components. The following correlation of substation project and local and international logistics;

Table 6.4: Correlate each law to the substation project.

SN	Name of Law/acts/rule	Purposes to substation project	Remarks/Ref.
1	Electricity Act, 2018	This law has given idea about the construction work related to power generation, transmission and distribution, installation or reinstallation of machinery or equipment and any civil work related of TL. If any damage, harm or inconvenience is caused while doing civil works under this Act, the licensee shall, in such manner as may be prescribed by rules, pay compensation to the person affected or the owner of the land affected for acquiring land for construction of electricity towers. or the purpose of	This Electricity Act, 2018 is covered the substation construction and distribution of power line. S.RO. No. 28-

		laying power supply lines or doing civil works under this Act, the licensee shall reserve the right of way over the land and the space above or underground.	Lawl2019.-4n exercise of the power conferred by section 6l of the Electricity Act, 2018 published 30 January 2019
2	The Acquisition and Requisition of Immovable property Act, 2017	This law has given idea about land acquisition for substation project, price for the acquisition land etc.	Bangladesh: Act No. 25 of 2017, 10 th July 2017
3	Environment Conservation Act (1995) and Environment Conservation Rules (1997)	The act and it rules are related to the conservation of environment. Standard limit of ambient air, water, noise have given and which will use as reference level of pollutions	Act was published in the Bangladesh Gazette, extra-ordinary issue of 16-2-1995 and amended by Act Nos 12 of 2000 and 9 of 2002.]
4	The Bangladesh Wildlife (Preservation) Order of 1974	Wild animal” means any vertebrate creature, other than human beings and animals of usually domesticated species or fish, and includes the eggs of birds and reptiles; As per of this act (hunt) means do not killing, capturing, poisoning, snaring and trapping of any wild animal. Do not injuring or destroying or taking any part of the body of such wild animal or do not taking of nests or eggs of wild birds and reptiles during construction of substation project	Ministry of Fisheries and Livestock
5	Bangladesh National Building Code (BNBC)	BNBC has clarified the issue of safety of workmen during construction and with relation to this, set out the details about the different safety tools of specified standard. The BNBC code will following for the construction of control building of substations. Lux limit of control building inside,	-

		ventilation of control building.	
6	National Environmental Management Action Plan 1995	The National Environmental Management Action Plan (NEMAP) builds on the NEP and was developed to address specific issues and management requirements during the period 1995-2005. The plan includes a framework within which the recommendations of a National Conservation Strategy (NCS) are to be implemented. The NEMAP was developed with the following objectives: • To identify key environmental issues affecting Bangladesh; • To identify actions to halt or reduce the rate of environmental degradation; • To improve management of the natural environment; • To conserve and protect habitats and bio-diversity; • To promote sustainable development; and To improve the quality of life	DOE/MOEFC C
7	Environment Court Act 2010	The aim and objective of the Act is to materialize the Environmental Conservation Act, 1995 through judicial activities. This Act established Environmental Courts (one or more in every division), set the jurisdiction of the courts, and outlined the procedure of activities and power of the courts, right of entry for judicial inspection and for appeal as well as the constitution of Appeal Court.	DOE/MOEFC C
8	Bangladesh Water Act, 2013	The Water Act 2013 is based on the National Water Policy, and designed for integrated development, management, extraction, distribution, usage, protection, and conservation of water resources in Bangladesh. As per this Act, all forms of water (e.g. surface water, ground water, sea water, rain water and atmospheric water) within the territory of Bangladesh belong to the government on behalf of the people. There will take permission from executive authority for large scale water withdrawal	Ministry of Water Resources
9	Wildlife (Conservation and Security) Act, 2012	Restricts people from damaging or destroying vegetation in wildlife sanctuaries and hunting and capturing of wild animals	Ministry of Fisheries and Livestock

10	Disaster Management Act (2012)	The Act enacted to make the activities about disaster management coordinated, object oriented and strengthened and to formulate rules to build up infrastructure of effective disaster management to fight all types of disaster. It is necessary to mitigate overall disaster, conduct post disaster rescue and rehabilitation program with more skill, provide emergency humanitarian aid to vulnerable community by bringing the harmful effect of disaster to a tolerable level through adopting disaster risk reduction programs and to enact rules to create effective disaster management infrastructure to fight disaster to make the activities of concerned public and private organizations more coordinated, object oriented and strengthened to face the disasters;	Ministry of Disaster Management and Relief
11	Noise Pollution (Control) Rules, 2006	According to the Noise Pollution (Regulation and Control) Rules, 2006, acceptable sound levels are 55 decibels for daytime – 6am to 9pm –and 45 decibels for night – 9pm to 6am – in residential areas; 50 decibels for daytime and 40 decibels for night in quiet places; 60 decibels for daytime and 50 decibels for night in mixed areas; 70 decibels for daytime and 60 decibels for night in commercial areas; and 75 decibels for daytime and 70 decibels for night in industrial areas. Noise Pollution (Control) Rules lay down the permitted noise levels for both day and night-time as per ECR 1997. The Noise Pollution (Control) Rules state that no construction machines used to process and break down building materials (bricks, stones etc.) shall be used within 500 meters of any residential areas and such machineries cannot be used between 7 pm and 7 am except without the permission of the concerned authorities.	DOE/MOEFCC
12	E-waste Management Rule 2021	The main provisions of this regulation are as follows. Manufacturers, traders, sellers, transporters, repairers, collection centers, recyclers, dismantlers, etc. of the subject products are required to register with a prescribed form to the DOE. When applying for registration, they shall also submit WEEE management	MOEFCC

		plan. - Registered manufacturers, recyclers, etc. shall obtain environmental clearance in accordance with the Bangladesh Environmental Protection Rules, 1997. - Manufacturers have to establish individual or joint collection centers and set aside funds for the management of WEEE. - For fluorescent lamps and mercury incandescent lamps, if they cannot be recycled, they need to be handed over to collection centers for storage and disposal. - Manufacturers, importers, etc. shall meet the collection targets for WEEE as specified in the Schedule (10% in the first year of the implementation, 20% in the second year, 30% in the third year, 40% in the 4th year, and 50% in the fifth year and thereafter). - In order to facilitate the proper management of WEEE, the name, address and contact information of the trader or seller as well as the information on the registered collection center shall be displayed on the product or on the product label, or this information shall be provided to consumers or large consumers. Traders, sellers and collectors of WEEE shall receive them from consumers at designated points and transport them to collection centers.	
13	The Solid Waste Management Regulations 2021	The Regulations define the responsibilities of businesses involved in solid waste management and impose collection, recycling, and disposal obligations according to Extended Producer Responsibility (EPR) on manufacturers of non-biodegradable products such as glass, plastic, and bottles. The main provisions of the Regulations are as follows. - When recovering resources from waste, the principles of management that consider the waste hierarchy, such as the 3Rs, segregation, and reduction, must be followed at all stages from waste generation to final disposal. - Responsibilities of waste generators,	MOEFCC

		consumers, and users: Dispose of waste in accordance with the regulations of authorities including local government. Dispose of waste separately. Do not dump, store, or burn waste outdoors. Responsibilities of manufacturers (*not defined) and importers of products Collect non-biodegradable products such as glass, plastic, polyethylene, multi-layered packaging, bottles, and cans from consumers and recycle or dispose of them if appropriate. Determine work plans and implementation procedures for recycling and disposal. Ensure that EPR is properly implemented. Submit an annual report to the Department of Environment (DOE) on the amount of plastic recycled. Raise public awareness of proper waste management.	
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Chapter 07

Health and Safety Plan



7.0 Health and Safety Plan

7.1 Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) provides additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems. PPE is considered to be a last resort that is above and beyond the other facility controls and provides the worker with an extra level of personal protection. Table presents general examples of occupational hazards and types of PPE available for different purposes. Recommended measures for use of PPE in the workplace include:

- Active use of PPE if alternative technologies, work plans or procedures cannot eliminate, or sufficiently reduce, a hazard or exposure
- Identification and provision of appropriate PPE that offers adequate protection to the worker, co-workers, and occasional visitors, without incurring unnecessary inconvenience to the individual Proper maintenance of PPE, including cleaning when dirty and replacement when damaged or worn out. Proper use of PPE should be part of the recurrent training programs for employees
- Selection of PPE should be based on the hazard and risk ranking described earlier in this section, and selected according to criteria on performance and testing established

Table 7.1 Summary of Recommended Personal Protective Equipment According to Safety		
Objective	Workplace	Suggested PPE
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation.	Safety Glasses with side-shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords.	Plastic Helmets with top and side impact protection.
Hearing protection	Noise, ultra-sound.	Hearing protectors (ear plugs or ear muffs).
Foot protection	Falling or rolling objects, pointed objects. Corrosive or hot liquids.	Safety shoes and boots for protection against moving & falling objects, liquids and chemicals.
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures.	Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.

Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors. COVID 19	Facemasks with appropriate filters for dust removal and air purification (chemicals, mists, vapors and gases). Single or multi-gas personal monitors, if available
	Oxygen deficiency	Portable or supplied air (fixed lines). On-site rescue equipment.
Work at height	Safety belt	The safety belt will be used to work at certain height during erection and stringing
Body/leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration.	Insulating clothing, body suits, aprons etc. of appropriate materials.
Musk	substation work site	Protect COVID 19 and dust

The following safety keys (key to life) will need for the construction of substation project. Key safety should be followed by all staffs of the substation project during the construction phase especially in erection and stringing. The following table has expressed health & safety hazard, Sources, consequence and safety measure of PPE

Table 7.2: Occupational hazard and safety analysis of substation project

SN	Hazard	Sources	Consequences	Safety Measures
1	COVID 19	This type hazard due to corona virus	Respiratory problem	Musk, social distance and hand wash is the safety measures of COVID 19
2	Head injury	Heavy objects get down to be on top	Headache, fever, blood clotting	Helmets is the safety measures for head protection
3	Slippery	Walking on wet ground at substation work site	fracture of bone and pain inside of body organs, ergonomic hazards	Safety shoes and boots for protection against moving & falling objects,
4	Heat and	Welding work for making	blister on skin,	Hand glove is the safety measures for

	burns	iron rod case	irritation on skin	heat and burns protection
5	Insect bites/snake	It will happen at accommodation location, temporary labours camp	Serious health hazards including Malariainfestation , fever and mortality	Anti-Insect spray, phenol , mosquito coil are the safety measures for Insect and snake protection
6	Noise hazards	Use of heavy machinery, hydraulic horn for vehicles, sound from diesel engines, pneumatic tools such as drills, grinders, electrical motors/generators	Loss of hearing	Ear-plugs are the safety measures for loud sound protection
7	Work stress	Work stress may be come out from the continuation of substation work with long interval of time	Headache	Taking rest and first aid treatment may be the safety measure of Work stress
8	Vibration	Whole-body or hand/arm vibration, poor lighting, or poorly designed tools, equipment,	Musculoskeletal disorder	short intervals between activity may be the safety measure of vibration
8	Non-ionizing radiation (EMF)	High voltage (400 and 132 kv) radiation	Headache, child leukemia	Mapping need for EMF from the all point of high voltage area of substation
9	Eye irritation	Dust dropped at eye-sight	Pain and itching at eyes	Glass to eye protection
10	biological hazards	Exposure to viruses, bacteria at works site	Fever, headache	To meet with physician is the safety measure of biological hazards
11	Accident	arrangement of inappropriate work environment, insufficient	Musculoskeletal disorder, fracture of bone and pain	Appropriate PPEs are the safety measures of Accident

		lighting, potential accidents with electricity and fire	inside of body organs, ergonomic hazards	
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7.1.1 Instructions of PPE

PPE are the last resort in the hierarchy for selection of risk controls. Hence it is very important that the PPE are based on the type of hazard to which a person is exposed. The PPE do not eliminate the hazard and are designed to interpose an effective barrier between the person and the harmful objects, substances, activity being performed.

- Demanding PPE Based on the peak number of work force at any time in the future in the life cycle of the project, the Project Managers are to plan the requirement of PPE i.e. safety harnesses, fall arrestor, helmets, safety shoes, gloves and first aid boxes so that it is adequate to provide the same to the entire workforce at all times.
- In addition to this peak demand of PPE and first aid boxes, the Project Manager has to decide on a Minimum Threshold Level (MTL) of the PPE too which must be available at the stores at all times.
- The initial requirement for the PPE including the MTL is to be forwarded to the Safety Head through the Division Safety Manager.
- The store in charge of each project has to ensure proper safe custody in the stores at all times
- The moment the stock in stores reduces below the MTL, the store in charge is to raise an indent for additional PPE.
- This is to be forwarded by the Project Manager to the Safety head through the Division Safety Manager.
- The store in charge shall issue the PPE to the **CMEC-CNEEC JV** staff / contractor staff based on the written approval from the Project Manager. Proper records of the issues are to be maintained by him in the Format.
- The store in charge shall issue the PPE to the contractors' staff only on a written approval from the Project Manager / Site Engineer. Proper records of the issues are to be maintained.
- The store in charge shall intimate details of the PPE demanded / received / issued to various site engineers / contractors supervisors every month to the Project Manager. A quarterly return on the same shall be forwarded to the Safety Manager of **CMEC-CNEEC JV**.
- The site engineer / site manager has to ensure that contractor's workforce is equipped with suitable PPE before commencement of work at any site. In case contractor is unable to provide adequate PPE, then the site engineer / supervisor will draw adequate numbers of PPE from the store in his name and give it to contractor staff. The same shall be back charged to the contractor.

- After completion of the work, the sub- contractors' supervisor will return the PPE to the store. In case of any pilferage / shortage of PPE, the stores in charge will record the same.
- The Project Manager shall record this deficiency in the sub-contractors' bills and the issue of whether to write off / back charge the same to the contractors will be dealt with separately by him keeping all the facts of the case in mind. Till such time as the issue of PPE is closed, the ownership of these PPE will rest with the site engineer / contractor to whom they have been issued.

7.2 Presentation of the medical facilities at Project Areas

An emergency is an unplanned event when a project operation loses control, or could lose control, of a situation that may result in risks to human health, property, or the environment, either within the facility or in the local community. Emergencies do not normally include safe work practices for frequent upsets or events that are covered by occupational health and safety. These are discussed in the previous chapter 3. CMEC-CNEEC JV will develop a list of contact information for all internal and external resources and personnel. The list should include the name, description, location, and contact details (telephone,) for each of the resources, and be maintained annually. CMEC-CNEEC JV will provide first aid attendants for the facility as well as medical equipment suitable for the personnel, type of operation, and the degree of treatment likely to be required before transportation to the hospital. The list of the emergency contact numbers of fire services and emergency numbers of medical colleges, hospitals, and health complexes is as following

Table 7.3: Contact detail of the following

Locations	Name of the institutes	Respective contact detail
Rupsha, Phultola, Monirampur, Maheshpur, Meherpur	Thana Health Complex, Monirampur	01717587467
	Thana Health Complex, Maheshpur	01711130103
	Khulna Medical College Hospital	01711011210
	Meherpur 250 bed District Hospital	01994389656
	Jhenaidah 250 Bedded General Hospital	01712552712
Fire service and civil defence	Rupsha Fire service , Khulna	01720-334464
	Mongla Fire service , Bagherhat	01730-009159
	Monirampur Fire service	01730-009176
	Mohespur Fire service	01317-302030
	Mehepur Fire service	01971-020209

7.3 Evacuation procedure for medical emergencies

The proposed route access of the substation will go through the above health complex and nearby the medical college hospital. CMEC-CNEEC JV will collect the contact number of key persons of the above hospital before starting the construction work of the substation. The list of the mobile phone number of emergency of the medical center will hang on the workplace as a poster. The site safety officer will call for an ambulance when an accident and the incidental event will have occurred at the substation workplace. There are 4 medical college hospitals between the areas. Besides these, every Upazilas have one health complex and every union have one or two community clinic in Bangladesh. Any emergency of health issues of occupants, workers, stakeholders and public, the emergency ambulance will call for shifting to the better treatment. Recently COVID19 is now a burning issue and PGCB has been instructed to prevent the COVID19. CMEC-CNEEC JV **will give safety training on the prevention of diseases.** CMEC-CNEEC JV will ensure for supplying pure drinking water to prevent water-borne diseases. Recently COVID-19 is burning issues which will be prevented by using facial mask and washing the hand of the workers with maintaining social distance (3 feet) among the people. PGCB has instructed the risk assessment about the COVID-19. The following instructions are

- Coughing and spitting is forbidden at anywhere of the work place of substation project and do not touch eyes, face and nose
- Wash hands for 20 seconds
- Always used mask during the construction work of substation project
- Fever, cough and problem of breathing
- If Fever, cough and problem of breathing, maintain the social distance (3 feet) or do not do any work at outside for 14 days

7.3.1: Gender and Gender Based prevention management Plan at COVID 19 Context

Gender-based violence (GBV) increases during every type of emergency – whether economic crises, conflict, or disease outbreaks. Pre-existing toxic social norms and gender inequalities, economic and social stress caused by the coronavirus disease 2019 (COVID-19) pandemic, coupled with restricted movement and social isolation measures, have led to an exponential increase in GBV. Many women are in ‘lockdown’ at home with their abusers while being cut off from normal support services. This briefing note provides concrete actions and strategies that UNDP, UN agencies, and other development partner

can take to prevent & address GBV in the context of COVID-19. Specific recommendations include:

- Providing policy advice to governments on integrating GBV in national/subnational COVID-19 response plans & budgets for **CMEC-CNEEC JV**;

- Supporting police and justice actors to provide adapted services during periods of confinement or lockdown;
- Adapting/expanding services such as shelters, safe spaces, and essential housing along with psycho-social support and advice for individuals experiencing or at risk of GBV of COVID 19 context;
- Promoting GBV-responsive health systems strengthening;
- Addressing GBV risk factors in socio-economic assessment and response;
- Engaging/empowering partners to send a strong message that: violence will not be tolerated, perpetrators will punish, services for survivors are available, and everyone has a role to play; and
- Do No Harm by ensuring that interventions do not reinforce existing power imbalances which not only underpin GBV but also undermine broader social cohesion and sustainable recovery.

7.4 Description of the internal organization and action to be taken in the event of an accident or incident

This will use to record number and type of accidents and incidents including near misses occurring in the workplace both at project site, details, and outcomes of any required investigation; corrective actions required to address incidents, and trend analysis to detect themes such as the recurrence of type of incidents. A safety committee will investigate formed under occupational health and safety specialist of the substation project. Appropriate mitigation measures will take based on the formal investigation. In addition the system should identify roles and responsibilities for recording, reporting and investigating incidents and for corrective action planning. **CMEC-CNEEC JV** has a policy for the free medical treatment for the labour and stakeholders who will fall into any accidental event. If any event will occur, site safety officer will call to an ambulance (private or Govt.) from hanging chat of contact lists. At the same time, safety officer will try to contact with project manager of **CMEC-CNEEC JV** will follow company regulation and law for accident or incident occurrence at the workplace and appropriate compensate according to record of investigation.

7.5 Safety Visit and Inspection

Safety visits and inspections is a systematic procedure to verify that the OHS Management System has been implemented and is in use according to the planned arrangements. The Divisional Safety Manager is to ensure that the OHS management systems are being implemented and followed as applicable. Safety visits and Inspections are carried out for ensuring effective implementation of the OHS management systems.

In this regards, all safety personnel shall visit the sites daily to stray at the substation yard and carry out safety inspections to ensure that all guidelines are being effectively implemented on ground. In the event of any variation from the policies issued, a report is to be forwarded to the

Project Manager for necessary compliance. The Safety Officer shall submit a Monthly Safety Report (MSR) to the Corporate HSE department by the third working day of the next month.

Project Managers are responsible for implementation of the laid down procedures at their projects.

Accordingly, they are to visit the project sites regularly to ensure effective implementation of the laid down. OHS management systems and to take corrective / preventive measures as deemed fit. Since safety is everybody's concern, in addition to the routine OHS visits and inspections by the safety personnel, all management and supervisory personnel of the company as directed specifically to do so, shall be required to carry out Site Safety Tours (SST) i.e. continual health and safety surveillance as they go about their day to day activities. This reflects a sense of involvement in safety for all the management team. Project Manager of **CMEC-CNEEC JV** shall list the names of managers required to do the SST. Personnel required to do SST, shall do at least one SST per monthly. Report on the SST shall be submitted to the safety head. The Project Manager shall be responsible to close actions within specified time limits and give feed back to the Safety Head. The Safety Head shall follow up all SST carried out to a conclusion.

7.6 Incident Reporting Procedure

To establish a system for reporting and investigating incidents / near misses;

- All incidents / unsafe acts / unsafe conditions occurring at the work sites (however minor they may be) are to be reported to the Project Manager / Safety Officer of **CMEC-CNEEC JV**
- Incident report is to be submitted to the Corporate HSE team within 24 hours of the incident.
- In case of fatal or serious incidents the Project Manager must immediately inform the Divisional Manager / Safety Head telephonically immediately.
- The Safety head shall report the matter to the Managing Director.

Fatal incident: Fatalities occurring directly as a result of a work related incident, including those that occur sometime after the incident as a direct result of the injuries sustained.

First aid case: Work related injury that requires one-time treatment and subsequent observation, and does not result in a lost day accident, for example minor scratches, burns, cuts, splinter injuries etc.

Incident: An unplanned / undesirable event that results in death, ill-health, injury or harm to people or damage to plant equipment or loss to property or an environment hazard.

Medical treatment injury: Medical Treatment Injury is an injury that requires treatment beyond first aid, but does not result in a Lost Day Accident. For example, if someone has a small cut they will receive first aid (from trained first aider), however, if they get a big cut that requires treatment from a nurse or doctor (either on site or at hospital) then it becomes a medical treatment injury. If this person is then off work for one shift or more it then becomes a Lost Day Accident.

Near miss: An event that gives rise to an incident or had the potential to lead to an incident

Non-conformance: Any deviation from the laid down practice, standards, or specifications as spelt out by the CMEC-CNEEC JV management.

Serious injuries: Any injury resulting in unconsciousness requiring resuscitation or admission to hospital for more than 48 hours viz. amputation, serious or multiple fractures, loss of sight in one or both eyes or serious burns.

Unsafe act: An act (whether witnessed or not) that unnecessarily increases the likelihood of injury, violates established safety rules or is contrary to expected conduct.

Unsafe condition: A condition not directly caused by the action or inaction of the employees in an area that may lead to an incident or injury if uncorrected. It may be caused by fault design, incorrect fabrication, inadequate maintenance, or subsequent deterioration.

The following classification shall be used for reporting accidents / incidents: Fatality: A work related injury that results in death regardless of the time intervening between injury and death. An employee, contractor, or sub-contractor fatality should be reported, when it is work related.

Serious injury: A work related injury that results in unconsciousness requiring resuscitation or admission to hospital for more than 24 hours. Serious injuries include amputation, serious or multiple fractures, loss of sight in one or both eyes, serious burns etc.

Lost Time Incident (LTI): A work related injury sustained from a single identifiable incident which results in the inability of an employee to work for at least one full day or shift any time after the day or shift on which the injury occurs. Absence more than 48 hours.

Medical Treatment Injury (MTI): A work related injury sustained from an identifiable incident that requires medical treatment by a registered medical practitioner that is beyond the scope of normal first aid treatment. Absence less than 48 hrs.

First aid injury: A first aid injury is a work related injury that requires first aid treatment. The first aid treatment may be administered or supervised by a medical practitioner.

Notification

All incidents regardless of category and severity shall be reported immediately to the Project Manager / Safety Officer immediately.

7.7 Action to be taken immediately after an incident

When an accident involving personal injury or property damage occurs, the Project Manager shall take the following actions

- Care for the injured person is the first priority. Make immediate arrangements to transport him to the nearest hospital if required and provide medical attention at the earliest within the hour.
- Check to see if the work needs to be suspended, cordoned off or properly guarded in preparation for the investigation by the incident investigation team. Take action accordingly and report the same also along with the initial report telephonically.
- In case of property damage, determine the extent of damage and ensure that no further damage will occur.

- Prepare diagrams and sketches of the site as warranted by the circumstances. Prepare to obtain photographs and / or video film at the earliest if possible.
- Carry out initial independent investigations at site and submit a detailed report within 24 hours giving full details.
- Confirm the name of the injured person(s) together with the nature and extent of injuries and whether or not necessary medical treatment has been given to the Safety Head / Division Safety Manager along with the initial report telephonically.

7.8 Investigations

All fatal and serious incidents are to be investigated by a team formed for the same by the directions of the head of PIU at the earliest. The help of an expert (if required) may also be taken as a nominated member of the investigation. Incident investigation is to be carried out as per **CMEC-CNEEC JV** incident investigation procedure and a report submitted to the head of PIU, and **CMEC-CNEEC JV** Safety Head.

7.9 Tool Box Talk

A Tool Box Talk (TBT) is a hands-on way to remind our workers who are our most vital resource and are directly exposed to the hazards, that health and safety are as essential ingredients on the job as is progress. Tool Box Talk is one of the most effective ways to ensure safety awareness at the grass root level and is very helpful in reducing accidents at sites. All the workers at the project sites are to be covered. A TBT is a short pre-work meeting of 10-15 minutes held in the close vicinity of the work site before commencement of the work for the day wherein the workers are made aware of the hazards associated with the work at hand, the risks involved and the control measures thereof. TBT generally deals with specific problems on site and is not an alternative for continual safety training to be provided to the staff. TBT must be conducted every day before commencement of any work by the site in charge, who will fully aware of the activities to be performed at the site. It is important that all the workers and the contractors' supervisor at the project site necessarily attend the TBT before being allowed to work at the site for the day. In the event of an activity changing mid-way during the day, a separate TBT needs to be conducted.

TBT is not a lecture but is designed to get the workers to think and talk about health and safety issues. It is advisable to use pictorial cards for the TBT as pictorial representation is far more effective than plain lectures.

The contents of the Tool Box Talks should include:

- The environmental hazards and risks associated with the particular job to be execute.
- The measures to be taken to control the environmental issues for the particular job.
- Head count / attendance maintenance
- Rundown of previous day's work and details of work for the day
- Time schedule and sequence of work

- Safe working procedures / work instructions / method statements
- Emphasis of Do's & Don'ts
- Demonstration of any special application of work / safety
- Ensure understanding of safety requirements
- Potential safety hazards and the control measures to be followed
- Proper use of PPE
- Visual check of each worker's health
- Health check of PPE
- Visual inspection of chain pulleys and lifting appliances if being used at site
- Lessons learnt from accidents
- Hierarchy of the working teams
- Deliver a safety pep talk
- Any other instructions likely to affect safety
- Any other instructions related to safety issued by the **CMEC-CNEEC JV** management

At the end of the session, a record of the talk delivered must be maintained in the Tool Box Talk form. Details must include date, location, topics discussed, names of the attendees and name & signature of the person conducting the TBT. It is of utmost importance to obtain signatures / thumb impression of the attendees to confirm their participation. The efficacy of the conduct of the TBT and the records thereof must be regularly monitored. Safety officer of CMEC-CNEEC JV will visit daily for monitoring the safety aspects in the five substation yards.

7.10 Safety Meeting

The objective of the safety meetings is to provide a forum for ensuring successful supervisor – employee communications, by making effective use of the communication time by allowing employee participation and providing equal exposure to vital information. These meetings can also help to create a cooperative communication climate, encourage team spirit and enhance supervisor leadership skills and discussed with specific agenda about labour PPE, workplace safety, incident, labours resident, health & safety impacts, mitigation measure of impacts, work schedule methods. The output of the meeting will be writing regularly by the Health and Safety of the total substation projects

Some examples of the various types of safety meetings that are conducted to improve safety awareness amongst all personnel are pre-start work meetings, safety meetings and safety committee meetings.

A pre start work meeting will held before the actual start of work by the contractor at the substation sites. The main purpose of the meeting is to brief the contractors and their supervisors on the work procedures and risk assessment for the job, they will be done the work and to inform them about the safety rules and regulations to be followed at the substation sites as spelt out by the CMEC-CNEEC JV management. It is to be carried out by the Project Manager / Safety Officer. An induction certificate is to be got signed by the CMEC-CNEEC JV for record

purposes. The same is to be countersigned by the Project Manager too. Proper documentation of the pre start meeting with the contractor shall be maintained.

Objective of the project safety meetings is to assemble personnel responsible for safety of the operations in the project so that they can formally address the issues and take appropriate actions in relation to the achievement of site safety management objectives. The main thrust areas of the safety meetings shall be:

- Confirm that the safety and health management practices as spelt out by the CMEC-CNEEC JV management are carried out properly at all sites, by all concerned.
- Ensure that the works are being performed safely and smoothly.
- Ensure that all safety rules and regulations are being meticulously followed.
- Review safety inspection reports of all the sites.
- Resolve any safety issues raised by any contractor.
- Enforce safety training programs.
- Review safety statistics of the previous period.
- Review of the laid down safety practices and their improvements if necessary

Safety meeting will held at least once a month preferably in the first week of each month or any other day decided mutually in the meeting so as to achieve maximum attendance and work output. The project safety meeting will be attended by the Project Manager, Safety Officer, Site Managers, Site Engineers, sub-contractors, and representatives of the contractors if any. The Project Manager will preside over the meetings while the Safety Officer will be a secretary. Agenda of the meeting shall be as follows. This list is only illustrative and not exhaustive.

- Confirmation of minutes of the last meeting.
- Overview of site safety performance.
- Site safety inspection.
- Incident and accident investigation.
- Minutes of the safety meeting are to be recorded and circulated to all concerned.
- Proper documentation of the pre start meeting with the contractor shall be maintained.

7.11 Activity wise safe working procedure

To establish a safe working procedure throughout the substation project and EHS rules for various operations to ensure the work is carried out safely. It applies to all levels of employment of the organization including contractors working within our premises as well as at customers' sites. It is the responsibility of all Project Managers of **CMEC-CNEEC JV** to ensure that safe work practices have been communicated within the work areas. It is the responsibility of the engineer/supervisor/technician to ensure that the work has been carried out following the safe work practices

7.11.1 Excavation

- Check with authorities about underground facilities like water line, sewer line, electric cables, or telephone cables and obtain proper permit and take proper precautionary measures against the same before commencing any excavation.
- No excavation work is to be carried out unless the work is effectively supervised and planned.
- Ensure adequate manpower for the excavation and foundation work.
- Excavated earth / material must be kept at least 1 mtr away from the edge of the excavation.
- Precautions must be taken to ensure that boulders etc. do not fall back inside the pit.
- All plants and machinery should be placed at least 2 meters away from the edge of the pit to avoid collapse of the pit due to vibration produced by the machines. Wheel blocks must be provided to avoid any undesired movement.
- All JCB / excavator operators working at site must hold valid driving license.
- No vehicular movement must be permitted within 2 meters from the edge of the excavation.
- Excavations deeper than 5 meter must have proper shoring or sloping depending on soil conditions to avert pit collapse during excavation and foundation casting.
- Proper and strong ladders must be used for access and egress into and out of excavations by the workmen.
- Ladders must extend at least 3 meter above the ground level.
- In case there is movement of men or cattle in the vicinity of the excavation, the area is to be suitably barricaded and warning signs displayed before starting any excavation activity.
- Undercutting must not be resorted to under any circumstances.
- Ensure that electrical connections for dewatering pumps, if any, do not cause any danger to the workmen.
- Excavations must be inspected and thoroughly checked daily by an experienced and competent person before starting the work.
- After heavy rainfall, the site in charge should inspect the condition of the excavation. In case there is a possibility of pit collapse, all activity must be stopped immediately. Work must start only after ensuring adequate precautions against the danger.
- Lone workers should not be allowed to work in deep excavations.
- Workmen working at ground level above the protruding reinforcement bars must protect themselves by suitable means against fall on the same.
- Unnecessary gap between excavation and foundation casting is to be avoided.
- Appropriate PPE must be worn by workers at all times. PPE required for excavation activity includes safety helmets, shoes.
- Prohibit children / passers-by from entering into the working area.

7.11.2 Foundation and Concreting for Basement Column

- CMEC-CNEEC JV will keep enough manpower for the foundation work.
- In case there is movement of men or cattle in the vicinity of the excavation, the area is to be fenced with warning signs (luminous if necessary).
- Concrete mixers should be placed at least 2 meters away from the pit to avoid collapse of the pit due to vibration produced by the machine.
- Concrete mixers for 5 numbers substations basement foundation should not be operated by any unauthorized person.
- No maintenance is to be carried out on the concrete mixers while the machine is in operation.
- All rotating parts of the mixers must be adequately guarded.
- Wheel blocks are to be provided to the concrete mixers to avoid any undesired movement.
- Workmen working at ground level above the protruding reinforcement bars must protect themselves by suitable means against fall on the same.
- Template supporting jacks are to be placed evenly and as far away from the edge of the pit as practicable.
- Jacks to be placed on level ground.
- Wooden platform or sand bags are to be placed below the jacks for proper distribution of load.
- Unnecessary gap between excavation and foundation casting is to be avoided.
- Proper and strong ladders are to be used for access and egress into and out of excavations.
- Ladders must extend at least 3' above the ground level
- Main leg members are to be fitted with step bolts as the tower is being erected. The practice of fixing step bolts after erection of complete tower must not be allowed.
- Ascending / descending from the tower should be through step bolts only. The practice of ascending / descending from the tower through tower members must not be allowed.
- Heavy sections should preferably be lifted with the help of tractors. Tractor operator should be sufficiently experienced for this type of work.
- For manual lifting of sections / heavy members, the hauling rope is to be supported with a strong anchorage point to prevent slippage. The end of the hauling rope is to be wrapped around this anchorage point by sufficient member of turns.
- Wire / PP ropes used for tying pulleys etc. to the tower members must be adequately padded with folded gunny bags to prevent damage by the sharp edges of tower members.
- No tower erection works shall be carried out after sunset.
- Tower erection works shall not be carried out during inclement weather viz. dust storms, windy weather, rains or storms. If thunderstorm is approaching, the work should be stopped immediately.

