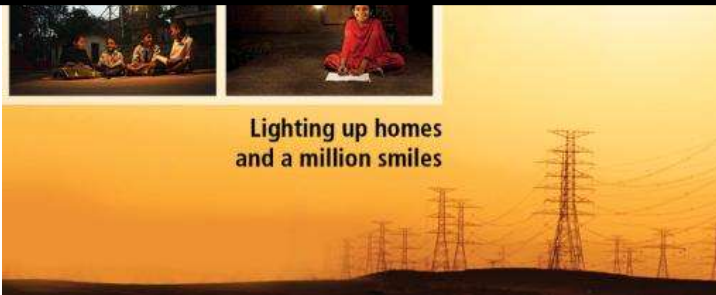


2021

Construction Environmental Social Management Plan



Rev.00



**Design, Supply, Installation,
Testing & Commissioning of
230kV & 132kV Transmission
Lines in Western Zone on
turnkey basis (ADB-
Package-3) under PGCB
L&T Construction, PT&D,
TL BU**

8/26/2021

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13 ANNEXURE 170

Abbreviations

➤ ADB	Asian Development bank
➤ AIDS	Acquired Immunodeficiency Syndrome
➤ BCCSAP	Bangladesh Climate Change Strategy and Action Plan
➤ BWDB	Bangladesh Water Development Board
➤ CEMP	Construction Environment Management Plan
➤ COH	Cluster Operation Head
➤ CITES	Convention on International Trade in Endangered Species
➤ CFC	Chlorofluorocarbon
➤ DG	Diesel Generator
➤ DOE	Department of Environment
➤ EHSO	Environment Health Safety Officer
➤ EQS	Environment Quality Standard
➤ E&S	Environment & Social
➤ EM	Environment Management
➤ EMP	Environment Management Plan
➤ EMS	Environment management System
➤ EIA	Environmental Impact Assessment
➤ ECR	Environmental Conservation Rule
➤ ECA	Environmental Conservation Act
➤ EHS	Environment Health Safety
➤ GPP	Guidelines for People's Participation
➤ GO	Government Organization
➤ GOB	Government of Bangladesh
➤ GHG	Green House Gases
➤ HIV	Human Immunodeficiency Virus
➤ H&S	Health & Safety
➤ HOD	Head of Department
➤ IEE	Initial Environmental Examination
➤ IECs	Important Environmental Component
➤ IPP	Indigenous People Plan

➤ ICZMP	Integrated Coastal Zone Management Project
➤ L&T	Larsen & Toubro
➤ MOEF	Ministry of Environment & Forest
➤ MSDS	Material Safety Data Sheet
➤ NBSAP	National Biodiversity Strategy & Action Plan
➤ NAPA	National Adaption Program of Action
➤ NGO	Non-Government Organization
➤ NWMP	National Water Management Plan
➤ NEMAP	National Environmental Management Plan
➤ NOC	No Objection Certificate
➤ PIU	Project implementation unit.
➤ PM	Project Manager
➤ P&M	Plant & Machineries
➤ PRSP	Poverty Reduction Strategy Paper
➤ PPE	Personal Protective Equipment
➤ TBT	Toolbox Talk
➤ TSE	Tensioner Stringing Equipment
➤ UNFCCC	United Nations Framework Convention on Climate Change
➤ WARPO	Water Resources Planning Organization

1. Introduction

This CESMP has been prepared to deal with environmental and social issues associated with the construction of “230kV & 132V Transmission Lines in Western Zone on Turnkey Basis (ADB Package-3,)” by PGCB. The project construction will be routed through Satkhira/Khulna/Bagerhat/Jessore/Monirampur/Kustia/Meherpur/Kaliganj/Maheshpur/Jenaidah area. The construction activities will be executed by L&T Construction, PTD, TL BU and multiple sub-contractors will be engaged for the said construction activity by L&T.

The purpose of this Construction Environmental and Social Management Plan (ESMP) is to provide a consolidated summary of all the Environmental and Social (E&S) commitments relevant for the construction phase of the Project. The measures focus on environmental (such as air emissions, biodiversity, and environmental contamination) and social aspects (such as the protection of human rights, communication with local stakeholders, safety of workers and communities). This ESMP also gives an overview about the E&S Management System that is being implemented to ensure systematic and effective execution of these commitments, including roles and responsibilities. The ESMP can be updated as the project proceeds through detailed design and construction to reflect the results of discussions with stakeholders and to include details of any other E&S developments.

2. Project Description

Name/Identity of the project: 230kV & 132kV Transmission Lines in Western Zone on turnkey basis (ADB-Package-3) under PGCB

Job Number: PGCB/ADB/3853-BAN/TL/Package-3 dated May 09, 2021

Client: PGCB, Bangladesh

Location:

- Kaliganj - Maheshpur 132kV Transmission Lines.
- Maniramour – Satkhira 132kV Transmission Lines.
- Satkhira – Rupsha 132kV Transmission Lines.
- Kushtia – Meherpur 132kV Transmission Lines.

Scope of Work – Supply:

Design & Testing & Supply of Towers, Insulators, Hardware Fittings & Accessories, Earth Wire, OPGW etc.,

Sl. No	Item Description	Unit	Quantity
1	Supply of Stub and Tower	MT	14254
2	ACCC-Hamburg Conductor	KM	752 KM/700 KM
4	Hardware fittings	Lot	100%
5	Tower Accessories	Lot	100%
6	OPGW	KM	204

Sl. No.	Item Description	Unit	Quantity
1	Detailed Survey/ Check Survey	KMs	177/177
2	Foundation/ Erection	Nos	568/568
3	Stringing	KMs	177

Scope of Work – Activities:**2.1 Project Context**

- The project is a Greenfield development. Land belongs to local people (Private Land). Some of land is used for agricultural purpose and some of land is pasture land.
- The project area and vicinity is close to sea level and is in a tropical climate. The ambient shade temperature variation is between 4 °C and 45 °C with periods of high humidity.
- Between May and November, low-lying areas are subject to flooding.
- The project area is a designated zone of moderate earthquake intensity. The seismic factor is 0.1 g.
- Atmospheric pollution is moderate, and no special insulator design or washing is required. The area is subject to high winds of typhoon strength.
- Four numbers Highway crossing & two number major road crossing, one Rivers crossing, one number Railway crossing, three number 132kV and three number 230kV power line crossing come under this line.

2.2 Project Activities

- This project will carry out various activities like route survey, establishment of construction camps for workers, site preparation and vegetation clearing, erection of towers, stringing of conductors and clearing of RoW.

Survey: -The technical specifications cover detailed survey including route alignment, profiling, tower spotting, and optimization of locations, check survey and soil investigation for the said project. These activities became more critical while performing survey in following situations,

- Waterlogged agricultural fields.
- Near Canals, Big & Small River Crossing
- Railway Crossing.

Pile foundation: - This activity will be executed with follow to various sub-activities like fixing of pile point, driving of temporary/permanent casing, boring, reinforcement cage lowering, tremie pipe lowering and concreting.

Tower Erection: - Piece Meal method of tower erection by derrick pole have been considered while executing the tower erection. Following sequence of activities were followed during tower erection:

- Collection and loading of tower members from store.
- Transporting the tower members to site.
- Unloading tower members at site.
- Segregation of the tower members as per the drawing for ease of identification.
- Assembly of the tower members at ground level as per approved drawing.
- Erecting the tower in sequential manner including provision of all supportive bracings.
- Final tightening, punching, welding of Tower from top to bottom.

Stringing: -This is laying of the conductor and earth wire up to required sag by manual or by machine the following sub activities have been performed during stringing activity:

- Preparation of PTP and approval before commencement of the work.
- Checking of tower for tightening of all tower members.
- Measurement of tower foot earth resistance
- Porcelain / Polymer Insulator and aerial roller hoisting.
- Positioning of TSEs wherever applicable.
- Backstay arrangements on tension towers including anchorage arrangements for Tensioner & Puller machine.
- Transportation and positioning of conductor drums.
- Availing shutdown on distribution lines, temporary earthing and lowering of distribution lines wherever applicable.
- Paving out of pilot wire and connection to Tensioner & Puller.
- Paving out of conductor, mid span jointing and make-off.
- Rough sagging of phase conductors.
- Final tension / stringing.

- Clip-in and jumper fixing.
- Stringing river crossing sections.
- Stringing of power line crossing sections.
- Stringing across highways and other service roads.
- Optical Ground Wire stringing.
- Testing and commissioning

2.3 Stakeholders

A stakeholder is a party that has an interest in a company and can either affect or be affected by the business. The primary stakeholders in a typical corporation are its investors, employees, customers, and suppliers.

External Stakeholders - External stakeholders are entities not within a business itself but who care about or are affected by its performance (e.g., Government of Bangladesh, Power Grid Company of Bangladesh, Asian Development Bank, District Authorities of Satkhira/Khulna/Bagerhat/Jessore/Monirampur/Kustia/Meherpur/Kaliganj/Maheshpur/Jenaidah, and Current land owners/users).

Internal Stakeholders- Internal stakeholders are entities within a business (e.g., employees, managers, the board of directors, investors).

2.4 Stakeholder Engagement & Grievance Mechanism

L&T will ensure that the local communities are informed at an early stage about the planned project, timelines, expected impacts and communication channels. It will also seek for feedback from the communities about the Project.

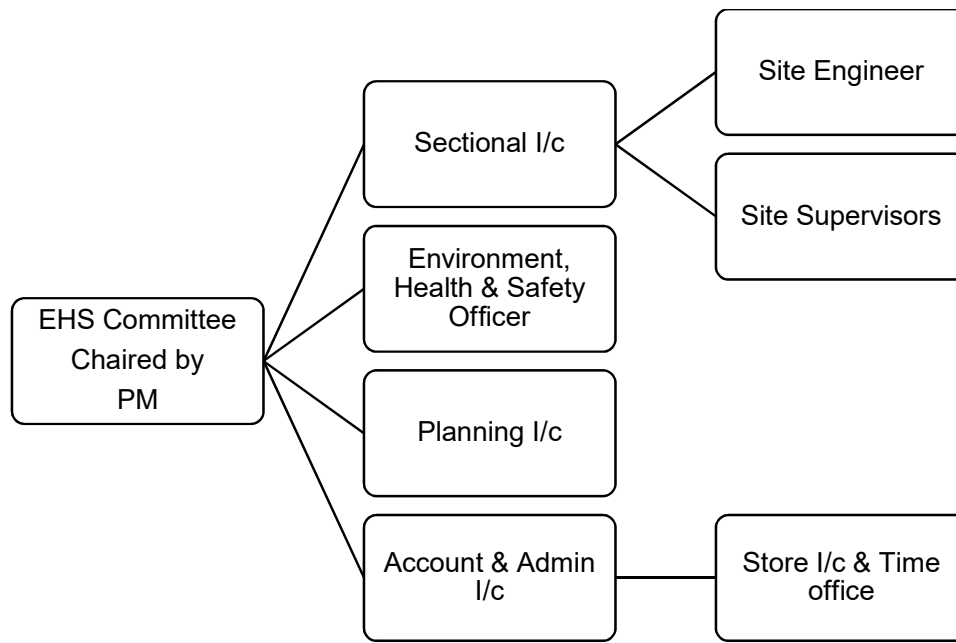
As part of its community liaison process, we will implement a Grievance Mechanism to ensure that all stakeholder comments, suggestions, and objections are captured and considered. It will allow the affected community and the workers to express their concerns and any complaints directly.

Contact details and information on the procedure, including grievance form, will be distributed to the local communities. All comments and complaints will be investigated by the project concerned authority and appropriate action taken, as necessary. Records of all complaints and actions will be maintained on site.

3. Project Implementation Arrangements

- EHS management is a line responsibility requiring active participation of all levels of management and supervision.

Implementation supervision for the project Design, Supply, Installation, Testing & Commissioning of 230kV & 132kV Transmission Lines in Western Zone on turnkey basis (ADB-Package-3) under PGCB will be carried out by the L&T with assistance and guidance by the Power Grid Company of Bangladesh (PGCB). A project steering committee will be formed with representative from L&T and PGCB to act as overseer of the project, this committee will meet once in quarter to monitor the progress and implementation status.



3.1 Roles & Responsibilities

Individual EHS roles and responsibilities, along with task and target shall be distributed to the individuals for action, as described below.

3.1.1 Project Manager (PM) / Construction Manager (CM)

- Project manager is overall responsible and construction manager is restricted to his area of work towards management of environmental protection, waste minimization / reduction and pollution prevention during work activities at site.
- Ensuring the CEMP plan & procedures are reviewed annually.
- Allocation of appropriate resources to ensure successful implementation and maintaining EHS commitments of contractor and legal requirements.
- Shall act as emergency coordinator in case of environmental emergencies.
- Communicate to project team that emphasis on cost, schedule, and quality will not override the importance of EHS implementation.
- Actively participate in the environmental walk downs, employer's environmental meetings, toolbox environmental talks and ensure that proactive / preventive and control steps are taken by their team within stipulated time frame.
- Shall ensure that fresh materials are purchased only after considering the reuse options of available materials.
- Shall ensure the wastages are segregated in the on-site and off-site areas and disposed of in periodical intervals by the approved agencies.
- Shall ensure that the temporary structures are planned as per environmental, health and

safety requirements.

- Report any environmental incidents to client.
- Shall extend full support for the promotional activities of environment.
- Shall monitor the implementation of environmental procedures and take corrective actions whenever required.

3.1.2 EHS Manager / Environmental Manager (EM) / Environmental Coordinator

- Site EHSO will be acting as EM or EC and shall be reporting to the PM and advice the site management (PM / CM) about latest revision of legal laws and day to day action required for the prevention of environmental degradation.
- Shall study the contract requirement and prepare, review and update CEMP plan for the project periodically.
- Shall ensure that all staff / visitors / workmen are familiar with the CEMP and shall maintain all documents required for proving compliance or non-compliance of CEMP at site office.
- Responsible for conducting environmental protection orientation for the employees joining at site and explain the local environmental protection requirements of the job to sub-contractors in the kick-off meeting / periodic meeting.
- Shall convene environmental meetings with site EHS committee members.
- Shall assist to the site engineer in conducting toolbox meetings for environmental protection to all the employees.
- Shall advice to purchase department in case of any queries so that environmentally friendly materials are used at site.
- Shall report all environmental incidents to project manager and investigate all environmental incidents, near misses and send report to Country Manager. Also, simultaneously he shall report all the incidents to employer as per client timeframe and procedures.
- Prepare environmental reports, statistics, incident analysis etc.
- Shall highlight all environmental related issues to the site management and in the site, committee meeting to follow up at site.
- Shall conduct self or coordinate with client for environmental walkthrough / audit at site and labour camps along with the site EHS committee members.
- Shall carryout environmental inspection at work areas, equipment for the corrective actions and follow-ups.
- Shall take a leading role to organize campaigns, training programs, competitions & other special emphasis program to promote environmental protection and waste reduction at the workplace for the employees either by him or his assigned representative.
- Conduct CEMP induction to all employees.

- Shall assist to prepare environmental risk assessments for critical work activities.
- Shall plan for procurement of appropriate gadgets such as oil spill kits, etc.
- Shall report all environmental related matters pertaining to status of environmental promotional program, feedback of PPEs, repeated environmental violations, incidents, hazardous work environment etc. PM / CM / Country EHS manager.
- Shall provide technical assistance on disposal of chemicals.

3.1.3 Site Engineer / Supervisor / Foreman

- Implement the Construction Environmental Management Plan at offsite (Camp and Temporary utilities) and on-site area (Office & Work area) in day-to-day activities.
- To analyse all the activities of the forthcoming period and identify the possible environmental impacts and finalizing the precaution to be taken in the site EHS committee meeting.
- Carry out Preliminary Hazard Analysis (PHA) / Risk Assessment and method statement for every activity to reduce impact on environment prior to execution and obtain approval.
- Shall proactively involve in site walkthroughs / audits / incident investigations / promotional programs / training / segregation of wastes and analysing possibilities of reuse of materials / spill prevention and containment / EHS meetings / substitute any hazardous process or materials with environmentally friendly ones, etc.
- Shall review the sub-contractor performance and their daily activities.
- Enforcement actions for non-compliance / environmental deviations in the implementation of CEMP.
- Shall report to about spotting of endangered species in work area and to help in rehabilitation.
- Housekeeping of their respective work area and segregate the wastes, disposal of all construction debris, chemical wastes and other as per the Waste Management Plan.
- Report all environmental incidents to EM/ PM/ CM.
- Shall give brief talk in the work about environmental impacts, preventive and control measures to reduce the environmental impact. (TBT Talks).
- Educate and motivate their workmen to follow best environmental protection practices. No one shall be allowed to deviate from the approved CEMP.
- Supply all the PPEs for handling of materials to keep the environment safe and hazardless to the person using.
- Shall take immediate action to control / prevent continuation of environmental incidents.

3.1.4 Sub-Contractor / Vendors

- All the sub-contractors and vendors shall abide CEMP plan. They shall implement suitable and enough procedures to eliminate, reduce or control EHS risks and

impacts.