- All safety equipment must be CE / ISI marked.
- Proper first-aid box should be available at site.
- At least two members of each gang must have first-aid training.
- One vehicle should be available at site for providing immediate medical help to the injured, if any.
- Additional safety measures need to be taken while carrying out erection works near power lines which include maintaining safe working distances while working near 'Live' power lines and ensuring proper tower earthing.

7.11.3 Erection of Lattice Tower for substation

- Before starting the erection work ensure the foundation work has been done at least 28 days before and the location is properly backfilled
- Check weather all the members being arrived at site.
- Sufficient area for free movement of men and materials are there.
- All the load bearing T&Ps like derrick pole/ gin pole, wire rope, pulley, de shackle, bow shackle etc are of tested, certified, in good condition and of proper capacity.
- Proper capacity winch machine to be used to lift the materials, tractor will not be allowed for the purpose.
- All the T&Ps to be daily inspected before start the job.
- Daily visual inspection to be carried out the pp rope or the fibre rope being used at site.
- The whole area is properly barricaded and warning signage provided
- Out siders are not allowed inside the working area.
- The job must be executed by competent and trained workforce.
- All the fitters must be medically examined.
- At least three guy ropes to be provided for the derrick pole.
- For gin pole four guy ropes to be used.
- For backstay at least three numbers of crow bars to be used, back stay on nearby tree are not allowed. Depending upon the soil characteristics helical backstay or decadent to be used for anchorage purpose.
- For one anchorage point only one backstay is allowed.
- Maximum angle for the guy rope will be 45.
- Nearby electrical line, road or rail line taken to be consideration. Check whether the guy rope is making fouls. If so proper safety measures to be taken (shutdown)
- Proper angel of the derrick pole or gin pole to be maintained.

- Erect the tower in a sequential manner. Work on the upper section will not be allowed until all the members and bracings of the lower section fully erected and also reasonably tightened.
- Fixing of two or more main leg members at ground level and erecting the same are not allowed.
- The leg should be erected along with the step bolts. Fixing of step bolts after erecting the tower should be avoided under any circumstances.
- Ascending on and descending from the tower should be through step bolts only. The practice of ascending on and descending from the tower through tower members must not be allowed
- No erection work will allow in adverse weather situations like high wind or thunderstorm.
- When pulleys etc. are tied to the tower member through wire rope / pp rope, the same should be protected against damage by the sharp edges of tower members by providing a padding of old tires etc.
- Two level work on same leg strictly to be avoided.
- While working at height is going on, ground work to be carried out to a safe distance and nobody will allow entering the center area, if anybody required going to the center area he must alert the height workmen to stop their job for the moment.
- All the hand tools using by height workmen must be tied to avoid any accidental fall.
- Height workmen must use tools bag while working at height.
- Proper backstay for the winch to be provided.
- Winch must be operated by competent, trained and authorized operator.
- While lifting any materials only one workman will give the instruction any chaotic situation to be avoided.
- Use tag line while lifting any members to control the swing of the suspended load.
- Nobody will allow standing under the suspended load.
- Barricade the whole working area and provide warning sings, no outsiders are allowed in the working location.
- The whole job to be supervised by authorized, competent and trained supervisor.
- Kept the access free from any obstructions.
Plan the work area properly and such a way that stacking of tower parts, ground assembly work etc will not interfere with the flow of work.
- Use PPEs as per the PPE matrix.

7.11.4 Stringing at substation

- No stringing work is to be carried out unless the work is effectively & competently supervised at all times when the work is in progress.
- Before commencing any stringing work, ensure that all the towers of the stringing section have been fully erected. Ensure all members / bracings have been fitted, tightened, punched and tack welding of nut-bolts done and filling of the towers have been completed.
- Ensure that all the towers of the stringing section have been permanently earthed.
- Sufficient area for free movement of men and material is to be ensured.
- Proper arrangement should be available at site for safe loading / unloading of conductor / earth wire drums.
- All members of the stringing gang should be sufficiently skilled and experienced for the job.
- Workmen having any injury or those under the influence of drugs (prescription / illegal) or alcohol must not be allowed to carry out any stringing activity or work on the tower under any circumstances.
- Appropriate PPE must be worn by all workers at all times. PPE required for this activity includes safety harness, safety helmets, shoes and gloves.
- All workers working at a height of above 2 mtrs must always use full body double lanyard safety harness. All straps of the safety harness must be properly tightened.
- One lanyard must be anchored to a strong support at all times. In addition fall arrestor is also to be ensured.
- Whenever workmen are to work on the conductor or insulator string, double lanyard safety harnesses must be used. Workmen must wrap & secure their safety harness around the insulator while crawling on it.
- All supervisors at the stringing site must always wear shoes and safety helmets.
- All vehicles in use at the site must be in good condition. The condition of vehicles including the braking systems shall be checked periodically. Defective parts shall be rectified / replaced immediately.
- T&P's used for stringing work, must be of good quality, of sufficient capacity for the job & have proper
- Test certificates.
- T&P's are to be thoroughly checked for their healthiness daily before use.
- All lifting appliances must be of adequate capacity and in good condition. Test certificates of all lifting appliances deployed at the site shall be checked prior to commencement of erection works.
- The lifting gears deployed for the erection works viz. lifting hooks, belts, slings, wire ropes etc. should be checked periodically and confirm its suitability to continue with work. Defective equipment is to be removed from the site and replaced immediately. Test certificates of all lifting gears deployed shall be checked prior to erection works.

- All machines / equipment to be used shall be checked for any defect or repair well in advance. Any defect or repair identified shall be rectified prior to the commencement of work.
- Major tools like pulleys, shackles, pull-lifts, come along clamps, steel wire ropes etc. must be thoroughly checked for safe working condition daily prior to commencement of work.
- All operators / drivers must be well experienced, sufficiently qualified and trained and must hold a valid driving license.
- Local villagers must be informed of the planned stringing activity in the vicinity of the village, if any in advance. They must be forewarned about the hazards involved and the special need for the children to be refrained from playfully infringing into the stringing area. The village head must preferably be intimated in writing about the same. Special checks for this should be maintained during the entire period of stringing.
- Continuous announcement preferably by megaphone is advisable in the area while stringing work is in progress to warn off the public from the area of operations.
- At least one person must be placed as a look out in each of the span when stringing work is in progress to ensure that no children hang on to the conductors during the stringing process. They must be in possession of whistles & flags for controlling public and communicating with their team.
- In addition a lookout must also be placed at a vantage position preferably at a height overlooking a few spans
- Special patrolling checks should be maintained during the entire period and stretch of the stringing work.
- Reliable, efficient and uninterrupted communication arrangement must be available amongst tensioner, puller, stringing supervisor and all the intermediate gang members.
- Tensioner and puller must be properly anchored and earthed.
- Ensure that all the towers of the stringing section have been permanently earthed.
- Adequacy of anchor blocks provided for towers, puller and tensioner machine stay arrangements must be verified and confirmed.
- For stringing on one side of the section, proper guying and back staying is to be provided at all the tension points.
- Guying and back staying is to be done by steel wire rope only. Diameter of the wire rope should not be less than 16 mm. anchoring for backstays should be strong enough to withstand the intended load.
- Angle of the guy rope with the horizontal plane should not be more than 45°.
- In case the guying and back staying arrangement is to be maintained for a long duration, then the anchoring area is to be cordoned off and a watchman posted to keep a watch.
- Guying and back staying is to be provided for one side stringing of 'D' type towers also.

- Guying and back staying arrangement should have a provision for adjustment of tension of the guy wires.
- Guying and back staying arrangement should be checked periodically to ensure that the same does not fail.
- As far as practicable, jumpers are to be left disconnected until all the work of the line is completed.
- Sequence of paying out should be from top to down for double circuit lines.
- Wire / PP ropes used for tying pulleys etc. to the tower members must be adequately padded with folded gunny bags to prevent damage by the sharp edges of tower members.
- Conductor drum stands shall be equipped with suitable brakes, to avoid over-run of conductors
- Conductors should not be left in such a position that they may cause danger to general public.
- Random inspection of hardware fittings is to be done at site to check for any crack or other damage before fixing them to the towers.
- Because tension applied will very high, it is essential to take extra precautions while stringing short spans or single spans.
- All final sag operations must be carried out using regulation winch machines only. Use of tractors must not be permitted.
- During final sagging after the load is transferred to the tower, sufficient time must be allowed for the load to be stable. During this period all the workmen on the tower must wait on the tower main body and not on the cross arm or conductor.
- For crossing any existing charged line, shutdown and PTW for the existing line must be taken.
- All the insulator strings should be thoroughly checked for any crack, chinks, availability, and proper placement of all spilt pins etc before lifting them on the tower.
- Stringing / sagging works should not be carried out during inclement weather conditions viz. dust storms, windy weather, rains or storms. If thunderstorm is approaching, the work should be stopped immediately.
- Stringing of conductors / sagging works shall be done only in daylight hours. No stringing and related operations shall be carried out after sunset.

Chapter 08

Health and Safety Training for Substation



8.0 Health and Safety Training for Substation project

Firstly, it should show commitment to the people being trained to recognize that the training is important. It should consult all employees or their representatives on the planning and organization of the training. Training should make sure that properly priorities and plan the training needs for work of substation equipment installation. It may have appointed somebody to give ‘competent assistance’ and they should be able to help.

The following is a list of common topics to cover in any workplace health and safety inductions. A mobile checklist can help remind you of the steps required follow and ensure consistency across organization.

- Hazards and risks at the substation workplace
- Special equipment, such as personal protective equipment (PPE), which may require additional training
- Safe work practices at work on height at substation yard
- Work health and safety legislation at substation yard
- Emergency procedures for any incidental or accidental events at the substation yard
- First aid boxes and other emergency contacts.

CMEC-CNEEC JV will arrange the safety training every day prior to start work.

8.1 Safety and health Orientation

Workplace of substation safety and health orientation begins on the first day of initial employment. Each employee has access to a copy of this safety manual which is formulated by PGCB, through the site supervisor, for review and future reference, and each employee will be given a personal copy of the safety rules, policies and procedures about the substation job. Site supervisors of **CMEC-CNEEC JV** will ask questions of employees and answer employees’ questions to ensure knowledge and understanding of safety rules, policies, and job-specific procedures described in the substation workplace safety program manual. All employees will be instructed by their supervisors that compliance with the safety rules described in the workplace safety manual is required.

8.2 Specific Training for the substation yard

In the construction period of substation; civil work for control building, gantry, boundary wall and, the specific training will need for all personnel whom are engaged with the substation project working. **CMEC-CNEEC JV** will give the following specific training

- Important information to help crane operators, users, and owners stay safe around lines and towers.
- Important safety precautions before digging, excavating, or building at substation area
- Information to help keep you safe when farming near lines, towers, substations, and other structures- it is belong to pond, garden, , road and rives etc.
- Important information to help horticulturalists and pickers stay safe around lines and towers- it is included when proposed line cross over poultry firm, garden, nursery etc.

- After arranging all equipment at the substation, training should give safe limit and distance limit electromagnetic fields (EMF) from the transformers.
- Training and guidance to operating large irrigators near existing overhead high voltage at substation area, and suggests ways to avoid electrical hazards.
- A guide will give to trainee people to help keep safe when working around substation area.
- Training on details keeping safe during recreational activities near substation area.
- Store keepers of the substation project will be taken special training on loading and unloading construction materials of substation project

8.3 Periodic Training of Employees

All employees of the substation project will retrain periodically on safety rules, policies and procedures, and when changes are made to the workplace safety manual. Individual employees will be retrained after the occurrence of a work-related injury caused by an unsafe act or work practice, and when a site supervisor observes employees displaying unsafe acts, practices, or behaviors. A list of the periodic training programs will be arranged by CMEC-CNEEC JV which is attached in appendix I

Chapter 09



Labour Conditions

9.0 Labour Conditions

9.1 Description of Human Resource Policy for construction works of direct and indirect workers:

Labour Force planning is the process of identifying current and future workforce composition to ensure the council has the right employees with the appropriate skills in the right position at the right time. It is a continual process aimed at analyzing the existing workforce and identifying potential emerging issues and future needs. Recognizing gaps between current and future requirements allows the development and implementation of strategies to ensure the activities in Council's Delivery Program can be achieved.

This Labour force management plan has been compiled within the context of the project and it is being guided by **CMEC-CNEEC JV**. This Policy is a high-level corporate statement of intent and establishes the principles to be followed in the management of environmental and Occupational Health and Safety (OHS) issues.

The scope of this Labour force management plan covers the construction, operational and decommissioning/closure phases of the Project. It is further applicable across the entire workforce at all skills levels and deals with all aspects relating to **CMEC-CNEEC JV**. Employees including recruitment labours and accommodation conditions, management of worker relationships and OHS, the WFMP also includes measures related to the management of workers engaged by third parties, and also the management of workforce-related risks within the supply chain.

This management Plan has been developed taking into account the requirements of Bangladesh labour law (2006), International Finance Corporation (IFC) Performance Standard 2 and the International Labour Organization (ILO) core conventions, and seeks to:

- ✓ Establish arrangements to appropriately manage and protect the OHS and welfare of **CMEC-CNEEC JV** workforce including both employees and sub-contractors and others who may be exposed to risks associated with **CMEC-CNEEC JV** operations and activities.
- ✓ Ensure that employees understand their rights in relation to labour and working conditions.
- ✓ Allow employees to exercise their right to freedom of association and collective bargaining.
- ✓ Provide employees and contractors with a feedback mechanism for them to raise feedback, concerns, complaints and grievances and to receive information on the response and any associated corrective action.
- ✓ Prevent discrimination in hiring, remuneration, access to training, promotion, termination, and retirement on the grounds of race, national or social origin, caste, birth, religion, disability, gender, sexual orientation, union membership, political opinions and age and promote equal opportunities. This applies equally to employees and non-employees.
- ✓ Manage disciplinary practices and retrenchment in a manner that treats those affected individuals with respect and dignity and without threat, abuse, or ill-treatment.

- ✓ Design and manage accommodation provided for use by CMEC-CNEEC JV workforce (including sub-contractors) in a manner that prevents or minimizes the risk of harm to health and safety.
- ✓ Ban the use or support of child, forced or compulsory labour in direct operations and in the supply chain. Ensure working hours do not exceed legal and industry standards and conditions of employment including remuneration are fair, equitable and are in line with industry norms

9.2 Labour Management Plan

The Labour force management plan has been guided by international good practice regarding workforce management and OHS. CMEC-CNEEC JV has committed to meeting the International Finance Corporation Environmental and Social Performance Standards (IFC Performance Standards). In practical terms, this means that CMEC-CNEEC JV and its contractors will satisfy the requirements of IFC. IFC recognizes that the pursuit of economic growth through employment creation and income generation should be accompanied by the protection of the fundamental rights of workers. The IFC General and Site-Specific Environmental, Health, and Safety (EHS) standards are also of relevance to the Labour force management plan and the relevant requirements have been incorporated herein.

As with any project of this scale and nature, certain impacts cannot be eliminated, i.e. residual impacts after implementing mitigation measures. Concerning impact mitigation, the Project subscribes to the philosophy of impact avoidance (by changes to project planning and/or design) and impact reduction (to reduce impacts that cannot be avoided to acceptable levels). What follows, is a description of the potential residual impacts and the mitigation measures proposed to reduce them to acceptable levels. The plan seeks to address potential impacts related to inadequate:

- ✚ Labour and working conditions;
- ✚ Accommodation conditions; and
- ✚ Occupational Health and Safety (OHS).

The impacts during construction will similar to those identified. The impacts during construction relevant to the Labour force management plan are:

- a. Exposure of workforce (including contractors) to potential harm, injury, ill-health and to enjoyment of human rights, etc.
- b. Exposure of the workforce (including contractors) to poor accommodation standards (both in design and operation).
- c. Exposure of workforce (including contractors) to inadequate OHS standards.
- d. Conflict and tension associated with interaction between the workforce (including contractors) and local communities

During construction the management of impacts related to labour and accommodation conditions and OHS for CMEC-CNEEC JV labour (including sub-contractors and supply chain) will focus

on the establishment of relevant policies and monitoring systems and corrective actions. These will include:

- The development of an OHS management system and OHS monitoring and surveillance programme.
- Fitness-for-work health screening.
- The development of a worker health awareness programme.
- The development of worker engagement procedures.
- Development of a worker feedback mechanism.
- The development of relevant Human Resource (HR) policies and procedures.
- The development of auditing programme for contractors and supply chain; and
- The development of a worker code of conduct.

CMEC-CNEEC JV will develop a sub-contractors control system that establishes clear accountabilities and responsibilities to ensure active engagement of sub-contractors, and provide a consistent process to avoid, eliminate, reduce, minimize or offset environmental, labour and community impacts and risks to the Project.

This system will recognize that risks vary from sub-contractor to sub-contractor depending on the scope of work, the activities involved and the sensitive receptors and resources that may be impacted in the area of work. The sub-contractors (person, institutional etc.) recruitment will be done according to their experience and good manner and good practice for substation construction. A risk based approach is therefore essential in determining which control measures are most important for the contractor to implement and manage. The risk based approach is utilized at three stages:

- Applicability of management plans to individual scopes of work (internal review and assessment);
- Tender review of control measures; and
- Pre commencement-work review

CMEC-CNEEC JV will consider during the qualification and selection process the ability of the contractor to understand and meet the requirements of the ESMS Management Plans. As part of this process contractors will provide with the relevant management plans. The evaluation process will consider their ability to conform to the management plans. During contract award, CMEC-CNEEC JV will conduct a “commence-work review” to refine, clarify, priorities and focus on the key legislation, standards, risks and commitments as relevant to contractor’s scope of work ensure that they meet set standards. New control measures that are identified will discuss and agreed for inclusion into the relevant plans. Sub-contractors will be required to establish OHS management arrangements in coordination by CMEC-CNEEC JV to ensure conformance to the management plans and other contractual commitments. These may include development of procedures and work instructions; training, definition of Key Performance Indicators (KPIs), monitoring and auditing schedules, reporting requirements, management reviews etc.

The impacts during operation are likely to be similar to those identified. However, the nature of the impacts may vary due to changes in labour requirements due to changes in activities. The

extent and scale of these impacts will be less than during construction due to a reduction in the size of the workforce and a more limited use of contractors.

Impacts will include:

- Exposure of workforce (including sub-contractors) to potential harm, injury, ill-health and to enjoyment of human rights, etc.
- Exposure of the workforce (including contractors) to poor accommodation standards (both in design and operation).
- Exposure of workforce (including sub-contractors) to health and safety incidents.
- Conflict and tension associated with interaction between the workforce (including contractors) and local communities.

In order to verify the management measures, CMEC-CNEEC JV will require several monitoring systems as part of its overall Environmental and Social Management System (ESMS). The site specific labour management plan is attached in appendix J

9.2.1 Labours Management plan Considering Gender based violence (GBV)

Gender-based violence (GBV) is an umbrella term for any harmful act that is perpetrated against a person's will and that is based on socially-ascribed (i.e., gender) differences between males and females. It includes acts that inflict physical, sexual, or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. These acts can occur in public or in private organization. CMEC-CNEEC JV shall not engage any person as an observer or participant in sexual acts. CMEC-CNEEC JV understands and acknowledges that failure to comply with this Code of Conduct may result in corrective action, probation, suspension, and/or termination from the work at substation yard. Before recruiting labours for the substation project, **CMEC-CNEEC JV** will give some terms and conditions to the labours community of about Gender-based violence (GBV) and will give training about GBV in the training period. The labours of five substation area will maintain code of conduct (COC) with key persons of CMEC-CNEEC JV. The Code of conduct for CMEC-CNEEC JV of the substation project is attached in an appendix L.

9.2.2 Protection for Sexual exploitation and abuse (SEA) at substation project

Violence against women (VAW) is one type of GBV and SEA which is very prevalent in Bangladesh and is often rooted in gender inequalities and harmful gender norms. Violence against women (VAW) in Bangladesh is still very high. Report on Violence against Women (VAW) Survey 2015 jointly conducted by the Bangladesh Bureau of Statistics (BBS) and UNFPA found that 73% of married women in Bangladesh have experienced forms of violence from their husband, 55% reported forms of violence in the past 12 months, and 50% reported physical violence in their lifetime.

Existence of laws and regulations as well as mechanisms helps to address SEA/SH risks. Bangladesh has the following mechanisms for SEA/SH/GBV/VAC mitigation, prevention and response.

- Eliminate discrimination; increase access to education and training, health and employment;
- The sexual harassment of girls and women is illegal, and issued a set of guidelines defining sexual delinquency to prevent any kind of physical, mental or sexual harassment of women, girls and children at their workplaces, educational institutions and other public places including roads across the country which is declared in by High Court decision 2009.
- The government has enacted a number of stringent laws and policies to protect men and especially women from gender based violence (GBV) including sexual exploitation and abuse/sexual harassment (SEA/SH): The Criminal Procedure Code, 1889; The Penal Code 1860; The Evidence Act 1972; Child Marriage Restraint Act 1929; Citizenship Act 1951 (Amended 2009); Muslim Family Laws Ordinance 1961; Dowry Prohibition Act 1980; Immigration Ordinance 1982; Immigration Ordinance 1982; Family Court Ordinance 1985; Women and Children Repression Prevention Act 2000 (2003); Women and Children Repression Prevention Act 2000 (2003); Women and Children Repression Prevention Act 2000 (2003); Women and Children Repression Prevention Act 2000 (2003); Acid Crime Prevention Act,2002;Acid Control Act 2002;The Bangladesh Labor Act 2006;Domestic Violence (Prevention & Protection) Act 2010;Human Trafficking Deterrence and Suppression Act, 2012;The Pornography Control Act, 2012; The Hindu Marriage Registration Act 2012

The proposed project involves construction work in the project implemented areas which may have the potential GBV risks in four areas: sexual exploitation and abuse (SEA), workplace sexual harassment (WSH), and non-sexual exploitation and abuse (NSEA). Therefore, the purpose of this action plan is to identify the issues, stakeholders, and possible service providers and assess their capacity that aid in accessing grievance redressed. The action plan will focus on some corresponding mitigation measures—sensitizing the communities and other stakeholders, strengthening the institutional capacities— to mitigate project related potential risk of GBV in the project affected population.

Considering the fixed base type of substation project, the substation project is expected to have minor labor influx. Project will construct at 5 different locations and it is expected that total labor including the skilled and unskilled will not be more than 500 for the substation. At substation yard, the number of labor is estimated maximum 50 whom are lived in labour camp in substation area. Construction of substations may require more labor compared to the TLs and most of the sub-stations will construct in peri-urban or urban areas where regular monitoring will be possible. All the construction camps will be constructed within the proposed sub-station areas. **CMEC-CNEEC JV** will arrange security guard at the labour camp of the substation

project area. There is no chance of entry of women in the labour camp of the substation project area. **CMEC-CNEEC JV** will arrange training program on SEA/SH at the assembly point at the substation project area.

9.3 Labours and Workers Accommodation Plan

The project of the area consists of one greater district of Khulna. Meherpur, Jasohe and Jhenaidah. The above substation does not affect the local household and other wealth of the local people. During the work, the entire workforce will accommodate in various temporary camps in the substation site or rental houses near the substation site. Phultola and Rupshasubstation is situated near the Khulna divisional city under City Corporation. The land area of Rupsha SS is 5.35 acres, Phultola is 2 acres, Monirampur is 3.0 acres, Maheshpur is 3.03 acres and Meherpur is 3.0 acres. These areas will use as labourhouseholds for accommodation under permission of PGCB.

CMEC-CNEEC JV will agree with the house for the establishment of a construction camp. The construction camp will have shade room with proper ventilation, sufficient lights, kitchen and toilet and rest room and availability of water (drinking), and hygienic sanitation opportunity.

9.4 Labor Management Plan with Gender Context and H&S

Employees working remotely, supply chain issues and the possibility of staffing shortages—though the COVID-19 virus. This system allows for response to a wide range of emergencies. WHO is always encouraged for the protection of workers and emergency responders in the context of paramedic situation. The protection of workers is one of the priorities for the response to COVID19 outbreaks. Occupational health services in health care facilities have an important role for protecting workers and ensuring the business continuity of health care services. When someone who has COVID-19 coughs or exhales, they release droplets of infected fluid. Most of these droplets fall on nearby surfaces and objects - such as desks, tables, or telephones. People could catch COVID-19 by touching contaminated surfaces or objects – and then touching their eyes, nose or mouth. If they are standing within one meter of a person with COVID-19 they can catch it by breathing in droplets coughed out or exhaled by them. In other words, COVID-19 spreads in a similar way to flu. In regard of gender issues protocols will be followed as per anti harassment policies and ADB/AIIB social guidelines. Any grievances related to gender issues will be treated as per guidelines and top priority.

As per OHSA has given “ten steps All Workplaces can take to reduce risk of exposure to Coronavirus: these are following

- ✓ Encourage workers to stay home if sick during
- ✓ Encourage respiratory etiquette, including covering coughs and sneezes
- ✓ Provide a place to wash hands or alcohol-based hand rubs containing at least 60% alcohol.
- ✓ Limit worksite access to only essential workers, if possible.

- ✓ Establish flexible worksites (e.g., telecommuting) and flexible work hours (e.g., staggered shifts), if feasible.
- ✓ Discourage workers from using other workers' phones, desks, or other work tools and equipment.
- ✓ Regularly clean and disinfect surfaces, equipment, and other elements of the work environment.
- ✓ Use Environmental Protection Agency (EPA)-approved cleaning chemicals with label claims against the coronavirus.
- ✓ Follow the manufacturer's instructions for use of all cleaning and disinfection products.
- ✓ Encourage workers to report any safety and health concerns.
- ✓

CMEC-CNEEC JV will arrange a training program on COVID-19 spreads and reduce risk of exposure of COVID 19 before starting the substation work in specific locations. The separated COVID management plant will keep at all the substation project.

All the labors will be provided with potable drinking water and the drinking water quality will be tested as per policy. Proper sanitation facilities will be provided and associated health checkup when needed.

If the worker or enterprise experiences or found cases related to COVID-19, immediately report to the National COVID-19 hotline 333 or 16263 or to the local authority hotline number provided. Department of Labour Hotline related to COVID-19: 02-8391324 (World Health Organization <https://www.who.int/>.) Head office Directorate General of Health Services (DGHS)-01797011919 Dhaka- 01714266843, 01972138530, 01711240390 Gazipur-01847129493 Narayanganj-01722909122, 01787386361 Barishal-01936493427 Chattogram-01712383773 Khulna-01749599797 Sylhet-01914300917.

Chapter 10



Local Recruitment

10.0 Local Recruitment

Site specific labor management plan provide an overview of the applicable Bangladesh legislative and ADB/AIIB provisions and how the risks and issues related to labor in the sub-component project of Power Grid Company of Bangladesh under Dhaka and Western Zone Transmission Grid Expansion Project (DWZTGEP) project to ensure reliable and quality supply of electricity to the rural and urban consumers in Bangladesh through improvements in technical efficiency of the distribution system. Staffs are typically offered renewable term appointments.

- A “term appointment” is a contract of fixed length, the minimum appointment being one year and the maximum being five years.
- Open-ended appointments are offered less frequently, on a case-by-case basis.

Positions in country offices are locally recruited. If a candidate with a required skills set cannot be found locally, or global mobility and international experience are essential, then international recruitment may be authorized.

CMEC-CNEEC JV will make reasonable efforts to ascertain that third parties who engage contracted workers are legitimate and reliable entities and have in place labor management procedures applicable to the substation project that will allow them to operate in accordance with the requirements of the project compliance. These contracted workers will have access to a grievance mechanism. In cases where the third party employing or engaging the workers is not able to provide a grievance mechanism to such workers.

10.1 Local labour Requirements

Substation project may require about 150 people per each substation worked with specialized construction skills. Based on the construction site, workers profile data and interviews with **CMEC-CNEEC JV**.

For a variety of reasons many employers prefer to conduct local recruitment first and turn to outside recruitment only if the local one does not succeed. Local recruitments are less expensive because there are no recruiting fees, and they generally require less training and fewer referral bonuses and travel and relocation costs. Local recruitments are also quicker. For a local hire, the process may be completed within a few weeks. In addition, many employers must recognize that some recruitment efforts involve competing for talent in a global marketplace and require effective use of modern technology. Effective employee recruitment is one way companies remain competitive in a changing and increasingly global marketplace. **CMEC-CNEEC JV** will recruit the local people from Mehepur, veramara, Kustia, Mongla, Monirimpur, Mohespur, Jhenaidah and Jasore areas for construction phase. Because, the local people do not need extra opportunity of housing and sanitation.

10.2 Job descriptions and the levels of qualifications required

Substation engineers often are responsible for coordinating supervising civil and electrical development. In this role, engineers develop budgets, including preparing construction bids for labour, materials, and equipment. Engineers will contact with labour forces, given direction how to develop the pile and column foundations at the specific site. Only labour, security personnel, and day-labour will recruit from the local areas of the project. The permanent employees have been already recruited and their job description already known to all.

10.3 Recruitment procedure and deployment schedule

Labour will be recruited for construction of substation. Labour will recruit who will be able to climb up high tower. During interview, work procedure will first be known to labor. Labour may be got job for his positive signal. Name, address, national ID card will be kept during seeking application and interview.

10.4 Initial training to be provided by the CMEC-CNEEC JV for each job description:

After selection of labour force group, CMEC-CNEEC JV will recall again of those labor for basic training, how to construct a substation project. Occupational safety issue has already been discussed in the previous chapters. Training also given in regard of gender concern, anti harassment policies and gender based violation related policies with procedures. Proper documentation will be kept and provided with project progress and associated reports to the project office of DWXTGEP.

Chapter 11



Project Machinery and Vehicle Traffic

11 .0 Project Machinery and Vehicle Traffic management

Managing traffic at a construction workplace of five substations is an important part of ensuring the workplace is without risks to health and safety. Vehicles moving in and outside road of the substation project, reversing, loading and unloading are often linked with death and injuries to workers and members of the public. The Construction Site Traffic Management Plan or CSTMP has been developed to help the Project manager at construction stage (PSCS) of substation and CMEC-CNEEC JV to identify hazards and apply appropriate controls so that the movement of vehicles and pedestrians on a construction site is managed and coordinated. Truck Driver / Delivery Driver Requirements

- Only authorized, inspected and approved vehicles may enter site;
- Only operate plant or equipment are authorized to;
- Remain in your vehicle or in a location as instructed by the operator whilst being loaded;
- Always observe and follow sign posted speed limits;
- Follow all instructions given by Liberty Industrial personnel or operators performing loading;
- Inspect load and ensure it complies with all CoR laws before leaving site;
- Fall Protection/prevention is required any time a driver is exposed to a fall hazard of one meter or more – this includes any truck, trailer, or flatbed (unless client site rules override this); and
- Standing on top of a load is strictly prohibited at all times.

Most of the substations are situated at the side of high-ways. The Rupsha substation is located near at the Khulna-Mongla high way. This road is busy with heavy traffic, because Mongla seaport is the second largest sec-port in Bangladesh. A city bypass road is crossed to the Phultola substation. Monirampur, Mohespur and Meherpur substation has to less traffic, light vehicles and heavy bus from Jessore, Jhenaidah and Kustia are moved in these roads. CMEC-CNEEC JV will make bypass road from all nearest road for the entire substation project. However, special traffic congestion will find at Rupsha and Phultola substations project.

Traffic includes buses, trucks; loaded lorry might be congested at these substations area. The most effective way to protect pedestrians is to eliminate traffic hazards. This can be done by designing the layout of the workplace to eliminate interactions between pedestrians and vehicles. Examples include prohibiting vehicles from being used in pedestrian spaces or providing separate traffic routes so pedestrians cannot enter areas where vehicles are used. The traffic congestion may be found when loaded trucks will carry substation materials; wire, erection materials, transformer, civil work materials entered from outside to the substation yard. CMEC-CNEEC JV will take step to minimize local traffic at the substation areas. A flag man will keep to stand when a trucks or heavy loaded vehicles entry from the high –way to the substation yard. Flag men will be work at day-night when heavy loaded vehicles come from outside of the

substation area. The heavy vehicles may enter at night time, because BRTA has made a rule for heavy truck for entering after 8 pm. When heavy loaded truck comes from Chattogram port, it will better to enter to five substations at night time. The entry security will inform to the flag men when vehicle come from outside to the entry point. Red-handed flag will stop road's vehicles (bus, truck, light vehicle and local people) to the high-way vehicles for certain period of time. The above mentioned phenomenon will happen during entry and outing vehicles to the substation yard. Besides, the substations will have to restrict to the local people near the substation area. Only selected and project related personnel's will enter to the substation project site. The gateman of the entry point of these substations will maintain visitor's register. The health & safety personal will give induction training on traffic to the visitors at the entry point. For the internal traffic, CMEC-CNEEC JV will make temporary brick carpeting road in the substation yard. Traffic congestion signboard will use at main-road of all substation area. The red and yellow color light is used at the substation area where it will need for the traffic management. The dust may emit due to friction of wheel and street. The internal road may be *kacha* at joining to substation, surrounding area of substation may non-visible through dust emitted from vehicles movement. CMEC-CNEEC JV will spray water to the internal and joint road (substation to main road) to mitigate the dust from the project site.

11.1 Description of the fleet of vehicles/machinery used for the execution of the works and emission levels and safety requirements

Experienced drivers will engaged in driving all types of vehicles. All vehicles will have to remain road permit from BRTA. In case of construction machinery operators (Crane, heavy trucks, rollers, excavator operators etc.) competency for such work should be proved through accepted permits licenses. The load test and inspection of crane, heavy trucks, rollers, excavator will be done by approved inspector. The inspector is certified from the directorate of labour, Ministry of Labour, Govt. of Bangladesh. A copy of the license or driving permit or a permit to handle heavy duty equipment will be retained by the site manager of **CMEC-CNEEC JV**. All equipment operators should possess valid permits issued by the traffic authorities or construction authorities of the Government of Bangladesh. The vehicle and machinery used for the construction purposes of the site should be inspected regularly by the site supervisor of **CMEC-CNEEC JV** employed for regular servicing, safety of tires, repairs oil and hydraulic vacuum. Stickers of different colors may be introduced to recognize the vehicles and machinery used by contractors and sub-contractors.

The transport tanager cum store keeper of **CMEC-CNEEC JV** will also be:

1. Ensure that all the drivers comply with traffic and transport guideline disciplines;
2. Ensure that vehicle parking space is provided away from the towns carrying stocks.
3. Ensure that the vehicles carrying stocks and construction materials roads
4. Ensure that vehicle road worthiness certificates are received for all in the site ,
5. Ensure that all the vehicles have updated insurance coverage.

Make sure that warning devices are fitted to the vehicles and machine when maneuvering in public roads and the work sites. Flashing orange lights should be mounted on all the vehicles and construction equipment heavy duty machinery should be fitted with reversing alarms or in the absence should have a banks-man to guide the driver/operator. Signaler should be engaged enabling the operators to safely operate their machinery. Ensure that drivers and signalers are in constant communication during operations of heavy machinery. **CMEC-CNEEC JV** may be used high-way for carrying of materials from Mongla or Chittagong to five substation areas

11.2 Deployment and maintenance sites for each vehicle and machine

Transportation of materials will be done by the different types of vehicles of the above project. Most of the roads of the above areas are good conditions. The project of CMEC-CNEEC JV is temporary or one time work. Tower materials will convey to tower locations of the CMEC-CNEEC JV. The roads are used by villagers; those roads will use for carrying the materials of substation. The minimum traffic congestion might be often due to remote areas (villages), the areas having lower amount of traffic congestion.

Use appropriate safe and decent transportation mode to transport workers to project sites, during the construction phase. Although it is not envisaged that large number of workers will transport from distanced town and villages to the work site, it is imperative that if they are provided routine transport, they must be provided with transport in vehicles equipped with canopy (closed vehicles) with seating facility. No worker must be allowed or must be asked to travel in a back of a pickup, flatbed truck or a lorry which is not suited for passenger travel. This aspect had been very poor in the project construction site. In case of transporting heavy machinery, appropriate Lorries (Low bed) should be used and they should be loaded and parked on the vehicles using required safety methods.

The project may require large quantities of construction materials such as cement, sand, and metal, pylons making materials, wires and aggregates during construction. It is desirable to locate storage and loading areas away from the areas of frequent pedestrian activity (community foot paths and agricultural land areas)

The area that has been identified for the storage of aggregates will have to be reviewed in the light of its close proximity to human activities such as agriculture, play areas and areas used by the pedestrians.

The following measures are to be followed:

- k) All deliveries of stocks should be carefully planned and suppliers should be advised as to the time and location at which these will have to be delivered.
- l) They should inform in advance the site stores keeper the delivery of such stocks so that traffic and transportation can be properly managed.
- m) The frequent presence of trucks can add to increased traffic, sound (excessive noise), and smoke pollution through exhaust emission.

- n) Avoid as far as possible the peak traffic hours such as school hours in order to reduce the risk of any children/traffic accident/incidents.
- o) In the event that spills of aggregates occur, (substation materials) all the roads should be cleaned after the deliveries are made. The drivers should be made aware of this requirement.
- p) Ensure that allowable axel weight is not exceeded when the deliveries are brought by the suppliers using the Fort portal main highway.
- q) All the drivers employed by the **CMEC-CNEEC JV** must be fully sensitized about the speed limits and the need for strict compliance to the safety rules.
- r) Regular sensitizing sessions are carried out by the Site administration officer and the Environment/Health & Safety Manager of **CMEC-CNEEC JV**
- s) In case of transporting of friable materials and spoils, adequate protection will ensure when transporting them. All materials will transport in closed trucks or by using tarpaulin sheets to cover materials.

A temporary warehouse and vehicle parking will locate near to the labour camp/rental house, so that. It is easy way for loading. The materials come from the sea-port (possible Chittagong sea port) will be directly beside this camp. Hired vehicles will be used for the transportation of goods. If the vehicles will delay after loading or the night, then the car will give space in the parking place.

11.3 Mapping of itineraries, travel times, and areas where speeds are limited

In case of imported materials from foreign countries, these materials will come to Bangladesh by way of ships. After uploading these materials from ship to truck or lorry, it will transport to the materials storage locations. The storage locations should be middle position of the substation yard. One or two sub-storage will need for storing the substation materials and wire. The project location is western side of Bangladesh; Mongla sea port is nearer to Khulna, Meherpur, Monirampur and Mohespur. These areas will be a suitable of warehouse of the substation project.

With a view to reducing the number of road fatalities, the government has decided to fix speed limits for motor vehicles plying on city roads and highways. "No motor vehicles will allow to exceed the speed limit of maximum 40 km per hour on the roads in the capital and 80 km per hour on the highways," decided by Bangladesh Road Transport Authority (BRTA). Truck and lorry do not enter to the city area at before 20.00.

The Government of Bangladesh may make rules for the purposes of carrying into effect the provisions.

Without prejudice to the generality of the foregoing power, such rules may provide for the

- Nature of the mechanical or electrical signaling devices which may be used on motor vehicle ;
- The removal and the safe custody of vehicle including their loads which have broken down or which have been left standing or have been abandoned on roads;
- The installation and use of weighing devices ;
- The maintenance and management of godowns for the storage of goods removed from over loaded vehicles and the fees, if any, to be charged for the use of such godowns ;
- The exemption from all or any of the provisions of Fire Brigade vehicles, ambulances and other special classes of vehicle, subject to such conditions as may be prescribed
- The maintenance and management of parking places and stands and the fees, if any, which may be charged for their use ;
- Prohibiting the driving downhill of a motor vehicle with the Sear disengaged either generally or in a specified place;
- Prohibiting the taking hold of or mounting of a motor vehicle in motion;
- Prohibiting the use of footpaths of pavements by motor vehicles
- Generally, the prevention of danger, injury or annoyance to the public or any person, or of danger or injury to property or of obstruction to traffic ; and
- Any other matter which is to be or may be prescribed by rules.

The traffic management plan has been discussed at previous chapter as traffic control 3.7.

11.4 Equipment and Material Handling Management Plan

Some equipment is made of ceramic which have a change to broken at moment. Some equipment is too small it can be lost anywhere at the substation project. So, proper handling and storage of Material and equipment is needed for the equipment and material handling management plan.

Sand, cement, stone, and others will need for basement of control building, gantrytower;**CMEC-CNEEC JV**willarrange all materials and the equipment for the civil work at the tower location. One diesel WM, generator, and pump for water will need for the progress of civil work. After finished the civil work, erection will be started with steel or steel allow which is approved by the PGCB. PPE and safety issues will be arranged by **CMEC-CNEEC JV**during erection of the substation tower. Finally the following equipment will need for the 5- substations

List of equipment and accessories for substation	Voltage Detectors, Insulating Sticks, Short Circuiting & Earthing, Earth Clamps, Phase Comparators, Insulating Gloves, Insulated Tools Earthing Connections, Cable Terminations, Sealing Ends, Surge Arresters Hydraulic heads and battery tools for power line cutting and compression of crimping connectors, terminals and joints used in high voltage electrical transmission and distribution
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	Transformer, cable, gantry cable etc
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All equipment and materials will handle with care and appropriate PPE will be taken by labours during the movement from one place to another. The material handling will also be needed from storage or warehouse at the substation yard. Proper way should be taken to up and downloading the equipment and material to the vehicles or from the vehicle.

11.5 Dust Suppression

The dispersion of dust on unpaved roadways can result in many disadvantages. Flying dust can present visibility problems to drivers, greatly increasing the possibility of vehicle accidents. In addition, unpaved roadways that are unstable due to the constant dispersion of gravel dust become susceptible to continuous road deterioration. This can result in wasted municipality and county road budget costs. Dispersed road dust can also stunt the growth of crops and damage the exteriors of nearby homes. Fortunately there are easy, efficient and cost effective solutions to control the problem of road dust regardless of the type of surface involved. Dust might be flow away to the ambient environment by way natural activates (wind flow, cyclone), besides these friction of tires and road may be caused of dust eruption at the project locations. The roads of village are kacha (made of soil only) or not carpeting, it is very chance to eruption dust by the kacha road compared to the carpeting road.

Take time to consider dust control issues before beginning project in order to save time, money, and project resources. Identify site-specific air quality and dust control issues up front and develop a consensus for addressing these issues. Phase your project and plan your site layout to minimize disturbance of the soil. Include the following action items:

- Make sure everyone working on the job knows who's in charge and all the requirements for dust control. Encourage a proactive and continuous focus on air quality issues on the job site.
- Evaluate dust control procedures periodically to identify additional issues that develop as the job progresses.
- Limit the amount of area graded at any one time. Lessening the amount of surface being disturbed at any one time reduces the amount of dust control required and the amount of water or dust suppressant needed.
- Install wind fences or barriers (less than 50 percent porosity). Place barriers around storage piles, parking, and equipment staging areas.
- Develop semi-permanent staging areas to cut down on the amount of disturbed area.

- Restrict access on unpaved areas to vehicles and equipment that are necessary that day. Limit unnecessary travel and keep the speed under 15 mph on unpaved surface areas.
- Re-stabilize disturbed surfaces by paving permanent roads and restoring vegetation as soon as possible.

Water spray is only one mitigation measure for dust suppression at the project site of substation. Watering is a very effective dust suppressant. When applied regularly, water provides temporary stabilization to disturbed surface areas and reduces fugitive dust caused by earthmoving and driving on non-stabilized surface areas. Water also aids in compaction. It is required that fugitive dust generated from all earthmoving activities be controlled. Watering is one way to control fugitive dust.

- Roads and disturbed surfaces visibly appear moist with minimal silt
- Soil has a crusted surface and is not easily crumbled between your fingers
- Soil moisture content is optimum for compaction
- Visible emissions are less than 20 percent opacity

Prior to any activity on site –

- ❖ Wet the area to depth of cuts or equipment penetration For Active Operations –
- ❖ Apply water 15-30 minutes before starting operations
- ❖ Apply water at the end of the day (e.g. soak overnight the next day's work area)
- ❖ Before and after grading, water using a water truck
- ❖ During trenching, water using a fine spray or mist
- ❖ During screening, mist material after it drops from the screen After Clearing an Area –
- ❖ Apply water in sufficient frequency to prevent visible emissions (at least every 2 hours)
- ❖ Apply water in sufficient quantity to maintain a moist surface
- ❖ Do not over-water - muddy conditions increase track-out water penetration
- ❖ Surfactants or palliatives added to water increase penetration, especially in high clay soils

In the climate of Bangladesh, dry season is started from October to March, there is more possible flow away fugitive dust during this time. However the dust level is lowering at the monsoon, because heavy rainfall might be happening at the period. At this moment no need to spray water to the work place of substation yard

11.6 Capacity of the tanker trucks used and calculation of the number of trucks required

Gross vehicle weight rating (GVWR) is simply the maximum allowable weight of an entire vehicle when it's packed up and ready to go -- that includes the weight of the vehicle itself, all of the necessary fluids for operation (gasoline, diesel, oil and so on) and any cargo, passengers and tools. A vehicle's GVWR is calculated by its manufacturer, and it can typically be found in owner's manual or on the vehicle's doorframe, near the door latch

Curb weight is simply how much the vehicle weighs on its own, without any cargo or passengers. This measurement includes a full tank of gas and any other fluids that keep a car running. So, a vehicle's payload capacity -- the amount of stuff it can safely carry after you've filled up the tank with gas and topped off all of the fluids -- is just a matter of subtraction.

Gross vehicle weight rating - curb weight = payload capacity

CMEC-CNEEC JV will be calculated how loaded truck by the above equation. Load is also depending on the condition of road. Khulna- Mongla road, Kustia-Meherpur road, Monirampur-Jashore road, Jhenaidah –Mohespur road is suitable to transport substation materials. These roads will use for the transportation of goods and labour. The number calculation design of tanker truck will be depended the road condition along all projects.

Chapter 12



Clearing and Vegetation

12.0 Clearing and Vegetation

Trimming or removing the hazard trees is a secondary part of the construction phase of the substation project. Tree trimming (cleaning of trees) will mandatory after the acquisition of land and before landfilling at the substation project. Tree trimming may be done by crews using mechanical trimming equipment or aerial lift trucks, or by climbing crews (an alternative way of trimming). **CMEC-CNEEC JV** crews clear vegetation and redefine the easement width with light-duty power equipment.

12.1 Methods, species and schedule for the plantation atsubstation project Areas

As per the contract document, about 50 trees will plant in each substation project after finished all the construction and arrangement work. Trees will plant inside the boundary wall of the substation project. The skills and knowledge required to plan the implementation of plantation works must be transferable to a different work environment. Knowledge and understanding are essential to apply this standard in the workplace, to transfer the skills to other contexts and to deal with unplanned events.

Chapter 13

Biodiversity



Biodiversity

13.0 Biodiversity

Biodiversity refers to the variety and variability of life on Earth. Biodiversity is typically a measure of variation at the genetic, species, and ecosystem levels. Sub-station construction and maintenance can lead to the permanent removal of woody vegetation and in some cases to the complete conversion of strips of forest ecosystem into bare land or land covered by completely different vegetation communities. The secondary EMF from the sub-station maybe affects to the forest. But it has been reported EMFs and flora and fauna are conducted. Since then little research on this subject has been performed, reflecting the general agreement that EMFs have not been shown to have any detectable effects (with the specific exceptions of honey bees in hives and trees growing close enough to lines to be subject to corona). The construction and operation of substation projects can affect biodiversity in many ways, including habitat conversion and fragmentation, changes in hydrology, soil compaction, and erosion introduced species, and hunting and harvesting enabled by the operation of a power line through the substation. Species in small, rare, sensitive, and otherwise critical habitats may be especially affected by the area of sub-station.

The main effects of roads on terrestrial vertebrates as well as a variety of mitigation measures that have been widely used for different ways: crossing structures, dry ledges, fencing, right-of-way escape ramps, and noise barriers. Because some species have similar needs and respond in the same way to mitigation measures, specific design standards.

Traditional rights of various ethnic-communities, living in and around state forest areas, will recognize and maintain with due respect to their forest-related cultural values and religious beliefs. Conservation initiatives related to forest, wildlife and biodiversity by indigenous communities will encourage; Undertake a credible valuation of the ecosystem services that the forestry sector provides in Bangladesh. Strengthen protection measures for all types of forested areas by providing adequately trained manpower, requisite tools, and logistics along with support from other law enforcement agencies.

Project construction activities have the potential to generate a wide range of environmental impacts on ecologically valuable receptors (flora & fauna) including designated sites, sensitive habitats and protected species. Examples of such adverse negative impacts include

- Vegetation loss and conversion including impacts to habitats supporting notable species;
- Felling of trees and effects on roosting bats and nesting birds;
- Loss of ponds and impacts to watercourses with associated amphibians and fish; and
- Disruption of large mammal movements.

The project seeks to proactively address such impacts and proposes to use an adaptive management approach (plan-do-check-act-replant) to reduce their potential severity, based around the use of 'Biodiversity Specialists' to clear the route prior to removal of any vegetation.

13.1 Biodiversity Management Plan for substation project

In the substation project is generally located in fixed position. BMP is very important part of transmission project. In the substation project GOB is acquired land and CMEC-CNEEC JV will filled the low land by sand with approved height from the ground level. Land owner (affected persons) may be trimming his/her trees before land filing or before developing the substation project. If there are trees in the past and the trees do not need to be cut down for developing the substation. So that CMEC-CNEEC JV will has no needed to cut down the existing trees at the project site. When TL will connect to the bays of substation, trees under transmission line will cut down to minimize the impacts for the transmission line project. This phenomenon is not under the construction of substation project. TL project is beyond the substation project activities.

No hamper will be caused to biodiversity components during the project construction as associated measures will be ensured and management plan from EMP will be followed accordingly.

13.2 Measures for limiting Invasive Alien Species

Invasive species are the second largest threat to biodiversity after habitat loss. An invasive species is a species that is not native to a particular area, but arrives (usually with human help), establishes a population, and spreads on its own. Invasive species have much larger impacts on an ecosystem than other species. They have a disproportionate effect, which is what makes them so harmful.

Not all species that arrive in a new location become invasive—in fact, most do not. Lots of garden plants are imported from other places, and even if they sometimes grow wild, they do not achieve big populations and do not make a huge splash on native species survival. These are just called non-native or introduced species. The introduced species that do become invasive are the ones that cause big problems.

Some places are especially vulnerable to invasive species. Islands usually have lots of endemic species and few large grazers or predators; this makes island species more at risk when non-native species are introduced.

Other places have very low rates of species invasion, usually because the climate is especially harsh, like in the Arctic, or organisms need special adaptations to live in that particular habitat, like mangrove trees that can tolerate living in saltwater. As humans move around the globe, more non-native species are turning up in these harsh habitats, some from similar habitats in other parts of the world. These species are more likely to become invasive.

Here are some ways invasive species impact native ecosystems:

- Habitat modification
- Compete with native species for resources
- Predation of native species

- Herbivory on native plants
- Bring in pathogens
- Hybridize with natives, leading to loss of genetic diversity

CMEC-CNEEC JV will be constructed substation without disturbance of Alien Species at the project area. Labours of the substation project do not kill or hunt any bird during the project period. As per instruction of PGCB, bird diverter will adjoin to the wire for the mitigation measure of Alien Species at substation project.

13.3 Integrated Pest Management Plan (IPMP)

Integrated pest management plan is a strategy that promotes use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides. Rural development and health sector projects have to avoid using harmful pesticides. Other pesticides can be used, but only as an element of an Integrated Pest Management Plan (IPMP) that emphasizes environmental and biological controls. Though increase in agriculture production hence an increased usage of chemical pesticides and fertilizers is not included in the program objectives, such a consequence of the program cannot be ruled out. Hence this policy is triggered. An integrated pest management plan (IPMP) will prepare and its implementation started during the construction phase of the substations project.

Chapter 14



Emergency Plan

14.0 Emergency Plan

14.1 Description of facilities

Transmission and distribution facility" as defined in the act means an arrangement of conductors and transformation equipment that transmits electricity from the high voltage terminal of the generation transformer to the low voltage terminal of the step down transformer operating phase to phase at a nominal high voltage level of more than 230 and 132 kV to a nominal low voltage level of 33 volts or less at substation, and includes:

- substation energized in excess of 230/132/33 kV volts;
- Insulating and supporting structures;
- substations, transformers and switchgear;
- operational and control devices;
- all property of any kind used for the purpose of, or in connection with, the operation of the transmission facility, including all equipment in a substation used to transmit electric energy from the low voltage terminal, to electric distribution system lines that exit the substation and are energized at 230 & 132 kV volts or less, and
- Connections with electric systems in jurisdictions bordering Alberta, but does not include a generating unit or an electric distribution system.

Facilities managers are responsible for the security, maintenance and services of work facilities to ensure that they meet the needs of the organization and its employees. Facilities managers essentially look after all of the services that help a business or other organization do its work. Responsibilities can include:

- ✓ overseeing and agreeing contracts and providers for services including security, parking, cleaning, catering, technology and so on
- ✓ supervising multi-disciplinary teams of staff including cleaning, maintenance, grounds and security
- ✓ ensuring that basic facilities, such as water and heating, are well-maintained
- ✓ managing budgets and ensuring cost-effectiveness
- ✓ allocating and managing space between buildings
- ✓ ensuring that facilities meet government regulations and environmental, health and security standards
- ✓ advising businesses on increasing energy efficiency and cost-effectiveness
- ✓ overseeing building projects, renovations or refurbishments
- ✓ helping businesses to relocate to new offices and to make decisions about leasing
- ✓ drafting reports and making written recommendations

Substation is via of electricity transported over long distances to consumers. New electric transmission facilities will require for some new wind energy facilities. Electric transmission is the process by which large amounts of electricity produced at power plants, such as industrial-scale wind facilities, is transported over long distances for eventual use by consumers. Substation is kept in the middle position between the power generators and consumers of electricity. Substation is work as step-down activity at the project site. Electricity is usually transmitted to a substation near a populated area. At the substation, the high voltage electricity is converted to lower voltages suitable for consumer use, and then transmitted to end users through relatively low-voltage electric distribution lines. The construction, operation, and decommissioning of high-voltage (230/132 & 132/33 kV) substations and associated facilities would create a range of environmental impacts. The main components of high-voltage electric substations and associated facilities include: transformer, Cable Trench including soak pit, PVC pipes, Gantry Tower structures, 132 kV Equipment Foundation

14.2 Emergency situations

Emergency situations are those conditions that may result in imminent or direct threats to public safety or threaten or impair the companies' ability to provide reliable transmission service to its customers. Emergency situations may include:

- Failure of conductor splices.
- Damage to structures or conductors from wildfire, high winds or other weather related conditions (storm, earthquake etc).
- Line or system outages or fire hazards caused by trees falling into conductors.
- Breaking or imminent failure of cross-arms or insulators, which could, or does, cause conductor failure.
- Damage to structures or conductors from vandalism

In the case of an emergency where life or substantial property is at risk or there is a potential or actual interruption in service, CMEC-CNEEC JV will promptly respond to the emergency and conduct any and all activities, including emergency repair requiring heavy equipment access to the structures or other ancillary facilities, needed to remedy the emergency.

Every utility should consciously address and decide which plan is the most realistic for their particular situation. In doing so a number of factors come into play such as: the size of the utility, the availability of subcontractors who can be depended upon during emergency.

14.3 Emergency procedures

On-site emergency plans will prepare to protect the public health, safety, and environment on and off the substation project site in the case of a major natural disaster or construction accident relating to or affecting the substation Project. The Applicant shall prepare the plans and be responsible for implementing the plan with its operations team in coordination with the local

emergency response support functions. The plans will describe the emergency response procedures to be implemented during various emergency situations that may affect the project or the surrounding community or environment. The emergency plans described in this section are an outline of the details that will include in the detailed emergency plans to be developed prior to the construction and operating phases of the project. This outline is based on Applicant's experience in operating other similar wind power projects. During both construction of the substation project, safety manager will be equipped with cellular phones. Preliminary construction emergency plans will be developed and submitted for review by PGCB, prior to the start of construction activities. Preliminary operations and maintenance emergency plans will also be developed and submitted for review by PGCB and prior to the start of plant operations. During the substation project construction and startup period, the emergency plans will be updated to conform to safety information for the specific equipment needed at the project.

The emergency plans cover a number of events that may occur at or near the substation project site by natural causes, equipment failure or by human mistake. The following is a list of potential events that will be covered by the emergency plans.

- Personnel injury;
- Construction emergencies;
- Project evacuation;
- Fire or explosion;
- Floods;
- Extreme Weather Abnormalities;
- Earthquakes;
- Volcanic eruption;
- Facility Blackout.

The Project operating and maintenance (O & M) group of CMEC-CNEEC JV and third party contractors will receive regular emergency response and safety training to assure that effective and safe action procedure will be taken to reduce and limit the impact of an emergency at all substation project sites.

14.4 Fire Fighting Management Plan

Fire extinguisher and sand bucket will be kept at substation materials storage house. The adverse negative impact of storage house is fire incident. At the substation site, the fire extinguisher will be kept to protect fire incidents from welding machines, engine oil, generator room, etc... This fire safety management plan applies to all other staff working on-premises employed by any other employer. In this respect, other staff will comply with these relevant fire safety arrangements and policies. A fire safety management plan details the arrangements to implement, control, monitor and review fire safety standards and to ensure those standards are maintained. The plan describes the arrangements for effectively managing fire safety to prevent fire from occurring and, in the event of a fire, to protect people and property near the substation

project. Among the above emergencies, fire issues might have occurred at the substation locations during the work periods.

At the substation r locations, the poster with emergency contact number Thana, district fire services and civil defense will hangat the substation project site at the time of fire incident; water may be spray to the existing fire by using a water pump which is an act fire hydrant at the substation project yard. In an emergency of fire, the project people of CMEC-CNEEC JV will give the fire message to the fire services and civil defense. At the time of the fire incident, water may be spray into the existing fire by using a water pump which is an active fire hydrant.

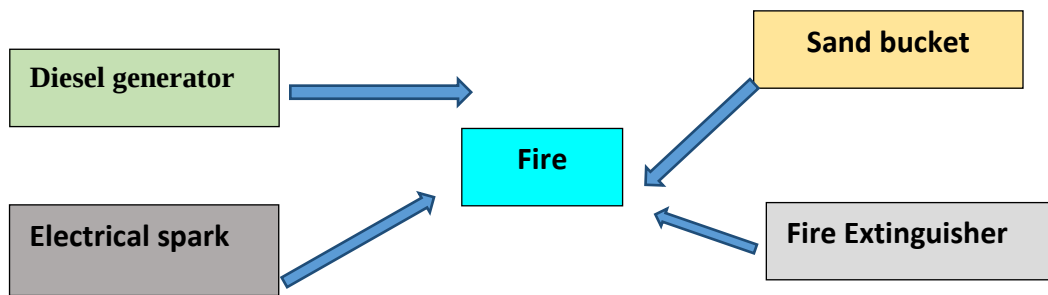


Fig 15.1: Site specific fire management plan

Any emergency situation of fire, the project people of CMEC-CNEEC JV will give the fire message to the fire services and civil defense. There are many causes for fire incident at the project area of substation and wire house of substation materials. The fire extinguishers and sand bucket is only mitigation measure for fire incident at wire house of substation materials.



Fig 15.2: Sand bucket and Fire extinguisher for Fire safety

14.5 Emergency Response plan

Emergency Response Procedures will identify who does what and when in the event of an emergency. Responsibility for who is in charge and their coordination of emergency actions shall be identified. Nature of emergency & hazardous situations may have come at the substation project. All accidents and near-miss incidents shall be investigated to determine what caused the problem and what action is required to prevent a recurrence. Employees required to perform investigations shall be trained in accident investigation techniques. The incident/accident investigation should be a fact-finding exercise rather than faultfinding. For this project, emergency response systems should be in place to deal with dangerous goods uncontrolled releases of dust and gaseous emission, natural calamities fires burns and injuries. There are to be trained emergency response teams, specific contingency plans and incidence-specific equipment packages in place to cope with these types of emergencies. In case of an emergency, incident occurs; immediate action must be taken to mitigate the impacts. To minimize the possibility of injury to the responders and others emergency responders must follow a specific sequence of actions as stepped out in the preceding paragraphs of the following flow chart.

14.6 Reporting

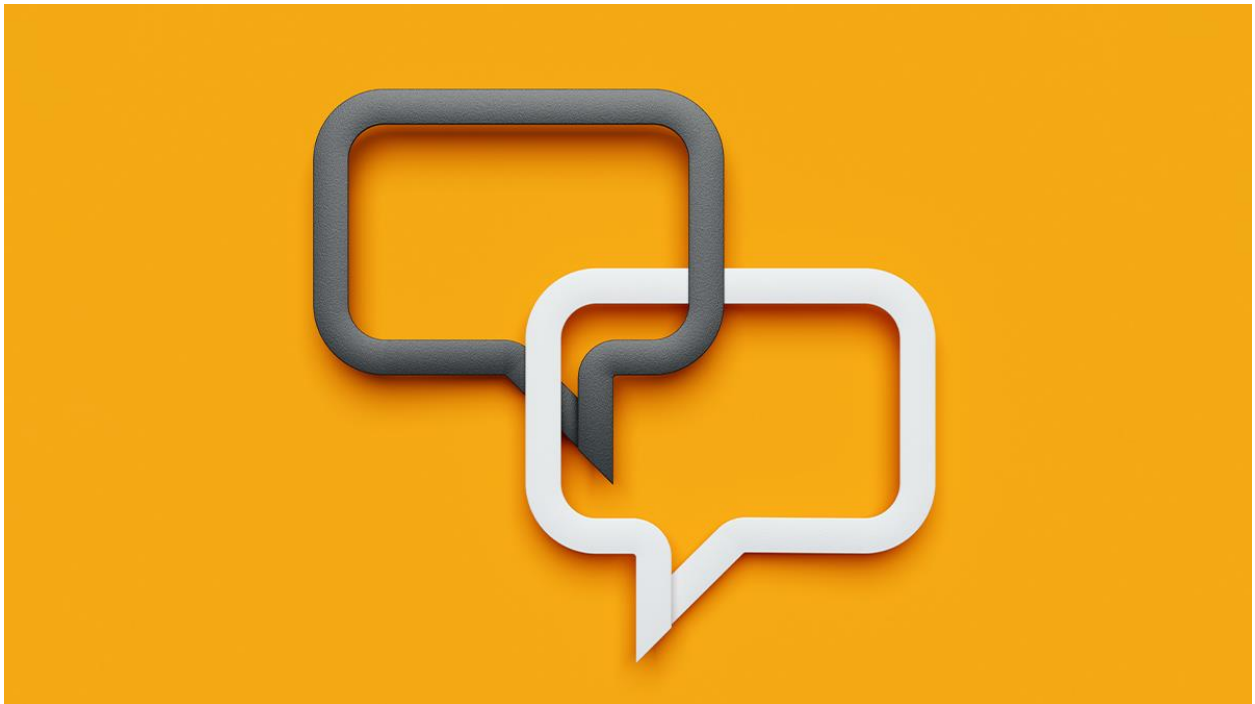
The main environmental issues during the construction phase of the substation project, the report will be provided by the CMEC-CNEEC JV as per the management and monitoring plan of CESMP, after the field visit of environmental consultant, social consultant, and safety officer of the project. The reporting schedule will monthly, but the site project manager will reported weekly to the head of the office of CMEC-CNEEC JV for overall progress work and work situation. The site safety officer will do the same as the site project manager. The site safety officer will be recorded any incidental event at the substation project site. For the environmental and social unit of PGCB, CMEC-CNEEC JV will give quarterly an Environmental & social compliance report based on the quarterly environmental issues, work progress, public consultation, and GRM. By comparing the quarterly information of the substation project to the previous quarter information for the same quarter, PGCB can get rich insight into the work performance and growth of CMEC-CNEEC JV.

Furthermore, quarterly reports help to predict the future potentiality of substation work, quarterly environmental and social issues which will highly be correlated to a CMEC-CNEEC JV's work progress for the five substations project. The PMU, PGCB establish an Environmental and Social Unit (ESU) which will be responsible for the implementation of the Environmental

Management Plan (EMP) and the Resettlement Plan (RP) for DWZTGE project. The ESU headed by a superintendent engineer (planning) will also include a manager (environment and resettlement) and 2 other assistant managers responsible for environment and resettlement aspects respectively. The ESU will be responsible for the overall planning, management and monitoring of the implementation of the environmental, social and RP aspects. The functions and responsibilities of the ESU include; preparation of periodic progress reports to the project management from field level from CMEC-CNEEC JV. CMEC-CNEEC JV will provide quarterly report including environmental issues, conflict, non-conformity, public consultation, traffic aspect near the substation project, GRM aspects.

The ADB will engage a third party consultation firm to implement the RP. The third party consultation firm will be responsible for mobilization of communities to participate in the process of RP implementation, environmental aspects, compensate conducting the relevant socio-economic surveys, project impact assessments and enumeration of the APs, preparation of inventory of losses, dissemination of relevant information including entitlements to APs, facilitation of the proper functioning of the GRM, and implementing all other safeguard measures to secure the rights of all APs including women and vulnerable groups. Third party consultation firm will also check the different reports of the construction activities.

Chapter 15



Base Line Study of Project Area

15.0 Base Line Study of substation Project Area

In the context of a substation project, Construction Environmental and Social Management Plan (CESMP) are concerned with the implementation of the measures necessary to minimize or offset adverse impacts and to enhance beneficial impacts. In this report, the standard procedure of substation construction will format. All the measures are said to be successful when they comply with the Environmental Quality Standard (EQS) of the host country in this case Bangladesh.

The environmental management plan has to be considered as part of the plant's overall management and it would be part of the plant operational manual.

Monitoring the performance of a plant is very important and sometimes vital. Substations in the project area generally do not monitor the environmental parameters related to plant operation, thereby neglecting the environment. For surveillance of the environmental performance of the substation area and monitoring of the quality of the local environment, the environment in the work zone and the general impact zone have to be performed regularly. A management setup has to be created for the environmental monitoring program which can ensure compliance with national environmental standards. Any additional monitoring required should be defined and resources allocated for the purpose. The quarterly and annual monitoring reports will also be placed on the company website for public scrutiny. In preparation of the basement study of the substation area, Environmental components, sub-components, and major activities of the project are identified. Probable impacts of the activities on the environment and their magnitude and duration are also identified.

15.1 Mitigation/Benefit Enhancement Measures

Mitigation normally involves measures that reduce and/or minimize impacts within the site boundary such as changes to timing, engineering design, and sediment by-passing to avoid sediment loss or reductions to the extent of a project. However, there will circumstances where there are impacts that affect mobile species and functionally linked habitats, which may involve measures to address these impacts beyond the boundaries of designated sites.

During the implementation of CESMP there will come a point when the likely implications of a project are sufficiently well understood to place them in the context of the potential for securing consent for the development. It has to be recognized from the outset that in some instances the impacts may be so severe that it is unlikely that consent will grant. Ideally, this situation should

not happen as projects of this type really should not progress as far as detailed CESMP. A broad-scale analysis, in conjunction with dialogue with the CMEC-CNEEC JV should screen out such options. In other cases, impacts are significant enough to require a package of compensation or mitigation measures to secure a neutral effect on the sustainable environment.

15.2 Monitoring Requirement

Priority should be given to the avoidance of impacts at source, whether through the re-design of a project or by regulating the timing or location of activities. If it is not possible to avoid significant negative impacts, consideration should be given to ways of minimizing the impacts by changes to design, timing or working practices, ideally to the point that they are no longer significant. These measures should be designed to meet specific ecological objectives that will deliver measures that specifically address the negative impacts that are predicted. The objectives may include:

- High level objectives related to the reasons for offsetting impacts, gross area of habitat proposed to be created or restored and its overall quality; and
- Detailed objectives comprising specific ecological requirements for the habitat created or restored in terms of, for example, the number of birds and the habitat attributes that they require.