- Shall report any potential environmental incidents or complaints to the L&T site Foreman / Supervisor including spilled oil, overflowing waste, excessive dust generation, wastewater overflowing etc.

3.1.5 Employees

All the workmen are responsible for their work and protecting the environment at work and responsible to:

- Follow company EHS policy, CEMP, environmental rules & regulations, Risk Assessment controls / work instructions and procedures without any deviations.
- Must undergo CEMP induction before starting up work.
- Follow the environmental instruction given by the supervisor / foreman while working in the hazardous area.
- Maintain their work area, work dress, accommodation neat and clean within acceptable hygienic condition at all the time.
- Report all environmental incidences / near misses on time to their supervisors / EM for corrective actions.
- Attend Toolbox / Special Meetings or briefings regularly and co-operate in EHS related issues with their co-worker.
- Shall not do any work without work instruction from the concern supervisor.
- Protecting the environment and minimizing the risk of damage to environment at his workplace.

4 Project Standards (National & International)

4.1 Government of Bangladesh (GoB)

4.1.1 Relevant Acts, Regulations and Guidelines

4.1.1.1 Constitution of the Government Republic of Bangladesh

In this constitution, the environmental issues also highlight the environmental protection and biodiversity conservation issues. In the Article 18 A: Protection and Improvement of Environment and Biodiversity; of the Constitution of the People's Republic of Bangladesh states that, "The state shall endeavour to protect and improve the environment and to preserve and safeguard the natural resources, biodiversity, wetlands, forest and wildlife for the present and future citizens".

4.1.1.2 Environmental Court Act, 2000 & subsequent amendments in 2002

The purpose of this act is to establish a formal system of environmental courts within Bangladesh, with a minimum of one active court to be maintained within each division. Specifically, the Act provides the framework for:

- Structure and jurisdiction of the court system.
- Powers and rights of the court and the relevant officers such as the Judges and Inspectors.
- Authority of the court to issue directives or penalties.
- Integration with other law-enforcement agencies; and
- Regulations for rights-of-appeal.

4.1.1.3 DOE 's IEE/EIA including EMP Guidelines for Industry, 1997

The IEE/EIA Guidelines is a handbook for procedures for preparing the IEE/EIA including EMP and for reviewing them for the benefit of the development partners, environmental consultants, reviewers, and academicians. While preparing these guidelines, the present environmental status as well as the need for rapid economic development of Bangladesh has been kept in view. These considerations have essentially resulted in simpler procedures to be followed for preparing the IEE/EIA including EMP.

4.1.2 Environmental, Social and Natural Resources Protection

4.1.2.1 The Environmental Conservation Acts (ECA), 1995 and Amendments

The provisions of the Act authorize by the DG of DOE to undertake any activity that is deemed fit and necessary to conserve and enhance the quality of environment and to control, prevent and mitigate pollution. The main highlights of the act are:

- Declaration of Ecologically Critical Areas.
- Obtaining Environmental Clearance Certificate.
- Regulation with respect to vehicles emitting smoke harmful for the environment.
- Regulation of development activities from environmental perspective.
- Promulgation of standards for quality of air, water, noise, and soils for different areas and for different purposes.
- Promulgation of acceptable limits for discharging and emitting waste; and
- Formulation of environmental guidelines relating to control and mitigation of environmental pollution, conservation, and improvement of environment.

4.1.2.2 The Environment Conservation Rules (ECR), 1997 and Amendments

The ECR, 1997 are the first set of rules promulgated under the ECA, 1995. These Rules provide for, inter alia, the following:

- 4.1.2.2.1 The National Environmental Quality Standards (EQS) for ambient Air, Surface Water, Ground water, Drinking water, Industrial effluents, Emissions, Noise and Vehicular exhaust.
- 4.1.2.2.2 Categorization of industries, development projects and other activities based on actual (for existing industries/development projects/activities) and anticipated (for proposed industries/development projects/activities) pollution load.
- 4.1.2.2.3 Procedure for obtaining environmental clearance.
- 4.1.2.2.4 Requirements for undertaking IEE and EIA's as well as formulating EMP's

- according to categories of industries/development projects/activities; and
- 4.1.2.2.5 Procedure for damage-claim by persons affected or likely to be affected due to polluting activities or activities causing hindrance to normal civic life.

4.1.2.3 National Environment Policy, 1992

The Bangladesh National Environment Policy, approved in May 1992, sets out the basic framework for environmental action together with a set of broad sectoral action guidelines. Key elements of the policy are:

- 4.1.2.3.1 Maintaining ecological balance and ensuring sustainable development of the country through protection, conservation, and improvement of the environment.
- 4.1.2.3.2 Protecting the country from natural disasters.
- 4.1.2.3.3 Identifying and regulating all activities that pollute and destroy the environment.
- 4.1.2.3.4 Ensuring environment-friendly development in all sectors.
- 4.1.2.3.5 Ensuring sustainable and environmentally sound management of the natural resources; and
- 4.1.2.3.6 Promoting active association, as far as possible, with all international initiatives related to environment.

The policy also states that EIA's should be conducted before projects are undertaken and the DOE is directed to review and approve all EIA's.

4.1.2.4 National Conservation Strategy, 1992

The National Conservation Strategy, 1992 provides recommendations for sustainable development of the industrial sector. The key aspects of the strategy are as follows:

- 4.1.2.4.1 Industries based on non-renewable resources should be made to adopt technology which conserves raw materials, and existing industries should be given incentives to install technical fixes to reduce wastage rate.
- 4.1.2.4.2 All industries shall be subject to an EIA and the adoption of pollution prevention/control technologies shall be enforced.
- 4.1.2.4.3 Hazardous or toxic materials/wastes shall not be imported as raw materials for industry.
- 4.1.2.4.4 Import of appropriate and environmentally-sound technology shall be ensured; and
- 4.1.2.4.5 Dependence on imported technology and machinery should gradually be reduced in favour of sustainable local skills and resources.

4.1.2.5 National Environmental Management Plan (NEMAP), 1995

The NEMAP is a wide ranging and multi-faceted plan, which builds on and extends the statements, set out in the National Environmental Policy. NEMAP was developed to address issues and management requirements related to the environment; it also sets out the framework within which the recommendations of the National Conservation Strategy are to be implemented. NEMAP was developed to achieve the following broad objectives:

- 4.1.2.5.1 Identification of key environmental issues affecting Bangladesh.

4.1.2.5.2 Identification of actions necessary to halt or reduce the rate of environmental degradation.

4.1.2.5.3 Improvement of the natural environment.

4.1.2.5.4 Conservation of habitats and biodiversity.

4.1.2.5.5 Promotion of sustainable development; and

4.1.2.5.6 Improvement of the quality of life of the people.

4.1.2.6 The Noise Pollution Control Rules, 2006

The Noise Pollution Control Rules have been established in order to manage noise generating activities which have the potential to impact the health and wellbeing of workers and the surrounding communities. Under this legislation, control zones are listed as:

4.1.2.6.1 Quiet Area – for example school or hospital.

4.1.2.6.2 Residential Area – an area primarily occupied by dwellings.

4.1.2.6.3 Mixed Area – area with a mix of residential, commercial and industrial land uses.

4.1.2.6.4 Commercial Area – an area primarily occupied by businesses and officers; and

4.1.2.6.5 Industrial Area – and area used for industry or manufacturing.

Day-time and night-time noise level restrictions are provided for these areas. Additionally, limits are provided for noise emissions from motor vehicles and boats.

4.1.2.7 The Protection and Conservation of Fish Rules, 1985

The Protection and Conservation of Fish Rules 1985 are a set of rules in line with the overall objectives of the **East-Bengal Protection and Fish Conservation Act**. The Rules require 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”. Further, the Rules states “...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”.

As per the nature of project execution, it is expected to have negligible or limited negative effects to fish. And will comply with these rules by enacting appropriate mitigation measures to reduce the potential for pollution of waterways, depletion of fisheries or disturbance of fish populations within the Project area wherever applicable.

4.1.2.8 National Water Policy (NWP), 1999

The NWP promulgated in 1999 with the intension of guiding both public and private actions in the future for ensuring optimal development and management of water that benefit both individuals and the society at large. The policy aims to ensure progress towards fulfilling national goals of economic developments, poverty alleviation, food security, public health and safety, decent standard of living for the people and protection of natural environment. According to the policy, all agencies and departments entrusted with water resource management responsibilities (regulation, planning, construction, operation, and maintenance) will have to enhance environmental amenities and ensure that environmental resources are protected and restored in executing their tasks. Environmental needs and objectives will be

treated equally with the resources management needs.

The policy has several clauses related to the protection and prevention of the natural environment for ensuring sustainable development. Some of the relevant clauses are:

Clause 4.5b: Planning and feasibility studies of projects will follow the Guidelines for Project Assessment, the Guidelines for People's Participation (GPP), the Guidelines for EIA and all other instructions that may be issued from time to time by the Government.

Clause 4.9b: Measures will be taken to minimize disruption to the natural aquatic environment in streams and water channels.

Clause 4.9e: Water development plans will not interrupt fish movement and will make adequate provisions in control structures for allowing fish migration and breeding.

Clause 4.10a: Water development projects should cause minimal disruption to navigation and, where necessary, adequate mitigation measures should be taken.

Clause 4.12a: Consider environmental protection, restoration and enhancement measures consistent with NEMAP and the NWMP.

Clause 4.12c: Ensure adequate upland flow in water channels to preserve the coastal estuary ecosystem threatened by intrusion of salinity from the sea.

4.1.2.9 [National Water Management Plan \(NWMP\), 2001 \(approved in 2004\)](#)

The National Water Resources Council approved on March 31, 2004 a 25-year National Water Management Plan. The plan provides a framework within which all concerned with the development, management and use of water resources water services in Bangladesh can plan and implement their own activities in a coordinated and integrated manner. The planned activity programs have been presented in the eight sub-sectoral clusters: i) Institutional Development, ii) Enabling Environment, iii) Main River, iv) Towns and Rural Areas, v) Major Cities; vi) Disaster Management; vii) Agriculture and Water Management, and viii) Environment and Aquatic Resources. Each cluster comprises of a number of individual programs. WARPO was assigned to monitor the NWMP.

4.1.2.10 [National Forest Policy, 1994](#)

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

The need of amendments of the existing forestry sector related laws and adoption of new laws for sectoral activities have been recognized as important conditions for achieving the policy goals and objectives. The Forest Policy also recognizes the importance of fulfilling the responsibilities and commitments under international multilateral environmental agreements.

The project line length is not routed through any forest areas and will not be affect the forest policy.

4.1.2.11 National Fisheries Policy, 1999

The National Fisheries Policy, 1999 was formulated following review and intent of the East-Bengal Protection and Conservation of Fish Act 1950, which was updated by the Protection and Conservation of Fish (Amendment) Ordinance 1982 and further refined by the Protection and Conservation of Fish (Amendment) Act 1995. These Acts and ordinance provide provisions for the protection and conservation of fish in fresh water and brackish water bodies.

The Fisheries Policy highlights the need to conserve fish breeding grounds and habitats. It intends to promote fisheries development and conservation in all water bodies.

As per the nature of project execution, it is expected to have negligible or limited negative effects to fish breeding ground and habitats, however the appropriate mitigation measures will be taken care to reduce the potential if applicable.

4.1.2.12 National Strategy for Waste Management

The strategy for solid waste management is essential in order to minimize the environmental, social and economic problems. To minimize these problems, recently the GoB has taken some initiatives and accordingly in December 2010, the DoE under MOEF has formulated a national '3R' strategy for waste management in a draft form. It is the latest strategy which will take time to implement globally. For the proposed project, the '3R' strategy shall be followed to minimize the waste impact on environment.

The concept of this strategy is minimizing waste impacts in terms of quantity or ill-effects, by reducing the quantity of waste products with simple treatments and recycling the wastes by using it as resources to produce same or modified products. The principle of '3R' is stated as reducing waste, reusing and recycling resources and products.

4.1.2.12.1 Reducing means choosing to use with items with care to reduce the amount of waste generated.

4.1.2.12.2 Reusing involves the repeated use of items or parts of items which still have usable aspects.

4.1.2.12.3 Recycling means the use of waste itself as resources.

4.1.2.13 Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009

The GOB also prepared the BCCSAP in 2008 and revised in 2009. This is a comprehensive strategy to address Climate Change (CC) challenges in Bangladesh. BCCSAP built on and expanded the NAPA. It is built around the following six themes:

- 4.1.2.13.1 **Food security, social protection and health** to ensure that the poorest and most vulnerable in society, including women and children, are protected from CC and that all programs focus on the needs of this group for food security, safe housing, employment and access to basic services, including health.

- 4.1.2.13.2 **Comprehensive disaster management** to further strengthen the country's already proven disaster management systems to deal with increasingly frequent and severe natural calamities.
- 4.1.2.13.3 **Infrastructure** to ensure that existing assets (e.g., coastal and river embankments) are well maintained and fit for purpose and that urgently needed infrastructure (cyclone shelters and urban drainage) is put in place to deal with the likely impacts of climate change.
- 4.1.2.13.4 **Research and Knowledge management** to predict that the likely scale and timing of CC impacts on different sectors of economy and socio-economic groups; to underpin future investment strategies; and to ensure that Bangladesh is networked into the latest global thinking on climate change.
- 4.1.2.13.5 **Mitigation and low carbon development** to evolve low carbon development options and implement these as the country's economy grows over the coming decades.
- 4.1.2.13.6 **Capacity building and Institutional strengthening** to enhance the capacity govt. ministries, civil society and private sector to meet the challenge of CC.

4.1.2.14 [Bangladesh Labour Act, 2006](#)

This Act pertains to the occupational rights and safety of workers and the provision of a comfortable work environment and reasonable working conditions. In the chapter VI of this law safety precaution regarding explosive or inflammable dust/gas, protection of eyes, protection against fire, works with cranes and other lifting machinery, lifting of excessive weights are described. And in the Chapter VIII provision safety measure like as appliances of first aid, maintenance of safety record book, rooms for children, housing facilities, medical care, group insurance etc. are illustrated.

4.1.2.15 [Vehicle Act, 1927, the Motor Vehicle Ordinance 1983](#)

Key features of the vehicle act, 1927, the motor vehicle ordinance 1983 is as follows:

- 4.1.2.15.1 Exhaust emission.
- 4.1.2.15.2 Vehicular air and noise pollution.
- 4.1.2.15.3 Road/traffic safety.
- 4.1.2.15.4 Vehicle Licensing and Registration.
- 4.1.2.15.5 Fitness of Motor Vehicles.
- 4.1.2.15.6 Parking by laws.

4.1.2.16 [The National Biodiversity Strategy & Action Plan \(NBSAP\), 2004](#)

NBSAP for Bangladesh, 2004 provides a framework for conservation, sustainable use and sharing the benefits of Biodiversity of the country. A major focus of the NBSAP, 2004 is the need for cross-sectoral linkages, reflecting the fact that in Bangladesh, biodiversity conservation is closely interwoven with social and economic development. Thus, the NBSAP also provides a framework for securing the necessary environmental conditions to reduce poverty, ensure sustainable development and respond to the implementation of elements of the country's PRSP.

4.1.2.17 The Electricity Act 1910

This act relates to the supply and use of electrical energy, allows any person to secure a license to supply energy and to put down or place electrical supply lines for the transmission of energy. Sect 19(1) of the Act provides that the licensee, in the exercise of any of the powers conferred by or under this Act, will cause as little damage, detriment and inconvenience as may be, and will make full compensation for any damage, detriment or inconvenience caused by the licensee or by anyone employed by the licensee. L&T will refer to the applicable provisions in this Act.

4.1.2.18 New Electricity Act 2018 & Rule 2020

This act is the latest amendment of electricity act 1910, where the necessary electrical clearance as per kV rating wise available and will be followed as per applicability during the construction of said transmission line project. This law has also the provision of compensation to the people whose land or area will be used for the construction of transmission line project.

For construction of the transmission line project, no area or land will be acquired only the compensation against the damage to crop will be processed as per the applicable norms and procedures set by this law and client PGCB.

4.1.2.19 Natural Water Bodies Protection Act 2000

According to this Act, the character of water bodies i.e. rivers, canals, tanks, or floodplains identified as water bodies in the master plans or in the master plans formulated under the laws establishing the municipalities in division and district towns shall not be changed without approval of concerned ministry. This Act is under the Rajdhani Unnayan Kartipakkha/Town Development Authority/Municipalities.

Any part of Component 3 that will cross rivers, ponds, canals, and drainage channels will refer to this Act and will secure the required approval and clearances.

4.1.2.20 Wildlife (Protection and Safety) Act 2012

Provides for the conservation and safety of biodiversity, forest and wildlife of the country by repealing the existing law relating to conservation and management of wildlife of Bangladesh. Under this Act, hunting, trapping, killing of wildlife are strictly prohibited

This project will not affect areas of habitats known to host wildlife. Route is along urban areas.

4.1.2.21 National River Protection Act 2013

Creation of National River Protection Commission to manage and control water and environmental pollution, etc., and ensure socio-economic development of a multi-use and rational use of natural resources.

L&T will ensure compliance to relevant provisions of this Act.

4.2 Relevant International Environment Agreements

The applicable international environmental agreements where Bangladesh is a signatory which can provide guidance during the implementation of the project.