Offsetting measures carry a degree of uncertainty. Furthermore, even when they are effective, there may be a temporary or permanent loss of ecological value due to a time lag between damage occurring and new habitats becoming fully functional and/or species becoming established. Forward planning is essential in order to have compensating habitats in place as soon as possible. Follow up monitoring will require establishing the level of success of compensation.

The uncertainty associated with a project will vary according to a number of factors, including the:

- technical feasibility of what is proposed (*e.g.* experience of projects where the proposed mitigation has been employed or carried out);
- Overall quantity of what is proposed (*e.g.* is it large enough to be viable; is it of at least equivalent extent to that of the lost habitat?);
- Overall quality of what is proposed (*e.g.* does it compare favourably with features lost and those whose loss or damage is to be compensated?);
- level of commitment provided to achieve what is proposed (*e.g.* is there a realistic understanding of what resources and effort will require to achieve predicted outcomes and
- Timescale over which predicted benefits are expected to be realized.

Offsetting measures should be presented in the context of site integrity or conservation status of the features to which it applies. Evidence should be provided to explain current understanding of their effectiveness and the extent to which their success can be guaranteed, for example, mitigation may be designed to ensure that the status of a species' population can be maintained following development.

In the above circumstance, CMEC-CNEEC JV has taken an initiative to monitor maximum number of environmental parameters, samples, indication during construction stage of substation project area. The air noise and water samples will collect at pre construction stage as a base line study of the five project locations. The air, noise and water samples will collect in same way during operation phase of five substations. The comparable any deviation or variation between two results of environmental monitoring will give idea to PGCB for further modification

15.3 Monitoring Indicators

Environment monitoring and its associated development of datasets and indicators is one of the challenging and exciting priorities for CMEC-CNEEC JV in the project construction period for substation. Monitoring targets key indicators that not only help track the state of the environment, but also the contribution of environmental resources and services to the economic and social well-being of indoor and outdoor population around the project area of CMEC-CNEEC JV

The Environmental indicators are as following:

Air Quality: Main concerns relate to the effects of air pollution on human health, ecosystems, and buildings, and to their economic and social consequences. Human exposure is particularly high in urban areas where economic activities and road traffic are concentrated. Causes of growing concern are concentrations of fine particulates (PM₁₀ & PM_{2.5}), NO₂, toxic air pollutants, and acute ground-level ozone pollution episodes in both urban and rural areas. SO_x emissions have decreased significantly in many countries and have been successfully decoupled from fossil fuel use and economic growth (absolute decoupling). The main challenges are to further reduce emissions of NO_x and other local and regional air pollutants in order to achieve stronger decoupling of emissions from GDP and to limit the exposure of the population to air pollution. This implies implementing appropriate pollution control policies, technological progress, energy savings, and environmentally sustainable transport policies.

Water quality: Main concerns relate to the potential impact from inappropriate waste management on human health and on ecosystems (soil and water contamination, air quality, land use and landscape). Water is a vital issue in the ecosystem. Water quality parameters will be monitoring as per DOE standard in at ground water and surface water from the nearby channel.

Sound level: Noise is a vital parameter in the environment. Noise will monitor at the workplace, generator area, and outside of the workplace where people live apart from TL.

Occupational health and safety monitoring:

The Health and Safety officer of CMEC-CNEEC JV will set out a technical approach to monitoring progress against the site occupational health and safety measurement. The occupational aspects are PPEs, work place noise, dust level, biological hazards, work on height, EMF etc. CMEC-CNEEC JV will check all health and safety aspects for all occupants like labours, visitors, stakeholders, and engineers.

Monitoring of health and safety training: Health and Safety officer will give instruction about the training especially to the non-qualified labours at the SS yards. Besides, training on work on height, fire incident, mug-drill of fire & earthquake will also monitor

Community health and safety monitoring: The Community Health and Safety Standard recognize that project substation construction activities, equipment, and infrastructure can increase community exposure to risks and impacts. Potential negative impacts affecting health and safety may arise from a broad range of supported activities, including from substation construction activities, changes in the nature and volume of traffic and transportation, water and sanitation issues, use and management of hazardous materials and chemicals, impacts on natural resources and ecosystems, the influx of project labour, and potential abuses by security personnel. CMEC-CNEEC JV will monitor all above aspect including the COVID 19 aspect.

Monitoring of traffic Congestion: CMEC-CNEEC JV will monitor the traffic congestion during the construction period of substation and substation materials transportation. CMEC-CNEEC JV may include the traffic police during the project period of the road; Khulna-Mongla, Khulna city bypass road, Jasore- Satkira road, Meherpur-Kustia and Mohespur-Jadoppur. The traffic layout of all the substation project is attached an appendix K

Chapter 16



Impact Assessment and Mitigation Measures of the SubstationProject

16.0 Impact Assessment and Mitigation Measures of substation project

The main purpose of the substation project is the development of infrastructure to transmit electrical power from one location to another through a substation. Nevertheless, the electrical transmission system is more complex and dynamic than other utilities, such as water or natural gas. Electricity flows from power plants, through transformers, transmission lines to substations, distribution lines and then to the consumer. The transmission system is highly interconnected, not just transmission lines to load centers but also to other transmission lines to assure the smooth flow of power in the grid. The power entering the system flows along all available paths i.e. the flow of high voltage from one location to another grid substation. The anatomy of a substation project can be represented by the following components:

- Project land;
- Foundations;
- Transformer
- Railway slipper for keeping Transformer
- Cable drainage system
- Towers for cable erection
- 132 , 230 kV gantry foundation
- Control building
- Capacitor stations;
- Substation terminations.

Specific components of a transmission tower and line are:

- small towers;
- Conductors;
- Earth wires;
- Insulators; and
- Wave traps and other hardware.

Table 16.1 Checklist of potential impacts/issues assessment with mitigation measured at the substation project

SI No	Topic / Potential Impact / Issue	Impacts	Mitigation Measured
1	Land acquisition/ requisition	Loss of 16.38 acres of land for the construction of 5 substations (mainly agricultural/ paddy, water body, marsh) permanently at substation sites. Temporary loss of land (requisition) for construction camps etc.	Prior to commencement of construction activities, the owners of the affected lands must be notified and provided proper compensation in time as per the government and ADB guidelines. As per the government and ADB guidelines, RP should be prepared for land acquisition/ requisition/ compensation and follow it. Use GIS instead of AIS, in order to reduce land requirement.
2	Top soil	As the lands, are paddy fields removal of top soil might not be required before the land filling.	Site specific mitigation measures will be required in 5 substation lands.
3	Cutting of trees/ Clearing of vegetation	Lands selected for the construction of 5 substations are paddy fields, including small extents of marshy lands and water-bodies. Only the land earmarked for Purbachal-2 substation (Dhaka) is a highland. Fifty-six trees (> 5 m in height) to be removed from these lands. Loss of standing crops (if any), grass and bushes at substation sites and construction camp sites is anticipated.	Prior to the start of removal of trees/ clearing of vegetation, provide adequate compensation to the owners.
4	Fauna (Wildlife)	Possible 3-acre water body loss. Disturbance of wildlife due to project activities such as earthworks, moving of project equipment and transports, especially during night time.	Water body loss might be fully restored as the compensation will enable water body owner to build similar water bodies within the paddy land they will buy. DC shall ensure the compensation is for restoration of lost water bodies with restoration of new water bodies at same size prior to the old water bodies to be filled up. Prepare construction management plan (CMP, by the contractor) to be approved by PGCB before access to site is permitted and follow it properly. Follow the government rules and regulations, EHS guidelines and WHO noise guidance whichever is more stringent on noise. Project workers should not disturb or kill any wildlife.

SI No	Topic / Potential Impact / Issue	Impacts	Mitigation Measured
			Fishing is not allowed.
5	Construction Waste	Generation of construction wastes from the construction materials.	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 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. Use of construction materials containing recycled content when possible and in accordance with accepted standards. Adequate collection, separation, and storage of waste on site and safe transportation to the disposal sites and disposal methods at designated, licensed, engineered and sanitary landfills shall be provided.
6	Drainage congestion and flooding	Reducing floodplain storage area and increase local flooding, due to earth filling of substation sites and access roads above highest flood level (HFL). This will be a major environment impact as the 5 lands selected for construction of substations consist of paddy lands, marshes and water bodies. Drainage congestion if the surrounding sites are blocked by the earth embankment.	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. Consideration of the HFL during design of substations, to avoid inundation. Substation civil designs will include drainage and flood control measures to avoid adverse impacts by land filling in new substation lands and also specify that the soil/sand shall be sourced only from

SI No	Topic / Potential Impact / Issue	Impacts	Mitigation Measured
			existing licensed suppliers who are authorized by the government to supply soil/sand for land filling.
7	Noise level	Noise pollution due to construction activities, generators and construction vehicle movement.	Use of noise reducers in heavy construction equipment. It is required that no construction should be allowed during night time (9 PM to 6 AM). As per EHS guidelines, avoid prolonged exposure to noise (produced by equipment) by workers. Regulate use of horns and avoid use of hydraulic horns in project vehicles. Generators should be placed within rooms (concrete walls with roof). Noise levels will continue to be monitored in pre-construction and construction, and if there is exceedance at the village edges, noise baffles will be constructed.
8	Air quality and dust	Air pollution and dust generation due to construction activities especially due to the underground cabling, generators and construction vehicle movements.	All vehicles (e.g., trucks, equipment, and other vehicles that support construction works) shall be well maintained and not emit dark or smoky emissions in excess of the limits described in the 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 (water sprayer) shall be available where earth and cement works are required. Spray water on dry and loose surfaces of the construction sites regularly. Maintain adequate moisture content of soil to minimize dust during transportation, compaction and handling. Construction materials (sand, gravel, and rocks) and spoil materials will be transported in trucks covered with tarpaulins. Sprinkle and cover stockpiles of loose construction materials (e.g., fine aggregates, sand).

SI No	Topic / Potential Impact / Issue	Impacts	Mitigation Measured
			Avoid use of equipment such as stone crushers at the sites, which produce significant amount of particulate matter. N95 masks should be provided to all personnel in areas prone to dust emissions throughout the period of construction.
9	Soil Quality	Soil pollution	Laboratory analysis of the river bed 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% bonded capacity.
10	Siting of construction camps	Removal of vegetation such as grass, standing crops (if any) shrubs and trees. Environmental pollution (such as air/dust, noise, water, wastes, excess soil) affecting nearby the settlements.	Prior to the start of clearing of vegetation, provide adequate compensation to the owners in time. Locate construction camps away from residential settlements, cultural sites, water bodies, etc. (minimum 0.5 km). Try to use fallow land to avoid crop damage. Just after completion of the construction, hand over the camp sites to the owners as in earlier condition.
11	Traffic congestion/ road accident	Traffic congestion and road accidents due to movement of construction vehicles.	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.

SI No	Topic / Potential Impact / Issue	Impacts	Mitigation Measured
12	Pollution due to wastes	Pollution due to wastes (construction wastes from construction activities and general wastes from workers' camps)	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/ labour 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. Prior to the start of construction, contractor should prepare waste management plan (WMP) based on the EMP, for approval by PGCB before access to site reflecting national and EHS guideline requirements.
13	Community health and safety (H&S)	Community H&S nearby the substation site could be affected.	Safety barriers and warning signs surrounding the construction site. Generators should 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.
14	Occupational health and safety (H&S)	Health and safety risks of construction workers.	An experienced Health & Safety (H&S) Manager must be engaged on each works package with appropriate qualifications and experience and not doubling up on any other job by the contractor prior to start of construction. Before access to site granted, 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.

SI No	Topic / Potential Impact / Issue	Impacts	Mitigation Measured
			Safety induction by the H&S Manager should be provided for the workers and visitors before they will be allowed to access the site. Prior to starting work, a tool box meeting should 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) 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.
15	Physical Cultural Resources	Possibility of damage to Physical Cultural Resources.	Chance Find Procedure to be developed following the IFC Guidance Note 8 and BAN regulations
16	Employment generation/ income	Employment opportunities for the local people, especially for PAPs.	Employ local people, especially PAPs, for the project activities (as much as possible).
17	Tree replantation	A total of 75,000 indigenous tree species (three times the number of affected trees from both substations and transmission line) can be planted in home gardens and govt. lands	Planting of 75,000 saplings to replace felled trees, on the side slopes of the access roads, during the monsoon period. The number of saplings which die within 3 years of planting should be replaced by new saplings. Nursing period of planted saplings should not less than 3 years.

SI No	Topic / Potential Impact / Issue	Impacts	Mitigation Measured
18	Drainage congestion	Drainage congestion could occur in the surface drains within the substation area, if proper O&M is not done regularly.	Clean the drains, especially during the monsoon, regularly. Ensure adequate monitoring.
19	Community health and safety	Community H&S nearby the substation site.	Safety barriers and warning signs surrounding the substation sites with awareness raising program. Generators should be placed in the closed rooms. operational H&S risk assessment to be undertaken.
20	Safety and security of workers	Risk to continuous power supply and even damage of substation.	Ensure security of substation in collaboration with law enforcement agencies. Keep complaint book in the substation for recording of people's complaints. Ensure availability of adequate safety gear for substation operations.
21	Power Supply	Due to adequate reliability of power supply, social life and economic condition of the people will be improved.	O&M of the substations should be done in time for adequate power generation
22	Short Circuit/Accident	Due to a possible short circuit of the substation, disruption of power and accident could occur.	O&M of substations should be done in time by experienced personnel.
23	Pesticide Use and Management	Impacts of dangerous species	There are no pesticides/herbicides used at the project site. Only phenol is used for the management of project site snake at the substation project. Phenol is hazardous material and given up the training on how used phenol at the project site subdomain.

SI No	Topic / Potential Impact / Issue	Impacts	Mitigation Measured
24	Watershed	Water pollution	At the substation site have khals, pond, and much low land. CMEC-CNEEC JV do not polluted the water body by dumping waste materials from the project site.
25	Use of Forest Resources, Hunting and Poaching	Biodiversity impacts	CMEC-CNEEC JV did not used forest recourses and Hunting and Poaching of any this near the project area of substations
26	Avian Protection	Biodiversity impacts	Bird mainly live in a locality where the tree, sufficient food and locality area where human beings are available. CMEC-CNEEC JV will install bird diverter devices as per the plan (if have) of PGCB at the substation project area.
27	Fire	Fire incident	A fire management plan to minimize the risk of forest fires and will be developed and implemented by the CMEC-CNEEC JV during the construction phase of the substation. PGCB will take initiation for fire management at the operation phase of substations
28	EMF	Health hazards	Power Grid Company of Bangladesh (PGCB) will give a provision about the measurement of EMF after operation of the substation grid.

Chapter 17



Final Conclusion and Recommendations

17.0 Conclusion

The substations need the yard cleanness and appropriate waste handling and disposal practices. Handling of hazardous and non-hazardous material needs to be improved especially in storage arrangement and prevention of spillage. So, it is felt that PGCB requires carrying out corrective measure mentioned in the CAP for compliance in regards of EHS safeguards. The package P7 substation under PGCB is financed by ADB. The engineering consultation is given by approved consultant of PGCB. The project is located at 5 locations under Khulan, meherpur, JasoreJhenaidah and Meherpur district of Bangladesh and constructed 5 substations under **CMEC-CNEEC JV**. An IIE has already been carried out for the project according to the requirement of PGCB and ADB for necessary environmental and social clearances. At substation project, Environment, Social, Health and Safety (ESHS) Management System (MS) is a comprehensive system of policies, procedures, and standard procedures that is developed and implemented to manage ESHS hazards and risks related to the development. But beyond these policies, regulations, mitigation measures of negative impact, **CMEC-CNEEC JV should** not be done anything for making the 230/132 kV substation at Rupsha and 132/33kV substation at Phultola, Meherpur, Mohespur, Monirampur.

CESMP is a living document that will revise according to the basic and detailed design of the project is developed and modified. CESMP report is work progress design of substation with mitigation measure of all aspects/activities/impacts of substation construction. Fire hazard, health and safety issues, EMF hazard, and impacts due to solid wastes willthe major impacts associated with any phase of the substation project. This may create long-term and irreversible effects to a limited degree on the receiving environment if no mitigation measures are adopted.

However, in the case of **CMEC-CNEEC JV**all necessary implementation measures to mitigate adverse environmental and health and safety impacts have already been taken to meet National Environmental Quality Standards. On the other hand, the plant has a positive impact in terms of employment in the operation phase. Further, this will indirectly help in boosting up the national economic condition through foreign investment. An outline of environmental and social management plans have been given in the present report to mitigate/enhance the impacts, which generally occurs during the operation phase of substation

17.1 Final Recommendations

CMEC-CNEEC JV already has an own manual for developing 230/132/33 kV substations,under this package of Dhaka and Western Zone Transmission Grid Expansion Project (DWZTGEP).CMEC-CNEEC JVhas what thing [safety issue for workers, grievance mechanism, wage control, hazardous materials controls; various traffic and driving regulations, solid waste, codes and restrictions; security, hygiene, ergonomics, medical and first aid information; etc.] mentioned in the CESMP, these will maintain in ESHS issues.

- CMEC-CNEEC JV shall have an Occupational Health, Safety, and Accidents Prevention Plan, who shall establish the necessary policies and the staff's obligation to know, comply with, and respect these policies.
- The CMEC-CNEEC JV shall oblige its employees, suppliers and agents related to the contract execution to comply with all conditions relating to occupational health, safety, and accident prevention, as established by the contract documents.
- Whenever the Environmental Supervising Entity requires, the CMEC-CNEEC JV shall review and adjust the Occupational Health, Safety, and Accidents Prevention Plan. Work may be suspended when the CMEC-CNEEC JV does not comply with the occupational health requirements or does not follow the instructions.
- The CMEC-CNEEC JV shall inform the PGCB in writing of any accident occurring at the work sites. CMEC-CNEEC JV shall also keep a register of all occupational illnesses occurring among the personnel and damages caused to property or public goods. Monthly reports on these topics shall be prepared.
- The management CMEC-CNEEC JV personnel shall be equipped with personal and mass protection equipment appropriate for the risks they face (proper clothing, helmet, gloves, boots, goggles, ear protection, when necessary, etc.). The protective equipment shall be of good quality and shall be periodically checked to guarantee their proper condition.
- Warning and informative signals shall be placed at important places at overhead line project to avoid accidents on the access roads, hazardous slopes and, in general, in places representing any kind of hazard.
- CMEC-CNEEC JV will give progress report of overhead power line project to PGCB and any kind of addition and alteration for the route of pylon making and site of substation small tower erection, which will be informed to PGCB. PGCB will also monitor and consult with CMEC-CNEEC JV for the work progress.
- This CESMP is a living document and CMEC-CNEEC JV will followed and regulated by CESMP document at the work period of substation
- CMEC-CNEEC JV has been monitored air, water (surface & groundwater) and noise level as a basement study of the substation project area. The results of the environmental parameters indicated that the existing environment is fair and quite. CMEC-CNEEC JV will start civil work at five location for substation project

Chapter 18



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Appendixes

(A-L)

Environmental Policy of CMEC–CNEEC JV

The proposed project of entitled” Design, Supply, Installation, Testing and Commissioning of 230/132/33 kV GIS Substation at Rupsha and 132/33 kV GIS Substations at Phultola, Monirampur, Maheshpur, Meherpur on turnkey basis (Package-7)” CMEC–CNEEC JV always focuses on infrastructure (civil and electrical) and industrial engineering and starts to work on Research & Development design consulting and advanced manufacturing. CMEC – CNEEC JV shape its core capabilities in five areas: marketing, business integration, investing and financing, project engineering and project management, and boost the transformation of an old state-owned foreign trade company which had relied heavily on government to a vibrant new enterprise with advanced concept, scientific management, and competitiveness.

CMEC–CNEEC JV has possessing strong project engineering ability and project management expert team in major industrial and construction sectors; capable of facilitating the owners’ objectives in project engineering, equipment performance and construction via good cooperation with design institutions.

CMEC-CNEEC JV having complete project management system and feasible program; having professional project management team and having strong coordinating capability to ensure the smooth, on-time, high-quality and cost-effective execution of the project. We are on the way to achieve the goal of becoming a large-scaled renowned international company that will renovate continuously technology trade and project contracting and provide value-added service to our clients. We will continue to grow in a fast and better way by deepening reform and implementing the new development strategy and try to build up a reciprocal and win-win situation with our customers. CMEC-CNEEC JV has already shown their performance to the project implementation to China. CMEC-CNEEC JV has achieved certificate on Environmental Management System (EMS) from their great achievement of environmental policy and objectives, significant environmental aspects, prevention of pollution and continual improvement of environmental performance as part of ISO 14001. CMEC-CNEEC JV has given greater emphasis on leadership and includes proactive initiatives to protect the environment, such as more sustainable use of resources and climate change mitigation measures. CMEC-CNEEC JV is to establish, implement, and maintain an OH&S management system to improve occupational health and safety as part of ISO 45001 eliminate hazards and minimize OH & S risks (including system deficiencies), take advantage of OH&S opportunities, and address OH&S management system nonconformities associated with its activities. CMEC-CNEEC JV has already achieved certificate on Occupational Health & Safety Management System (OHSMS). CMEC-CNEEC JV has a well-developed set of environmental policies, Acts and Rules for the construction of substation project that deal with project pollution of water, soil and air.

Bangladesh has a responsibility for control and abatement of water pollution falls to the Department of Environment (DoE) within the Ministry of Environment and Forest (MoEF). CMEC-CNEEC JV will show their performance to environmental activity at the project

locations, so that, all aspect and impact under control of Department of Environment as well as Government of the People's Republic of Bangladesh. Broadly, DoE are mandated to set and enforce environmental regulations for all forms of pollution and media (air, water, and soil). Specifically in relation to water pollution, DoE are responsible for: pollution control; setting water quality standards (WQS) for water use.

CMEC-CNEEC JV will also obey the environmental policy of Bangladesh. Bangladesh has National Environmental Management Plan, 1995, Environmental Conservation Act (1995), Environmental Quality Standards, the Environmental Court Act 2000, The National Water Policy, 1999 and Rules (ECR 1997). CMEC-CNEEC JV will take environmental policy of Bangladesh to achieve the construction of substation 5 location as per instruction of Power grid Company of Bangladesh (PGCB). During the construction of substation, the following policies will be kept by CMEC-CNEEC JV

- CMEC-CNEEC JV will ensure that employees have a level of knowledge and understanding appropriate to their environmental responsibilities and will aware of actions they can take to reduce their impacts.
- CMEC-CNEEC JV is committed to construction substations with all responsible, environmentally sound, and sustainable manner.
- CMEC-CNEEC JV will follow all aspect of environmental conservation rule (ECR) 1997 for the standard level of water, air and noise level at 5 project locations.
- CMEC-CNEEC JV will take initiative polices for the control, prevention and abatement of pollution of waters and suggest measures for the implementation of these water related policies. The quality of water will keep sustainable without disturbance of aquatic environment
- Air pollutants and fugitive dust will control and prevention it sources and also keep limit standard as per environmental quality system.
- Noise level will keep with limit (day-night) , so that, noise from the construction site of substation do disturbance of the surrounding environment;
- Solid waste and hazardous waste will be controlled as per national and international logistic and waste materials will be kept within the 3R (re-use, reduce and recycle) policies at the work site;
- CMEC-CNEEC JV will assess and measure significant impacts at the sub-station project site and work will be progresses with mitigation measure of above mentioned impacts
- CMEC-CNEEC JV will control greenhouse gases from their respective sources;
- CMEC-CNEEC JV will monitoring all environmental aspect/impacts during the period of substation construction;
- CMEC-CNEEC JV will control project site traffic, waste management , ecosystem and biodiversity
- CMEC-CNEEC JV will ensure to protect wildlife, soil erosion , dangerous substances and local flora & fauna;

- CMEC-CNEEC JV will recruit local labours and stakeholder to smooth continuation of construction activity of sub-station project.
- CMEC-CNEEC JV will following the Bangladesh Labour Law (2006) regard to minimum wage of labour, good workplace and health aspect and shelter;
- CMEC-CNEEC JV will make temporary boundary wall to protect wildlife and make water drainage system for storm water management
- All aspect of ISO 45001 will be followed by CMEC-CNEEC JV for occupational health & safety impacts at each workplace substation;
- CMEC-CNEEC JV will ensure labour accommodation, accidental and incidental event of labour , local transportation, supply pure drinking , community health aspect and will manage non-conformity issue at the project
- CMEC-CNEEC JV will assess OH & S risks under control of OHSA, NIOSH, taking into account factors and the needs and expectations of its workers and other interested parties (labours, stakeholders and local people) near the substation area;
- CMEC-CNEEC JV will carry out regular inspections, audits, and reporting and must be empowered in order to be effective as per appropriate authority (PGCB, PDB, DOE). CMEC-CNEEC JV will comply "emergencies" as per any environmental requirements, particularly when there is time.
- CMEC-CNEEC JV will use energy as efficiently as possible and communicate environmental information to all interested parties
- CMEC-CNEEC JV will avoid disruption to local habits and consult the community on environmental issues and improve the level of environmental quality by enhancing levels of specified requirements verified by inspection procedure
- Implement document preventive action procedures to eliminate (or reduce) the impact of pollution and contamination;
- CMEC-CNEEC JV will keep environmental and quality awareness training program during the period of construction of substation;
- CMEC-CNEEC JV will process of securing the protection and conservation of natural resources and ecosystem in the field of substation project. Greening organization offers a comprehensive approach to improving the environmental performance all aspects, including environmental logistic, biodiversity, vehicle management, local flora, fauna as well as air & water.

CMEC-CNEEC JV will dedicate to the continual improvement in the environmental performance and implement with this above environmental policies during all activities. All construction activities will be taken an integral and cultural part to construct the substation project.

 (Ge Wenbo)

PD/ CEO/ Country Manager (any)

JV of China Machinery Engineering Corporation (CMEC) & China National Electric Engineering Co., Ltd. (CNEEC)

Appendix B

Annexure-2

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

Memo No: 22.02.0000.018.72.055.20. 160

Date: 28/07/2020

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

Ref: Your Application dated 10/06/2020 and 19/07/2020.

With reference to the above, the Department of Environment (DOE) is pleased to award the Environmental Clearance in favor of the Dhaka and Western Zone Transmission Grid Expansion Project of Power Grid Company of Bangladesh Ltd. (PGCB) subject to fulfilling the following terms and conditions:

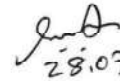
1. The activity under this Project shall not result in the loss of containment of any materials that would affect health or will have damaging impact on the environment or natural resources.
2. Proper and adequate sanitation facilities shall be ensured in labor camps throughout the proposed Transmission Pipeline construction program.
3. No solid waste can be burnt in the project area. An environment friendly solid waste management should be in place during whole the period of the project in the field.
4. Proper and adequate on-site precautionary measures and safety measures shall be ensured so that no habitat of any flora and fauna would be demolished or destructed.
5. All the required mitigation measures suggested in the EMP report along with the emergency response plan are to be strictly implemented and kept operative/ functioning on a continuous basis.
6. To reduce dust, spraying of water over the earthen materials should be carried out from time to time.
7. Resettlement plan should be properly implemented and people should be adequately compensated.
8. After the construction work, top soil should be properly restored. No wetland should be filled up.
9. Construction material should be properly disposed off after the construction work is over.
10. As described in the report environmental monitoring should be strictly followed and monitoring report should be shared with DOE to ensure the environmental management properly.
11. At the time of commissioning of the Transmission Pipeline and other facilities utmost precautionary measures should be taken to reduce the possibility of accident.
12. The Environmental Management Plan (EMP) included in the EMP Report shall strictly be implemented and kept functioning on a continuous basis.



13. In case of any emergency, the following information shall immediately be reported to Headquarter of the Department of Environment (DOE) simultaneously
 - a) Nature of incident (fire, accident, collision, etc.)
 - b) Personnel affected (injured, missing, fatalities, etc.)
 - c) Emergency support available and its location (standby transport, medical facilities, etc.)
 - d) Weather conditions
 - e) Current operations (abandoning the site, fire fighting, etc.)
14. All pollution incidents shall be reported immediately and simultaneously to the nearby Office of the Department of Environment.
15. Full and adequate utilization of the techniques for mitigation of pollution and environmental damage as well as that for treatment of wastes shall be ensured.
16. Power Grid Company of Bangladesh Ltd (PGCB) shall submit a detail work plan with time schedule of development activities at least 7(seven) days ahead of the work commences in the field to Headquarter of the Department of Environment (DOE) simultaneously.
17. On completion of the Transmission Pipeline and other construction, the project authority shall hand-over and leave the land to the actual land-owner in a replenished condition in terms of fertility and topography.
18. Comprehensive Environmental Performance report shall be submitted on a monthly basis to the DOE Headquarter including actual intervention and the rehabilitation, mitigation and treatment options adopted at the project site.
19. All parameters of effluent, gaseous emission, noise, solid waste, hazardous waste, etc. shall be within the limits in the Environment Conservation Rules (ECR) 1997. In case of non-coverage of ECR 1997 the World Bank Environment, Health and Safety Guideline shall be adhered to.
20. There shall be specific format for Environment Monitoring. Environmental Monitoring Reports shall be made available to DOE Head Quarter on a monthly basis during the whole period of the well development project.
21. Rehabilitation of human settlement or compensation for any sort of activity which will incur damage or loss of public or private property or any natural resources shall be addressed as per Government of Bangladesh rules and regulations;
22. No activity of cutting/razing/dressing of hill or hilly land is endorsed under this clearance without due permission/clearance of the concerned authority of the Government of Bangladesh.
23. Appropriate permission would be required to obtain from the forest department in favor of cutting/felling of any plant/tree/sapling forested by any individual or government before doing such type of activity.
24. Power Grid Company of Bangladesh Ltd (PGCB) shall extend active cooperation to DOE officials to facilitate their visit to the site as and when necessary.
25. This clearance is valid only for the said component of Power Grid Company of Bangladesh Ltd (PGCB) as figured out in the EMP report submitted to this department.



26. This clearance is valid for one year from the date of issuance and the project authority shall apply for renewal to the Head Office of DoE with a copy to the divisional/Regional offices of DoE concerned at least 30 days ahead of expiry.
27. Violation of any of the above mentioned conditions shall render this Environmental Clearance as void and legal action will be taken as per Environmental Conservation Act, 1995 and Environmental Conservation Rules, 1997.
28. This Environmental Clearance Certificate has been issued with the approval of the appropriate authority.


28.07.2020

(Syed Nazmul Ahsan)
Director (Environmental Clearance)
Phone # 8181673

Project Director (Chief Engineer)

Dhaka and Western Zone Transmission Grid Expansion Project
Power Grid Company of Bangladesh Ltd (PGCB)
NLDC Bhaban (8th floor), Avenue-3, Jahurul Islam City
Aftabnagar, Badda, Dhaka-1212.

Copy Forwarded to :

- 1) PS to Secretary, Ministry of Environment, Forest and Climate Change, Bangladesh Secretariat, Dhaka.
- 2) Director, Department of Environment, Dhaka Regional/ Rajshahi/ Khulna/ Barishal/ Rangpur Divisional Office, Dhaka/ Rajshahi/ Khulna/ Barishal/ Rangpur.
- 3) Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

পেপ হাবিয়ার বাংলাদেশ
পরিচ্ছন্ন পরিবেশ



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

Memo No: 22.02.0000.018.72.055.20.115

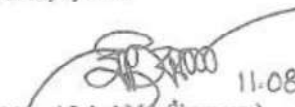
Date: 11/08/2021

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 14/07/2021.

With reference to your above application, the Department of Environment hereby renews the Environmental Clearance Certificate in favor of Dhaka and Western Zone Transmission Grid Expansion Project of Power Grid Company of Bangladesh Ltd. The terms and conditions stated in the Environmental Clearance Certificate 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 until 27 July, 2022. An application for further renewal along with a) the renewal fees (as per the ECR, 1997) b) VAT on renewal fees (in separate Treasury Chalan) and c) all associated documents shall be submitted to the Head Office of DoE with a copy to Concerned Regional/Divisional Offices at least 30 days ahead of expiry date.


(Masud Iqbal Md. Shameem)
Director (Environmental Clearance)
Phone: 8181673

11-08-2021

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) PS to the Hon'ble Secretary, Ministry of Environment, Forest and Climate Change, Bangladesh Secretariat, Dhaka.
- 2) Director, Department of Environment, Dhaka Regional/Rajshahi/Khulna/Barishal/Rangpur Divisional Office, Dhaka, Bogura, Khulna, Barishal, Rangpur.
- 3) Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

Number	Items	Environmental code of practices
ECOP 01:	Project Planning and Design for construction of TL	Proposed lines designs used for environmental assessment purposes must include, for each section of each alternative locations, the specific information essential to determining potential environmental impacts, including area of substation, types of electrical equipment, and area of substation. Most of impacts diminish for proper design of substation. Land use changes, Public Health (EMF), wildlife, forest, wetland and riparian impacts are the common for the long live for the substation project,. Some impacts are seen during the construction substation project. Hydrologic changes, soil erosion, health, & safety, resettlement impacts. The environmental code of practice on design to be needed all potential impacts are mitigated for the construction of new substation project. The design of substation is approved by PGCB and site clearance has already given by DOE, BD after submitting EIA and IEE
	Impacts	Any wrong design of substation, all of the adverse impacts will be seen during the construction and operation period of substation project. Even substation locations must have an alternative site, otherwise, it may affect to the surrounding environment
	Mitigation measure	Proper design of substation at the fixed location may have mitigated all of the adverse impacts. Biodiversity resettlement, public health for EMF, wildlife (bird) will be mitigated through proper design of substation project
ECOP 02	Location Selection	The location of substation will need to be selected for minimizing the impact of existing environment and underground utilities paralleling. substation will be selected location must be mapped and identified in detail to have a smooth proceedings during coordination with other involved parties, may it be utilities, government agencies, owners, etc. This very important during acquisition of rights of way and application of necessary permits. Power grid company Bangladesh Ltd has taken permission from DOE as site clearance of the project and forest department and has bought land from land owners through appropriate way. However, any alternation and addition of substation, CMEC-CNEEC JV will take permission from PGCB.
	Impacts	Substation locations will be 400-500 meter far away from existing house hold which would negatively impact the land HHs
	Mitigation measure	PGCB will be given solution for this existing situation for the location of substation project.
ECOP-03	Tower in	Small towers transformers & control building is the key component for the substation project

	substation yard, transformers & control building,	
	Impacts	During the erection small towers, health & safety impacts, incidental/accident impacts might be happened. EMF will be affected from transformers. The higher EMF issues may have health effect to local people, flora and wild life.
	Mitigation measure	Proper PPE including safety belt and work permit for erection small towers are the mitigation measure of such erection. De-shielding of EMF should be done by the appropriate design and location of transformer position in the substation yard
ECOP-04	Power Cable Installation at substation towers	Stringing of cable onto the erected small towers, accessories manually or using equipment.
	Impacts	Accident at tower site due to falling of accessory, snapping of earthwire of incorrect tensioning etc. Impact on safety of workers due to lack of PPEs.
	Mitigation measure	Adequate amount of PPEs will be kept at the workplace of power cable installation. Training on work at height will be given before started work and safety protocols for earthing, accessories, and installation of small towers. Proper tension maintained between the tensioner and the puller keeps the conductor clear of the ground and other obstructions that could cause damage.
ECOP-05	Construction Camps	Camp will be made at the new substation yard of Rupsha Phultola, Monirampur, Maheshpur, Meherpur. The worker camps mainly migratory in nature and away from local populations.
	Impacts	Health & safety impact, dangerous species and wildlife
	Mitigation measure	CMEC-CNEEC JV will supply pure drinking water, kept carbolic acid at the camp to remove of snake and make temporary boundary wall around the camp and worksite area. Provision of adequate washing and toilet facilities to the workers should be made obligatory by the CMEC-CNEEC JV
ECOP-06	Waste Management	In the new substation project, solid waste, liquid and gaseous will be generated from the construction site of substation yard. Liquid waste (waste water) may be generated from pilling site of tower location. Gaseous waste (pollutants) may be generated from diesel engines, silencer pipe

Appendix C: Environmental Code of Practices

		of vehicle's exhaust. Dust including, PM10, PM2.5 may be generated from work side due to digging soil at the substation site. Solid waste included sludge will be made during pilling site from project area.
	Impacts	Air pollution, soil contamination soil erection may have seen as wastage impacts to the surrounding environment.
	Mitigation measure	Solid waste will kept in boxes as per color code and sold it approved vendors (DOE approved) for further 3R policy. Sludge management will be in proper way as per guideline of department of environment (DOE) , February 2015. Spraying water to the substation yard to mitigate the dust including SPM, PM2.5 and PM10
ECOP-07	Water Bodies	Water body may have near the substation site. The construction activities of substation may be polluted this water body
	Impacts	Soil erection, water pollution and water-flora impacts may be seen
	Mitigation measure	CMEC-CNEEC JV do not fall any liquid, solid waste to the water body during the period of the construction of substation project.
ECOP-08	Electromagnetic Field	The effect of electromagnetic field (EMF) may be disturbance to local community and flora & fauna. Electromagnetic radiations emitting from electrical equipment from substation which can cause childhood leukemia. According to the research of the World Health Organization, we can suffer from insomnia, anxiety, headache, skin burns, fatigue, and muscle pain because of radiations from high voltage (230/132 kV) substation. If such conditions really do occur, then electromagnetic radiations can be prevented from entering the human body by providing adequate shielding using metal. Things like buildings, trees, etc. can also serve as shielding for this purpose. In this way, we can reduce the health hazards caused by these dangerous radiations.
	Impacts	Health hazards
	Mitigation measure	EMF will be measured before and after construction of 230/132 substation projects. Any deviation from the two levels (before and after) will be take initiative for de-shielding to new construction of substation area.
ECOP-09	Public Health and Safety	Sometimes due to any fault or other factors electricity from substation can flow to ground through the equipment or a person near the project site HHs and APs. It can cause serious injuries or death to that person.

	Impacts	Health hazards
	Mitigation measure	Awareness program and public consultation may the mitigation measure of Public Health and Safety from the substation construction project.
ECOP-10	Material Storage, Transport & Handling,	Material Storage, Transport, & Handling are closely related to the substation construction project.
	Impacts	Fire incidence , traffic impacts
	Mitigation measure	CMEC-CNEEC JV will keep fire extinguishers, sand bucket at the substation project material storage area and traffic will be controlled by labour or store security personnel. Traffic materials will be kept at the material storage areas, road crossing area, and especially high-way crossing areas
ECOP-11	Cutting/trimming of Trees	Tree trimming should be done under the direct supervision of an arborist or an experienced individual trained in the proper procedures for performing this work. Hazards commonly associated with tree trimming include falls, electrocution, sharp objects, and struck-by at substation before land filling
	Impacts	Possible loss of biodiversity, and interference with public utilities.
	Mitigation measure	Do not attempt to trim or climb trees during inclement or windy weather. Tree plantation will be the next steps of mitigation measure for tree removed at the substation site before construction. About 50 trees will be planted at the substation area.
ECOP-12	Biodiversity	Changes to habitat composition will also change habitat quality for plants and animals which can have a positive, negative, or neutral effect depending on the species at the substation site.
	Impacts	Lose of flora and fauna
	Mitigation measure	CNEEC will be cut and cleaning minimum of flora at the substation site
ECOP-13	Natural Habitats	While the mixture of habitats created which can allow greater density and diversity of wildlife to be present at substation. This project may also produce a negative edge effect for some species which require large, undisturbed habitat. The owl is one example of a raptor dependent on old growth forest that is negatively affected by fragmentation. Woodland caribou, which require large tracts of

Appendix C: Environmental Code of Practices

		relatively undisturbed habitat may also be negatively affected by any habitat fragmentation effects caused by the substation project
	Impacts	Loss of Avian
	Mitigation measure	The activities of substation construction do not disturb the adjacent fauna which will be mitigation measure for natural habitats.
ECOP-14	Occupational Health and safety	Falling from height due to slips and trips from work on height at the substation project
	Impacts	Health & safety impacts
	Mitigation measure	Only exclusive trained and qualified workers will be climbed up to the tower. First aid box, tool box to talk and wear proper PPE which will be ensured by CMEC-CNEEC JV
ECOP-15	Community Health and safety	Community Health and Safety items include public health and safety concerns that may affect labours, stakeholders during construction activities of substation, and may also impact time away from work. Health and safety, and prevent disease and promote healthy and safe living are included in community health of the project.
	Impacts	Health hazard
	Mitigation measure	Awareness, safe drinking water, mask & hand washing for COVID19

Appendix D

Annexure-1



Ref. No.:27.21.0000.453.06.001.21.122

Date: 04/03/2021

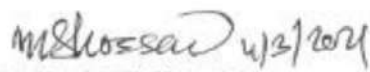
Appendix D

Office Order

As per approval of PGCB management a Grievance Redress Committee for "Dhaka & Western Zone Transmission Grid Expansion Project" has been formed by following members:

Sl. No.	Name & Designation	Name of the Office	Status in Committee
1.	Deputy Project Director of concerned package	DWZTGEP, PGCB	Convener
2.	Executive Engineer of concerned package	DWZTGEP, PGCB	Member
3.	Manager Accounts & Admin	DWZTGEP, PGCB	Member
4.	Sub-Divisional Engineer / Assistant Engineer/ Sub Asst. Engineer of concerned package	DWZTGEP, PGCB	Member
5.	Project Manager or representative of concerned Turnkey Contractor	Concern Turnkey Contractor	Member
6.	Representative of RAP implementation consultant	RAP implementation consultant	Member
7.	Local Union Parishad Member	Union Parishad	Member

Committee will manage construction related complaints & payment for compensation and make report time to time to undersigned.

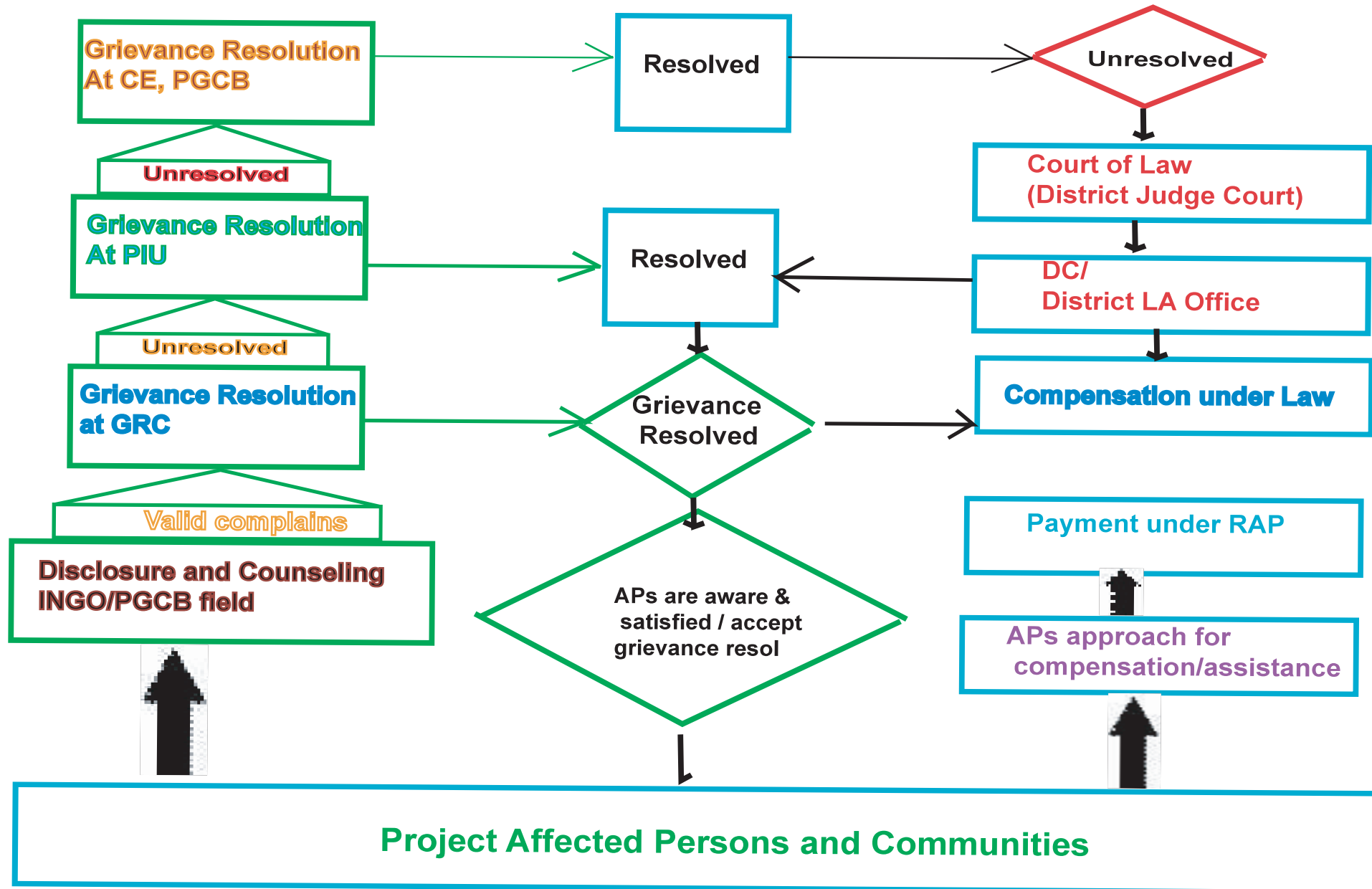

(Md. Sharfuddin Hossain)
Project Director (CE)
Dhaka & Western Zone Transmission
Grid Expansion Project
Mobile No: 01713850419

Copy to:

1. Managing Director, PGCB
2. Executive Director (P&D/O&M/Finance), PGCB.
3. Chief Engineer, (P&D), PGCB
4. Mr. Convener/ Member of the Committee.
5. BRM, ADB, Dhaka.
6. Office Copy.

Appendix D

Grievance Redress Flow Chart (Substation project)



Appendix D**GRIEVANCE FORM**

Indicate the Nature of Grievance(s)

Name.....

1.....

Address.....

.....

2.....

Contact.....

.....

Name of Sub Project

3.....

.....

.....

Date and registration of
grievance

4.....

.....

I agree that the duration of time to solve this grievance will be no longer than three (3) months unless the
Grievance Appeal Committee sees otherwise.I agree that the Grievance Appeal Committee is the final forum for decisions on any claim for
compensation of any sort and that all decisions will be guided by the applicable laws.

I will abide by the ruling of the Appeal Committee on the outcome of the grievance/complain.

Signature of Complaint

Signature of Agent

Signature of Grievance Officer

OFFICIAL USE

The outcome of the claim is in favour of the complainant

☐

The outcome of this claim is in favour of the defendant

☐

The outcome of this claim requires further research

☐-----
Signature of Convener

Appendix D

Compliant form (Worker) [অভিযোগ ফর্ম (কর্মী)]

Worker name (কর্মীর নাম)		Date and time submitted (জমা দেওয়ার তারিখ এবং সময়)	
Age বয়স		Gender (F/M) লিঙ্গ (F/M)	
Job title (কাজের শিরোনাম)			
Worker Address (কর্মীর ঠিকানা)		Worker Contact number (কর্মীর যোগাযোগ নম্বর)	
Details of grievance (অভিযোগের □□□□□)			
Date, time and location of event (তারিখ, সময় এবং অবস্থান)		Witness (es) if applicable [সাক্ষী (প্রযোজ্য হলে)]	
Description of Grievance (provide clear details of the grievance) (অভিযোগের বর্ণনা অভিযোগের স্পষ্ট বিবরণ প্রদান করুন)			
Proposed solution/ Recommendation প্রস্তাবিত সমাধান/সুপারিশ	Contractor's agency (ঠিকাদার সংস্থা)	Worker supplier (শ্রমিক সরবরাহকারী)	
Worker Signature (কর্মীর স্বাক্ষর)		Date	
Received by: Name and Signature (অভিযোগ গ্রহীতার নাম এবং স্বাক্ষর)		Date	

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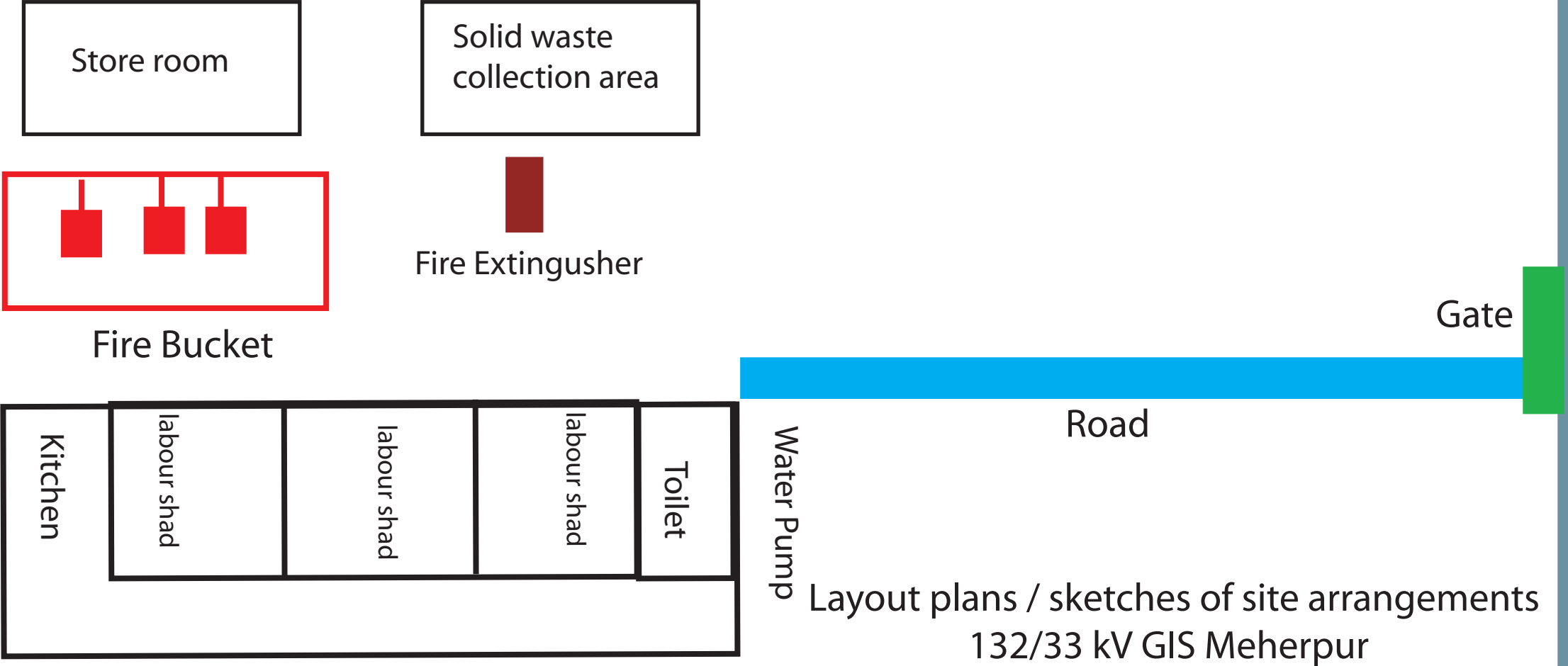
Appendix E

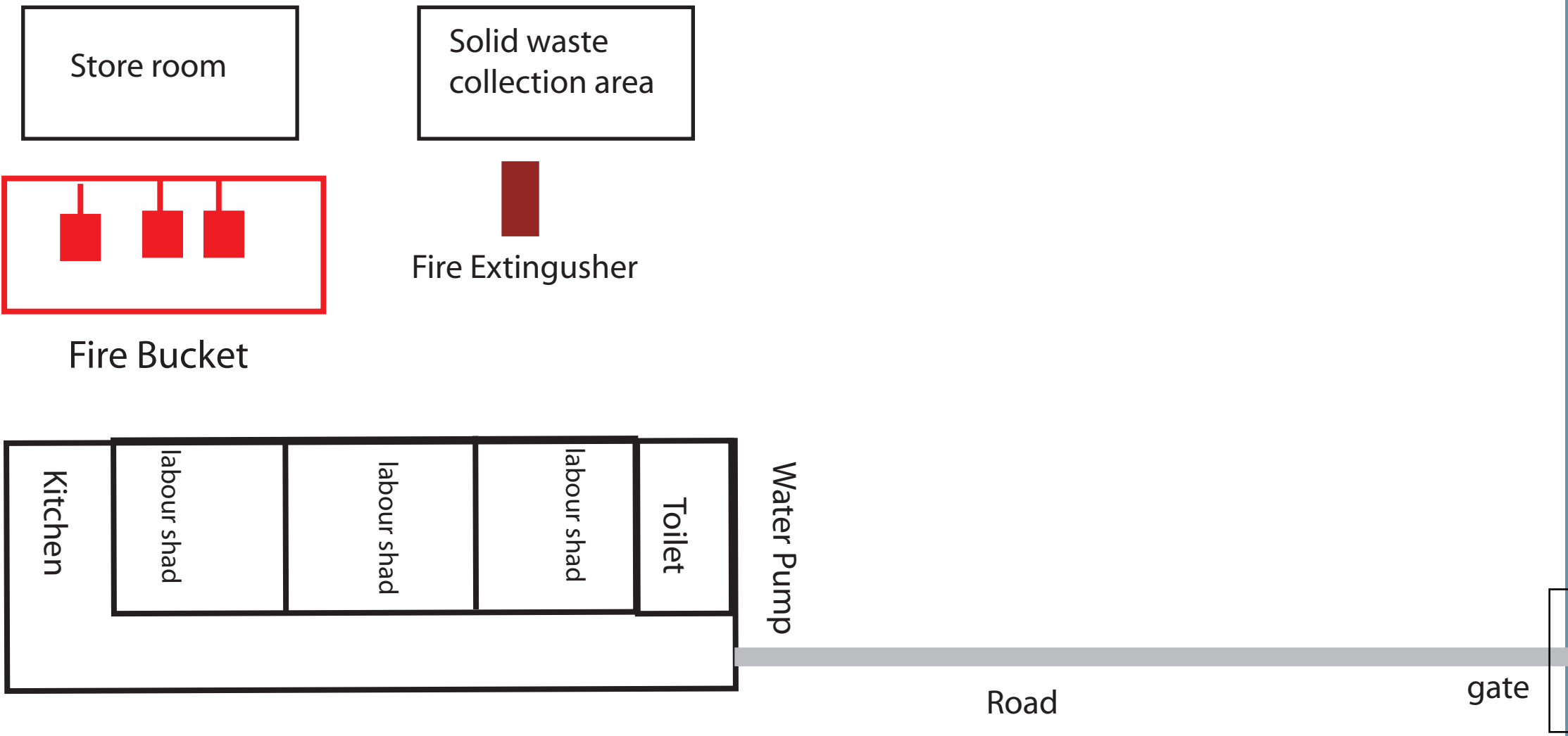
Incident/Accident Tracker

Date of Incident/ Accident				Time		11.30	
Name(s) of Persons Involved/ Identity of Damaged Property				Age(s)	25	Gender (M/F)	M
Address of Person(s) Involved				Work Post /Designation		Daily labour	
Supervisor			Location of Incident/ Accident				
Classification (Indicative / Serious/ Severe)							
Description of Incident/ Accident							
Nature (Work-related Injury, Non-work related injury, Illness, Environmental Harm, Damage to Property)						Not applicable	
Body Part Injured/ Part Damaged				Time Off Work (Hours/ Days/ Weeks/ Months)			
Cause of Incident/ Accident							

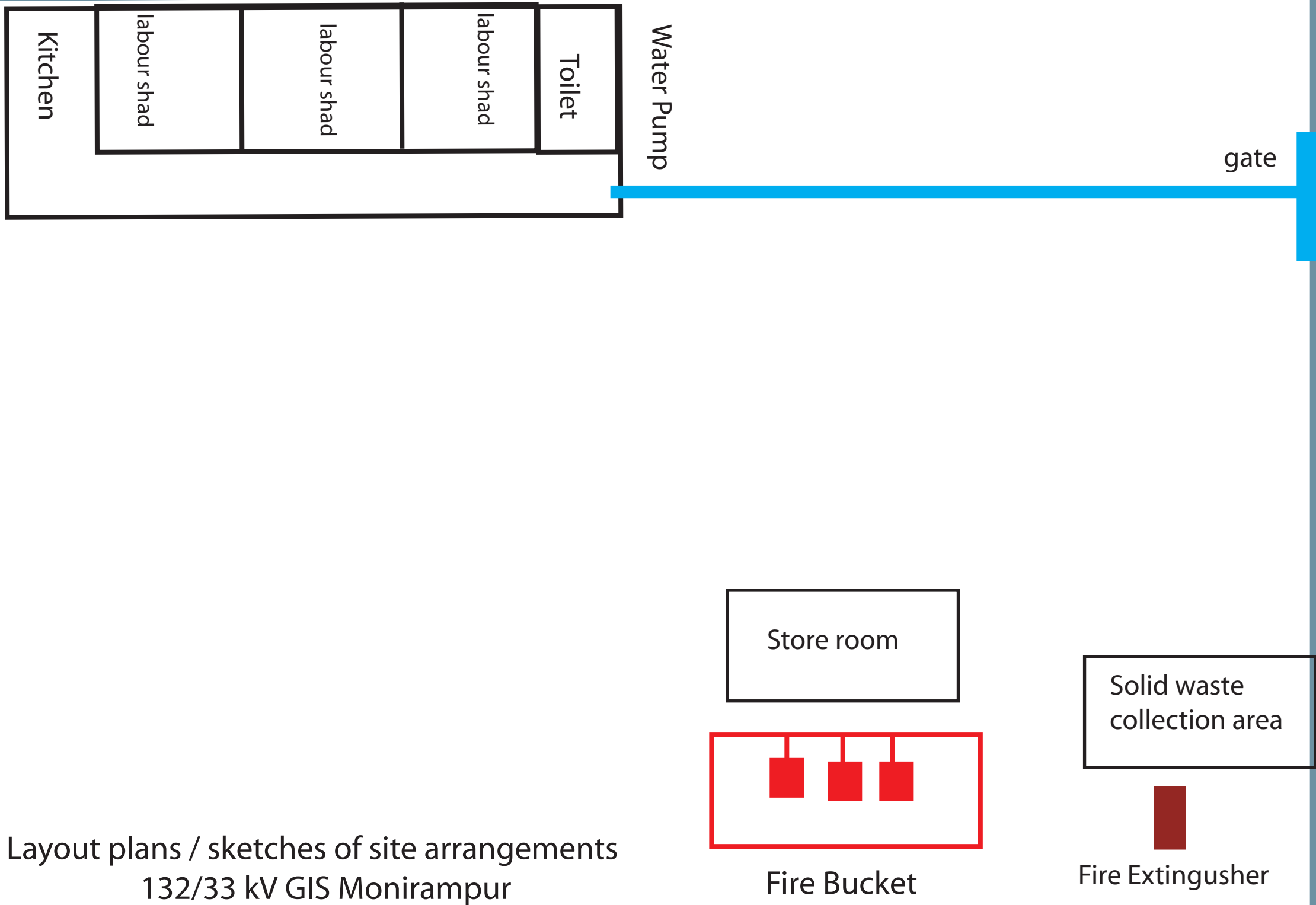
Appendix E

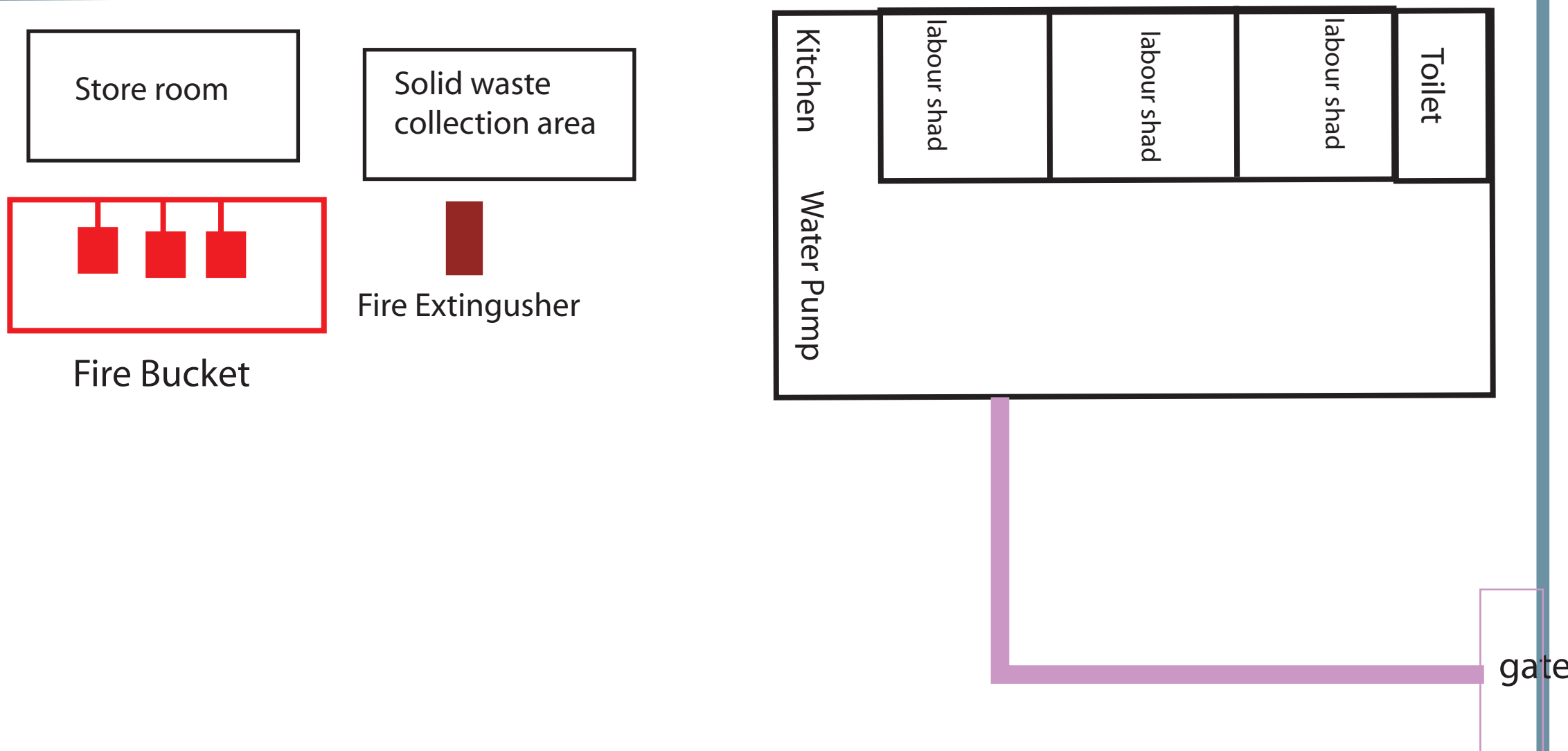
Direct Cause(s)		Root Cause(s)	
Notifiable/Non-Notifiable (indicate Persons or Authorities Notified)			
Actions Taken			
Immediate Actions			
Follow-Up Actions			
Police Investigation Ref: (If need)			
Mitigation Measures			
Received and Handled by:	Name of site manager		



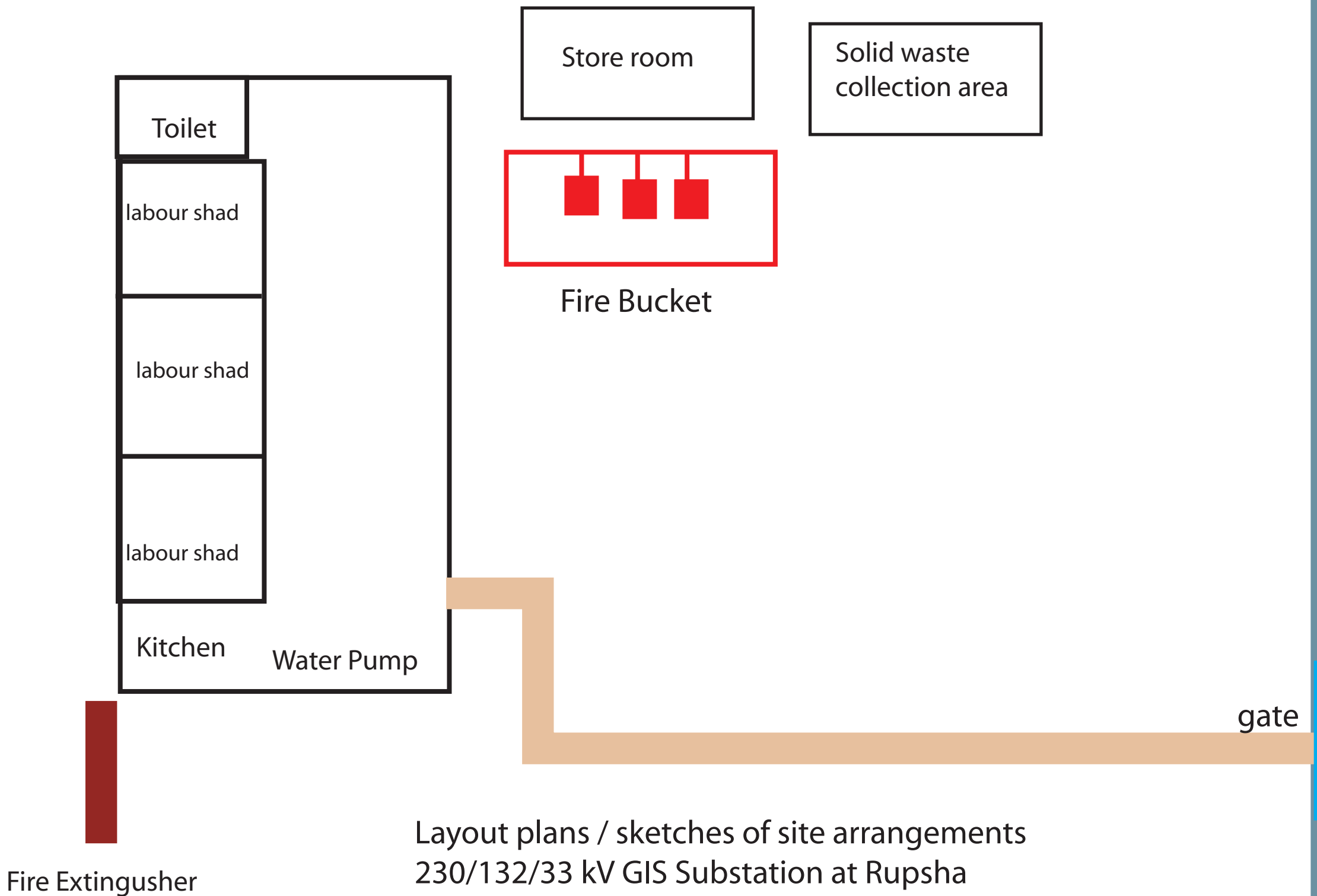


Layout plans / sketches of site arrangements
132/33 kV GIS Maheshpur





Layout plans / sketches of site arrangements
132/33 kV GIS Phultola





ACCREDITATION CERTIFICATE

Issued under the authority of Bangladesh Accreditation Act, 2006
by Bangladesh Accreditation Board (BAB), Ministry of Industries to

Envirocare International Ltd.

**House # 02, Road # 05, Dhour, Neshat Nagar
Turag, Dhaka, Bangladesh.**

This is to certify that this

Inspection Body (Type-A)

is accredited in accordance with the international standard

ISO/IEC 17020:2012

in respect of the associated scope, subject to the terms and
conditions governing the relevant conformity assessment
body (CAB) accreditation.