4.2.1 Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris 1972)

Defines and provides for the conservation of world's heritage by listing the natural and cultural sites whose value should be preserved. L&T will ensure compliance to relevant provisions of this Act.

4.2.2 Convention on Biological Diversity (1992)

A framework for biodiversity and Requires signatories to develop national strategies (National Biodiversity Strategy and Action Plan) for the conservation and sustainable use of biological diversity

Any replacement of cleared vegetation resulting from construction activities will be consistent with the objectives and priorities of the current Action Plan

4.2.3 Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington 1973) – also known as CITES

Addresses the exploitation patterns and overharvesting that threaten species of flora and fauna.

Under this Convention, the governments agree to restrict or regulate trade in species that are threatened by unsustainable patterns and to protect certain endangered species from overexploitation by means of a system of import/export permits.

It will be ensured that it will not cause any harvesting and exploitation of wild flora and fauna during implementation.

4.2.4 Vienna Convention for the Protection of the Ozone Layer

A framework for efforts to protect the globe's ozone layer by means of systematic observations, research and information exchange on the effects of human activities on the ozone layer and to adopt legislative or administrative measures against activities likely to have adverse effects on the ozone layer.

No such chemicals will be used during execution of this project which can affect the ozone layer like methyl chloroform, a solvent generally used for industrial processes.

4.2.5 Montreal Protocol on Substances that Deplete the Ozone Layer (a protocol to the Vienna Convention for the Protection of the Ozone Layer)

Designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion.

No such chemicals will be used for construction of project which can cause harm to the ozone layer.

4.2.6 Kyoto Protocol (1997)

Commits its Parties to set internationally binding emission reduction targets. This agreement is linked to the United Nations Framework Convention on Climate Change (UNFCCC).

It will be ensured that zero or minimal fugitive natural gas emissions.

4.2.7 UNFCCC (1992)

Aims to achieve stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a level low enough to prevent dangerous anthropogenic interference with the climate system.

It will be ensured that any operation related to its implementation will comply with this agreement.

4.2.8 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)

Aims to reduce the amount of waste produced by signatories and regulate the international traffic in hazardous wastes.

It will be ensured that disposal of chemicals used (if and when needed) will follow the instructions in the material data safety sheet.

4.3 Donor Agencies

4.3.1 ADB Safeguard Categories

4.3.1.1 Environment

Proposed projects are screened according to type, location, scale and sensitivity and the magnitude of their potential environmental impacts, including direct, indirect, induced and cumulative impacts. Projects are classified into the following four categories:

Project Category	Significance and nature of impacts
Category A	A proposed project is likely to have significant adverse environmental impacts that are irreversible, diverse or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An EIA including an EMP is required.
Category B	The proposed project's potential adverse environmental impacts are site-specific, few if any of them are irreversible, and in most cases, mitigation measures can be designed more readily than for category "A" projects. An IEE including an EMP is required.
Category C	A proposed project is likely to have minimal or no adverse environmental impacts. An EIA or IEE is not required, although environmental implications need to be reviewed..
Category FI	A proposed project involves the investment of ADB funds to or through a financial intermediary. The financial intermediary must apply and maintain an environmental and social management system unless all of the financial intermediary's business activities have minimal or no environmental impacts or risks.

4.3.1.2 Involuntary Resettlement

The involuntary resettlement impacts of an ADB-supported project are considered significant if 200 or more persons will be physically displaced from home or lose 10% or more of their productive or income-generating assets. Projects are classified into the following four categories:

Project Category	Significance and nature of impacts
Category A	A proposed project is likely to have significant involuntary resettlement impacts. A resettlement plan, which includes assessment of social impacts, is required.
Category B	A proposed project includes involuntary resettlement impacts that are not deemed significant. A resettlement plan, which includes assessment of social impacts, is required.
Category C	A proposed project has no involuntary resettlement impacts. No further action is required.
Category FI	A proposed project involves the investment of ADB funds to or through a financial intermediary. The financial intermediary must apply and maintain an environmental and social management system unless all of the financial intermediary's business activities are unlikely to generate involuntary impacts.

4.3.1.2.1 Indigenous Peoples

The impacts of an ADB supported project on indigenous peoples are determined by assessing: the magnitude of impact in terms of

4.3.1.2.1.1 customary rights of use and access to land and natural resources.

4.3.1.2.1.2 socio-economic status.

4.3.1.2.1.3 cultural and communal integrity.

4.3.1.2.1.4 health, education, livelihood, and social security status; and the recognition of indigenous knowledge; and

4.3.1.2.1.5 The level of vulnerability of the affected Indigenous Peoples community.

Projects are classified into the following four categories:

Project Category	Significance and nature of impacts
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Category A	A proposed project is likely to have significant impacts on indigenous peoples. An indigenous people plan (IPP), including assessment of social impacts, is required.
Category B	A proposed project is likely to have limited impacts on indigenous peoples. An IPP, including assessment of social impacts, is required.
Category C	A proposed project is not expected to have impacts on indigenous peoples. No further action is required.
Category FI	A proposed project involves the investment of ADB funds to or through a financial intermediary. The financial intermediary must apply and maintain an environmental and social management system unless all of the financial intermediary's business activities unlikely to have impacts on indigenous peoples.

4.3.2 Relevant policies and guidelines of EXIM Bank

The EXIM bank of India doesn't have any specific policies and guidelines, hence the policy and guidelines as per GoB will be applicable for the project.

4.4 Administrative Setup related to Environment in Bangladesh.

The Ministry of Environment and Forests (MoEF) is the agency responsible for planning, promoting, coordinating and overseeing the implementation of programs and plans regarding environment and forestry. The MoEF deals with all national environmental matters and is responsible for the prevention and control of pollution, forestation and regeneration of degraded areas and protection of the environment, and in the framework of legislations. MoEF also undertakes surveys, impact assessment, pollution control, research, and collection and dissemination of environmental information, as well as environmental awareness among all sectors in Bangladesh.

The MoEF oversees the activities of the following technical/implementing agencies:

- Department of Environment (DOE);
- Forest Department (FD);
- Bangladesh Forest Industries Development Corporation (BFIDC);
- Bangladesh Forest Research Institute (BFRI);
- Bangladesh National Herbarium (BNH);
- Water Resources and Planning Organization (WARPO);
- Bangladesh Inland Water Transport Authority (BIWTA);
- Department of Fisheries (DOF);
- Bangladesh Water Development Board (BWDB),
- Roads & Highways Department (RHD);
- Bangladesh Agricultural Extension (BAE),
- Bangladesh Road Transportation Authority (BRTA);
- Bangladesh Metrological Department (BMD)

- Union Parishad.

4.4.1 Department of Environment (DoE)

The DOE has been placed under the MoEF as its technical wing and is statutorily responsible for the implementation of the ECA, 1995. The principal activities of the DoE are:

- Defining EIA procedures and issuing environmental clearance permits the latter being the legal requirement before the proposed Project can be implemented.
- Providing advice or taking direct action to prevent degradation of the environment.
- Pollution control, including the monitoring of effluent sources and ensuring mitigation of environmental pollution.
- Setting the Quality Standards for environmental parameters;
- Declaring ECAs, where the ecosystem has been degraded to a critical state; and
- Review and evaluation of IEEs and EIAs prepared for projects in Bangladesh.

4.4.1.1 The Environment Conservation Rules, 1997 as amended in 2002, 2003, and in 2017 (hereinafter referred as ECR)

The Provisions under the ECR are summarized as follows: The industries for the purpose of obtaining ECC have been classified into the following four categories based on their site and impact on the environment:

- Green
- Orange-A
- Orange-B
- Red

The list of industries falling under each category has been annexed in the Schedule-1 to the ECR.

- For proposed industries falling under the Orange B category, a Site Clearance Certificate (SCC)/Environmental Clearance Certificate (ECC) need to be obtained from DoE.
- The project entrepreneur shall apply for SCC/ECC in form 3 along with prescribed documents and application fees.
- SCC/ECC will be valid for 1 year from the issuance date and shall be renewed at least 30 days prior to expiry.
- Various environmental quality standards pertaining to air, water, sound, odor etc. have been laid down in the schedules attached to the Act.
- Emissions and waste discharge standards have been laid down in Schedules 9-11.

The person in charge of facility/unit shall

The proposed project falls in Orange B category, for which SCC/ECC is required upon submission of IEE report and EMP.

Therefore, PGCB will carry out an IEE report to be submitted to the DoE.

PGCB will apply to the DG, DoE for getting SCC with required documents.

PGCB shall follow the guidelines presented in the ECR to prepare the documentations required to apply for and obtain the clearance required to initiate any intervening activities from the DoE.

PGCB will follow EMP mentioned in IEE report and follow the environmental quality and other applicable standards mentioned in ECR.

notify the Director General (DG), DoE in case of pollutant emission/ discharge in excess of prescribed standards or where there is a possibility of the same.	
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5 Environmental Management & control

EHSO identifies the significant environment impacts from environment aspect & impact assessment and proposes the adequate control measures to reduce the impact within insignificant limit. EHSO during the EHS inspections shall inspect the work areas with reference to the following environmental requirements. Identifies all conformities and non-conformities and specifies them with positive / negative remark in the EHS inspection report.

5.1 Environmental Management Plan

This chapter describes the environmental and social management plan of the Project. It describes institutional arrangements for the environmental and social management of the project, provides mitigation and monitoring plans, and presents monitoring and reporting requirements.

5.1.1 Objectives

The basic objective of the environmental and social management plan is to manage adverse impacts of proposed project interventions in a way that minimizes the adverse impact on the environment and people in the project area. The specific objectives of the environmental and social management plan are to: Facilitate the implementation of the mitigation measures discussed earlier in the document.

- Maximize potential project benefits and control negative impacts;
- Draw responsibilities for contractors, consultants, and other members of the project team for the environmental and social management of the Project;
- Define a monitoring mechanism and identify monitoring parameters in order to:
- Ensure the complete implementation of all mitigation measures,
- Ensure the effectiveness of the mitigation measures;
- Assess environmental training requirements for different stakeholders at various levels.

5.1.2 Construction Stage Site Specific Management Plans

The following site specific management plans mentioned in this report-

- Pollution Prevention Plan
- Waste Management Plan
- Water Management plan
- Occupational Health and Safety (EHS) Plan
- Traffic Management Plan
- Fuel and Hazardous Substances Management Plan
- Health and Safety Plan for Covid-19
- Emergency Preparedness Plan
- Communication Plan

5.1.3 Management/Mitigations and Compliance Monitoring Plan

The Plan describes the potentially negative impacts of each subproject activity, lists mitigation and control measures to address the negative impacts, and assigns responsibilities for implementation and monitoring of these measures. The Plans are given in Table mentioned below-

Management/ Mitigations and Compliance Monitoring Plans

Impacts/ Issue	Actions	Responsibility		Key Performance Indicator	Timing
		Execution	Monitoring		
Design/Pre-Construction Phase					
Land Use Change	• Transmission lines will be aligned to minimize impacts on cultivation fields and other important areas. • Compensation and assistance will be paid to the persons/ households losing their crops.	PGCB		• Documentary evidence of payment of compensation and assistance; • Number of complaints related to land use change and compensation received through GRM; • Number of complaints resolved.	Before construction
Loss of Crops Production	Compensation and assistance will be paid to the PAPs.	Contractor	CSC	• Documentary evidence of payment of compensation and assistance • Income levels of affected households; • Number of public grievances re resettlement and compensation received; • Number of complaints resolved	Before construction
	• Contractors will lease the land for construction facilities on temporary basis. Proper documentation will be carried out for this leasing. • Site selection will be carried out in consultation with the community and local officials; approval from Construction Site Consultant (CSC) will also be required for the selected sites.	Contractor	CSC	• Documentary evidence of land leasing for temporary facilities • CSC approval for the selected site(s) Absence of grievances regarding temporary facilities	Before contractor mobilization
Soil, Water and Noise pollution	A pollution prevention plan will be prepared in accordance with Environmental Code of Practices (ECP), national.	Contractor	CSC	Approved plan; Plan itself will outline appropriate KPIs for its implementation.	Before construction
Land loss and Crop Loss	Compensation will be paid to the land owners for tower footing area according to existing law. Similarly, assistance will be paid to the persons/households losing their livelihoods like crop loss.	PGCB		• Documentary evidence of payment of compensation and assistance; • Number of complaints related to land use change and compensation received through GRM; • Number of complaints resolved	Before Construction
Loss of Tress	Compensation plan needs to be planned for trees that will be cut down due to commencement and rate of the trees will be finalized through adjacent forest department office.	CSC	CSC	• Documentary evidence of payment of compensation and assistance; • Number of complaints related to land use change and compensation received through GRM; • Number of complaints resolved	Before Construction
Disposal of excavated material	Identification of re-use of excavated material on site, to reduce off site effects. Maximization of use excavated material in construction	Contractor	CSC	• Availability of plan to dispose excavated material.	Before construction

Water quality	Oil and chemical storage and vehicle wash and oil change facilities will be established on impermeable surfaces to avoid percolation; and Drainage system will be designed in order that all spills will be drained and collected in a sump for further appropriate disposal	Contractor	CSC	- Monitoring in accordance with Drinking Water and Sanitation Plan. - No breaches of Material Safety Data Sheet (MSDS) for hazardous substances.	Before construction
Traffic Management	A Traffic Management Plan (TMP) will be prepared.	Contractor	CSC	Approved TMP; Plan itself will outline appropriate KPIs for its implementation.	Before mobilization of contractor
Construction camp (and other temporary facilities) site selection	Site for construction camp will be selected with approval from the Construction Supervision Consultants (CSC). Areas having thick/dense vegetation will be avoided as far as possible. No beels (water ponds) or khals (water channels) will be affected.	Contractor	CSC	Approval from CSC Plan itself will outline appropriate KPIs for its implementation	Before mobilization of contractor
Waste management	A Waste Management Plan will be prepared and approval obtained from CSC.	Contractor	CSC	Approved Plan; Plan itself will outline appropriate KPIs for its implementation	Before mobilization of contractor
Employment Opportunities	There will be a new job opportunity for project areas people. A large proportion of this workforce will be needed both skilled and semi-skilled laborers including drivers, machinery operators, steel fixers, technicians, electricians, fitters, welders, watchmen, camp staff, warehouse staff, and manual laborers. Local community can avail these opportunities based on the desired eligibility criteria and competency on relevant field.	Contractor	CSC	Approved plan, and compliance with the labor recruitment plan	Before mobilization of contractor

Contractor Mobilization and Demobilization; Transportation of Materials and Supplies

Traffic management	The contractor will implement the traffic management plan. Construction activities will be scheduled in a manner to avoid peak traffic hours. Liaison and coordination will be maintained with relevant authorities such as City Corporation and Traffic Police. Traffic signage will be placed where necessary and appropriate to warn the drivers and pedestrians about the construction activities. ECP to be implemented GRM will address the traffic congestion related issues.	Contractor (with PIU's assistance)	CSC	Number of any non-compliance reports Number of complaints / grievances. Number of traffic accidents/incidents involving project vehicles and lorries bringing materials and supply to project	During mobilization and de-mobilization
Health and Safety	Occupational health and safety procedures and OHS Plan will be enforced. Public safety will be included in the Plan. Implement fuels and hazardous substances management plan. Fencing would be provided around construction sites as appropriate to minimize public safety risks. Covid issues must be well taken care of, labours must have good sanitation and accommodation facility according health guideline. A Traffic Management Plan will be implemented that will aim at ensuring access to residential areas, and preventing of unsafe situations, especially near schools, housing areas, construction areas, camps and offices. Special attention should be focused on safety training for workers to prevent and restrict accidents and on the knowledge how to deal with emergencies. Road	Contractor	CSC	Number of any non-compliance reports; Number of any related public complaints. Number of patients affected to Covid and measures to be taken Number of accidents, incidents and near-misses.	Throughout contractor mobilization and demobilization

	signage will be fixed at appropriate locations to reduce safety hazard associated with project related vehicular traffic. Liaison with traffic police and communities will be maintained Project drivers will be trained on defensive driving. Vehicle speeds near / within the communities will be kept low, to avoid safety hazards. Awareness raising of communities will be carried out about the construction activities and associated safety hazards. ECPs will be implemented.				
Air Quality	The equipment and vehicles used during the construction process will comply with the national on exhaust emissions. Concrete batching plants will be located minimum 500 m away from residential areas and will have appropriate dust/emission suppression mechanisms such as wet scrubbers. Contractor will implement dust prevention measures such as watering of roads near the residential areas and spraying of water on loose material where required and appropriate. Regular air monitoring will be carried out near the sensitive receptors to ensure ambient air quality remains within the limits defined by national standards Measures will be taken to protect the workers from excessive dust (i.e., usage of personal protective equipment). A GRM will be put in place to receive complaints from public on various aspects of environmental issues, including air pollution. These grievances will be addressed by the contractor by adopting necessary pollution control measures. Continued consultations with the affected communities will be carried out during construction phase. ECP on air quality management will be implemented.	Contractor	CSC	Number of non-compliance reports. Number of community complaints. Ambient air quality found beyond the national and Guidelines	Throughout contractor mobilization and demobilization
Noise	The equipment and vehicles used during the construction process will comply with the national standards on noise. Contractors will adopt appropriate noise attenuation measures to reduce the noise generation from construction activities. The noise attenuation measures will include, (i) fitting of high efficiency mufflers to the noise generating equipment; and (ii) keeping acoustic enclosures around drilling equipment. The construction activities near the settlements will not be carried out during night time. Regular noise monitoring will be carried out near the sensitive receptors listed in. A GRM will be put in place to receive complaints from public on various aspects of environmental issues, including noise pollution. These grievances will be addressed by the contractor by adopting	Contractor	CSC	Number of non-compliance reports; Noise measurement data Number of community complaints.	Throughout contractor mobilization and demobilization
Road Crossing/ Blocked Route	Contractor will prepare and implement a traffic management plan, in consultation and coordination with the local community The community will be informed about the nature of	Contractor	CSC	Number of any non-compliance reports Number of complaints	Before and during construction

	construction activities and possibility of any blocked route; alternate routes will be identified with the help of local/affected community. Duration of such blockage will be minimized to the extent possible. Liaison and coordination will be maintained with relevant authorities such as City Corporation and Traffic Police. Liaison with the community will be maintained. The GRM described earlier will also address community grievances related to any blockage of local routes				
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Construction Activities (Towers Foundations; Tower Erection; and Conductor Stringing)