Certificate Number : **05.010.21**
Accreditation Date : **16 June 2021**
Date of Issuance : **16 June 2021**
Date of Expiration : **15 June 2024**




Md. Monwarul Islam
Director General

This certificate must be returned on request; reproduction must follow BAB guidelines. For the specific scopes to which this accreditation applies, please refer to the Directory of CABs at BAB website.



Certificate of Registration

This is to certify that

ENVIROCARE INTERNATIONAL LTD.
3RD FLOOR, HOUSE 09, ROAD 06, SECTOR 12,
UTTARA, DHAKA, BANGLADESH

has been assessed and registered by TCCPL as conforming to the requirements of:

ISO 9001:2015
[Quality Management System]

The Quality Management System is applicable to:

**Testing, Inspection, Assessment, Calibration, Research
and Development**

Certificate No: **Q-88018031383** | Certificate issue date: 18-03-2019 | Certificate valid till: 17-03-2022

1st Surveillance due before: 17-03-2020 | 2nd Surveillance due before: 17-03-2021

Managing Director



Accredited by **United Accreditation Foundation (UAF)** Full Member of IAF
3510, Colmar, Norfolk, VA 23509, United States of America (USA)
To check certification status: <http://uafaccreditation.org>

Trans Continental Certifications Pvt. Ltd.
www.tccplcertifications.com

To check certification status: <http://uafaccreditation.org>, www.tccplcertifications.com or write us at info@tccplcertifications.com
Certificate is the Property of TCCPL and shall be returned immediately when demanded
Lack of fulfilment of conditions set out for the issuance of this certificate and timely completion of
periodic surveillance audit may render this certificate invalid

CERTIFICATE - CERTIFICAT - ZERTIFIKAT - CERTIFICATO



Envirocare International Ltd



LES LATA ENVIROTECH SERVICES

(An ISO 9001: 2008 CERTIFIED COMPANY)

A CENTER FOR SALE, SERVICING AND CALIBRATION OF
AIR POLLUTION MONITORING SYSTEM & ENVIRONMENTAL CONSULTANCY

Office : K-307, UPSIDC Industrial Area Site-V, Kana, Greater Noida, Gautam Budh Nagar – 201310 (U.P)

Telefax : 0120 – 2341454 Cell : 09968204605, 09560354939

Branch : M-101, Gali No. 9, Master Park, Khora Colony, Post Office Sector – 62, Nodia – 201309 (U.P)

E-mail : lataenvirotechservices@gmail.com, lata_envirotech@yahoo.com, salesataenvirotech@gmail.com

Web : www.lataenvirotechservices.com Cell : 09968204605, 09560354939

CALIBRATION CERTIFICATE

M/S ENVIROCARE INTERNATIONAL LTD.

House-9 (3rd Floor), Road-6, Sector-12, Uttara,
Dhaka, Bangladesh

Page	:	1 of 3
Certificate No	:	LE/APM – 250/0094
Date of Calibration	:	04/10/2020

This is to certify that the **Combined PM 10 and PM 2.5 Sampler Model APM 250**. Make Lata Envirotech has been calibrated by us. Details of reference and their traceabilities to NABL accredited agencies are given blow.

SL. NO: 94-DTK-PK-2020

S. No.	Name of Unit Calibrated	Calibrated Traceable to	Master Calibration Certificate No. & Date of Calibration
Combined PM 10 and PM 2.5 Sampler Model APM 250			
(i)	Dry Gas Meter (PM 2.5) S. No: 160540378	Dry Gas Meter CSIR – NPL, Delhi	15080520/D5.08/C-025 Dt: 19/09/2020
		Stop Watch Belz Calibration Lab Faridabad	6160804 Dt: 06/09/2020
(ii)	Dry Gas Meter (PM 10) S. No: 160540377	Dry Gas Meter CSIR – NPL, Delhi	15080520/D5.08/C-025 Dt: 06/09/2020
		Stop Watch Belz Calibration Lab Faridabad	6160804 Dt: 02/09/2020
(iii)	Time Totalizer	Stop Watch Belz Faridabad, Haryana	6160804 Dt: 02/09/2020

Recalibration is due on 03/10/2021 or after a major repair or overhaul.



For Lata Envirotech Services

Horam Singh
Horam Singh
(Chief Executive)

LES LATA ENVIROTECH SERVICES

(An ISO 9001: 2008 CERTIFIED COMPANY)

A CENTER FOR SALE, SERVICING AND CALIBRATION OF
AIR POLLUTION MONITORING SYSTEM & ENVIRONMENTAL CONSULTANCY

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Web : www.lataenvirotechservices.com Cell : 09968204605, 09560354939

M/S ENVIROCARE INTERNATIONAL LTD.

House-9 (3rd Floor), Road-6, Sector-12, Uttara, Dhaka, Bangladesh

CALIBRATION REPORT

Environmental Conditions	Page : 2 of 3
Temperature in °C 32	Certificate No : LE/APM – 250/0094
	Date of Calibration : 04/10/2020

Combined PM 10 and PM 2.5 Sampler Model APM 250

SL. NO: 94-DTK-PK-2020

Flow Totalizer (PM 2.5)

Dry Gas Meter (PM 2.5)

S. NO. 160540378

S. NO.	Test Piece Measured Volume (M ³)		Test Piece Measured Volume (M ³)	Test Piece Measured Volume (M ³)		Reference TRUE Volume (M ³)	Calibration Factor For Volume Correction
	Initial	Final		Initial	Final		
1	15.9488	16.0314	0.0826	13.8566	13.9372	0.0806	0.976
2	16.0314	16.1160	0.0846	13.9372	14.0206	0.0834	0.986
3	16.1160	16.2120	0.0960	14.0206	14.1152	0.0946	0.985

Checked By



Certified By

LES LATA ENVIROTECH SERVICES

(An ISO9001: 2008 CERTIFIED COMPANY)

A CENTER FOR SALE, SERVICING AND CALIBRATION OF
AIR POLLUTION MONITORING SYSTEM & ENVIRONMENTAL CONSULTANCY

Office : K-307, UPSIDC Industrial Area Site-V, Kana, Greater Noida, Gautam Budh Nagar – 201310 (U.P)
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Branch : M-101, Gali No.9, Master Park, Khora Colony, Post Office Sector – 62, Nodia – 201309 (U.P)
E-mail : lataenvirotechservices@gmail.com, lata_envirotech@yahoo.com, salesataenvirotech@gmail.com
Web : www.lataenvirotechservices.com Cell : 09968204605, 09560354939

M/S ENVIROCARE INTERNATIONAL LTD.

House-9 (3rd Floor), Road-6, Sector-12, Uttara, Dhaka, Bangladesh

CALIBRATION REPORT

Environmental Conditions	Page : 3 of 3
Temperature in °C 32	Certificate No : LE/APM – 250/0094
	Date of Calibration : 04/10/2020

Combined PM 10 and PM 2.5 Sampler Model APM 250

SL. NO: 94-DTK-PK-2020

Flow Totalizer (PM 10)

Dry Gas Meter (PM 10)

S. NO. 160540377

S. NO.	Test Piece Measured Volume (M ³)		Test Piece Measured Volume (M ³)	Test Piece Measured Volume (M ³)		Reference TRUE Volume (M ³)	Calibration Factor For Volume Correction
	Initial	Final		Initial	Final		
1	15.5284	15.6174	0.0890	14.1284	14.2148	0.0864	0.971
2	15.6174	15.7120	0.0946	14.2148	14.3080	0.0932	0.985
3	15.7120	15.8184	0.1064	14.3080	14.4126	0.1046	0.983

Time Totalizer

S. NO.	Time Totalizer Reading (Hrs)		Test Piece Measured Time (M ³)	Reference TRUE Time (Min)	Calibration Factor
	I. Reading	F. Reading			
1	28.62	29.12	30	30.008	1.000

Checked By



Certified By

Harman Singh

**A CENTER FOR SALE, SERVICING AND CALIBRATION OF
AIR POLLUTION MONITORING SYSTEM & ENVIRONMENTAL CONSULTANCY**

Office : K-307, UPSIDC Industrial Area Site-V, Kana, Greater Noida, Gautam Budh Nagar – 201310 (U.P)

Telefax : 0120 – 2341454 Cell : 09968204605, 09560354939

Branch : M-101, Gali No. 9, Master Park, Khora Colony, Post Office Sector – 62, Nodia – 201309 (U.P)

E-mail : lataenvirotechservices@gmail.com, lata_envirotech@yahoo.com, salesataenvirotech@gamil.com

Web : www.lataenvirotechservices.com Cell : 09968204605, 09560354939

M/s Envirocare International Ltd.

House # 09 (Level 4), Road# 6, Sector # 12

Uttara, Dhaka-1230 Bangladesh

Page	1 of 2
Certificate No :	LE/APM – 860/285
Date of Calibration :	02/11/2020

CALIBRATION CERTIFICATE

This is to certify that the Respirable Dust Sampler Make Lata Envirotech Model APM 860 have been calibrated by us. Details of reference and their traceabilities to NABL accredited agencies are given below.

Respirable Dust Sampler Model APM 860

SL. NO: **285-DTH-PK-2020**

S. No.	Name of Unit Calibrated	Calibrated Traceable to	Master Calibration Certificate No. & Date of Calibration
<u>Respirable Dust Sampler Model APM 860</u>			
1	Flow Meter	Top Loading Calibrator LES-CCL, Grater Noida U.P	LES-CCL/FF/TLC/10 Dt: 20/10/2020
		Digital Pressure Indicator Belz Calibration, Faridabad, HR	7101815 Dt: 02/10/2020
2	Time Totalizer	Dig. Stop Watch Belz Calibration, Faridabad, HR	6182275 Dt: 20/10/2020

Recalibration is due on 01/11/2021 or after a major repair or overhaul.



For Lata Envirotech Services

Horam Singh
Horam Singh
(Chief Executive)

A CENTER FOR SALE, SERVICING AND CALIBRATION OF AIR POLLUTION MONITORING SYSTEM & ENVIRONMENTAL CONSULTANCY

Office : K-307, UPSIDC Industrial Area Site-V, Kana, Greater Noida, Gautam Budh Nagar – 201310 (U.P)

Telefax : 0120 – 2341454 Cell : 09968204605, 09560354939

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M/s Envirocare International Ltd.

House # 09 (Level 4), Road# 6, Sector # 12 Uttara, Dhaka-1230

Bangladesh

CALIBRATION RESULTS

Environmental Conditions	Page	2 of 2
Temperature in °C	Certificate No :	LE/APM – 860/285
32	Date of Calibration :	02-11-2020

Respirable Dust Sampler Model APM 860

S. NO: 285-DTH-PK-2020

FLOW METER

S. No	Test Piece Measured Flow Rate (m ³ /min)	Reference True Flow Rate (m ³ /min)	Calibration Factor
1	0.760	0.750	0.987
2	0.880	0.870	0.989
3	1.000	0.985	0.985
4	1.110	1.090	0.982
5	1.230	1.215	0.988

TIME TOTALIZER

S. No	Time Totalizer Reading (Hrs)		Test Piece Measured Time (min)	Reference True Time (Min)	Calibration Factor
	I. Reading	F. Reading			
1	27.78	28.28	30	30.04	1.001



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Page	:	1 of 2
Certificate No	:	LE/LES – 411/0453
Date of Calibration	:	04/10/2020

CALIBRATION CERTIFICATE

This is to certify that the **Attachment for Gaseous Sampling Lata Envirotech LES 411** has been calibrated by us. Details of reference and their traceabilities to NABL accredited agencies are given blow.

Gaseous Sampling LES 411

SL. NO: 453-DTK-PK-2020

S. No.	Name of Unit Calibrated	Calibrated Traceable to	Master Calibration Certificate No. & Date of Calibration
(i)	<u>Gaseous Sampling LES 411</u>		
	Rotameter (0-3 Lpm) S. No. AG16L1911-797	Stop BUBBLE TUBE Belz Calibration, Faridabad Haryana	7094109 Dt: 20/09/2020
		Stop Watch Belz Calibration, Faridabad, HR	7094109 Dt: 20/09/2020

Recalibration is due on 03/10/2021 or after a major repair or overhaul.



For Lata Envirotech Services

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Horam Singh
(Chief Executive)

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CALIBRATION RESULT

Environmental Conditions	Page : 2 of 2
Temperature in °C 32	Certificate : LE/APM – 250/0094
	Date of Calibration : 04/10/2020

Rotameter (0-3 IPM)

S. NO. AG16L1911-797

S. NO.	Test Piece Measured Flow Rate (Lpm)	Reference TRUE Flow Rate (Lpm)	Calibration Factor
1	0.5	0.492	0.984
2	1.0	0.986	0.986
3	1.5	1.478	0.985
4	2.0	1.966	0.983
5	2.5	2.456	0.982
6	3.0	2.960	0.987


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Page	:	1 of 4
Certificate No	:	LES/APM 160/0134D
Date of Calibration	:	05/10/2020

CALIBRATION CERTIFICATE

This is to Certify That the LES Stack Sampler APM 160 have been calibrated by us. Details of reference unit and their traceability to NABL Accredited agencies are given below.

Stack Sampler Make Lata Envirotech Model 160.

Sl. No. 99-DTH-PK-2020

Sl. No.	Name of Unit Calibrated	Calibrator Traceable to	Master Calibration Certificate No. & Date of Calibration
Stack Sampler Make Lata Envirotech Model 160			
1	Pressure Indicator	Digital Pressure Indicator Belz Calibration, Faridabad, HR	7101815 Dt: 01/09/2020
2	Pyrometer (K-Type)	Millivolt Source meter Belz, Faridabad, Haryana	61182276 Dt: 01/09/2020
3	Stop Watch	Stop Watch Belz Calibration, Faridabad, HR	6182275 Dt: 02/09/2020
4	Rotameter (0-3 Lpm) Sl.No. AG17A2055-939	DRY GAS METER LESCCL CREATE NOIDA	LES-CCL/FF/FC/12 Dt: 07/09/2020
5	Rotameter (0-30Lpm) Sl.No. AG14E4080768	Stop Watch Belz Calibration, Faridabad, HR	6182275 Dt: 02/09/2020
		DRY GAS METER LECCCL CREATE NOIDA	LES-CCL/FF/FC/12 Dt: 26/09/2020
		Stop Watch Belz Calibration, Faridabad, HR	6182275 Dt: 01/09/2020
6	Vacuum Gauge	Vacuum Gauge Belz Calibration, Faridabad, HR	7115697 Dt: 02/09/2020
7	Pitot Tube Sl. No. PT-04	S TYPE PITOT TUBE LESCCL GREATER INDIA	LES-CCL/FF/PT/17 Dt: 07/09/2020
8	Nozzles	DIGITAL CALIPER Belz Calibration, Faridabad, HR	7115693 Dt: 25/09/2020

Recalibration is due on 04/10/2021 or after a major repair or overhaul.



For Lata Envirotech Services

Horam Singh
(Chief Executive)

Horam Singh

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Page	:	2 of 4
Certificate No	:	LES/APM – 160/0134D
Date of Calibration	:	05/10/2020

Combined Date Generated for Stack Sampler Make Lata Envirotech Model 160

SL.NO. 99-DTH-PK-2020

1. DIGITAL PRESSURE INDICATOR

Sl.	Test Piece Measured Reading (mm)	Reference True Reading (mm)	Calibration Factor
1	10.3	10.4	1.010
2	22.6	22.7	1.004
3	34.1	34.2	1.003
4	45.4	45.1	0.993
5	46.8	45.5	0.994
6	66.8	65.9	0.987
7	88.2	87.2	0.989
8	98.1	96.5	0.984
9	100.7	98.3	0.976
10	105.6	103.6	0.981

2. PYROMETER (K-TYPE)

Sl.	Test Piece Measured Temp.(0c)	Reference True Temp.(0c)	Calibration Factor
1	45	50	1.111
2	95	100	1.053
3	140	150	1.071
4	190	200	1.053
5	235	250	1.064
6	280	300	1.071
7	402	400	0.995
8	503	500	0.994
9	604	600	0.993

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Page	:	3 of 4
Certificate No	:	LES/APM 160/0134D
Date of Calibration	:	05/10/2020

3. STOP WATCH

Sl.	Test Piece Measured Time (Min)	Reference True Time (Min)	Calibration Factor
1	30	30.04	1.001

4. Rotameter (0-3 Lpm)

Sl.No. AG17A2055-939

Sl.	Test Piece Measured Flow Rate (Lpm)	Reference True Flow Rate (Lpm)	Calibration Factor
1	0.5	0.490	0.980
2	1.0	0.988	0.988
3	1.5	1.486	0.991
4	2.0	1.958	0.979
5	2.5	2.436	0.974
6	3.0	2.902	0.967

5. Rotameter (0-30Lpm)

Sl.No. AG14E4080768

Sl.	Test Piece Measured Flow Rate (Lpm)	Reference True Flow Rate (Lpm)	Calibration Factor
1	5	4.890	0.978
2	10	9.640	0.964
3	15	14.850	0.990
4	20	19.540	0.977
5	25	24.730	0.989
6	30	29.190	0.973

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Page	:	4 of 4
Certificate No	:	LES/APM 160/0134D
Date of Calibration	:	05/10/2020

6. Pressure Gauge (Gas)

Sl.	Test Piece Measured Flow Pressure (MMHG)	Reference True Flow Pressure (MMHG)	Calibration Factor
1	100	100	1.000
2	190	200	1.053
3	290	300	1.034

7. Pressure Gauge (SPM)

Sl.	Test Piece Measured Flow Pressure (MMHG)	Reference True Flow Pressure (MMHG)	Calibration Factor
1	110	100	0.909
2	210	200	0.952
3	310	300	0.968
4	420	400	0.952

8. DIA OF NOZZLES

Sl.	Nozzles Dia mm (Inches)	Test Piece Measured Dia (mm)
1	3.175 (1/8")	2.9
2	6.350 (1/4")	6.2
3	9.525 (3/8")	9.4

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CALIBRATION CERTIFICATE OF PITOT TUBE

Calibration Certificate No.	LES/Pitot/0134OD	Calibration Date: 05/10/2020	Page 1 of 1
Suggested Date of Next Calibration: 04/10/2021			
Sl. No.	Name of Unit Calibrated	Calibrated Traceable to	Master Calibration Certificate No. & Date of Calibration
1	Pitot Tube Sl. No.: PT-04 Length: 1 mtr	S TYPE PITOT TUBE LESCCL GREATER INDIA	LES-CCL/FF/PT/17 Dt: 03/10/2020

Calibration S Type Pitot tube mentioned above was carried out at variable wind speed tunnel facility of LATA ENVIROTECH. Air velocities were obtained from the differential pressure reading using FCRI calibration Pitot Tube, Calibration has been done in full range of velocity (2-25 m/sec). Calibration digital indicator have been used to record deferential pressures.

TEST OBSERVATION AND RESULTS

Sl.No.	FCRI Calibration 'S' Type Pitot Tube K= 0.8437		S' Type Pitot Tube (Under Calibration)	
	Daynamic Pressure (mmwc)	Air Velocity (m/s)	Daynamic Pressure (mmwc)	Factor K
1	6.8	9.82	6.6	0.856
2	9.9	11.85	9.7	0.852
3	12.5	13.32	12.1	0.858
4	14.6	14.39	14.2	0.856
5	17.9	15.95	17.1	0.863
Average coefficient				0.857

Note:- if its tip gest damaged due to its long use under adverse operating conditions and improper handling, it is then recommended to get it recalibrated for good results.

For Lata Envirotech Service

Horam Singh

Horam Singh
(Chief Executive)



Design, Supply, Installation, Testing and Commissioning of 230/132/33 kV GIS Substation at Rupsha and 132/33 kV GIS Substations at Phultola, Monirampur, Maheshpur, Meherpur on turnkey basis (Package-7).

Contract No.: PGCB/AIIB/L0272A/DWZTGEP/GIS/P7

SN	Sampling	Date , Location with GPS
1	Air Quality Parameters	Name of the Place: GPS Date
2	Surface Water Quality Parameters	Name of water resource: GPS
3	Ground Water Quality Parameters	Name of water resource: GPS
4	Noise (Measured at Site Location)	
5	Soil pollution	Name of water resource: GPS
6	EMF	Name of the Place:

Sample collector
Envirocare

CMEC CNEEC JV

Representative
ADB

Representative
PGCB

Design, Supply, Installation, Testing and Commissioning of 230/132/33 kV GIS Substation at Rupsha and 132/33 kV GIS Substations at Phultola, Monirampur, Maheshpur, Meherpur on turnkey basis (Package-7).

Contract No.: PGCB/AIIB/L0272A/DWZTGEP/GIS/P7

Field Level data sheet of ambient air quality parameters

Company Name:

Date of sampling

Location of sampling

GPS Coordinate

Information about sampling

Table: Particulate Matter (PM)

SN	Name of parameters	Filter paper ID	Mass of filter paper		Volume of air (m ³)/ rota-meter reading		Total time
			Initial	Final	Initial	Final	
1							
2							
3							
4							
5							

Table: Gaseous Pollutants

SN	Name of parameters	Volume of absorbing reagent (ml)	Volume of air (m ³)/ rota-meter reading		Total time
			Initial	Final	
1	NO _x				
2	SO ₂				
3	CO				
4	O ₃				

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Design, Supply, Installation, Testing and Commissioning of 230/132/33 kV GIS Substation at Rupsha and 132/33 kV GIS Substations at Phultola, Monirampur, Maheshpur, Meherpur on turnkey basis (Package-7).

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Noise Level

Location	Noise level		GPS

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Safety Training on Substation Construction

1.0 Materials Handling:

In the training program of materials handling of substation project, the following matter will be discussed by CNEEC

- ❖ Aluminum is having sufficient conductivity. More over it is light in weight. Which results in low conductor weight and less sag. The only limitation is its low tensile strength. To overcome this limitation steel core is used for increasing the tensile strength of aluminum conductor such as in ACSR (Aluminum conductor steel reinforced) conductor.
- ❖ In the unloading, handling, and storage of structures, care should be exercised so as not to damage the surface or surface coating, or deform the members. Bare wire rope or steel chains should not be used for handling without adequate protection of the surface. Structural members should not be dumped, dragged, rolled, dropped, nor used as loading or unloading skids or blocking.
- ❖ Heavy members should not be stacked on top of lighter members. The maximum weight of material bundles should not exceed a specified weight, typically 1600–1800 kg (3500–4000 lb), to facilitate handling and unloading. Components with dissimilar finishes should not be stored over one another to minimize discoloration of the lower members.
- ❖ Care should be taken for substation materials to ensure proper blocking, stacking, and handling of concrete members. Refer to the structure drawings and instructions to verify correct lifting methods, replacement of support blocking, and stacking limitations.
- ❖ It is very common for concrete poles of substation component to require a two-point pickup due to the weight and possible long lengths. Identifying the correct blocking locations is important to eliminate the potential of overstressing the member. CNEEC and PGCBL should verify correct blocking and number of possible layers for stacking to avoid damage to concrete members lower in the stack.
- ❖ The white rusting action will stop after exposure to air. When extended transport or storage is anticipated, either of the following two methods can be used to prevent oxide formation:
 - a) Spacers may be placed between the nested pieces to ensure adequate ventilation.
 - b) Galvanized members may be treated with a solution which will inhibit oxide formation for six months to one year.
- ❖ Weathering steel fasteners, though rarely used on concrete poles, and other materials subject to deterioration should be protected from the elements during storage.
- ❖ During the course of the substation project, the material yard should be kept relatively neat and clean and the growth of vegetation kept to a minimum. Good housekeeping minimizes damage and loss of material in the yard, facilitates material handling and periodic physical inventories, and complies with environmental considerations.

- ❖ If delivery of material is made initially to the structure site for storage, care should be taken to avoid interference with foundation construction, access roads, or drainage. Truck delivery of complete structures from the manufacturer directly to the structure site can be advantageous since it eliminates at least one unloading and loading cycle.
- ❖ However, security of material stored at a structure site is minimal and the subsequent loss of time due to missing items can result in significant construction cost increases.

2.0 Piling Safety

Pile foundations are responsible for transmitting heavy concentrated loads of the superstructure to the underlying competent strata. Installation of pile foundations requires a lot of heavy-duty equipment, which makes it essential to follow the standard safety protocols.

Safety Program for piling

- ✓ All operations shall be carried out under the immediate charge of a qualified and competent foreman who shall also be responsible for the safety arrangements of the work.
- ✓ For work during the night, the lighting of at least 100 lux intensity shall be provided at the worksite.
- ✓ Every crane driver or hoisting appliance operator shall be competent to the satisfaction of the engineer-in-charge
- ✓ The personnel under the age of 21 years shall not be in charge of any hoisting machine including any scaffolding, winch, or give signals to the operator.
- ✓ In the case of deep foundations (20 meters), working in compressed air requires several precautions to be taken to safeguard the workmen against severe hazards to life, compressed air disease, and related ailments.
- ✓ Depth of piling depend on the soil test report which will be done by CNEEC before started the civil work at substation locations

2. Piling Rig Safety

- The pile drivers shall not be erected in dangerous proximity to electric conductors.
- If two pile drivers are to be erected at one place, these shall be separated by a distance at least equal to the most extended leg in either rig.
- The frame of the rig shall be structurally safe for all anticipated live, dead, or wind loads.
- A suitable test shall be carried out by the structural foreman whenever there is any doubt about the structural strength.
- No pile driving equipment shall be taken into use until it has been inspected and found to be safe.

- The pile drivers shall be firmly supported on heavy timber sills, concrete beds, or other secure foundations.
 - The rig shall be secured with a minimum of four guys to ensure the stability to prevent accidents due to wind, storm, gales, and earthquake.
 - The pile driving equipment in use shall be inspected by a competent engineer at regular intervals, not exceeding three months.
 - The pile lines and pulley blocks must be inspected by the foreman for any type of defects or wear and tear, before the beginning of each shift,
 - The defective parts of pile drivers, such as mechanical slings, sheaves, and hose shall be repaired only by competent persons and inspected by foreman-in-charge of the rig.
 - Any air or steam equipment shall be repaired while it is in operation or under pressure.
 - The hoisting ropes on pile drivers shall be made of galvanized steel.
 - Easily accessible shut-off valves shall control steam and airlines.
 - The hose of air and steam hammers shall be securely lashed to the hammer to prevent it from whipping if a connection breaks.
 - When the hammer is not in use, it shall be in dropped position and held in place by a cleat, timber, or another suitable means.
 - For every hoisting machine and every chain rig hook, shackle, swivel and pulley block used in hoisting, the safe working loads shall be ascertained.
 - Regular testing shall be carried out on the hoisting machines, and the working load shall be considered as half of the tested load.
1. Motor gearing, electrical wiring, transmission, and other dangerous parts of hoisting machine should be provided with adequate safeguards.
 2. The workers are employed on electrical installations work, which is already energized, insulating mats, and wearing apparel, such as gloves, etc., shall be made mandatory.
 3. When loads have to be inclined, they must be adequately counterbalanced, and the tilting device shall be secured against slipping.
 4. Necessary precautions shall be carried out to prevent a pile driver from overturning if a wheel breaks.
 5. Adequate precautions shall be carried out to prevent the hammer from missing the pile.
 6. To prevent the long piles and heavy sheet piling against falling, they shall be secured in place prior to piling work.
 7. When steam boilers are used, the safety regulations of boilers shall be strictly followed, and safety valves shall be adjusted to $7N/cm^2$ in excess of working pressure accurately.

3. Safety Precaution during Operation of Equipment

- ❖ The workers employed in the vicinity of pile drivers shall wear helmets conforming to accepted standards.
- ❖ The pile shall be prepared at a distance at least equal to twice the length of the longest pile from the pile driver.
- ❖ Piles being hoisted in the right should be so slung that they do not have to be swung or whip-round.
- ❖ A hand rope shall be tied to a pile that is being hoisted to guide and control its movement.
- ❖ When a pile is guided into position, workers shall not put their hands or arms between the pile and the inside guide, but shall use a rope for guiding.
- ❖ A pile shall be provided with an iron ring or cap over the driving end to prevent grooming before the pile is hoisted.
- ❖ When creosoted woodpiles are being driven, necessary precautions shall be taken to prevent workers from receiving skin or eye injuries from splashes of creosote.
- ❖ No air or steam shall be blown down until all workers are at a safe distance.

3.0 Excavation & Foundation Work Safety

Spread foundations, drilled shaft foundations, pile foundations, and anchors are treated. This guide is intended to be used as a reference source for those involved in the ownership, design, and construction of transmission structures. substation excavation and foundation work shall be carried out to the satisfaction of the PGCBL in accordance with the technical specifications and conform to location, lines, grades and cross sections shown on the construction drawing or as directed by the PGCBL. CNEEC will be give instruction to the labours about the total technical specification of Piling depth, pile cup and total foundation of substation tower

4.0 Tower Erection and Stringing Work Safety

Transmission tower is a tall structure, usually a steel lattice tower, use to support an overhead power line. There are procedure for the 230/132 kV substation tower for making or erection. Precise safety will be needed for straining of metal wire at the substation. CNEEC will be give training how erection of lattice tower and straining at substation

5.0 Usage of PPEs

Personal Protective Equipment (PPE) is to be worn during conditions of work when engineering and administrative controls do not provide adequate protection from hazards. The use of PPE is to be considered a last resort and is not to be considered as an alternative to following proper



Safety Procedures and Rules. PPE is issued by the CNEEC on the understanding that employees will take good care of it and will return it when it is no longer required. CNEEC will take steps to recover any losses due to the loss, abuse, or misuse of PPE supplied. GHPT will make site rules; NO PPE NO WORK”. CNEEC will give training on

- Head protection - Hard hats must be worn properly at all times.
- Eye & Face protection: Safety glasses complete with side shields must be worn by all employees except when working in areas where eye protection is not required (i.e. offices, enclosed equipment, vehicle cabs). In addition to safety glasses, mono-goggles will be worn for added protection where designated. When using grinders, cut-off saws, high pressure wash systems or similar equipment a face shield will be worn in addition to safety glasses.
- Cloths: The minimum standard requires that long pants cover the entire leg and that shirt sleeves cover the arms for at least 6" from the shoulder.
- Hand protection: Gloves must be worn where hazards to the hands exist. The selection of appropriate hand protection will depend upon the hazard involved. Gloves must be worn when handling wire rope, lifting/carrying objects with sharp edges, or where the hands may be exposed to chemical hazards.
- Safety Shoe: Safety footwear which has been designed and constructed to protect the feet against a variety of injuries including impact, compression and puncture, will be worn on all work sites. The minimum standard is safety work boots that are at least 6" high at the ankle and the boot laces must be fully laced up to provide ankle support.

6.0 Work on height: fall protection

- Fall protection: Fall protective equipment shall be used to prevent vertical falls where the working platform is at or more than 2.5 meters above floor level (the next level to which a worker could fall). The minimum standard for fall protection is a full body harness, with a lanyard tied to a secure anchor point. Use of safety belt and training on work at height will be given by CNEEC.

7.0 Environmental Protection and Basic Hygiene

Environmental protection based on the controlling and prevent air water contamination by the substation civil work. Noise protection and controlling of work place noise. Water uses will be minimum and water for work will be re-use to again and again. Lastly water will be resettling in hole with a certain period of time. After settled the waste water, upper portion of water from sludge will be discard to the nearby land. Fugitive dust is major air pollutants at the work site, water spray will be continuation always until fugitive dust mixed with water. CNEEC will give training of workplace noise and noise as per ECR 1997. Basic hygiene will be needed to accommodation place of labours and workers. CNEEC will be given facilities of 1;15 ratio toilet to accommodation location or rental house. Use of toilet, personal hygiene and safety from hygiene will be included in the training program.



8.0 Incident Reporting

Depending on the incident, official forms of incident reporting may have to be completed and submitted. The employee who reported the accident has to cooperate if called in for questioning to provide details needed. As a general rule, the employee must provide information in the incident report as accurately as possible on the following:

- The place of the accident
- The date and time of the accident
- The people involved or injured.
- Their position or involvement in the accident.
- Their actions immediately after the accident

China National Electric Engineering Co., Ltd (CNEEC) will take further necessary actions if any incidental occurrence will be happened during the construction of substation project.

9.0 Electrical Safety and tool box talk

Electrical safety is a general practice of workers who are exposed to handling and maintaining electrically powered equipment. This type safety will be needed during testing and commissioning of substation from one substation to another substation. The safety training based on

- High voltage 132 kV
- Metal conductors
- First aid after electrical shocked
- Tool box talk

10 First aid

Introduction to First Aid, Cardio Pulmonary Resuscitation (CPR), Choking, Bleeding, Fit, Fainting & unconsciousness, Shock, Bites, Dressing of wounds, Burn, Bone fracture, and Transportation of casualties.

12.0 Medical Treatment case

A medical treatment case is any injury sustained on the substation project job by an employee/labours/worker which requires medical treatment from a professional physician. A medical treatment case does not necessitate time off work beyond the date of the injury to be classified as such. China National Electric Engineering Co., Ltd (CNEEC) will be kept the contact number of ambulance services and list of contact number of health complex, potential doctor at TL project site. Any emergency situation one's can call ambulance and contact with health complex/hospital or a doctor.

13.0 Fire safety Training



Fire Accidents may be because of petroleum substance leak from containers, oil/gas leakage, or spillage in transportation & cylinder, diesel engines, electric short circuit, nature calamity, sabotage, etc. Broad measures for protection from fire incidences and control along with specific protection devices, systems are required in place and operational all the time. Fire Water system, Fire alarms and communication system, different types of fire extinguishers with standard operating procedure defined is must. All fire extinguishers should be ISI marked. In the fire training issues, the following aspect will be included

- Fire Triangle- A fire needs 3 elements in order for it to ignite – oxygen, fuel and heat – and a fire can be extinguished by removing one of these elements. For instance, covering a fire with a fire blanket removes the oxygen supply.
- Discovering a fire (assembly points)- training on how to at the appropriate assembly point of the substation project area
- Use of fire extinguishers- How to use a fire extinguisher for Pull the pin out and how the nozzle at the base of the fire.
- Mug drill for fire incident will be done by China National Electric Engineering Co., Ltd (CNEEC) at substation project site and storage area.

14. Earthquake Training

Earthquakes usually give no warning at all. “Earthquakes don’t kill people, but unsafe buildings acts to do it.” Before the earthquake: Check and safeguard accommodation place and overall facility. Report the concerned official about the cracks in the walls, loose attachments / equipment and unwanted debris, junk that may create problem. The training on earthquakes will be including from the end of the training, participants

- will enhance the understanding of the concept of Disaster Risk Reduction especially for Earthquake hazard
- will gain knowledge on the concept of Earthquake hazard and its impact (structural and non - structural)
- will strengthen their capacity on earthquake risk reduction such as preparedness and response

Earthquake modules will provide brief the concept of earthquake hazard and structural, social and economic impacts, historical events of earthquakes at substation work place, accommodation locations and storage areas. Safety tips will be trained for earthquake (before, during, after) steps of conducting community participatory through earthquake mug-drill.

Appendix J

**A ADB project of Power Grid Company of Bangladesh
Ltd**

on

**Design, Supply, Installation, Testing and Commissioning of
230/132/33 kV GIS Substation at Rupsha and 132/33 kV GIS
Substations at Phultola, Monirampur, Maheshpur, Meherpur on
turnkey basis (Package-7).**

Contract No.: PGCB/AIIB/L0272A/DWZTGEP/GIS/P7

Site Specific Labours Management Plan

Environmental & Social Unit (ESU), PGCB

October 2022

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1.0 Introduction

Site specific labor management plan provide an overview of the applicable Bangladesh legislative and WB Environmental and Social Standard 2 (ESS2) provisions and how the risks and issues related to labor in the sub-component component project of Power Grid Company of Bangladesh under Dhaka and Western Zone Transmission Grid Expansion Project (**DWZTGEP**) project to ensure reliable and quality supply of electricity to the rural and urban consumers in Bangladesh through improvements in technical efficiency of the distribution system. Labours will be managed during the implementation of the transmission line project. The site specific Labor Management Plans for the individual components will in due course be prepared by CMEC-CNEEC JV and will be reviewed and cleared by the Supervision consultant of ADB and PMU, PGCB as appropriate.

SN	Name of the ss	GPS
1	230/132/33 kV GIS Substation at Rupsha	22.77076 N 89.61685 E
2	132/33 kV GIS Substation at Phultola	22.92388N 89.48595E
3	132/33 kV GIS Substation at Monirampur	22.97617N 89.22928E
4	132/33 kV GIS Substation at Maheshpur	23.3422317N 88.9123916E
5	132/33 kV GIS Substation at Meherpur	23.79119N 88.6796798E

2.0 Overview of Labours use on the transmission line project

The Site Specific Labor Management Plan (SSLMP) has been developed to manage labor risks during the implementation of the substation project. The SSLMP is in line with national requirements as well as the objectives of the World Bank's Environmental and Social Framework, specifically objectives of Environmental and Social Standard 2: Labor and Working Conditions (ESS2) and Standard 4: Community Health and Safety (ESS4). The Project's Environmental and Social Assessment identified potential risks and impacts associated with substation Project implementation, associated with workers as well as community health and safety. Provisions of ESS, Labor Act 2006 (including Amendments of 2013 and 2018), and National Child Labor Elimination Policy 2010 etc have been thoroughly studied and cited to meet their requirement and obligations. Major points of consideration that include Conditions of Employment, OHS, Child/Forced Labor etc have also been referred as guidelines.

Various types of workers (Direct, Contracted, and Primary Supply workers), their estimated numbers, characteristics etc. have been set out in this LMP. Key potential environmental and social risks—such as unscrupulous labor practices, OHS, community risks, waste generation, risk of GBV, exploitation of child and forced labor have been identified. . Given the size of the project, the potential Environmental and Social (ES) risks and impacts, the capacity of the implementing agency to manage and mitigate the ES risks and the context, under which the project is being implemented, the ES assessment has set the project risk classification as high.

Grievance Redress Mechanism (GRM) for labor has been worked out so that any potential dissatisfaction, concerns, notice can be raised by anyone employed by the CMEC-CNEEC JV. For the PMU, PGCB, Contractor Management guideline has also been appended so that selection, retention, monitoring and guiding the contractor in its meeting of the ES requirement can be done in accordance with the ESS and national laws/acts. This LMP will form a part of the General Specification of Contract of the bidding documents. The preparation and implementation of site specific Labor Management Plan by the CMEC-CNEEC JV will be incorporated in the Bill of Quantities (BoQ) as a component of the general items of bidding document.

The transmission line project has four components as follows: Component A – civil work including piping work and pile cap ; Component B- erection of substation with definite height; and Component C – straining of metallic wire component D- management unit of the total substation project.

The substation project activities involve three types of employment, these include: (i) direct workers- the staff, such as PIU staff and who will be directly engaged by CMEC-CNEEC JV, (ii) contracted workers through third parties, such as sub-contractors and substation construction companies under trade license, who will employ consultants and contracted workers related to the construction of the 5-substation project, and (iii) primary supply workers – who will be engaged by the substation construction companies’ primary suppliers. There will not be any community workers involved in the project. The sections below provide detailed description of the type and number to be engaged throughout the project life for 24 months. Site Specific Labor Management Plans will be prepared by CMEC-CNEEC JV as part of SSESMP based on the provisions of these Labor Management plans and the details of labor to be used in those contracts. These plans will be reviewed and cleared by Supervision consultants of ADB.

3.0 Project Management Unit (PMU) and Project Implementation Unit (PIU) for ESPTNER

Implementation Support Mission of the Dhaka and Western Zone Transmission Grid Expansion Project (**DWZTGEP**) are jointly made a PMU of PGCB. The counter part of the package 7 SS project is ADB and consultants (environmental & Social) of ADB. The PIU of CMEC-CNEEC JV will be formed with project manager, substation Civil Engineers, Project coordinators, Site Managers/In-charge, Transmission Line Electrical Engineers, Environmental and Social Manager, Site Engineers, H&S Officers, Social Officers, Store Keepers and surveyors. The labour management plan is based on the PIU of CMEC-CNEEC JV. All labours of the substation project will be maintained the code of conduct of project implementation unit (PIU)

4.0 Project Approach to Labor and Working Conditions Management Plan

Transmission Line construction project will involve the mobilization and recruitment of a large number of labours during a limited period of time. Assuring good labour and working conditions for all persons whom will be engaged during the construction of transmission line project implementation of high priority for Power Grid Company of Bangladesh Ltd. The majority of

labours will belong to the sub-contractor. The accommodation will be the responsibility of the CMEC-CNEEC JV, which will have to draft their own plan in this regard, in compliance to the Bangladesh and World Bank (ESS2) legislation and norms, but also to the current Labor Management Plan.

The SSLMP represents an instrument that guides the CMEC-CNEEC JV, regarding their compliance with bidding documentations, in order to:

- ✓ Respect labour and working conditions for all their employees and the employees of their sub-contractors;
- ✓ Respect social and environmental conditions on sites of substations;
- ✓ Promote workers' conditions and rules for health, safety and security;
- ✓ Promote workers positive behaviour on the substation settlements; and
- ✓ Reduce negative impact of the substation project.

In particular, the provision of this Plan shall meet national legislation and international good practice in relation, but not restricted, to the following:

- ✓ Provision of all rights for all workers as envisaged in the national legislation (BLL 2006)
- ✓ All workers belonging to contractors and/or sub-contractors (and all other third parties) should be legally registered;
- ✓ Development of a worker registration system that enables CMEC-CNEEC JV to keep track of all workers on each site and to identify the person (organization) for whom they are directly working;
- ✓ CMEC-CNEEC JV will develop a register for all their workers. This register should contain data such as: name, age, sex, hours worked, wages, payments (including overtime payments) made, and any deductions made from their wages. The register will be in line with national requirements on registration of workers;
- ✓ Establishing a coherent and integrated grievance mechanism for all workers engaged in the substation project

Development of a workers' accommodation plan that should consider aspects such as:

- ✓ the provision of minimum amounts of space, heating, ventilation for each worker;
- ✓ provision of sanitary, laundry and cooking facilities and potable water;
- ✓ the location of accommodation in relation to the workplace;
- ✓ any health, fire safety or other hazards or disturbances and local facilities;
- ✓ the provision of first aid and medical facilities;

There are several stages to the process of addressing issues raised by workers' accommodation. These are:

- Assessing whether housing is needed for the project and if so, what sort;
- Assessing impacts on local communities and planning mitigation of potential negative impacts;
- Awareness of the national and local regulatory framework;

- Determining the standards to apply to the location of facilities, the construction of housing and provision of facilities; and
- Managing accommodation.

Purpose

This Labour Force Management Plan (LMFP) has been prepared by to comply with the minimum Government of Bangladesh and International Labour Standards, which include:

- Freedom of association and collective bargaining;
- Non-discrimination and equality of opportunity;
- Freedom from child labour;
- Freedom from forced labour;
- Retrenchment of which the core requirement of which is to have a retrenchment plan based on consultation and non-discrimination;
- Working relations which should include documentation and communication of conditions;
- Working conditions which should comply with collective bargains or, where these are not in place, national law minimums on matters such as pay, hours, etc.;
- Grievance mechanisms whereby an appropriate procedure must be in place for workers; and,
- Human resource policy whereby the Contractor is expected to have a human resource policy in place.

PGCB will ensure that the management of all labours working on the substation project including those who are indirectly employed:

- ✓ Complies with Bangladesh Labour law (2006) and meets the requirements of the International Finance Corporation (IFC) Performance Standards;
- ✓ Optimises the benefits associated with construction employment; and,
- ✓ Mitigates where possible any negative impacts that might occur as a result of construction employment or subsequent retrenchment.

This SSLMP seeks to achieve the above objectives through clear and manageable plans and procedures, underpinned by the explicit guiding principles detailed below. This SSLMP is applicable across 5 substation project by direct and indirectly-labour force at all skill levels working on the substation project development and implementation.

5.0 Brief overview of Labour Legislation;

5.1 Terms & Conditions

Terms and Conditions of employment are guided by The Bangladesh Labor Act, 2006 and Amendment 2013 that illustrate the basic conditions of employment which are materially consistent with ESS 2. 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. This

Act also contains:

- Contracts of employment
- Leave entitlements, i.e. annual leave, sick leave, maternity leave and compassionate leave
- The protection of wages (prohibition against unlawful deductions)
- Retrenchment procedures
- Fair and unfair reasons for termination of employment
- Grievance mechanism

5.2 Occupational health & safety

Chapter 6 of The Bangladesh Labor Act 2006 (**Safety**) specifically details the safety and working condition of the assigned workers. The salient aspects that this chapter illustrates are: Safety of building and machinery. It details the inspection requirement of these installations and actions to be taken if these are found unsafe for workers.

- **Precautions as to fire.** Illustrates fire safety requirement, equipment needed as well as actions to be taken in case of fire
- **Fencing of machinery, machinery in motion, automatic machines.** Details the fencing and safety requirement to be set around dangerous machinery.
- **Floors, Stairs and Passages.** Sets out the construction and setup requirement for safe access and ease of use.
- **Excessive weights.** Illustrates that no excessive weights to be lifted by any labours.
- **Dangerous fumes and explosive and flammable gas.** Details courses of action in case dangerous and explosive gases and fumes are in work area.
- **Personal protective equipment (PPE).** Makes it mandatory to supply workers with PPE.

5.3 Special Provision Relating to Health, Hygiene, and Safety

Chapter 7 of the Bangladesh Labor Act 2006 details:

- **Dangerous operations.** All potential dangerous operations to be declared and women and children to be barred from such operations.
- **Notice on accident.** Makes it mandatory to report any accident in workplace.
- **Notice on diseases.** If any worker is infected with any disease listed in the Second Schedule of the Act, it is mandatory to notify and the employer is obligated to treat the worker.
- **Restriction to Employ Women Worker.** Lists specific assignments where women may not be employed.
-

5.4 World Bank/IFC Safeguards Standards

They include:

- ✓ **ESS2 Labor and Working Conditions:** This Standard obliges the Developer (PGCB) to develop and implement written labor management applicable to the substation project. These procedures will set out the way in which project workers will be managed, in accordance with the requirements of national laws (BLL 2006).
- ✓ **ESS4 Environment and Social Framework on Community Health and Safety:** The Standard puts emphasis on community exposure to risks and impacts of the substation project and includes road safety risks; risks associated with security personnel as well as addressing water-related, communicable and non-communicable diseases (water born, COVID19) that can result from projects activities and have impact on project labor as well as the community; and
- ✓ **IFC Performance Standard 2:** Recognizes that, the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of labours or workers.

6.0 Responsible staffs and Procedure

Various aspects of the responsibility with respect to worker management have been described in details in the SSESMP. The summary of responsibility is appended below:

Overall Management. The PMU has the overall responsibility to oversee all aspects of the implementation of the LMP, in particular to ensure contractor compliance. PMU will address all LMP aspects as part of procurement for works as well as during contractor induction. CMEC-CNEEC JV is subsequently responsible for management in accordance with contract specific

Labor Management Plans, implementation of which will be supervised by the PMU. CMEC-CNEEC JV will be required to write, adopt, and implement a written Site Specific Labour Management Plan as part of the bidding document and contract before employing any labor in the work.

Occupational Health and Safety (OHS). Contractors must engage a minimum of one safety representative/ officer. He/she will ensure the day-to-day compliance with specified safety measures and records of any incidents. Minor incidents are reported to PMU on a monthly basis, serious incidents are reported immediately. Minor incidents are reflected in the quarterly reports to the WB, major issues are flagged to the WB immediately.

Labor and Working Conditions. Contractors will keep records in accordance with specifications set out in this LMP. PMU, PGCB may at any time require records to ensure that labor conditions are met. PMU will review records against actuals at a minimum on a monthly basis and can require immediate remedial actions if warranted. A summary of issues and remedial actions will be included in quarterly reports to the WB.

Worker Grievances. A Grievance Redress Mechanism (GRM) has been detailed with this LMP including the setup of a Grievance Redress Committee (GRC). Contractors will be required to abide by the provisions of the GRM. The Social Specialist/ Consultant will review records on a monthly basis. PMU will keep abreast of resolutions and reflect in quarterly reports to the ADB. Given the anticipated number of the project workers the labor GRM will be a separate document apart from the Project level

GRM, though personnel in the committees (GRC) on both the GRMs may have overlapping functions. Reporting Channels for the GRMs may also be same.

GBV, waste management, communicable diseases; CMEC-CNEEC JV will be fully responsible to ensure that their workers know and are trained on their obligations with respect to avoidance of any form of GBV, safe disposal of wastes and reporting of communicable diseases if they contract any. Continuous motivation, monitoring and reporting on the same is the responsibility of the Contractor. The PMU, PGCB will have a monitoring team to ensure the same.

Additional Training; CMEC-CNEEC JV will be required to ensure that the assigned workers are adequately trained and briefed with overall safety arrangement, use of equipment, GRM procedure, working conditions of the project. Training on GBV and preparation and obtaining signed code of conduct are also Contractor's responsibility.

6.1 Site-specific management for labor camps or rental house

As per terms and conditions of labours is guided by Bangladesh Labor Act, 2006 and Amendment 2013 that illustrate the basic conditions of employment which are materially consistent with ESS 2. The World Bank's Environmental and Social Framework, specifically objectives of Environmental and Social Standard 2: Labor and Working Conditions (ESS2) and Standard 4: Community Health and Safety (ESS4). The Project's Environmental and Social Assessment identified potential risks and impacts associated with substation Project implementation, associated with workers as well as community health and safety

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.

Various types of workers (Direct, Contracted, and Primary Supply workers), their estimated numbers, characteristics etc. will be set out in this site specific LMP. Key potential environmental and social risks—such as unscrupulous labor practices, OHS, community risks, waste generation, risk of GBV, exploitation of child and forced labor. For the accommodation of labours, there are two accommodated direct, contract and primary supply workers. The substation project activities involve three types of employment, these include: (i) direct workers—the staff, such as PIU staff and who will be directly engaged by CMEC-CNEEC JV, (ii) contracted workers through third parties, such as sub-contractors and substation construction companies under trade license, who will employ consultants and contracted workers related to the construction of the substation project, and (iii) primary supply workers – who will be engaged by the substation construction companies' primary suppliers. For the direct substation project labours will be adopted by CMEC-CNEEC JV and contract labour will be adopted by subcontractor of the substation project under supervision of CMEC-CNEEC JV. The primary supply labours will be local labours at the transmission project.

One of the positive impacts is local labours of any construction project. But the project will have to need skilled and contract labours from outside of the project area. But more negative impacts will be found for the foreign or outside labours. Outside labours must be needed for the

implementation of substation project work. The rental house and temporary labours shad will be necessary at the substation project area. The accommodation of labours, supply of drinking water, sanitation facilities, hygienic food will be provided to the labours for the outside (outside district). Substation project is moving type work; rental house is not always fixed along the substation right of way. CMEC-CNEEC JV has taken a plan to rent a house near the substation project site, so those rental houses have good sanitation facilities, supply drinking, shower water for bathroom and security guard etc. The rental house will also have facilities of cooking hygienic foods for labours and substation project site will be very near to the rental house, for this reason, no need extra transportation for carrying labours from rental house to project site. CMEC-CNEEC JV will also make labours shad in the substation project area where will have toilet, drinking water facilities and seat for taking lunch.

7.0 Policies and Procedure

This section outlines main policies and procedures to be followed during the implementation of the project and will be updated and amended as needed, after contracts have been awarded. Bangladesh has in place the Bangladesh Labor Act 2006 and Amendment 2013, National Occupational Health and Safety Policy 2013 that illustrates rights and responsibilities of employers and workers, conditions of employment, child and force labor issues, OHS requirements etc. In line with this LMP and National Labors Acts, the Contractor will prepare Labor Management Plan. The principles and procedures presented below represent minimum requirements, but are not an exhaustive list of requirements. As specified in the Labor Act and ESS2 of WB ESF, the employment of project workers will be based on the principles of non-discrimination and equal opportunity. There will be no discrimination with respect to any aspects of the employment relationship, such as recruitment, compensation, working conditions and terms of employment, access to training, promotion or termination of employment. The following measures will be developed by the CMEC-CNEEC JV and monitored by PMU to ensure fair treatment of all employees:

- As per Labor Code requirements, recruitment procedures will be transparent, public and nondiscriminatory with respect to ethnicity, religion, sexual orientation, disability, gender, and other grounds included in the Labor Code
- Applications for employment will be considered in accordance with the application procedures established by the Contractor.
- Clear job descriptions will be provided in advance of recruitment and will explain the skills required for each post
- All workers will have written contracts describing terms and conditions of work and will have the contents explained to them. Workers will sign the employment contract. Terms and conditions of employment will be available at work sites
- Unskilled labor will be preferentially recruited from the affected communities and local areas
- Employees will be informed at least two months before their expected release date of the coming termination. If more than 50 workers will be terminated within any three month

period, the Contractor will prepare a retrenchment plan for review and approval by the PMU

- The contracted workers will not pay any hiring fees. If any hiring fees are to be incurred, these will be paid by the Contractor
- The labor contracts will be developed in *Bangla* so as to be understandable by all workers
- In addition to written documentation, an oral explanation of conditions and terms of employment will be provided to workers who may have difficulties with understanding the documentation
- While communicating with women workers, it is to be ensured that they understand their rights and process of raising issues and grievances related to their employment
- PMU will include in contracts that all labors must be of the age of 18 years or more and that no forced or child labor would be allowed

The health and safety procedure illustrated in the Labor Acts, WB Environmental and Health Safety Guidelines (**EHS**G) (General and Infrastructure) and ESS 2 will be referenced all activities under the transmission (package 1) implementation. PMU is expected to carry out field visits and inspections of the construction from time to time. PMU will include into the bidding documents specific OHS standard requirements that all contractors will meet under this project. The standards will be consistent with local regulations, WBG EHS guidelines and Good International and Industry Practices (**GIIP**). The following OHS standard requirements should as a minimum be included in the OHS Plan to be prepared by the CMEC-CNEEC JV:

- ✓ Risk Assessment Procedure for substation project;
- ✓ Work permitting for hazardous work (working at heights, work on energized substation , work within confined spaces);
- ✓ Rules for life threatening works;
- ✓ Emergency response procedure;
- ✓ Fall prevention and working at heights;
- ✓ Excavations safety, Ladders and scaffolding safety; welding and cutting safety; Cranes, Derricks, and forklifts safety; power and hand tools safety;
- ✓ Respiratory prevention to chemical and airborne hazards (including dust, silica and asbestos);
- ✓ Electrical safety (hazardous energies control, safe distance work, wiring and design protection, grounding, circuit protection, arc fault protection, Electrical safety, PPE and dielectric tools); hazards communication; Noise and vibration safety; Steel erection safety; fire safety; material handling safety; concrete and masonry safety;
- ✓ Substation construction PPE;
- ✓ OHS training for substation project

In addition, OHS plans also include OHS accountability matrix for all staffs including substation Project manager, contract manager, OHS staff, foremen, and all labours with clear roles and

OHS responsibilities. CMEC-CNEEC JV must have its own OHS staff that will be responsible for the implementation and supervision of the OHS program. CMEC-CNEEC JV will also provide a safe workplace, therefore a risk assessment will be completed before the commencement of substation construction activities, and safety measures will be implemented in accordance with applicable safety standards. PPEs and other preventive measures will be provided at no cost for labours. All e labours will strictly follow rules for life threatening works (OHS rules that cannot be broken in any circumstances), which will be enforced under contractual matrix of consequences. Monthly OHS meetings will be conducted to discuss preventive measures, deviations and non-compliances, accidents and corrective actions. CMEC-CNEEC JV will conduct internal OHS surveys and audits to verify compliance of OHS practices. Non-compliances will be documented and reported internally. A time frame for a corrective action will be set and followed up. Daily OHS briefings will be conducted before the commencement of the works highlighting the hazards and preventive measures from each job. Contractors will document and report to PIU all accidents and illness with a day lost or more, fatalities or serious injuries that may happen at work site. There must be on site resources for first aid and for more serious injuries there must be a pre-approved health facility for medical treatment, as well as appropriate transportation of injured workers. CMEC-CNEEC JV will control the access to the construction site only to authorized people and verify if workers are meeting training and capacity requirements to carry out their jobs. All workers must complete at minimum an OHS induction to have access to the substation construction site.

If accommodations are provided for workers, CMEC-CNEEC JV will ensure that they are provided in good hygiene standards, with fresh drinking water, clean beds, restrooms and showers, clean bedrooms, good illumination, lockers, proper ventilation, safe electrical installation, fire and lightening protection, separate cooking and eating areas. PMU will conduct periodic supervision of CMEC-CNEEC JV's OHS performance, including site visits, at least monthly. These supervisions will cover compliance with above mentioned standards, accidents, violations of rules, recommendations, and progress of ongoing corrective actions. PMU, PGCB will include in the contract(s) as requirement for CMEC-CNEEC JV's to report on issues such as number of accidents rates, severity rates, number of recurring non-compliances, violations of rules, fatalities and serious injuries; and penalties for non-completion.

PMU will review and approve CMEC-CNEEC JV's safety plans and procedures.

PMU, PGCB will inform WB promptly about any incident or accident related to the project which has, or is likely to have a significant adverse effect on the environment, the affected communities, the public or workers (labor, health and safety, or security incident, accident or circumstance) as soon as reasonably practicable. Such events can include strikes or other labor protests, serious worker injuries or fatalities, project-caused injuries to community members or property damage. PMU will prepare a report on the event and the corrective action and submit to WB within 30 calendar days of the event.

CMEC-CNEEC JV will develop and implement Code of Conduct (CoC). The CoC will reflect the CMEC-CNEEC JV' core values and overall working culture. This will include provisions relating to GBV, waste management and disease prevention and work ethics. CoC will have to be understood and signed by all workers. The content of the CoC will be included in the Standard Bidding Documents (SBD).

CMEC-CNEEC JV will be required to provide the periodic information on the performance in terms of labor, OHS issues. The information will be included in the CMEC-CNEEC JV's monthly report and will be reviewed by PMU.

8.0 Age of Employment

Chapter III of Bangladesh Labor Act 2006 describes provisions related to Employment of Adolescent Worker. It details the restrictions of using child labor, where adolescent labors (age between 14 and 18, under Definition number 8, Chapter I, Labor Act 2006) can be used, fitness requirements, verification of age, reference to list of hazardous work not to be performed by adolescent workers, daily and weekly working hour restrictions, time of work, need for medical certificate etc. National Child Labor Elimination Policy 2010 also details the age of child (under 14 years) and adolescent (age 14-18), adolescent employment principles, their health and safety issues etc. Contractors and the monitoring PMU, PGCB officials is obliged to abide by the requirements of Chapter III of the Labor Act 2006. As per the Labor Act 2018 and ESF 5, no one below the age of 14 (minimum age) will be employed as a labor. A child over the minimum age (14) and under the age of 18 may be employed or engaged in connection with the project only if the work is not likely to be hazardous or interfere with the child's education or be harmful to the child's health or physical, mental, spiritual, moral or social development; an appropriate risk assessment is conducted prior to the work commencing; and the Borrower conducts regular monitoring of health, working conditions, hours of work and the other requirement of ESS5.

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.

9.0 Terms and Conditions

The terms and conditions of employment in Bangladesh are governed by the provisions of Bangladesh Labor Act 2006, Labor Law (Amendment) 2013, Bangladesh Child Labor Elimination Policy 2010. Chapter II of the Labor Act 2006 (Conditions of Employment and Service) makes it mandatory to provide workers with Appointment Letter, Identity Card, and a Service Book (Act 5 and 6). A registers of workers including details of all workers engaged also is mandatory to be maintained by the employer (Act 9). Leave Procedures are illustrated in Act 10. Termination of employment is described in Act 26 for both permanent and temporary workers.

Chapter IX details the working hours (maximum 8 hours a day ordinarily, except exceptional cases and 48 hours a week), rest hour (1 hour for more than 6 hours of work), overtime work (more than 8 hours a day with twice the rate of normal working hour), working hour for women (no work between 10 PM to 6 AM without her consent) and leave entitlement.

Chapter X of the Labor Act details wages and its calculation. Act 123 describes the time for wage payment (the wages of a worker shall be paid before the expiry of the seventh working day following the last day of the wage period in respect of which the wages is payable). Act 125 defines the cases where deductions may be made from wages.

Chapter XI of the Act (Act 148) makes it binding on the contractors (employers) to abide by the minimum wages rate. Contractors will also be required to comply with the most current decision of Wages Board assigned by the government. The Wage Board Order and the Labor Act specify the minimum wages, hours of work, overtime pay, leave entitlements, travelling and subsistence allowances and the issue of protective clothing.

Chapter XIII of the Act (**Trade Unions and Industrial Relations**) stipulates the right workers shall, without distinction whatsoever, have the right to form trade union primarily for the purpose of regulating the relations between workers and employers, or between workers and workers and, subject to the constitution of the union concerned, to join trade union of their own choice.

Upon receiving a public contract, the Contractor shall certify in writing that the wages, hour and conditions of work or persons to be employed by him on the contract are not less favorable than those contained in the most current wages regulation issued by the government recommended by the Wages Board Chairman. The employer shall maintain worker's register which will be available for inspection during working hours for the Inspector appointed by PMU. In ensuring full compliance with the law in this regard, the Contractor will be required to furnish PMU with copies of the Service Book or copies of contract of its entire workforce. Contractors will not be allowed to deploy any employee to work in the project if such copy of employment of that employee has not been handed to PMU. The Contractor also is obliged by the law to allow workers to form trade unions subject to the provision of Labor Act 2006. As a monitoring mechanism, a contractor shall not be entitled to any payment unless he has filed, together with his claim for payment, a certificate: - a) stating whether any wages due to employees are in arrears; b) stating that all employment conditions of the contract are being complied with. It will be a material term of the contract to allow PMU to withhold payment from contractor should the contractor not fulfill their payment obligation to their workers.

10.0 Grievance Redress Mechanism (GRM)

The Labor Act 2006 Section 33 provides for the Formal Grievance Procedure in case a worker who has been laid-off, retrenched, discharged, dismissed, removed, or otherwise terminated from employment. Section 202 (Subsection 24) describes the responsibilities of a Collective Bargaining Agent (CBA) especially bargain with the employer in matters of the conditions of work or environment of work of the workers and conduct cases on behalf of any individual worker or a group of workers under this Act. However, the PMU will require the Contractor to

develop and implement a Grievance Redress Mechanism (GRM) for their own workforce prior to the start of design stage. The Contractor will prepare their Labor Management Plan before the start of civil works, which will also include detailed description of the workers GRM. The GRM must be well circulated and written in a language understood by all. The workers GRM will include:

- ✓ A channel to receive grievances such as comment/complaint form, suggestion boxes, email, a telephone hotline that might also be anonymous;
- ✓ Stipulated timeframes to respond to grievances;
- ✓ A register to record and track the timely resolution of grievances;
- ✓ A responsible section/wing/committee to receive record and track resolution of grievances.

The GRM will be described in workers induction trainings, which will be provided to all project workers.

The mechanism will be based on the following principles:

- The process will be transparent and allow workers to express their concerns and file grievances.
- There will be no discrimination against those who express grievances and any grievances will be treated confidentially.
- Anonymous grievances will be treated equally as other grievances, whose origin is known.
- Management will treat grievances seriously and take timely and appropriate action in response. Information about the existence of the grievance mechanism will be readily available to all project workers (direct and contracted) through notice boards, the presence of “suggestion/complaint boxes”, and other means as needed.
- The Project workers’ grievance mechanism will not prevent workers to use conciliation procedure provided in the Labor Act 2006.

A PMU representative will monitor the Contractors’ recording and resolution of grievances, and report these to PMU in their monthly progress reports. The process will be monitored by the GRM Focal Point of PMU (preferably the Social Consultant).

11.0 CMEC-CNEEC JV Management

As part of the process to select construction Contractor who will employ contracted workers, the PMU will review the following information:

- Information in public records, for example, corporate registers and public documents relating to violations of applicable labor law, including reports from labor inspectorates and other enforcement bodies;
- Business licenses, registrations, permits, and approvals;

- Documents relating to a labor management system, including OHS issues, for example, labor management procedures;
- Identification of labor management, safety, and health personnel, their qualifications, and certifications;
- Workers' certifications/permits/training to perform required work;
- Records of safety and health violations, and responses; recordable incidents and corresponding Root Cause Analysis (lost time incidents, medical treatment cases), first aid cases, high potential near misses, and remedial and preventive activities required (for example, revised job safety analysis, new or different equipment, skills training, and so forth);
- 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; and
- Copies of previous contracts with contractors and suppliers, showing inclusion of provisions and terms reflecting/ materially consistent with ESS2.

The contracts with selected Contractor will include provisions related to labor and occupational health and safety, as provided in the World Bank Standard Procurement Document (SPD) and Bangladesh Labor Act 2006. The bid document will make it mandatory for the contractors to annex a Contractor's ESMP (CESMP) which will include work program, Code of Conduct, Traffic Management Plan, Labor Influx Management Plans, among others.

The PMU will manage and monitor the performance of the Contractor in relation to contracted workers, focusing on compliance by contractors with their contractual agreements (obligations, representations, and warranties). This may include periodic audits, inspections, and/or spot checks of project locations or work sites and/or of labor management records and reports compiled by contractors. Contractors' labor management records and reports may include: (a) a representative sample of employment contracts or arrangements between third parties and contracted workers; (b) records relating to grievances received and their resolution; (c) reports relating to safety inspections, including fatalities and incidents and implementation of corrective actions; (d) records relating to incidents of non-compliance with national law; and (e) records of training provided for contracted workers to explain labor and working conditions and OHS for the project.

12. Community Workers

The project is unlikely to engage any Community Workers.

13. Primary Supply workers

The primary suppliers for the project will mainly be construction material (brick, cement, rods etc) suppliers, Electrical and Sanitary Equipment suppliers, HVAC equipment (AC, Ventilation etc), IT and communication Equipment suppliers etc. Manufacturers of Electrical, Mechanical

and Plumbing (MEP), HVAC and IT / Communication equipment industries are not known to involve significant risks of child labor and forced labor. It is expected, that these primary suppliers will be large scale international companies. In case of construction material suppliers, Contractors shall be required to carry out due diligence procedure to identify if there are significant risks that the suppliers are exploiting child or forced labor or exposing worker to serious safety issues. In instances where foreign suppliers are likely to be contracted, the Contractor will be required to inquire during his/her procurement process whether the supplier has been accused or sanctioned for any of these issues and also their corporate requirements related to child labor, forced labor, and safety. If there are any risks related to child and forced labor, and safety identified, the Contractor will notify PMU and will address these risks and may avoid such suppliers, where possible.

ANNEXES

Annex I: Guidelines on the Code of Conduct

INTRODUCTION

This code of practice provides guidance to contractors who will undertake the substation construction facilities associated with this project. Construction of substation work is work carried out in connection with construction, and commissioning of substation along the ROW.

Substation Construction workers must always:

- Take reasonable care for their own health and safety
- Take reasonable care that their acts or omissions do not adversely affect the health and safety of other persons, and
- Comply with any reasonable instruction and cooperate with any reasonable policy or procedure relating to health and safety at the substation workplace.