Soil erosion	• Works will be carried out in a manner not to cause soil erosion. • Vehicular traffic near the bank line will be minimized. • Protective measures such as mulching will be undertaken to stop erosion. • Vehicular traffic on unpaved roads will be minimized.	Contractor	CSC	• Number of non-compliances observed. Number of complaints.	Throughout the construction phase
Tower Footing and Foundation	• Contractor will prepare proper layout regarding cofferdam construction • Contractor will have to manage all the necessary tools in order to block water getting into the cofferdam • Contractor must employ workers having prior knowledge and experience related to footing construction in the riverbed	Contractor	CSC	• Number of non-compliances observed. • Number of complaints.	Throughout the construction phase
Water contamination	• Contractor will be required to take appropriate measures to avoid and contain any spillage and pollution of the soil. • Contractor will confine the contaminants immediately after such accidental spillage. • Contractor will collect contaminated soils, treat and dispose them in an environment friendly manner. • All areas intended for storage of hazardous materials to be quarantined and provided with adequate facilities to combat emergency situations complying with all the applicable statutory stipulation. • Top soil to be stripped and stockpiled where practical. • Temporary stockpiles to be protected from erosion. • For sewage waste, appropriate treatment arrangement such as septic tanks and soakage pits will be installed on site. Water will percolate into the ground so there will be no discharge. Alternatively, sewage from construction camps and other facilities will be collected and transported to nearby municipal sewage treatment plants.	Contractor	CSC	• Number of non-compliances observed or reported • Monthly auditing of management of hazardous materials against Safety Data Sheet (SDS) • Soil and water quality monitoring data • Number of any non-compliance Number of related complaints	Throughout the construction phase
Vegetation loss; damage to crops	• Give proper compensation against homestead and tree felling to the actual owners. Minimize vegetation loss as much as possible during earthwork and wire stringing. • Clearing and removing of natural vegetation and crops will be minimized • Tree cutting will be minimized • Selecting barren/fallow land for	Contractor	CSC	• Area of vegetation lost/disturbed • Number of trees felled • Number of complaints received.	Throughout construction phase

	establishing aligning transmission lines. • Compensatory tree plantation will be carried out. Compensation will be paid for any crop damage. ECP will be implemented.				
Flying mammals and Migratory birds disturbance	• Planted of local trees are provides habitat for a variety of birds, animals, insects, and other organisms, while also providing corridors and greenways to link habitats. • Avoid killing of animals. • Use low sound emitting machineries • Avoid excess lighting and use shaded lights at construction site • Covered transmission line should be used to avoid the impact on aerial wildlife. • Use adequate color bands/flags with transmission wires so that the flying animals will aware while pass through the line	Contractor	CSC	Number of any non-compliance reports Number of sighting of key wildlife species	Before and throughout the construction phase
Health and Safety and COVID-19 issue	• The contractor will implement the OHS Plan that will also cover communities' health and safety aspects • The community will be informed about the nature of construction activities and the associated health and safety risks; awareness raising of the communities will be carried out for this purpose with the help of training sessions, posters, signage, and other similar means. • Awareness raising of communities will be carried out, in a culturally-sensitive manner, about the communicable diseases including sexually transmitted infections. • Regular safety monitoring will be carried out at the sensitive receptors. • The construction sites will be fenced as appropriate to minimize entry of the local communities particularly children in the work areas. • Liaison with the community will be maintained. • GRM will be established to address community grievances related to health and safety aspects. • Contractors will have dedicated and qualified staff for ensuring compliance with the OHS Plan • Covid issues will be well taken care of. All the labors need to have covid negative certificate along with all health report. • Proper hand sanitization facility should be arranged in work place and ensuring wearing mush during work period. Apart from these labor shed should be prepared keeping in mind the covid issue for maintaining safe social distancing. • Each construction site, contractor and subcontractors are recommended to appoint one or more COVID-19 safety coordinators, who should be tasked to ensure compliance for their respective stuff against the set out covid-19 safety compliance procedure on daily basis.	Contractor	CSC	Number of non-compliances observed or reported Number of respiratory protective devices and other PPEs issues to workers. Monitoring of compliance with Health and Safety standards (including monthly reporting of accidents). Number of accidents, incidents and near misses. Number of trainings provided. Number of complaints received.	Throughout construction phase

	• Covid 19 compliance procedures to be mandatorily included in the site specific safety manuals • Disinfecting work zone periodically during the day at break hours to be undertaken. • Regular trainings will be provided to the workers on OHS aspects. • Consumption of tobacco, smoking and spitting in open place to be strictly prohibited inside the construction area. • Awareness raising material will be used including posters, signage, booklets, and others required at construction sites, camp sites, and particularly near the fuel storage. • The project drivers will be trained in defensive driving. They will maintain low speed while driving through / near the communities. • Complete record of accidents and near-misses will be maintained. • First aid facilities will be made available at the work sites and in the camps. The contractors will engage qualified first aider(s). • Location and telephone numbers of the nearest hospital will be displayed at appropriate places at work sites and in construction camps. If necessary, the contractor will have an ambulance available at the site. • Use of appropriate personal protective equipment (PPE) will be mandatory. No worker (or even visitor) will be allowed on the site without the required PPE (such as hard hat, safety shoes). • Designated area for staff and visitor to wear PPE and to disinfect labors at least twice in a day. • Temporary isolation room and rest rooms to be created at site for staffs who may develop covid symptoms. • All vehicles entering and exiting to the site to be disinfected • Construction waste to be removed from site in covered containers/ vehicles. • Toilet facilities to be disinfected by maintenance staff regularly and documented in procedure checklist to ensure compliance. • Firefighting equipment will be made available as Code of conduct will be implemented				
Social conflict due to the Influx of Workers; gender issues	• Local norms and customs will be respected • Camp crew will avoid entering the villages • No child labor will be employed in the camps. • Camp staff will be provided training on code of conduct, gender issues, Gender Based Violence (GBV) and SE • Liaison with the community will be maintained. • GRM will be put in place • ECP will be implemented.	Contractor	CSC	Number of public grievances relating to in-migrants Number of trainings provided	Construction phase

Waste management					
Soil and water contamination	- Contractors will implement the Waste Management Plan. - Appropriate hazardous, industrial and domestic waste disposal facilities must be established. - For the domestic sewage, appropriate treatment and disposal system (e.g., septic tanks and soaking pits) will be constructed having adequate capacity. - Waste oils will be collected in drums and sold to the recycling contractors. - The inert recyclable waste from the site (such as cardboard, drums, and broken/used parts) will be sold to recycling contractors. - The hazardous waste will be kept separate and handled according to the nature of the waste. - Domestic solid waste will be disposed of in a manner that does not cause soil contamination. - Awareness raising for minimizing use of no biodegradable substances. - Regular maintenance of waste management facilities will be undertaken. - No waste dumping/release will be carried out in environmental sensitive areas and rivers. - Implement ECPs.	Contractor	CSC	- Monthly auditing of management of hazardous materials against Material Safety Data Sheet - Soil and water quality monitoring data - Reports if any non-compliance - Number of complaints received	Construction ph

5.2 Training / Awareness Orientation

L&T will ensure that all his employees are suitably trained in the proper work procedures & environment health and safety regulations pertaining to their duties.

Subcontractors shall implement appropriate training programs to assess the training needs of individuals appropriate to work and follow a training program matrix for their employees. The sub-contractor shall get any assistance for the training from EM.

Environmental Induction shall be conducted for all employees. In which every individual's role in environment protection and emergency preparedness shall be explained.

Animal Protection shall be insisted for all employees. All kind of vehicle and equipment operators shall be instructed to operate the vehicle / equipment at the speed of 30 km/hr nearby animal habitation area. No horn shall be used nearby animal habited area.

5.3 Environmental Reports

The maintenance of environmental reports and records during execution of the project is part of normal good project management. L&T will keep and maintain environmental reports and records in

its project offices. These environmental reports and records shall be made available to client and other bodies upon request for inspection or auditing purpose. These records shall include, but not be limited to,

- Environment monitoring register (Annexure 1).
- Environment inspection checklist (Annexure 2)
- Findings from the environmental inspections and audits.
- Minutes from environmental meetings.
- Compliance monitoring reports and records.
- Environmental consent and / or licenses.
- A log of environmental incidents including preventive / remedial actions. (Annexure 3 - IM-10.2.0-A)
- EHS training records
- Relevant photographs and videos

Additionally, the weekly, monthly, and incident reports will be prepared. Reporting system will be followed as per the client's standard procedures.

5.4 Environmental Audits

An Environmental Audit is a systematic, periodic, and objective process in assessing an organization's activities and services in relation to the followings,

- Assessing compliance with relevant statutory and national & internal requirements.
- Establishing the performance baseline for developing an Environmental Management System (EMS)
- Check the implementation of environmental management plans on a frequent basis and ensure CEMP recommendations are implemented, prior to commencement of all construction activities.
- Identify any events of non-conformance and rectify the same.
- Audit the area of construction and assess its conformity to the planned areas.
- Ensure all environmental mitigation measures are installed prior to commencement of all construction activities.
- Develop internal audit reports.

Regular site inspection is the first tier of environmental auditing. Site walk through and inspection will be carried out on a daily and weekly basis as per the requirement. Audit will be conducted against CEMP as per client's requirement or biannually. The report of the CEMP audit will be submitted to

employer if required.

The below formats in the attachments will be used for this environmental auditing purpose. The formats may be changed as per the client's requirement or the client's format will be used depends on the project requirements.

5.5 Environmental Incidents

- All environmental incident according to the definition mentioned above, are captured, investigated and recorded in the Environmental incident/non-conformance report (Annexure 4 – IM 10.2.1 E) and the detailed investigation and analysis report in (Annexure 4 - IM 10.2.1 F)
- Non-Conformance related to environment and legal requirement can also be investigated with the (Annexure 5 - IM 10.2.1 E)

5.6 Noise Management

Purpose of this noise management section is to ensure that our activities in the project site reduce the noise impact to the environment by controlling the level of noise generation during project execution. Also complying the client's EHS standards, national and international environmental regulations and environmental procedures of Larsen and Toubro Company. Larsen and Toubro shall implement additional measures as necessary to ensure the better noise reduction and control measures required by Bangladesh Government laws and regulations. Larsen and Toubro consider no job is important which will result any damage to human life or environment also safety and environment to be no less of a priority than other business considerations, including schedule and cost.

5.6.1 Noise Control Measures

Following are the major type of noise control measures which can be implemented in the construction site in order to reduce the noise level,

- Idling of engine, especially when trucks are in a line will not be allowed.
- Where machine and plants provided with covers, the cover should be kept closed when the machine is in use.
- The noise intensive activities should be planned during daytime.
- Trucks, heavy equipment, and machineries will be checked regularly.
- All equipment, vehicles and machineries being fitted with appropriate noise suppression equipment to reduce noise levels as far as are practicable.
- Regular preventive maintenance shall be carried out for the equipment.

- Noisy equipment will not be operated at the same time wherever possible.
- Noisy equipment will be oriented away from the sensitive receptors.
- Noise control awareness training will be provided to all site employees.
- Warning signs will be set up in active work areas, prohibiting entry to persons without hearing protection.
- Wherever possible noisy operations can be isolated from other activities and employees.
- The labour working under high noise (close to machinery or equipment, noise level approximately 85-90 db (A), noise exposure 40 hours per week) should be provided with the earmuffs and plugs. Ear protection should be available on demand.

5.6.2 Noise Monitoring

L&T will monitor sound levels whenever construction activity is ongoing and will institute corrective measures if the noise level exceeds the standard limit. Table below gives the normal noise standard limit set by many of the international authorities.

Acceptable Noise Emission Limits

Location	Allowable Limits of Noise Levels In dB (A)	
	Day (7:00 am -8:00 pm)	Night (8:00 pm-7:00 am)
Residential Areas with Light traffic	40-50	30-40
Residential Areas in downtown	45-55	35-45
Residential area which include some Workshops, Commercial Business or Residential Areas near the Highways	50-60	40-50
Commercial Areas & Downtown	55-65	45-55
Industrial Areas (Heavy Industry)	60-70	50-60

Noise measurement program will consist of 15 min. long noise monitoring done at different locations in the project site. Noise level from equipment in operation will be measured along with the program.

5.7 Water (prevention of pollution & conservation)

- Suitable local arrangement shall be made for water conservation & waste / storm water drainage system.
- Effluents shall be suitably disposed through sewage drainage system / septic tank. Wherever required effluent treatment plants shall be installed.
- Quality of the drinking water shall be periodically checked and maintained.

5.8 Air (prevention of pollution & conservation)

- Dust Control EHSO monitors visually the dust level in the working area / project site during the EHS Inspections. If the dust level is found to be abnormal then initiates necessary action for dust suppression.

The following dust suppression method shall be adopted according to the area/situation:

- Water is sprayed on the roads at regular intervals to minimize dust due to vehicular movement and wind blowing.
- Prior to start of construction operations such as demolition, crushing, chipping etc. water is sprayed in small quantities to control dust.
- Dumpers carrying excavated soils shall be covered with polythene sheets to avoid dust due to high velocity air currents during transportation.

5.9 Emergency Spill Response & Management

5.9.1 Purpose

Purpose of this spill response and control management plan is to establish a management plan which covers overall spill prevention, spill response and control plan for executing the projects by means of complying client's EHS standards, national and international environmental regulations and environmental procedures of Larsen and Toubro Company. Effective implementation of this plan will help to avoid the environmental impact over the soil and ground water. Larsen and Toubro shall implement additional measures as necessary to ensure the better spill prevention, response and control management and shall implement all applicable measures required by Government laws and regulations. Larsen and Toubro consider no job is important which will result any damage to human life or environment also safety and environment to be no less of a priority than other business considerations, including schedule and cost.

5.9.2 Objective

The objective of this plan includes,

- Prevention of spill incident during our company's activities.
- Outline a spill response procedure in case of accidental release of chemicals or fuels.
- To identify responsible person and to list responsibilities of spill management team

5.9.3 Emergency Spill Response & Management Response Team



5.9.3.1 Project Manager

- Project Manager is overall responsible for management of oil spill response, waste minimization / reduction and pollution prevention during work activities.
- Allocation of appropriate resources to ensure successful implementation spill response and prevention procedures.
- Report to the authorities in case of any reportable spill.

5.9.3.2 Environmental Manager / EHS Officer

- Inform the PM / authorities in case of any spills.
- Emergency site coordination for spill response action.
- Initial and full investigation and report preparation as per the Environmental Reporting and Record Procedure.
- Shall ensure that all the staff / workmen are familiar with the CESMP and spill response plan.
- Responsible for conducting spill response orientation for the employees joining at site. And explain the local environmental protection requirements of the job to sub-contractors in the kick-off meeting / periodic meeting.

- Prepare reports for spill incident analysis as per client's procedures.
- Shall plan for procurement of appropriate gadgets such as oil spill kit & inspect before use. And impart training to the workforce on how to use the spill response kit.
- Ensure the training program and mock drills for spill response team.
- Shall ensure all MSDS are available for emergency spill response.
- Co-ordinate during the implementation of spill response training program and conduct mock drills.
- Emergency site coordination in case of any type of spill.

5.9.3.3 Spill Response Team

- Each employee will be trained in spill response action so that in case of any spill a quick team formation can be possible. All employees will be trained how to use the spill response kit kept near the fuel storage area. The contribution of team in response will be,
- Try to stop the spill if it is practically possible and personally safe to do so.
- Assess the spill immediately and inform L&T EHS Department (Cell: +8801323-483928)
- Wear the appropriate PPEs provided in the spill response kit.
- Secure the spill with the socks provided in the spill response kit.
- Contain the spill with absorbent pad, recover the contaminated soil.
- Collect the pads and contaminated soil in the plastic bags provided in the spill response kit.
- Environmental Manager / Officer will allocate a space for the temporary storage in a hazardous waste bin.
- If the spill is large or uncontrollable keep away from the spill, wait for the instruction from EHS Department.

5.9.4 Sources of Spill

Fuel tanks, vehicles, equipment, plant, and machinery are the possible source of spillage in

connection with L&T project activity. One fuel tank with the required capacity will be installed in the identified area. L&T will try to get the power source from the electricity service provider in order to avoid the usage of diesel generator. L&T project activity do not require any bulk transportation or storage of chemicals. So, risk of such spill is low in our activities.

Spill can be happened during filling of fuel tank, fuel transfer and refueling of vehicles, heavy equipment, and generators. Defective valves, personnel error and leakage from tanks are the main causes of spill. Based on the potential harm to the environment the spill can be classed as minor and major spills.

5.9.5 Minor Spill

A minor spill can be an inappropriately controlled emission to land or aquatic resources that has the potential to cause environmental harm, a non-compliance with project / other legal environmental requirements and associated procedure, a situation where a major spill is narrowly avoided.

5.9.6 Major Spill

A spill or series of spills causing environmental harm or requiring an assistance of external organization, that spill causing breaching of environmental legislation or contract agreement can be considered as large spill.

5.9.7 Control Measures for Spill Prevention and Monitoring

L&T will adopt a construction methodology and equipment which will avoid or reduce any potential threat to the soil and ground water quality by means of any potential spill. Control measures that will be implemented are described below,

- Fuel oil tanks will be stored in a bunded area which can hold up to 110% of the total capacity of the tank.
- Generators will be kept in a spill tray or proper alternate arrangements will be done to contain any spill from the generators.
- Liquid chemicals and hazardous materials will be stored in a spill tray.
- Vehicles will not be washed in the site.
- Concrete pumps /mixer will be washed as per the approved method by the client.
- Vehicle maintenance will be carried out in a designated area with an impervious surface.

- Wastewater will not be discharged to the ground. Wastewater will be collected in a septic tank and handed over to an approved waste handling sub-contractor.
- Sewage tank and wastewater networking system will be monitored every day by a designated person. At present visual monitoring will be carried out when the level of the sewage is around 75 % sewage truck will be called for.
- Immediately clean spill and inform supervisors.
- Wastewater from all facility in connection with the project will be collected in the septic tank.

5.9.8 Spill Response Procedure

In case of a minor spill,

- Quickly control the spill by stopping or securing the spill source. This could be as simple as tipping up a container or capping a hose / line. Contain the spill by using absorbent pads to soak up spilled material. Wear gloves and protective clothing, if necessary.
- Put s absorbents over the spilt and secure in a designated or hazardous waste bin.
- Maintain and dispose the spilt material as per the waste management plan.
- Immediately inform to the PM/EM through phone: + 880 1322-446913 an initial incident investigation report will be prepared by L&T Environmental Manager and will be submitted to client if required.

Both the spilt material and the absorbent will be considered hazardous waste and will be disposed of in compliance with state and federal environmental regulations. In case of generation of any contaminated soil resulted from spill, it will be transported from the site by an approved waste transportation service provider.

In case of a major spill, that is if the spill is uncontrollable, such as bursting of tanks and flowing of fuels in an uncontrollable manner the response action will be,

- Evaluate the area outside the spill.
- Engines and electrical equipment near the spill area will be turned off.
- Eliminate various sources of ignition in the area.
- Equipment emergency stop button can be used at this time.
- Report immediately to L&T Environmental Manager / EHS Manager / Project Manager who will report to the client immediately.
- Assess the situation, if possible, contain all the spilt liquid with the absorbent pad and keep in a hazardous waste bin.

- Recover the contaminated soil and keep along with the absorbent pads and handed over to the approved waste transportation service provider.
- Investigate and prepare an initial environmental incident report and submit the report to the client if required.
- Along with the site team Environmental Manager needs to conduct a detailed investigation and prepare the report. Client representative needed to be invited for the investigation. Investigation report shall be submitted to client and L&T Country EHS Manager within a week.

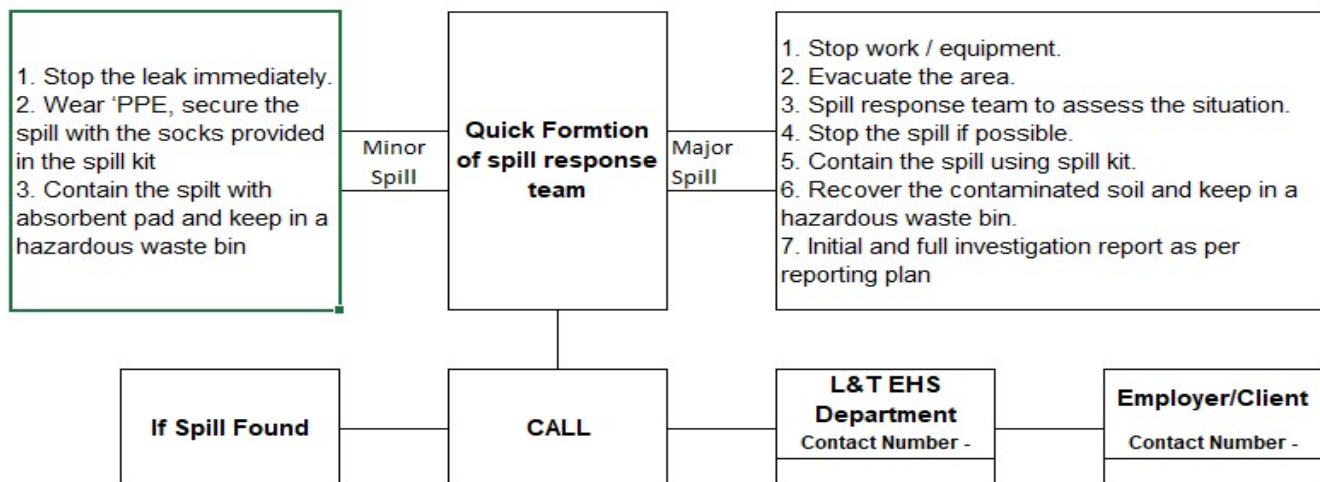
5.9.9 Training

Spill response and control training will be provided to project staff and workmen. Apart from this mock drill also will be conducted as per the mentioned time period. Spill response training will be given to all employees within two weeks after joining.

5.9.10 Reporting

All spills will be reported to L&T EHS Department immediately by L&T Environmental or Project Manager. In case of major spill client will be informed immediately. All minor spills will also be reported to L&T EHS department and client for incident Investigation.

5.9.11 Emergency Spill Response Action



6 Waste Management Plan

6.1 Purpose

Purpose of this waste management plan is to ensure that our activities in the project site and offices reduce the impact to the environment by minimizing the waste generation. Also complying the client's EHS standards, national and international environmental regulations

and environmental procedures of Larsen and Toubro Company. Larsen and Toubro consider no job is important which will result any damage to human life or environment also safety and environment to be no less of a priority than other business considerations, including schedule and cost.

This plan will be used to manage various types of waste generated during the execution of our company projects at different stages. It is also targeting to implement all the possible measures and practices to minimize the waste generation by means of segregation, reduce, reuse, and recycle.

6.2 Roles and Responsibilities

6.2.1 Project Manager

- Project Manager is overall responsible for environmental management including waste management, waste minimization / reduction and pollution prevention during work activities.
- Allocation of appropriate resources to ensure successful implementation of this waste management plan.

6.2.2 Environmental Manager / EHSO

- Initiate the waste reduction methods in offices and site locations.
- Shall ensure that all the staff / workmen are familiar with the CEMP and waste management plan.
- Responsible for waste management orientation for the employees joining at site.
- Initiate the waste reduction and management awareness programs.

6.2.3 Employees

- Each employee should attend the waste management orientation.
- Try to stop the activities which may produce more waste.
- Follow the waste management procedures.
- Do not make unwanted waste.
- Put the wastes in the designated waste bins.

6.3 Waste Categories

Each stage of company's construction activity generates considerable amount of waste. Various

stages of construction activities with a potential to generate waste are

- Paper
- Excavation
- Screed concreting
- Civil work
- Wooden conductor drum
- Insulator wood packing
- Hardware packing bags (plastic)
- Cleat packing bags (plastic)
- Painting work

The main categories of the waste which are expected to be generated from the projects may be, Office waste & construction waste.

6.3.1 Office Waste

Major type of office wastes is paper, plastics, printing cartridge and florescent lamp will also be produced but in a very minor quantity. Food waste and sewage are the other type of waste produced in considerable quantity. Apart from this first aid facility will produce medical waste.

Used oil and filters will be generated from these diesel generators used for power supply to the office and other site facilities like store, first aid room, security rooms, mess hall, etc.

6.3.2 Construction Waste

L&T construction activities will generate the waste such as excavated soil, wood waste, metal scrap, concrete waste, and cable waste. Chemical residue will be produced in a very minor quantity during water proofing and painting works. Finishing work will also generate small amount of paint, varnish and thinner waste or its empty bottles.

Equipment maintenance will be carried out in the maintenance area provided in the designated area with a cemented floor. Only the carpentry workshop will be set in the site which will create wood waste. Vehicle water washing will be carried out in the provided designated area. No concrete washing will also be done in the provided designated area. The concrete chute of the mixer will be covered while moving across the site. Motor oil and grease waste will be generated from site vehicles, equipment, plant and machinery.

6.4 Waste Management

All possible measures are taken to avoid waste generation. The Project Manager prepares the wastage limitations of various bulk materials such as cement, steel, aggregate and brick etc. During the initial stage of the project, and this is approved by the Cluster Operation Head / Head Operations. The planning engineer in co-ordination with storekeeper / section In-charge / HOD prepares the current wastage rate and compares with the waste reduction targets set for the project.

This is prepared in the form of system compliance report. If the wastages are exceeding the targets additional control measures are taken to reduce the wastage. Solid waste generated in the site shall be disposed at demarcated areas. Drawing of the site layout indicating the demarcated waste disposal area should be available with the Site Engineer / Section In-charge / HOD. Solid waste generated in the site shall be segregated in to hazardous & non-hazardous waste. Hazardous waste includes those that are specifically listed by regulation and those that are characteristically hazardous (i.e. ignitable, corrosive, reactive, toxic), while the other waste shall be classified as non-hazardous.

6.4.1 Non-Hazardous waste management

Uncontaminated hard waste such as dirt, bricks, concrete etc. shall be disposed in a municipal solid waste landfill or suitable disposal location identified by the client.

The hardened concrete and bricks may be used as clean fill material at site, if possible.

Refuse bins shall be placed at conspicuous locations at site to collect waste and surplus food, food packaging, and organic waste etc.

6.4.2 Hazardous materials

When any hazardous substance is procured, used, stored, or disposed, Material Safety Data Sheet (MSDS) for the substance shall be available at the worksite.

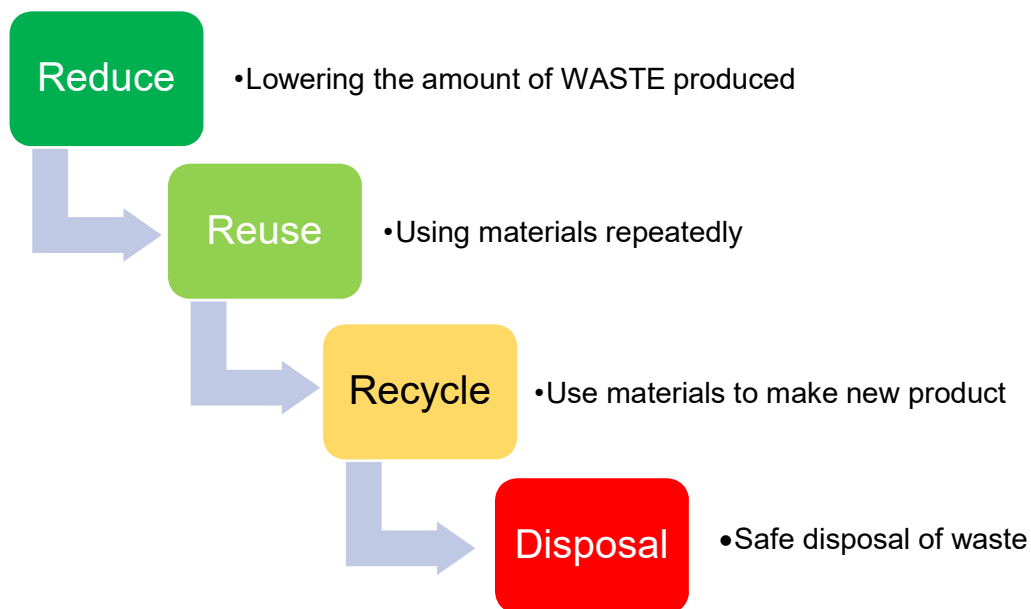
Hazardous waste needs to be disposed according to recommendations of material safety data sheet or as per local regulations.

Based on the nature of project flammable liquids like diesel and other chemicals or lubricants such as paints, hydraulic oils will be stored and required for the construction activity. The diesel and paint are the consumable materials.

6.4.2.1 Storage of flammable liquids

Since the material requirements for this project need to be supplied prior to construction period (to allow tower foundation, erection and stringing works to commence), there is no need for large quantities of fuel as material drop off is limited to this period alone. Thus, there are no risks of improper storage of fuel and spillage resulting in contamination of groundwater and surface water. Vehicles can get the required fuel from the local depot and no fuel is required for the construction work itself. However, the following precautionary measures shall be taken to prevent land pollution due to accidental spillage in the flammable liquid storage area.

- The floor of the storage area & the collecting drains shall be of Plain Cement Concrete (P.C.C) with an impermeable layer such as polythene sheets below it.
- The slope of the floor shall be 1:80 to enable easy flow of spillage oil into the collecting drain.
- The spillage oil in the drain shall be collected and sent for recycling or disposal as per local regulations.



6.4.3 Reduce

The critical first step of waste prevention is “Reduce” part of Reduce – Reuse – Recycle strategy. In general, before purchasing of any new material analysis will be made on really is the material need for the project and environmental of the product during disposal of that material. Whenever, possible used materials will be purchased. Only the mandatory documents will be printed in order to minimize the paper usage and both sides of the paper will be printed. Wherever possible, used papers can be reused. Envelops and wrapping papers will be reused. Most of the time communication and document transmission will be done electronically. USB flash drives will be used instead of CDs and

DVDs. We hope and believe that every little bit of trash avoided does make a big difference. In offices we will try to use the traditional mugs in the place of plastic / paper cups also fabrics in the place of tissue papers.

6.4.4 Reuse

Wherever possible, we will try to purchase the reusable products like food and beverage cups, plates, writing pens, towels, etc. Papers will be used on both sides. Rechargeable type or solar batteries will be used for our purpose.

6.4.5 Recycle

Designated bins will be provided for collecting the recyclable materials like glass, paper, tin cans, scrap metal, motor oil, ink cartridge, tires, etc. At the end the collected material will be sent for recycling. Whenever possible, the products made of recycled materials will be purchased, depends on availability.

6.4.6 Office Waste Management

It is that type of waste which is generated from offices, and the workers facilities / rest area. Paper and plastics will be collected in a bin clearly labelled as per given in the attachment. Once the bin is full it will be transferred to the waste skips designated for paper and plastics. When the skip of paper and plastic waste is full the same will be handed over to the vendor for recycling.

One separate skip will be provided for food waste in each location which will be covered. Sewage and wastewater from welfare facilities will be collected into the sewage tank / septic tank. Sewage tank will be buried underground in concreted floor. The level of sewage tank will be daily visually inspected. Once the tank is about to full capacity (about 75 %) the sewage water transporting sub-contractor will be informed to collect the sewage.

Used cartridge and batteries will be collected in separate bin and will be reused. If the reusing is not possible the same will be handed over to the waste transporting sub-contractor. All the hazardous waste generated in this project will be temporarily stored in designated hazardous waste storage area. Hazardous waste storage area will be concreted. Biomedical waste from first aid facility will be collected in a biohazard container. Only the trained first aider will handle the biohazard waste. Examples of types of bins and waste skip to be used are given in the attachments.

6.4.7 Construction Waste Management

Excavated soil will be used for the back filling. Wood waste will be collected in a designated area. Reusable wood waste will be segregated and used for site purposes. A skip will be provided in site

locations for the collection of scrap metal. Cured Concrete waste will be disposed off as per the agreed method disposal. Chemical waste or empty epoxy cans produced during the water proofing and painting work will not be stored on site. It will be taken away from the site by the water proofing subcontractor. But a temporary storage area will be designated.

Apart from this the project activities are unlikely to produce any hazardous waste. Empty cans of thinner and paints generated in the finishing stage will be collected in a separate bin. In case of any hazardous waste such as contaminated soil after a spill incident, will be collected in bin with tight lid and will be handed over to the approved hazardous waste material transporter. Such type of hazardous waste will be stored in the designated hazardous waste storage area.

Generation of waste will be very less as nature of the construction activities of said project, however the waste generation report will be maintained on weekly / monthly basis.