MANAGING RISKS WITH CONSTRUCTION WORK

The first step in the risk management process is to identify the hazards associated with substation construction work. Examples of hazards include:

- ❖ Collapse of trenches
- ❖ Falling objects, for example tools, debris and equipment
- ❖ Hazardous manual tasks
- ❖ Structural collapse
- ❖ The construction workplace itself, including its location, layout, condition and accessibility The handling, use, storage, and transport or disposal of hazardous chemicals
- ❖ The interface with other works or trade activities
- ❖ The physical working environment, for example the potential for electric shock, immersion or engulfment, fire or explosion, slips, trips and falls, people being struck by moving plant, exposure to noise, heat, cold, vibration, radiation (including solar UV radiation), static electricity or a contaminated atmosphere, and the presence of a confined space.
- ❖ The use of ladders, incorrectly erected equipment, unguarded holes, penetrations and voids, unguarded excavations, trenches, shafts and lift wells, unstable structures such as incomplete scaffolding or mobile platforms, fragile and brittle surfaces such as cement sheet roofs, fiber glass roofs, skylights and unprotected formwork decks welding fumes, gases and arcs

SAFE WORK METHOD STATEMENTS (SWMS)

Who are involved in high risk substation construction work must develop and implement arrangements to ensure the work is carried out. This necessitates a SWMS, which is a written document that details high risk substation construction work activities to be undertaken, hazards or risks arising from those activities and measures to control the risks. All workers who will be involved in high risk construction work must be provided with information and instruction so they:

- Know what to do if the work is not being conducted in accordance with the SWMS.
- Understand and implement the risk controls in a SWMS
- Understand the hazards and risks arising from the work

This information and instruction may be provided during general substation construction induction training, workplace-specific training or during a toolbox talk by the principal of CMEC-CNEEC JV or subcontractor.

OCCUPATIONAL HEALTH SAFETY (OHS) MANAGEMENT PLANS FOR CONSTRUCTION PROJECTS.

An OHS management plan is a written plan that sets out the arrangements for managing some site health and safety matters. The intention of an OHS management plan is to ensure the required processes are in place to manage the risks associated with a complex construction project, as there are usually many contractors and subcontractors involved and circumstances can change quickly from day to day. An OHS management plan must be in writing and must be prepared by the principal contractor before a project commences. It should be easily understood by workers (including contractors and subcontractors). It may not be necessary to communicate the entire OHS management plan to all workers; however, they must be made aware of the parts that are applicable to the work they are carrying out. The OHS Management Plan must contain: arrangements for consultation, co-operation, and coordination:

- Arrangements for managing incidents
- Arrangements to collect and assess, monitor and review SWMS.
- Names of persons at the workplace whose positions or roles involve specific health and safety responsibilities, for example site supervisors, project managers, first aid officers
- Site-specific health and safety rules and how people will be informed of the rules

While OHS management plan is required for every substation construction project, CMEC-CNEEC JV may prepare a generic OHS management plan that applies to several construction projects, if the arrangements to manage work health and safety are the same for each construction project. However, the principal contractor must review and revise the plan to ensure it addresses the risks of the actual workplace.

INFORMATION, TRAINING, INSTRUCTION, AND SUPERVISION

All contractors and subcontractors must provide relevant information, training, instruction, and supervision to protect all persons from risks to their health and safety arising from construction work carried out. A range of activities can assist in ensuring people have the necessary knowledge and skills to complete the work safely, including general construction induction training and other training that may be specific to the workplace or the task the person is performing.

Information that might be provided includes workplace health and safety arrangements and procedures, such as for emergency evacuations. Information can be provided in various forms, including written formats or verbally, for example during workplace-specific training, pre-start meetings or toolbox talks. General construction induction training provides basic knowledge of construction work, the work health and safety laws that apply, common hazards likely to be encountered in construction work, and how the associated risks can be controlled. Any person who is to carry out construction work must successfully complete general construction induction training, for example project managers and engineers, foreman, supervisors, surveyors, and labours.

GENERAL WORKPLACE MANAGEMENT ARRANGEMENTS

The principal contractor must put in place arrangements for ensuring compliance with the following duties:

- Providing a safe working environment
- Zero tolerance to Child Labor
- Providing and maintaining adequate and accessible facilities
- Providing first aid
- Preparing, maintaining and implementing emergency plans

- Providing workers with PPE, if PPE is to be used to minimize a risk to health and safety
- Managing risks associated with airborne contaminants
- Managing risks associated with hazardous atmospheres including ignition sources I. Storage of flammable and combustible substances
- Managing risks associated with falls, and
- Managing risks associated with falling objects.

The principal contractors may put in place arrangements for ensuring compliance with the above requirements through contractual arrangements, but they cannot rely only on these arrangements to ensure compliance. The principal contractor may also coordinate with other subcontractors, and check compliance whenever the principal contractor attends the construction site.

Part II: Code of Conduct for CMEC-CNEEC JV

Each employee including trainee or volunteer of a Contractor who have interaction with the Project must sign this “Code of Conduct.” In this Code, “Contractor” shall mean and apply to the contractor, its employees, sub- contractor, officers, agents, representative or those contracted through the Contractor to perform services authorized by the contract. The contractor agrees to adhere to this Code of Conduct when providing services to this project. The Code of Conduct is in addition to all other contract requirements, policies, rules and regulations governing delivery of services. The purpose of the code is to protect vulnerable people from abuse, neglect, maltreatment and exploitation. It clarifies expectation of conduct of the parties and their employees, which includes administrative staff, care staff, support services staff and any others when interacting with the project. Contractor, its agents or representatives authorized through it shall not abuse, sexually abuse or sexually exploit, neglect, exploit or maltreat any fellow employees or people from general public/ community. Additionally, no person shall cause physical injury to any other person.

CMEC-CNEEC JV shall not by acting, failing to act, encouragement to engage in, or failure to deter from will cause any person to be subject to physical or mental abuse, sexual abuse or sexual exploitation, neglect, exploitation, or maltreatment. The Contractor shall not engage any person as an observer or participant in sexual acts.

CMEC-CNEEC JV understands and acknowledges that failure to comply with this Code of Conduct may result in corrective action, probation, suspension, and/or termination of contract.

Equally important to realize is that this Code also protects any person under the age of 18 years and any person 18 years of age or older who is physically or mentally handicapped or impaired due of mental illness, mental deficiency, physical illness or disability, or other temporary or permanent cause, to the extent that he is unable to care for his own personal safety.

1) Abuse shall include the following, but is not limited to:

- Harm or threatened harm, meaning damage or threatened damage to physical or emotional health and welfare of any person.
- Unlawful confinement.
- Deprivation of life-sustaining treatment.
- Physical injury including, but not limited to, any contusion of the skin, laceration, malnutrition, burn, fracture of any bone, subdural hematoma, injury to any internal organ, any injury causing bleeding, or any physical condition which imperils a person’s health or welfare.
- Any type of physical hitting or corporal punishment inflicted in any manner upon the body.

2) Sexual misdemeanor will include, but not be limited to:

Engaging in exploitive or manipulative sexual intercourse with any person. There will be zero tolerance to sexual misdemeanor including rape, defilement of minors/ sexual child abuse, sexual harassment and elopement.

- ❖ Taking indecent liberties with a person, or causing an individual to take indecent liberties with a person, with the intent to arouse or gratify sexual desire of any person.
- ❖ Employing, using, persuading, inducing, enticing, or coercing a person to pose in the nude.
- ❖ Employing, using, persuading, inducing, enticing or coercing a person to engage in any sexual or simulated sexual conduct for the purpose of photographing, filming, recording, or displaying in any way the sexual or simulated sexual conduct. This includes displaying, distributing, possessing for the purpose of distribution, or selling material depicting nudity, or engaging in sexual or simulated sexual conduct.
- ❖ Use of profanities and obscene language in communities or when instructing others.

3) Neglect may include but is not limited to:

1. Denial of sufficient nutrition to any person.
2. Denial of sufficient sleep to any person.
3. Denial of sufficient protective gear to any person.
4. Failure to provide adequate supervision; leading to drug use in workplaces, accidents and impairment of employees
5. Failure to arrange for medical care and/or medical treatment for any person in an emergency.
6. Failure to drive courteously at all times, leading to accidents. g. Failure to avoid damage public property.
7. Neglecting public and employee complaints.

4) Drug abuse may include but is not limited to:

- a. Smoke in public or smoking in undesignated areas
- b. Consumption of alcohol while on duty/at work
- c. Use and trading in narcotics

5) Illegal trade activities without necessary licenses:

- a. Trade in protected fauna or flora species
- b. Trade in ivory or similar regulated wildlife products including game meat c.

Trade in processed, semi-processed minerals and their ores

Financial exploitation will include, but is not limited to:

Utilizing labor of without paying for it, or at a non-commensurate financial rate/ wage.

Mistreatment will include, but is not limited to:

8. Physical exercises, such as running laps or performing pushups,
9. Unauthorized chemical, mechanical or physical restraints
- 10 Assignment of unduly physically strenuous or harsh work.
 - ✓ Failure to behave in a polite and courteous manner to the general public
 - ✓ Requiring or forcing the individual to take an uncomfortable position, such as squatting or bending, or forcing people to repeat physical movements when used solely as a means of punishment.
 - ✓ Denial of any essential service solely for disciplinary purposes
 - ✓ Denial of visiting or communication privileges with family or significant others
 - ✓ Requiring the individual to remain silent for long periods of time solely for the purpose of punishment.

Site Specific Labours Management Plan

Contractor agrees to document and report abuse, sexual abuse and sexual exploitation, neglect, maltreatment and exploitation as outlined in this Code and cooperate fully in any resulting investigation. Contractor shall prominently display a poster, notifying contractor employees of their responsibilities and to report violations and giving appropriate phone numbers.

Contractor/ Employee/ Volunteer/ subcontractor

Signed: _____ Date (dd/mm/yyyy): _____

Name:

Annex II: Compliant form

Employee name

Date and time submitted

Age

Gender (F/M)

Job title

Employee / worker ID

Employee Address

Employee Contact number /email

Details of grievance

Date, time and location of event

Witness(es) *if applicable*

Description of
Grievance(*provide
clear details of the
grievance*)

Proposed solution/
Recommendation

Worker Signature

Date

Received by: *Name and Signature*

Date

Annex III: Incident Tracker

Date of Incident/ Accident	Time	
Name(s) of Persons Involved/ Identity of Damaged Property	Age(s)	Gender (M/F)

Address of Person(s) Involved	Work Post /Designation
----------------------------------	---------------------------

Supervisor	Location of Incident/ Accident
------------	-----------------------------------

Classification (Indicative / Serious/ Severe)

Description of Incident/
Accident

Nature (Work-related Injury, Non-work related injury, Illness, Environmental Harm, Damage to Property)	Medical Support Treatment Given
--	------------------------------------

Body Part Injured/ Part Damaged	Time Off Work (Hours/ Days/ Weeks/ Months)
------------------------------------	--

Cause of Incident/ Accident

Direct Cause(s)	Root Cause(s)
-----------------	---------------

Notifiable/Non-
Notifiable (indicate
Persons or Authorities
Notified)

Actions Taken

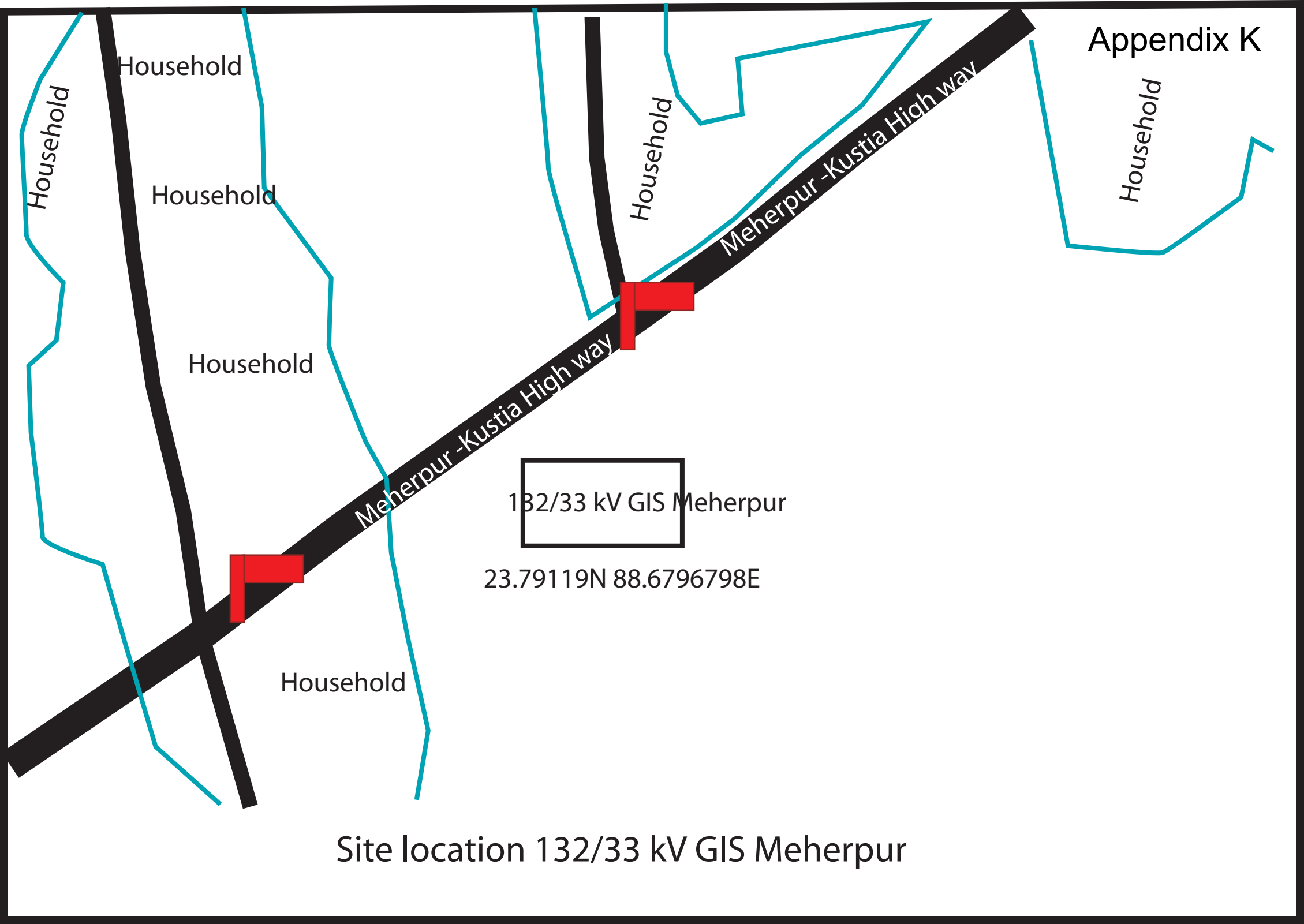
Immediate Actions

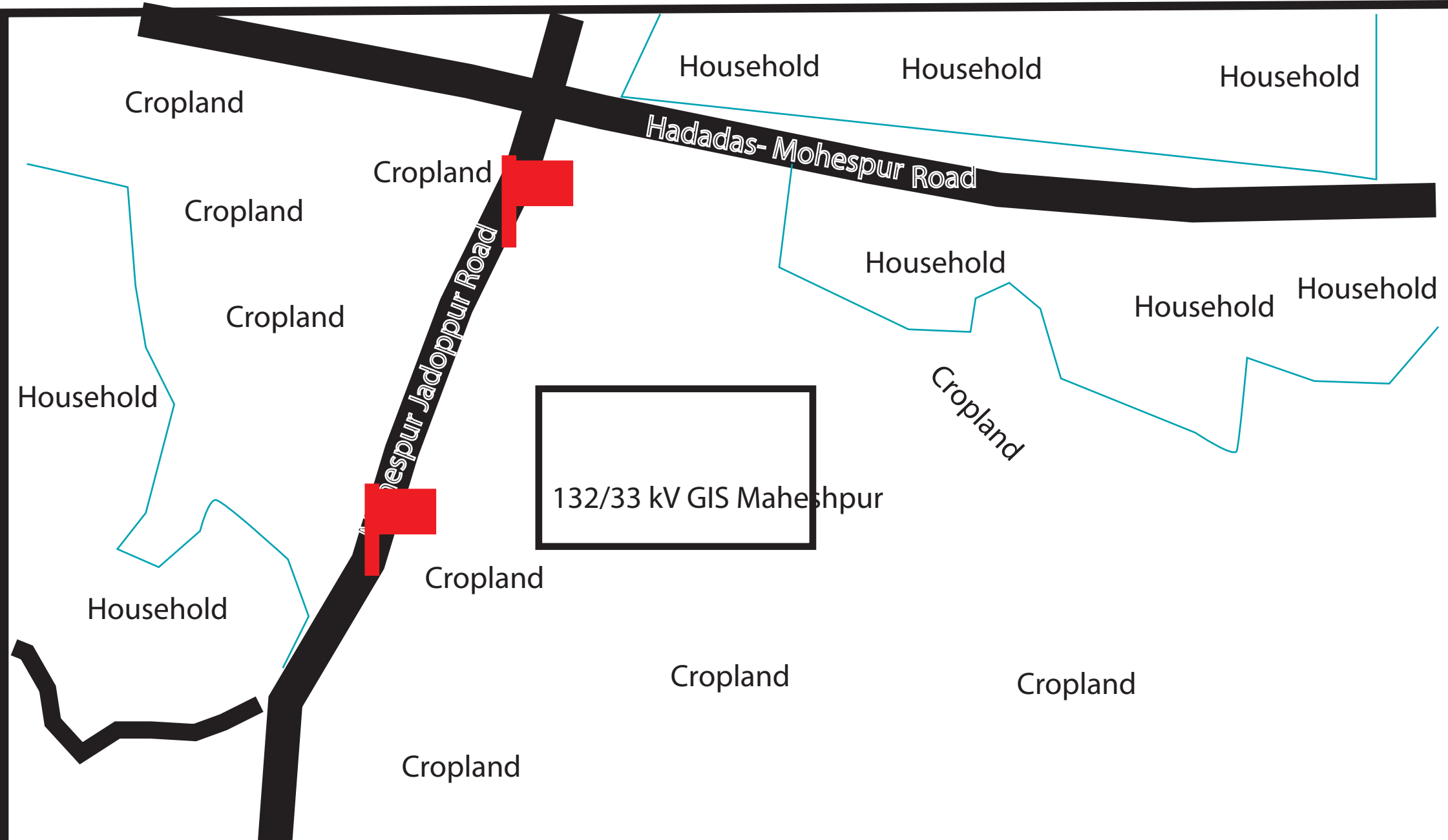
Follow-Up Actions

Police Investigation Ref:

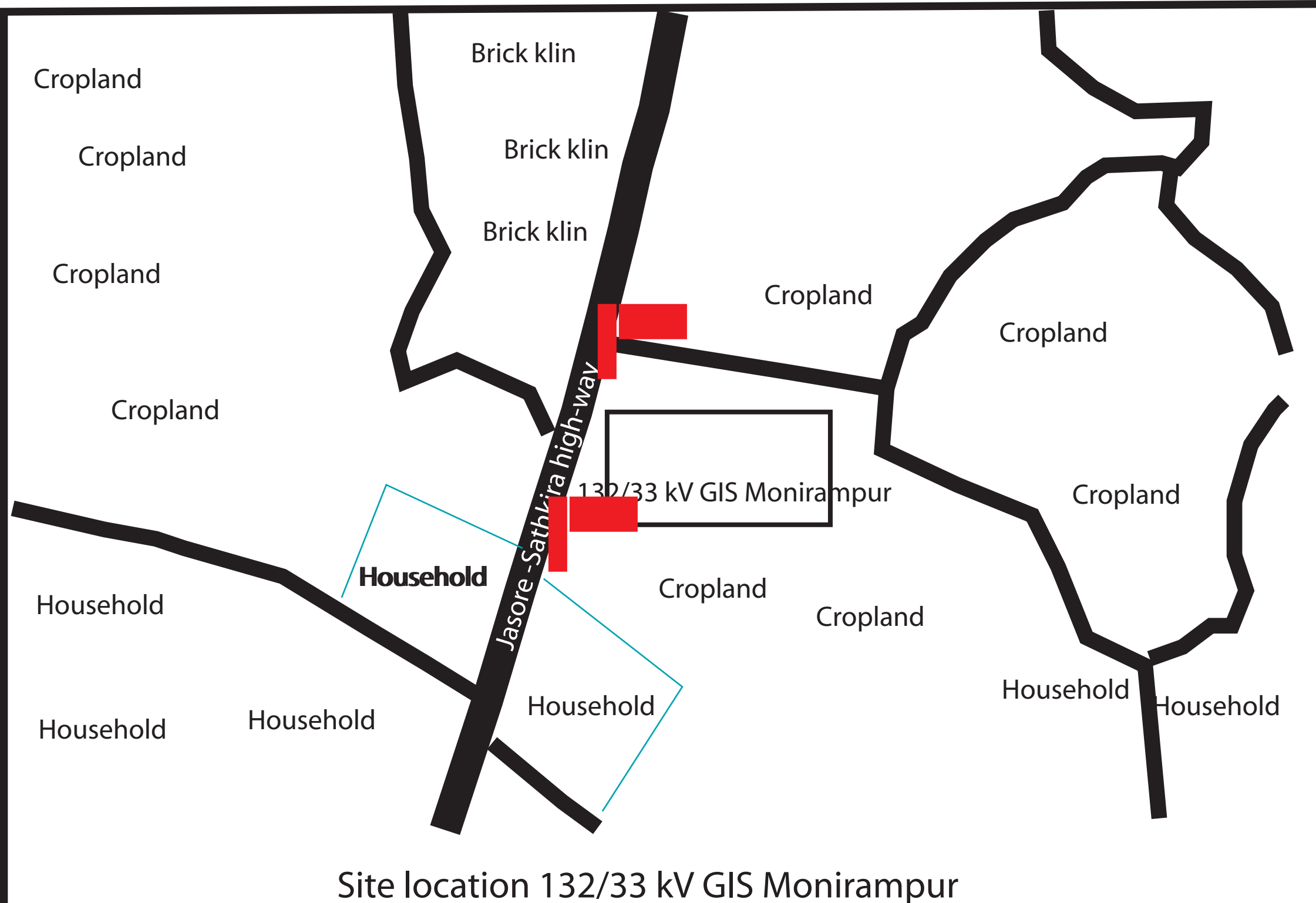
Mitigation Measures

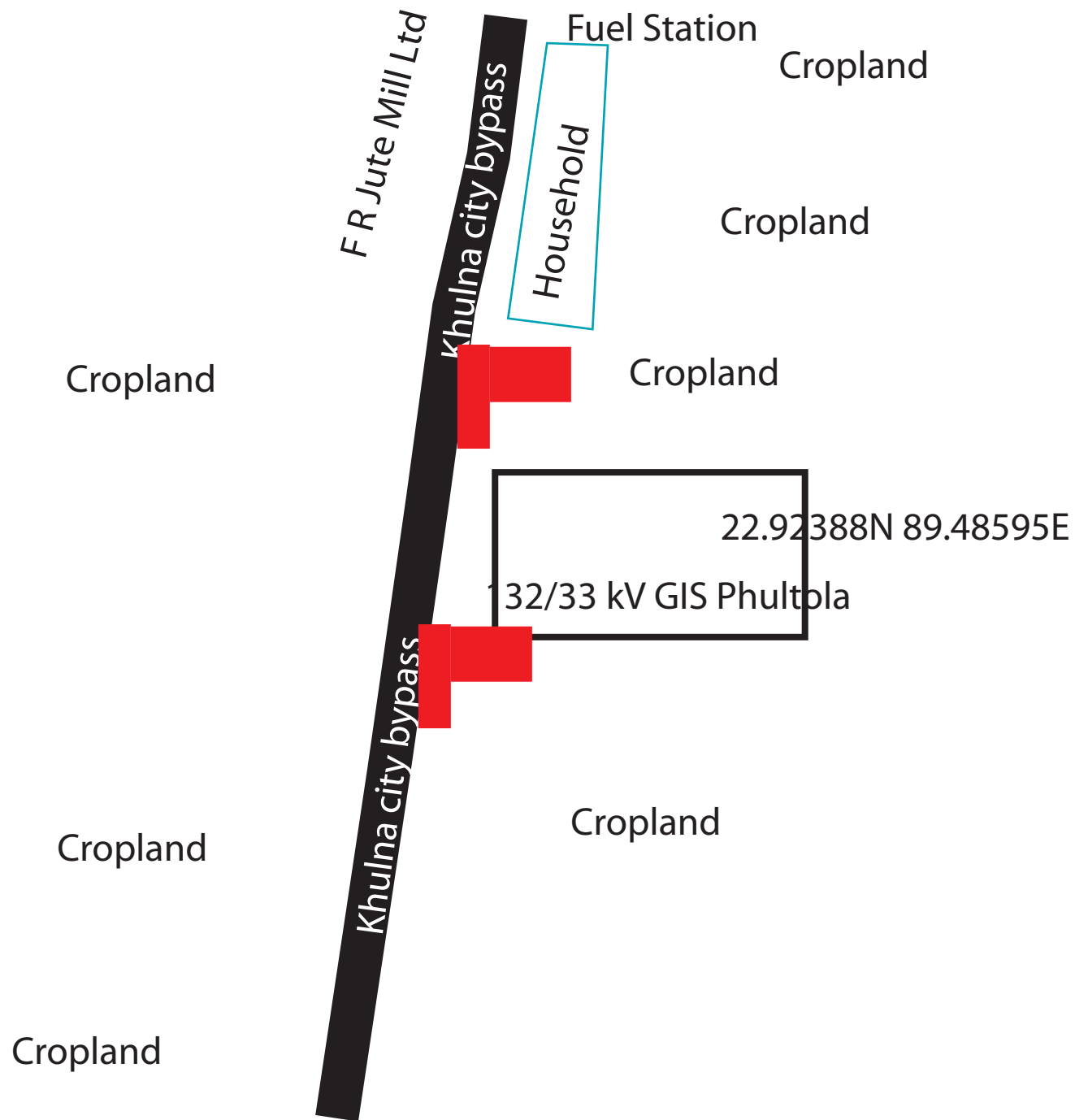
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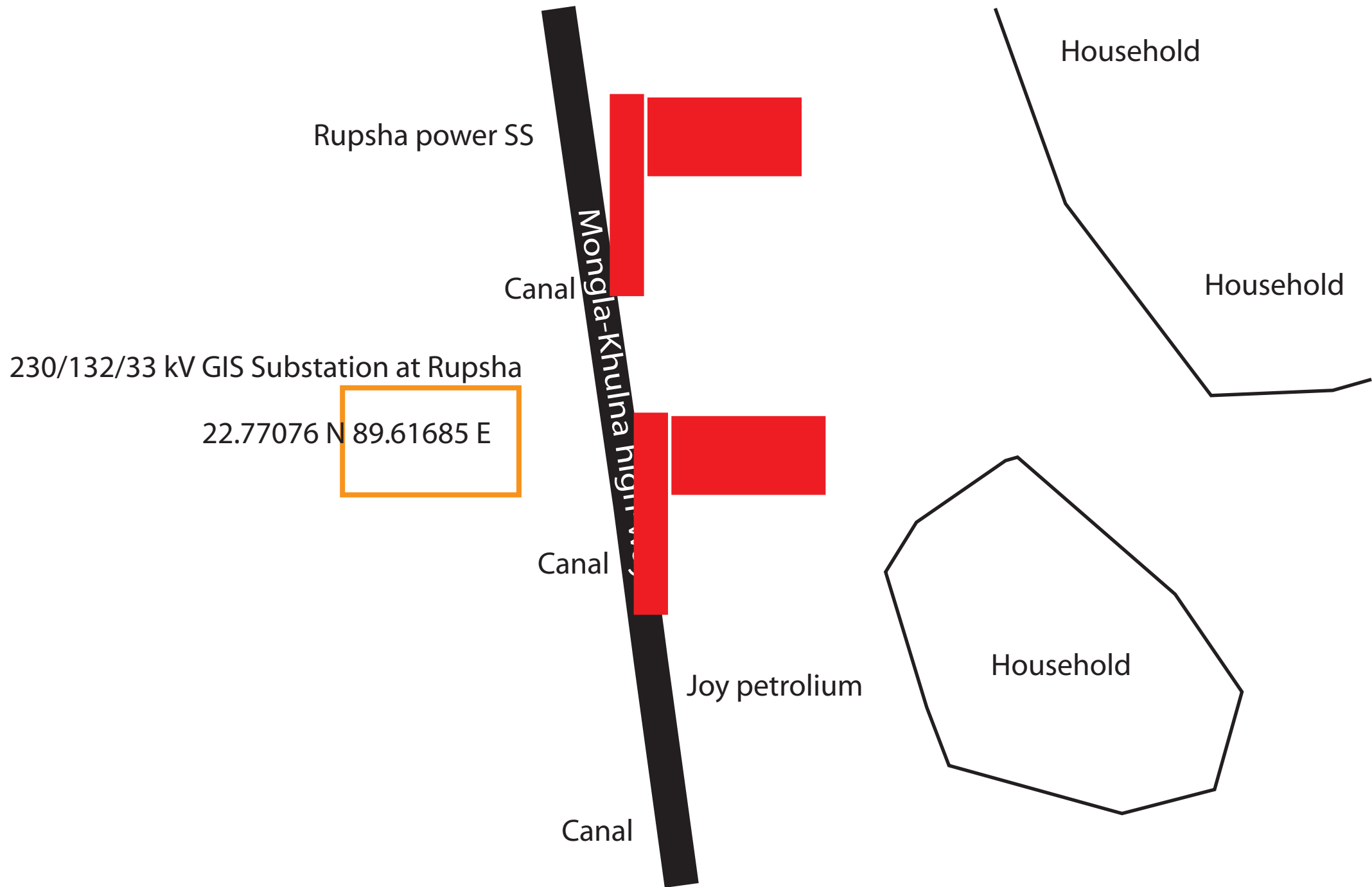


Site location 132/33 kV GIS Maheshpur

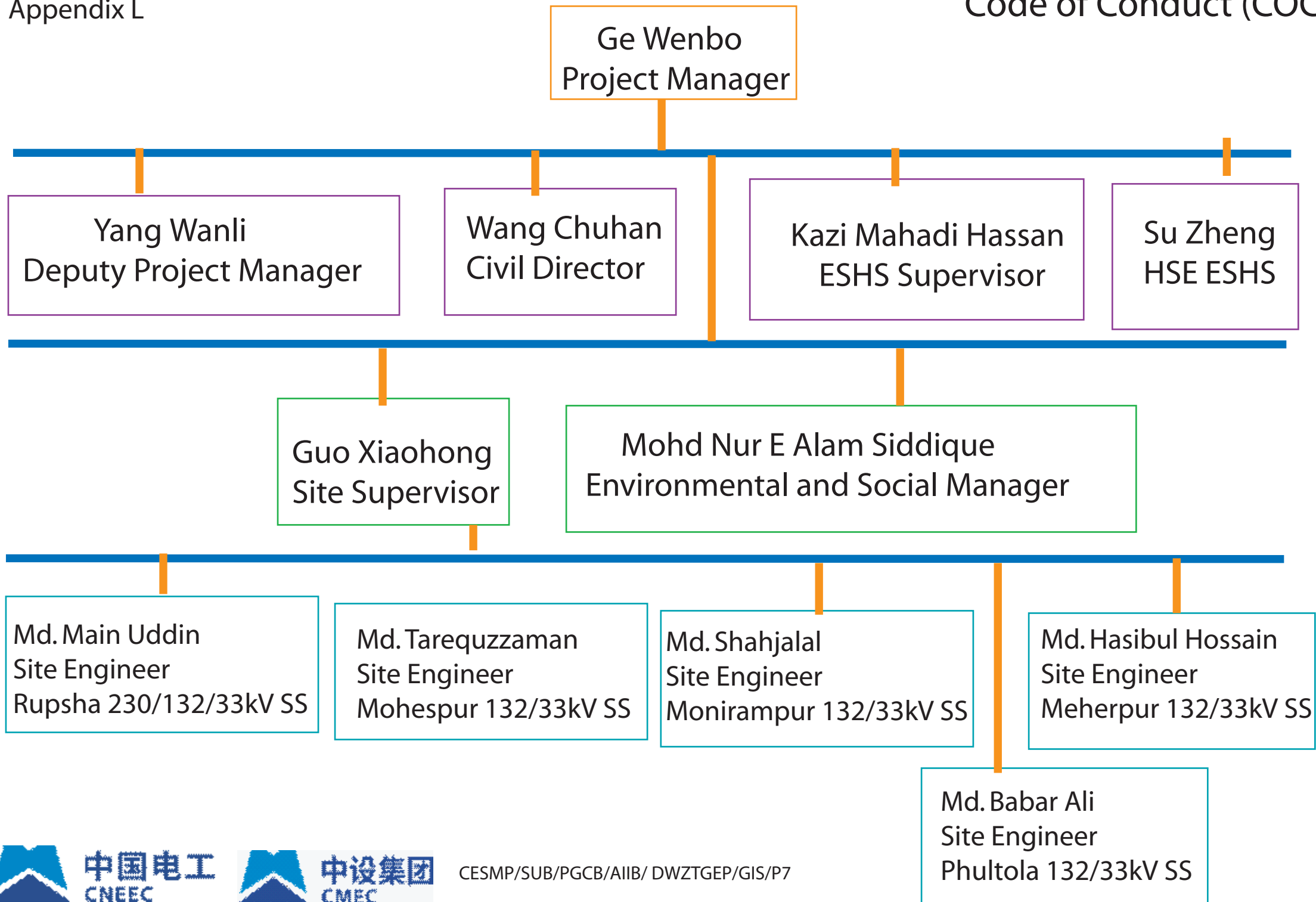




Site location 132/33 kV GIS Phultola



Site location 230/132/33 kV GIS Substation at Rupsha



Tree management plan

A Tree Management Plan is required:

- To plan for the protection and conservation of trees affected by the project.
- To manage the removal of trees and plantation process.

A comprehensive and proactive Tree Management Plan will ensure that the trees hampered within the scope of the project and managed responsibly and according to best practices. As per current practice 1:3 policy will be initiated and implemented with concurrence of project office. For felling of one tree three trees will be planted related to possible scenario (fruit bearing, forestry & medicinal).

Tree Management Program

A comprehensive and proactive Tree Management Program should reflect and balance forest and ecosystem health, ecosystem services, aesthetics, social values, and risk management. The Tree Management Program will focus on the following areas:

- Tree Classification
- Maintenance & Monitoring
- Removals
- Renewal
- Protection & Conservation
- Communication & Education

Associated procedure will be followed and reported with project progress and compliance associated reports. Guidelines from ADB/AIIB will be considered and followed.