6.5 Fuel and Hazardous Substances Management Plan

6.5.1 Purpose

The purpose of this document is to ensure vehicles, equipment, and vessels are fuelled safely on construction sites, to ensure fuel is stored safely on construction sites, and to protect the environment from spills and the hazards associated with spills.

6.5.2 Responsibilities

It is the primary responsibility of the Supervisor(s) to ensure that all fuel handling, dispensing, and storage is done in a safe and proper manner in accordance with this procedure.

6.5.3 Environmental Protection Procedures

The accidental release of fuel during handling or dispensing may adversely affect the environment. The following protection procedures are intended to prevent a loss or escape of product and, in the event of a spill, to minimize the impact of the spill on the environment.

6.5.4 Delivering and Dispensing Fuel

6.5.5 Delivering fuel to the site

- Delivery of fuel to the site will be by approved highway tanks or mobile refuelling tanks.
- Delivery may be into on-site mobile refuelling tanks or directly into the equipment.
- Highway tanks shall be operated by a competent person.

6.5.6 Dispensing fuel

- All dispensing or transferring of fuel will be attended for the duration of the operation. The attendant must be aware of proper fuel handling procedures to minimize the risk of a spill and shall continuously scan the area adjacent to the fuelling operation for possible leaks or spills.

- The transferring and dispensing of fuel will be done with pumping equipment, an approved hose, and top-fill nozzle.
- Ensure that a site-appropriate spill containment kit is readily available.
- When unreeling the fuel transfer hose and nozzle, the nozzle must be in the upright position. The nozzle shall be kept clear of the ground when returned to the reel or storage position.
- The transfer of fuel must be stopped prior to overflowing, leaving room for expansion.
- The operation of moving equipment in the immediate area of a fuelling operation shall be suspended. • Welding and/or burning operations within 3 metres must be stopped while fuelling is in progress.
- Maintain regular inspections of fuel systems and their components. Check for leakage, deterioration, or damage, in accordance with the Construction Regulation.

6.5.7 Spills

Preventative measures are the best means of avoiding an accidental release of petroleum products. However, in the event of an accidental release, the following will occur:

- The Constructor will have appropriate spill response equipment available for all phases of the project area. See Appendix A for a list of such equipment.
- Clean-up action will follow the spill contingency plan. See Appendix B for a sample spill contingency plan.
- All spills or suspected spills of petroleum products, on land or into the water, regardless of size, will be reported immediately to the Supervisor. The Supervisor will report the spill immediately to the Project Manager, or his delegate, who shall ensure notification of the appropriate authorities.

6.5.8 Posting of Procedure

This procedure shall be posted or available on site and a copy shall be incorporated in the company safety policies and procedures. All records of employee training must be kept.

6.5.9 Procedure for Storing Fuel on Construction Sites

- Where the circumstances require, fuel may be stored in an approved mobile refuelling tank.
- Mobile fuelling tanks must be stored in an area where it cannot be hit by vehicles or other equipment. The fuel storage area also must be located away from drainage channels.
- Fire extinguishers shall be located near the fuel storage areas and be of a suitable type and size to permit the evacuation of workers during a fire.
- Any worker who may be required to use a fire extinguisher shall be trained in its use.
- Smoking will not be permitted in the area of the fuel storage facility and "No Smoking" signs will be posted. Smoking will not be permitted during any fuelling operation. "No Smoking" signs are to be maintained in good condition.
- Waste oils, lubricants, greasy and oily rags, or other materials subject to spontaneous combustion will be retained in a labelled container used for that purpose exclusively and will be properly disposed of at frequent intervals.
- Appropriate emergency spill equipment will be available in the fuel storage area. See Appendix A for a list of such equipment.
- No "hot work" shall take place within 3 metres of a storage zone. Posting of Procedure In cases where fuel is being stored on site, this procedure shall be posted or available on site and a copy

shall be incorporated in the company safety policies and procedures. All records of employee training must be kept.

6.5.10 Spill Response Equipment to be Available at Site

For sites where fuel is stored and dispensed, the following supplies shall be kept available to respond to and contain a diesel fuel spill.

A commercially available kit recommended for a 40 gal. spill typically contains:

- 3" dia. x 48" oil socks. Quantity: 10
- 3" dia. x 10' oil socks. Quantity: 3
- 17" x 19" oil pads. Quantity: 40
- 18" x 18" x 2" pillows. Quantity: 8
- Disposable material containment bags. Quantity: 10
- Latex gloves. Quantity: 2 pair
- Granular absorbent. Quantity: 4 gal.
- Polyethylene salvage drum container. Quantity: 1 with 55 gal. Capacity

6.5.11 Spill Contingency Plan

All spills or suspected spills of petroleum products, on land or into the water, regardless of size, will be reported immediately to the Supervisor. The Supervisor will report the spill immediately to the Project Manager, or his delegate, who shall ensure notification to the Concerned Authority, unless the spill is classed as non-reportable, according to the criteria below.

6.5.12 Non-Reportable Spills

Class VIII Spill: the spill of gasoline or an associated product of not more than 100 litres in areas restricted to the public, or not more than 25 litres in areas with public access, at a location defined as a bulk plant, marina, private outlet, or retail outlet need not be reported to the Ministry or to the municipality if the following conditions are met.

The four conditions that must be met for the reporting exemption to apply are:

1. The spill of gasoline or an associated product does not enter and is not likely to enter directly or indirectly water or a watercourse, as defined by the Ontario Water Resources Act;
2. The spill does not cause adverse effects other than those that are readily remediated through clean-up and restoration of paved, gravelled, or sodded surfaces;
3. Arrangements for remediation are made immediately; and
4. Records of the spill are maintained.

6.5.13 Other Spills

Any spill exceeding 100 litres or which does not meet the conditions for exemption from reporting requirements must be reported to the Supervisor, Project Manager, and the authorities. The report shall include details of the type of material spilled, the source of the spill, and whether the spill has reached the environment (e.g. drains, sumps, or waterways).

The supervisor on site or other designated person shall take charge of spill containment and clean-up. Workers shall be assigned to assist with control and remedial measures to:

- stop the leak
- block off any drains or access to drainage
- if spill has entered or is in danger of entering a waterway, boom-off area to contain spill
- assess the level of the spill and report as necessary
- assess the method of clean-up
- in an environmentally sensitive area, get advice from the Ministry of the Environment for clean-up measures
- proceed with recovery of spilled fuel and clean-up
- arrange appropriate disposal of fuel recovered and debris (in landfill site)
- if a government authority sends a representative to monitor the clean-up and ensure that it is done adequately, cooperate fully with the representative
- maintain a record of the spill and clean-up.

Details of records are to be prepared and kept for two years and must include:

- Date
- Time
- Location
- Duration of the release
- Identity and quantity of the pollutant
- Circumstances of the spill
- Containment and clean-up methods used
- Disposal and re-use method used
- Specifics of any adverse effect observed.

7 Bio-diversity Management Measures

As electrocution and collision while flying is the major concerns for avian groups, so the mitigation can be considered from tower design to setup and also in operation phase. For electrocutions, the mitigation measure can be thought to develop means for avoiding the contact/touch between the avian body and the power transmission wires. For the avoidance of collision, the mitigation approaches can be based on the principles how the bird can avoid the direction toward the power line/transmission line.

7.1 Tower Design :

The tower design should consider keeping adequate clearances between two conductors or two wires to avoid electrocutions of a large bird. The risk arises when large birds touch phase jumper and grounded structures or phase conductor and grounded parts. For the raptor species, horizontal distance of conductor separation can be 230 cm, which can accommodate the wrist-to-wrist distance of largest bird (which is approximately 215 cm), and can be considered as the standard for raptor protection. Likewise, vertical separation of at least 122 cm can accommodate the height of an eagle from its feet to the top of its head (which is approximately 92 cm) to avoid the risk of electrocutions by fleshy parts like wrists, feet, or other skin. Although the minimum distance between two energized or grounded parts are not represent an electrocution threat to large birds, nonetheless perch guards may be needed for large avifauna to minimize the risk of arcing electrocution caused by the urination jet of large birds roosting on the cross-arm above the conductors.

7.2 Use line visibility/markings/avian guard :

As the major risk for the avian species is to collision with power line, so, it is important to take necessary measures for minimize the risk of collision through diverting the flyway. There are many devices are using commercially in power transmission line in this regards. Marker balls, swinging markers can be a good device for warning bird to divert the flying direction without collision with power line. Buzzard Guard, Spiral vibration dampers, bird flight diverters, or other similar devices are commercially available products to increase the visibility of overhead wires to birds. The mentioned devices can be used at the different locations of the proposed transmission line.

7.3 Line insulation :

Insulating the vulnerable bare metalwork by high performance polymeric covers in TL and substation system can be a good solution for avoiding risk of bird and wildlife electrocutions in power towers or substation hardware due to insufficient clearances between two critical hardware.

7.4 Other wildlife Management measures :

The proposed high voltage TLs are not such concerned regarding wildlife risks except avifauna as the RoW will traverse mostly on the paddy fields and some portions will traverse over the settlement vegetation. Accordingly, no important habitats fall within the RoW of the proposed project. Impact on wildlife during construction of transmission towers and wires can be reduced through proper inventories of vegetation at access ways and tower feet, inventories of wildlife presence, bird nests at the proposed tower sites and surroundings. According to the information of inventories, the following precautions can be taken:

- i) Avoiding wildlife breeding and bird nesting season for construction the TLs.
- ii) Labour should be properly warned about the presence of wildlife and wildlife expulsion before starting the work.

7.5 Management measures to protect orchards/fruit garden :

It should be given highest priority to minimize or avoid damage of fruit tree and subsequently lessen the disturbance of depedent wildlife. To do such, all the equipment and construction materials shall be placed in barren or agricultural land within the corridor of two garden patches. Labour should be aware to avoid disturbance of forest resources. Vehicle and labour movement path must be avoiding sapling and tree damage. During the wire stringing, two stringing poles should be set up at the two boundary sides of the forest patch and then lifting the cables to avoid touching the fruit tree.

7.6 Biodiversity Management Plan

Construction phase management:

This management is focus on the planning, design and construction activities. Following Table represents the potential impacts, mitigation measures and responsible parties for action

Table:-Construction phase biodiversity management procedures

Potential Impact	Mitigation/ Management	Responsible Party	Compliance Monitoring	Activity type	Timing/ Frequency	Key Performance Indicator	Supervision Authority
Tree and scrub trimming	Pre-Assessment of existing vegetation (no. of trees, height and species composition of undergrowth vegetation) at the site done by the contractor representative team (admin or survey) Walk-over/Pre-construction surveys and implementation of measures and monitoring during construction.	Contractor	Confirming the Contractor has incorporated the presence of a representative to perform the pre assessment survey	Planning	Once before starting of construction work	Tender/Recruitment documentation	PGCB, BFD and DoE
Habitat damage for Site Access	Pre-Assessment of existing vegetation (no. of trees, height and species composition of undergrowth vegetation) at the site done by the operation team (admin or survey) Walk-over/Pre-construction surveys and implementation of measures and monitoring during construction.	Contractor	Confirming the Contractor has incorporated the presence of a representative to perform the pre assessment survey	Planning	Once before starting of construction work	Tender/Recruitment documentation	PGCB, BFD and DoE
Wildlife disturbance associated with construction	Pre-Construction Survey by contractor representative should be performed on abundance and distribution of faunal species before any onsite activity starts. Prepare maps of all relevant environmental features and conservation criteria along the project footprint (including permanent and temporary occupation areas). Provide training to workers and other project personnel.	Contractor	Confirmation on the preparation of a project specific survey	Planning	Once before starting of construction work and monthly during construction	Register/Availability of a Survey Plan in time and with appropriate contents	PGCB, BFD and DoE

7.7 Biodiversity Monitoring Program

As one of the key elements of the CESMP, a two-tier monitoring program has been proposed comprising compliance monitoring and effects monitoring. The main purpose of this monitoring program is to ensure that the various tasks detailed in the CESMP particularly the mitigation measures are implemented in an

effective manner, and also to evaluate program impacts on the key environment and social parameters. Both these types of CESMP monitoring are discussed below.

7.7.1 Compliance Monitoring:

The purpose of the compliance monitoring is to ensure that the contractor implements the mitigation measures given in the ESMP are effectively and timely implemented. This monitoring will generally be carried out by the CSC with the help of checklists prepared on the basis of the mitigation measures.

7.7.2 Effects Monitoring:

Effects monitoring is a very important aspect of ESMP and aims to ensure environmental protection. The effects monitoring plan proposed for the project is presented in Table mentioned below. The monitoring will comprise surveillance to check whether the contractor is meeting the provisions of the contract during construction and operation of the project including the responsible agencies for implementation and supervision. Compliance indicators or threshold limits for the monitoring are also given in Table mentioned below.

Table: -Effects Monitoring Plan

Parameter/ Activity	Location	Means of Monitoring	Compliance indicator/ threshold limits	Frequency	Responsible Agency	
					Implementation	Supervision
During Construction						
Hydrocarbon and chemical storage and handling	Constructio n camps and yards	Visual Inspection of storage facilities	No leakages from the containers in the storage. Handling follows procedures to avoid spillages.	Monthly	Contractor	CSC
Traffic Safety	Access Roads; other roads in project area (particularly along the underground transmissio n line route	Visual inspection to see whether proper traffic signs are placed and flag persons for traffic management are engaged	Smooth flowing of traffic; and placement of traffic signs and flag-person	Monthly	Contractor	CSC
Dust	Constructio n sites	Visual inspection to ensure good standard equipment is in use and dust suppression measures (e.g., spraying of waters) are in place.	No dust generation from the construction activities	Weekly	Contractor	CSC
		Spot measurements with potable meters	Compliance with national and international guidelines.	Monthly	Contractor	CSC
Noise	Constructio n sites; camp site	Noise measurement using portable noise meter;	Compliance with national and international standards	Monthly	Contractor	CSC

Waste Management	Construction camps and construction sites	Visual inspection that solid waste collection facilities are in place and waste is disposed at designated site	Facilities are clean and waste collection and disposal facilities are in place	Monthly	Contractor	CSC
Drinking water quality	Camps, offices	Testing of water quality of workers camp water supply for drinking water standards	national and international guidelines for drinking water	Monthly	Contractor	CSC
Air (PM, CO ₂ , SO _x , NO _x) and Noise quality	At sensitive sites identified by CSC	24-hour continuous monitoring with appropriate equipment	Compliance with national and international guidelines	Half yearly	Contractor	CSC, PIU
Clearance of vegetation	Each of construction sites (Labor shed, Stock Yard, Materials stocking) at the proposed tower sites	Direct observation	Vegetation management	Once during construction	Contractor	PGCB
Safety of workers Monitoring and reporting of accidents	At work sites	Usage of PPE and implementation of contractor EHS plan	All workers should be provided with, and use necessary PPEs	Monthly	Contractor	CSC, PIU
Grievances	In the project area	Number of grievances registered and addressed	Minutes of grievance redress meetings; number of grievances received; number of grievances resolved.	Monthly	CSC	PIU
Compensation for land loss and crop loss	Land owners of tower footing location	Compliance monitoring and documentation of compensation procedures	Compensation rates needs to fixed according to existing law of government.	Before starting the construction activity	PGCB and Contractor	Compensation for land loss and crop loss

7.8 Land Clearing & Removal of Vegetation (Set as Separate Point)

The existing vegetation inside the tower base area of the proposed transmission line will need to be cleared or cut before starting the construction works. Most of the portions of the proposed RoW fall inside paddy fields and a few traverse over orchards and homesteads vegetation. Additional vegetation damage (mainly shrubs and herbs) will be occurred at the proposed tower sites for storing construction materials, labor and construction vehicle movement.

Second time vegetation damage will be occurred during stringing of wires (about 51km.). A vegetation survey should be conducted to identify the number of trees will need to be shaved out (partially or fully affected) inside RoW (Right of Way). However, most of the trees need to be trimmed rather than cut, so, trees on the settlement, roads and orchards which are falls inside the alignment would be trimmed or cut.

As much as possible, large trees on the edge of the RoW should not be disturbed or damaged, as these are favored habitats of the birds. As with other project areas where trees will be cut, the potential loss of bird and wildlife habitats can be countered by planting suitable trees at other locations which are currently degraded.

Allow the vegetation along the alignment to grow back to at least 2 meters height (if technical specification permits and possible), which will provide cover for most wildlife that need to move through the RoW.

7.8.1 Mitigation Measures:

- Use barren land or possible low vegetated land for placing of materials and constructing labour shed.
- Construction activities should be completed within scheduled time.
- Avoid tree felling if possible.
- Give proper compensation against homestead and tree felling to the actual owners.
- Minimize vegetation loss as much as possible during earthwork and wire stringing.
- Aware labours about plant conservation before starting the work.
- Choose local indigenous medium size plant species for plantation.

7.8.2 Residual Impacts:

With the help of above mitigation measures, the impacts associated with establishing the site facilities are likely to be addressed adequately and the significance of residual impact will be minimum.

8 CONSTRUCTION

8.1 Planning stage:

- Ensure that key/ routine maintenance and operations can be implemented by the community/beneficiaries.
- Account for proper ventilation and adequate resistance to severe weather or natural disasters.
- Plan the project execution to minimize use of natural resources (material, water, land).
- Plan the Project in a climate-friendly way to minimize its carbon footprint and tap into the mitigation potential of the construction industry.
- Engage with the persons living in the area around the Project site (including neighbors, local decision makers) early in the planning process and throughout construction activities to inform them about the planned construction and seek for their feedback around potential sensitivities (protected areas, places of worship, holy trees etc.).
- Site visits and discussions with the local population should be conducted throughout the execution phase.

- A grievance mechanism will be designed and established for workers and the public during the planning phase already.
- Hire unskilled workers and skilled workers, if available, from the local communities to encourage social growth and development in the region.
- Conduct Induction Training for workers as outlined in this ESMP before start of construction.
- Establish core E&S procedures already at the planning stage. This includes as a minimum:
 - Incident Reporting (fatal accidents, medical treatment cases; first aid cases; restricted work injuries; near misses; environmental events)
 - Grievance Mechanism (one combined mechanism for workers and community)
- Training Procedures/ Training material as outlined above (Occupational H&S; Community H&S; environmental sensitivities)
- Work site/ construction site risk assessment and corresponding Construction H&S Plan

8.2 Register Of E&S Aspect

Topic/ Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
Occupational Health and Safety				
Occupational Health and Safety	Provide EHS Training to the construction workforce (including sub-contractors, temporary workers, and drivers)	Training performed and recorded	Project team	Check Training records
	Ensure site premises are provided with appropriate fencing (where applicable) and lighting. Use hazard notices/signs/barriers to prevent access to dangerous areas.	EHS planning of construction site done, items installed	Project team	Random site inspection
	Ensure speed limits on site and on transporting routes.	Speed signs installed	Project team	Random site inspection
	Ensure the use of Personal Protective Equipment (PPE) for workers.	PPE used on-site by workers	Project team	Random site inspection
	Maintain standard in housekeeping on site.	Good housekeeping on-site	Project team	Random site inspection
	Ensure provision of Health and Safety (H&S) facilities at the project site, including shaded welfare areas, bathrooms, and potable water. (store)	H&S Facilities provided at site	Project team	Random site inspection
	Ensure that the workers camp and construction areas are open only to formal employees.	Access controlled	Project team	Random site inspection
Fire Prevention	Provide necessary fire prevention equipment on site in line with applicable regulations. (Wherever applicable)	Fire prevention equipment in place	Project team	Regular site inspection
Labour Rights	Ensure that workers have access to and are aware about the Grievance Mechanism	Grievance Mechanism in place and grievances recorded	Project team	Review of grievance register

	Ensure minimum legal labour standards as per GoB regulations (child/forced labour, no discrimination, working hours, minimum wages) are met	Grievance Mechanism Records, Training recorded	Project team	Inspection reports (also from labour authorities), Review of grievance register and training record
	Provide hygienic, adequate facilities for workers, ensuring toilets and changing rooms are separated to male and female employees. Wherever applicable	Appropriate facilities in place	Project team	Random site inspection
Noise and Vibrations				
Noise and vibration impact at the construction sites and from construction traffic	Limit the hours of operation for specific pieces of equipment or operations, especially mobile sources operating through community areas or close to residential houses (typically between 10 pm and 7 am). Avoid vehicle movements at night.	No work conducted between 10pm and 7 am/ Grievance Mechanism	Project Concerned team	Random site inspection, Review of filed grievances, review of timesheets of workers
	Use of state-of-the-art technology and limit the number of machines operated simultaneously.	Grievance Mechanism	Project Concerned team	Spot checks, Review of filed grievances
	Ensure the use of modern and well-maintained equipment (e. g. use of silencers).	Technical Specification Sheet	Project Concerned team	Random site inspection
	Set traffic speed limits. Verify drivers' behaviour with respect to driving speed and safety.	Speed limit signs Driver Training Records as part of Induction training	Project Concerned team	Random site inspection, Review of training records
	Plan vehicle routes to avoid settlements where possible.	Safest routes selected, Grievance Mechanism	Project Concerned team Contractor	Review of traffic routes, Review of filed grievances

	Use protective hearing equipment for workers conducting noisy activities.	Protective hearing equipment used.	Project Concerned team	Random site inspection
Topic/ Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
Traffic and Transport				
Disruption, noise and increased air pollution	Schedule traffic activities to avoid peak hours on local roads if feasible.	Peak hours on local roads avoided, Grievance Mechanism	Project Concerned team	Review of filed grievances
	Ensure safe driving by Project personnel (e.g., through training/induction).	Driver Training Records as part of Induction training	Project Concerned team	Review of training records
	Prevent storage of construction materials, equipment and machineries on traffic lanes.	Dedicated storage areas in place	Project Concerned team	Random site inspection
Soil and Groundwater				
Environmental contamination/ spills	Collect and segregate wastes and ensure safe storage and in line with legal requirements.	Waste collection areas existent, waste inventories	Project Concerned team	Random site inspection, Review of waste inventories
	Ensure disposal through waste contractors licensed for treatment/removal/recycling of each of the waste types.	Disposal through licensed contractors	Project Concerned team	Random site inspection, Inspect offsite waste disposal facilities if feasible

	Ensure appropriate containment and disposal of construction wastewater, including sanitary water.	Water disposal compliant with legal requirements	Project Concerned team	Random site inspection
	Ensure appropriate and safe storage of contaminants such as fuels, construction materials and wastes. Provide absorbent and intervention materials in sufficient quantities and at relevant locations for intervention in case of leakages/spills.	Safe storage of hazardous materials, Spill remediation equipment in place.	Project Concerned team	Random site inspection
	Implement appropriate secondary containment and spill controls for maintenance or refueling works.	Containment and spill controls in place	Project Concerned team	Random site inspection
	Ensure immediate cleaning of any spills and remediation of contaminated areas after construction.	Workers trained.	Project Concerned team	Random site inspection One-time inspection after construction
Best practice soil handling	Ensure appropriate storing of topsoil removed. After construction topsoil will be used as backfill for restoration of the area.	Topsoil stored and re-used	Project Concerned team	Random site inspection
	Limit stockpile height to 2 m maximum to avoid soil compensation.	Stockpile height limited	Project Concerned team	Random site inspection
	Restoration of construction working area to the best possible after construction activities are completed.	Reinstatement completed	Project Concerned team	One-time inspection after construction
	If construction takes place on inclined surfaces/slopes, ensure preventive erosion control measures are applied (e.g., plan to retain trees and other vegetation, use of natural contours for roads and drainage networks, excavated drainage channels).	Preventive erosion control measures in place	Project Concerned team	Random site inspection
Water and Hydrology				

	Restrict excavation activities during periods of intense rainfall. Use temporary bunding to reduce the risk of sediment, oil or chemical spills to the receiving waters.	No excavation during intense rainfall	Project Concerned team	Random site inspection
	Reuse wastewater wherever feasible.	Wastewater reused	Project Concerned team	Random site inspection
Flora and Fauna				
Areas of high ecological value	Assess the occurrence of protected areas and/or natural/critical habitats at and around the construction site. Avoid these areas where possible through traffic management and site setup.	areas of ecological value avoided	Project Concerned team	Random site inspection
Site Clearance-Vegetation removal and habitat disturbance	Limit vegetation clearing to areas within the site boundary where it is necessary.	Vegetation clearing minimal	Project Concerned team	Random site inspection
	Avoid clearing mature trees.	No mature trees cleared	Project Concerned team	Random site inspection
	Avoid off-road vehicle traffic. Use existing roads.	No off-road traffic	Project Concerned team	Random site inspection
	Ensure revegetation of cleared areas where possible after construction using native species.	Revegetation completed	Project Concerned team	One-time inspection after construction
Light	Shield lighting downwards towards the site to avoid side-spill. Avoid tall masts where possible.	Light nuisance minimized	Project Concerned team	Random site inspection
Pesticide Use and Management	If pesticides are to be used for agriculture program, only those that are low in human toxicity, that are known to be effective against the target species, and that have minimal effects on non-target species and the environment shall be used.	Pesticide Specification sheet	Project Concerned team	Random site inspection

Socio-Economic

Stakeholder Engagement and Grievance Mechanism	Engage/ communicate with communities and plan sufficient time for participation. Ensure regular consultations with the local authorities and communities regarding the management of construction. See also Planning stage (Chapter 8.1).	Minutes of Meetings Grievance Mechanism	Project Concerned team	Review of grievance register
	Initiate an efficient Grievance Mechanism to allow potentially affected individuals to voice their concerns on the Project. See also Planning stage (Chapter 8.1).	Grievance Mechanism in place, grievances recorded	Project Concerned team	Review of grievance register
Topic/ Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
Local Employment & Procurement	Ensure local communities are preferred for the supply of goods. and services to the Project and Project personnel, where appropriate.	Local Procurement and Employment Records	Project Concerned team	Review procurement and employment rules and records
Crop/Tree Compensation	Engage with the local community and potential affected households to understand the land ownership and land use. Follow the applicable guideline for crop compensation including provisions.	Grievance Mechanism records Management Plan for Compensation if needed	Project Concerned team	
Impacts on livelihoods	Engage with the local community and potential affected households to understand their needs and identify the risk of damage to their livelihood basis through the Project (e.g., take of pastureland, lack of access to water). Crop compensation including provisions for livelihood support for the affected parties.	Minutes of Meetings Grievance Mechanism records	Project Concerned team	Review of grievance register and meeting minutes

Community Health and Safety	Ensure all contractors implement codes of conduct concerning employment and workforce behaviour (including but not limited to safety rules, zero tolerance for substance abuse, environmental sensitivity of the area, dangers of sexually transmissible diseases and HIV/AIDS, gender equality and sexual harassment, respect for the beliefs and customs of the populations and community relations in general).	Workers Code of Conduct Grievance Mechanism records	Project Concerned team	Worker interviews, Review of grievance register
	Target signage and outreach activities to improve public awareness of traffic changes and potential hazards for high-risk sections of public roads, including near the site and laydown areas.	Warning signs Minutes of Meetings	Project Concerned team	Inspection of traffic routes, Review of grievance register
	In case of security personnel at the site, ensure proper training and in the use of force and appropriate conduct toward workers and affected communities	Training Records	Project Concerned team	Review of training records and grievance register
Communicable Diseases	Report any occurrence of any communicable diseases amongst the workforce (COVID-19, STD, HIV/AIDS, TB, malaria and Hepatitis B and C) and set up disease prevention program if needed.	Communicable Diseases Register	Project Concerned team	Review of diseases register and disease prevention program if available.
Cultural Heritage				
Damage of Cultural Heritage	Ensure all chance finds of cultural heritage (e.g., graves, old ceramic, old building fragments) are reported immediately to the relevant authority. If possible, avoid excavation in the ultimate neighbourhood of a chance find, fence the chance find and await instructions from the competent authority.	Training records, records about chance finds	Project Concerned team	Random site inspection
	Ensure the workforce has access to primary healthcare	Healthcare	Project Concerned	Random site inspection

	on site, providing prescriptions.	available on site	team	
Ambient Air				
Dust emissions (especially in dry conditions)	Ensure watering of transportation roads during dry and windy conditions. Generally, keep roads in good condition.	Watering conducted, roads in good conditions	Project Concerned team	Random site inspection, inspection of roads
	Cover truck loads with canvas to avoid dust blow.	Trucks covered	Project Concerned team	Random site inspection
	Ensure optimal traffic routes. Enforce vehicle speed limits on unpaved roads.	Speed limit signs Driver Training Records	Project Concerned team	Random site inspection
Emissions from equipment and vehicles	Use equipment and vehicles in appropriate technical conditions. Provide emissions control equipment where applicable (e.g., filters).	Technical Specification Sheet	Project Concerned team	Each time new equipment/vehicle is used at the site. Random site inspection
	Ensure optimal traffic routes to minimize lengths of travel while avoiding settlements if possible.	Optimal routes chosen	Project Concerned team	Random site inspection
	Ensure vehicles and equipment are switched off when not in use.	Engines switched off	Project Concerned team	Random site inspection

8.3 Transmission line construction related activity and mitigations plan

8.3.1 Aspect & Impact Assessment for TOWER FOUNDATION activity

Activity	Environmental Aspect	Normal / Abnormal / Emergency	Environmental Impact	Evaluation of aspects			Environmental Risk due to Aspects	Existing Control Measures	Residual Impact level			Responsibility
				P	S	IL=PXS			P	S	IL=PXS	
Survey	Identification of tree removal along the line corridor	Abnormal	Resource depletion (Deforestation drives the climate changes, loss of habitats for millions of species)	4	5	20	Action from enforcement authority, Tribal people threat to staff and workmen,	1. Tree cutting inly after forest approval. 2.Avoid tree cutting, consider it during preliminary survey. Ecological survey should be carried out before finalizing the route. 3. Organize tree plantation. 4. Organize awareness program on Global warming. 5. Organize different promotional program	2	3	6	surveyor/ person involved during SIR/Site Engineer / EHS Engineer
Excavation	Fuel consumption by Excavator or backhoe loader	Normal	Resource depletion (Consumption of energy from non-renewable)	4	5	20		1. Drawing shall be followed strictly; extra excavation shall be avoided. 2. Periodical maintenance shall be carried out.	2	3	6	Site Engineer

Activity	Environmental Aspect	Normal / Abnormal / Emergency	Environmental Impact	Evaluation of aspects			Environmental Risk due to Aspects	Existing Control Measures	Residual Impact level			Responsibility
				P	S	IL=PXS			P	S	IL=PXS	
	Out of Hours works	Normal	Noise Pollution (Noise outside of standard construction hours)	2	2	4	Results in community complaints	1. Working hour shall be maintained strictly, i.e., avoid excavation at night or early morning.	1	2	2	Site engineer/PM
	Emission from vehicles/ Excavator	Normal	Air pollution (CO ₂ Emission from Mobile Excavator)	4	3	12	Community complaints due to CO ₂ release vehicle and create irritation.	1. Pollution certificate to be ensured for all vehicles.	2	1	2	Site Engineer / EHS Engineer
	Potential oil Leakage	Normal	Land pollution (Effect on growth of plants, decrease soil fertility, Toxic dust)	3	3	9	Complaints from landowner due to infertile soil and growth of crops	Provide secondary containment to avoid ground contamination	3	2	6	P&M Engineer/ Site engineer/ EHSO
			Land pollution & Water pollution (Diesel/fuel spills, including those resulting from maintenance activities) (Contamination of surface water by petroleum hydrocarbons)	4	3	12	Interested parties like - Road users, public safety concerns and community complaints	Ensure that waste oils or leakage oils are in a container and dispose or return to store not to dispose or thrown at site.	2	2	4	P&M Engineer/ Site engineer/ Storekeeper/ EHSO
								1. Vehicle shall not be placed in such a place which can be an obstacle for the				Site engineer

								local community. 2. Ensure the service water/oils/lubricants are not affecting to the any approach road or public access.				
	Waste generation (old parts, contaminated wastes, lubricant oil disposal)	Normal	Land pollution, water pollution (Inappropriate disposal of waste) Contamination of waste, Spread of contaminated waste	4	4	16		Waste generated by equipment shall be accumulated and hand over to store for safe disposal method, and in case of hired equipment must instruct to supplier to take care.	2	3	6	P&M Engineer/ Site engineer/ Storekeeper/ EHSO
	Water extraction from excavated pit	Normal	Resource depletion (Drawdown of local groundwater levels and reduced recharge rates.)	4	1	4	Action from enforcement authorities (Ground Water pollution)	1. Locations are having with high water level may be executed in summer season preferably. 2. Extracted water should be diverted to the nearby paddy fields to utilize it for crops, drainage or ways to flow of water should be made to avoid mud in the road.	2	1	2	PM/ Planning Engr/ Site Engineer / EHSO
				2	2	4	Road user safety concerns and community complaints		1	1	1	Site Engineer
	Soil mixing, erosion, rutting, and compaction	Abnormal	Land pollution - Can greatly affect future crop yields (Soils may be mixed during the excavation	2	2	4	Complaints from interested party like public, landowner.		2	2	4	Survey, Design/ Top Management

			of pole foundations)									
Concreting	Generation of cement bags	Normal	Land and water pollution (Inappropriate disposal of waste, Contamination of waste, Spread of contaminated waste)	4	4	16	Failure to meet legal requirements – Action from enforcement authority	1. All cement bags shall be accumulated and return to store. 2. Storekeeper shall ensure its safe stacking/placement without contaminate & for safe dispose of same. 3. Reuse of unbolts or sharp edge protection for tower erection and stringing activity, then also it should be return to store after usage.	2	4	8	Site engineer, PM, Store IC, EHSO, Top management
Concreting	Release of alkaline water from concrete washout from SLTM	Normal	Land pollution (Contamination of land, Contamination of surface water by alkaline water)	4	4	16	Compliant from interested parties like community, landowners, public	After completion of concreting activity, the water generated by concrete washout activity should be accumulated and disposed at a place where surface water and flora and fauna will not be affected.	3	3	9	Site Engineer
	Generation of concrete debris	Normal	Land pollution	4	4	16	Compliant from interested parties like community, landowners, public	All concrete debris should be collected and transported to store where it should be accumulated and then it should be handed over to municipality or any outsource agency to for landfill	2	2	4	P&M Engineer/ Site engineer/ Storekeeper/ EHSO

8.3.2 Aspect & Impact Assessment for DG OPERATION activity

Activity	Environmental Aspect	Whether Normal / Abnormal / Emergency	Environmental Impact	Evaluation of aspects			Environmental Risk due Aspects	Existing Control Measures	Residual Impact level			Responsibility
				P	S	IL= P x S			P	S	IL= P x S	
DG Operation	Consumption of Fuel	Normal	Resource Depletion	4	5	20	Action from enforcement authority - Failure to meet legal requirements (Greenhouse gas emissions due to consumption of energy from non-renewable resources, such as diesel)	1. Power supply should made available to minimize or limit the usage of DG 2. Issue of diesel after verifying the running meter	2	3	6	PM/Site Accountant/Store IC/EHSO
	Battery Waste	Abnormal	land pollution, Resource depletion	3	4	12	Community complaints from interested parties like public, client – (These wastes may affect to the human health or the environment (soil, air, water) when improperly treated, stored, transported or disposed of or managed.)	1.Batteries can be REUSED in case not much older like not more than 2 years. 2.Used battery shall be kept in a safe place without contaminate to soil for final disposal.	2	4	8	PM/Site Accountant/Store IC/EHSO
	Emission from DG	Normal	Air pollution	5	1	5	Action from enforcement authority - Failure meet legal requirements (Greenhouse effect, increasing global warming)	1. Power supply for store operation shall be made available to limit the usage of DG.	2	3	6	PM/Site Accountant/Store IC/EHSO
	Spillage of Diesel / Lubricant	Abnormal	Land Pollution	3	3	9	Communal complaints like interested parties – landowners - Effect on growth of plants, decrease soil fertility, Toxic dust, changes in soil structure	1. Periodic inspection and maintenance shall be carried out. 2. DG should be placed on the sand & bricks or MS sheet.	3	2	6	PM/P&M Engineer/Store IC/EHSO

8.3.3 Aspect & Impact Assessment for MATERIAL HANDLING activity

Activity	Environmental Aspect	Whether Normal / Abnormal / Emergency Situation	Environmental Impact	Evaluation of aspects			Environmental Risk due Aspects	Existing Control Measures	Residual Impact level			Responsibility
				P	S	IL=PXS			P	S	IL=PXS	
Mechanical material handling (loading/unloading, transportation)	Fuel consumption by Pick n Carry crane/ vehicles	Normal	Resource depletion	5	5	25		1. Organize tree plantation. 2. Organize awareness program on Global warming. 3. Usage of crane should be properly, and logbook should be maintained strictly.	2	3	6	Store IC
	Noise	Normal	Noise pollution generated during mechanical excavation	1	2	2	Mental stress, reducing hearing capacity, Noise from site establishment causes disturbance and leads to community complaints	1. Optimum usage of crane should be done.	1	2	2	Store IC / P&M Engineer
	Exhaust air emissions	Normal	AIR pollution (CO ₂ Emission from crane and loading/unloading vehicles)	4	3	12	Action from enforcement authority, Greenhouse effect & global warming	1. Pollution certificate to be ensured for all vehicles on periodic basis.	2	1	2	P&M Engineer / Store IC / EHSO

	Potential oil Leakage	Normal	Land pollution	3	3	9	Complaints from interested party like landowners (Effect on growth of plants, decrease soil fertility, Toxic dust, changes in soil structure)	During servicing of equipment, provide any steel sheet or plastic sheet under the oil chamber or any parts from where there is chance of falling of oil on ground, it should be maintained for ground contamination.	3	2	6	P&M Engineer/ EHSO
Mechanical material handling (loading/unloading, transportation)	Potential oil Leakage	Normal	Land pollution, (Diesel/fuel spills, including those resulting from maintenance activities)	4	3	12	Action from enforcement authority (Contamination of surface water by petroleum hydrocarbons)	Ensure that waste oils or leakage oils are stored in a container for REUSE like maintenance of T&Ps	2	2	4	P&M Engineer/ Store IC/ Store keeper/ EHSO
	Vehicle maintenance: waste generation (old parts, contaminated wastes, lubricant oil disposal)	Normal	Land pollution (Solid/Hazardous waste management)	4	4	16	Inappropriate disposal of waste, Complaints from interested party like public and community, (Contamination of waste, Spread of contaminated waste)	Waste generated by equipment shall be accumulated and hand over to store for safe disposal method through outsourcing.	2	3	6	P&M Engineer/ Store IC / EHSO

8.3.4 Aspect & Impact Assessment for OFFICE Operation

Activity	Environmental Aspect	Whether Normal / Abnormal / Emergency	Environmental Impact	Evaluation of aspects				Environmental Risk due to Aspects	Existing Control Measures	Residual Impact level				Responsibility
				P	S	IL=PX	S			P	S	IL=PX	S	
Office Operation	Electricity consumption (for lighting, air conditioning, refrigerators, office equipment and other purposes)	Normal	Resource Depletion (Depletion of natural resources and Global warming and ozone layer depletion due to release of CFCs.)	5	3	15			Conducting awareness programs on environment protection, tree plantation, Setting energy consumption reduction objectives as a part of management objective	3	2	6		
	Water consumption (for drinking, cleaning, flushing)	Normal	Resource Depletion (Depletion of ground water levels)	5	2	10			Conducting awareness campaigns for less water consumption	4	2	8		
	Consumption of papers	Normal	Resource Depletion, (Depletion of natural resources)	5	2	10			Conducting awareness campaigns for less paper consumption	3	2	6		
Printing and photocopy, Usage of printer/xerox machine	Consumption of stationery and office equipment	Normal	Land and Water pollution Solid & E waste management (Creation of waste and pollution)	4	2	8		Action from enforcement authority	Ensuring limited usage of office stationeries	3	2	6		
Usage of printer/xerox machine	Consumption of cartridges for printers, copies,	Normal	Land & water pollution E waste	4	3	12		Action from enforcement	Replacing the damaged cartridges and recycling with the authorised vendor	3	3	9		

	fax machines		management (Creation of waste and pollution)				nt authority, Communa l complaints					
	Release of ozone from photocopiers and laser printers	Normal	Air pollution	5	3	15		Ensuring right maintenance of the photo copiers and reduction in pollutant emission	3	3	9	
Usage of refrigerators in pantry	Use/release of CFC substances (e.g. refrigerants for air conditioning units)	Normal	Air Pollution (Depletion of natural resources and release of CFCs, Global warming and ozone layer depletion)	4	3	12		Tree plantation, ensuring usage of less energy consuming equipment, Setting energy consumption reduction objectives as a part of management objective	2	3	6	
Wash out of kitchen utensils	Domestic wastewater discharge (from pantry, flushing)	Normal	Water pollution (Depletion of ground water levels) Odour due to wastewater	5	2	10	Communa l complaints may receive due to open sewerage system – bad odour	Conducting awareness campaigns for less water consumption Proper drainage system for disposal and avoiding of nuisance	4	2	8	
	Noise from office equipment	Normal	Noise pollution	5	1	5	Complaint s from communit y, public due to Fatigue and damage of hearing capacity in	Reducing the noise levels of office equipment using noise reduction / damping methods and using silencers and silent equipment like silent DGs	3	1	3	

							humans due to prolonged exposure					
	Disposal of waste (general refuse)	Normal	Water pollution, air pollution (Solid waste creation and issues in waste management)	5	2	10	Action from enforceme nt authority	Reducing waste generation by awareness	3	2	6	
Using of lights/ illumination	Disposal of Fluorescent tubes	Normal	Land pollution (Creation of E waste and non- disposable waste)	3	3	9		No disposal mechanisms identified	3	3	9	
Usage of invertor, UPS	Disposal of batteries	Normal	Land pollution	3	4	12		Returning damaged / non usable batteries to authorised disposal stations / vendors	3	2	6	
Miscellaneo us	Disposal of recyclable waste (paper, plastic, aluminium cans)	Normal	Land pollution	5	3	15		Reduction of paper usage by creating awareness and implementing digitisation	3	2	6	

8.3.5 Aspect & Impact Assessment for TOWER ERECTION activity

Activity	Environmental Aspect	Whether Normal / Abnormal / Emergency Situation	Environmental Impact	Evaluation of aspects			Environmental Risk due Aspects	Existing Control Measures	Residual Impact level			Responsibility
				P	S	IL=PXS			P	S	IL=PXS	
Tower Erection Activity	Waste generation like (damaged PPE materials, discarded PP ropes)	Normal	Land pollution, water pollution These wastes may affect to the human health or the environment (soil, air, water) when improperly treated, stored, transported or disposed	2	4	6	Complaints from community, client, Action from enforcement authority	1. It shall be kept at location and return to store for final disposal	2	2	4	Site Engineer/Store Ic / EHSO and Top management
Winch Operation	Fuel consumption	Normal	Resource depletion	5	5	25		1. Ensure periodical and proper maintenance to control excess fuel consumption due to issue of equipment.	2	3	6	P&M Engineer/ EHSO/ Site engineer
	Emission from motorized winch	Normal	Air pollution	2	3	6	Community complaints due to CO ₂ release from vehicle and create irritation.	1. Equipment should be maintained by P&M personnel on periodical basis.	2	3	6	P&M Engineer/ EHSO/ Site engineer

	Spillage of oil from winch	Abnormal	Land pollution (Effect on growth of plants, decrease soil fertility, Toxic dust, changes in soil structure)	2	3	6	Complaints from landowner due to infertile soil and growth of crops	1. Plastic sheets shall be laid on floor.	2	2	4	P&M Engineer/ EHSO/ Site engineer
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8.3.6 Aspect & Impact Assessment for TAK WELDING activity

Activity	Environmental Aspect	Whether Normal / Abnormal / Emergency Situation	Environmental Impact	Evaluation of aspects			Environmental Risk due Aspects	Existing Control Measures	Residual Impact level			Responsibility
				P	S	IL=PXS			P	S	IL=PXS	
Tack Welding	Emission of CO ₂ from tractor operation	Normal	Air pollution (Greenhouse effect, global warming)	1	2	12	Community complaints due to CO ₂ release from vehicle and create irritation	More number trees to be planted. Valid Pollution control certificate needs to be ensured	1	2	2	Site engineer / EHSO
	Emission of welding fumes	Normal	Air pollution (Greenhouse effect, global warming)	1	2	2	Community complaints due to CO ₂ release from vehicle and create irritation	More number trees to be planted. Valid Pollution control certificate needs to be ensured	2	2	2	Site engineer / EHSO
	Generation of wastes like - electrode tips	Normal	Land and Water pollution Solid waste management These wastes will affect to the animals, environment (soil, air, water) when improperly treated, stored, transported or disposed of or managed.	3	2	12	Complaints from interested parties like community, public, client	It should be kept with welder and return to store	2	2	4	Site engineer / EHSO & Top management

8.3.7 Aspect & Impact Assessment for conductor STRINGING activity

Activity	Environmental Aspect	Whether Normal / Abnormal / Emergency Situation	Environmental Impact	Evaluation of aspects			Environmental Risk due Aspects	Existing Control Measures	Residual Impact level			Responsibility
			Noise Pollution	P	S	IL=PXS			P	S	IL=PXS	
Insulator Hoisting	Solid waste (paper/card boards) generated from insulator crates	Normal	Land pollution	2	2	4	Action from enforcement authority	All solid wastes like papers shall be accumulated and stored for safe disposal	2	2	4	Site engineer/Store IC / EHSO
Conductor drum unloading	Solid waste generation	Normal	Land pollution	1	1	1	Action from enforcement authority	All steel drums and PVC sheets to be returned to store and then from store to hand over to manufacturer.	1	1	1	Site engineer / Store IC
Pilot/Conductor paving out by TSE	Fuel consumption	Normal	Resource depletion	4	5	20		1. Ensure periodical and proper maintenance to control excess fuel consumption due to issue of equipment. 2. Overload limitation of TSE.	2	3	6	P&M Engineer/ EHSO/ Site engineer
	Emission from TSE	Normal	Air pollution CO ₂ emission	2	3	6	Communal complaints by landowner, nearest public,	1. Equipment should be maintained and inspected	2	3	6	P&M Engineer/ EHSO/ Site engineer

							society	by P&M personnel on periodical basis.				
	Spillage of oil from TSE, hydraulic compression machine	Abnormal	Land pollution (Effect on growth of plants, decrease soil fertility, Toxic dust, changes in soil properties)	2	3	6	Communal complaints by landowner and Action from enforcement authority		2	2	4	P&M Engineer/ EHSO/ Site engineer
	Noise generated during TSE operation	Normal	Noise Pollution	1	2	2	Community complaints (Mental stress, reducing hearing capacity, Noise from site establishment causes disturbance.)		1	2	2	P&M Engineer/ EHSO/ Site engineer
Conductor paving out	Conductor rubbing with soil during paving out	Normal	Land pollution	2	3	6	Complaints from Landowner Generation and accumulation of aluminium waste in soil due to rubbing of conductor may change the soil nature	Ground roller should be applied to keep clearance of conductor from ground	2	2	4	P&M Engineer/ EHSO/ Site engineer

Corridor clearance	Tree cutting	Abnormal	Resource depletion	4	3	12	Action from enforcement authority Deforestation drives the climate changes, loss of habitats for millions of species	1. Avoid tree cutting, consider it during preliminary survey. Ecological survey should be carried out before finalizing the route. 2. Organize tree plantation.	2	2	4	surveyor/person involved during Site Engineer / EHS Engineer
Final Sagging of conductor	Emission from motorized winch	Normal	Air pollution Greenhouse effect, global warming	2	3	6	Complaints from local community and other landowner or farmers	1. Equipment should be maintained and inspected by P&M personnel on periodical basis.	2	3	6	P&M Engineer/ EHSO/ Site engineer
	Spillage of oil from winch, hydraulic compression machine	Abnormal	Land pollution	2	3	6	Complaint from Landowner (Effect on growth of plants, decrease soil fertility, Toxic dust, changes in soil structure)	1. Plastic sheets shall be laid on floor. 2. Regular Maintenance.	2	2	4	P&M Engineer/ EHSO/ Site engineer
	Noise generated during motorized winch operation	Normal	Noise Pollution	1	2	2	Community complaints (Mental stress, reducing hearing capacity, Noise from site	1. Equipment should be inspected by P&M personnel before putting them in	1	2	2	P&M Engineer/ EHSO/ Site engineer

							establishment causes disturbance)	operation and checked the highest noise level.				
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8.3.8 Guide for Aspect and Impact Assessment

Guide for Aspect and Impact Assessment				
Value	Probability	Severity		
		Use of resources	Release to Air/Water/Land/Flora/Fauna/Ozone	Noise Generation
5	Daily / Frequently at site	Scarcely available Non-renewable Non-recyclable resources (E.g. Diesel, Petrol)	Release of Toxic / inflammable / Hazardous Substances beyond our site	101 dB and above
4	Weekly / Occurrence in our IC	Hazardous chemical, Non-recyclable (Paint, Acid)	Release of Toxic / inflammable / Hazardous Substances within our site	91 to 100 dB
3	Monthly / accordance in other ICs	Available but Non-Renewable resources (Power)	Release of Toxic / inflammable / Hazardous substances within our Works area	81 to 90 dB
2	Yearly / Occurrence in construction Industry	Scarcely Available but Recyclable (Paper, Water)	Release of Nontoxic / Non inflammable / Non-hazardous substance beyond out site	71 to 80 dB
1	Very rare occurrence in construction industry	Easily available, Recyclable, Renewable (Solar / Wind energy)	Release of Nontoxic / Non inflammable / Non-hazardous within the site	60- 70 dB

8.4 EHS Inspection Resources

8.4.1 Environmental Monitoring register

Depending upon the nature and scope of activities at sites / work place, surrounding environment (habitat), neighbouring Locality (dwelling, distance form site / work location), legal requirements and other relevant factors, the different factors / attributes the monitor criteria will be set and executed in periodical basis.

(Annex 1 – Environment Monitoring Register)

8.4.2 Environment Inspection: -

EHSO identifies the significant environment impacts from environment aspect & impact assessment and proposes the adequate control measures to reduce the impact within insignificant limit.

EHSO during the EHS inspections shall inspect the work areas with reference to the following environmental requirements. Identifies all conformities and non-conformities and specifies them with positive / negative remark in the EHS inspection report.

(Annexure 2 – Environment Inspection Checklist)

8.4.3 Environmental Incidents

An occurrence or set of circumstances, because of which pollution (air, water, noise, and land) or an adverse environmental impact has occurred, is occurring, or is likely to occur.

Adverse environmental impact includes contamination, harm to flora and fauna (either individual species or communities), damage to heritage items and adverse community impacts

8.4.4 Non conformity & Corrective Action

Nonconformity is non-fulfilment of the requirements e.g. non evaluation of the environmental aspects of a product or services not for its significance, failure to periodically evaluate compliance obligations, responsibilities for emergency preparedness and response not assigned, certain objectives not achieved, maintenance schedule not adhered, operating criteria not fulfilled aspects EHS monitoring and frequency not at states, documented information not being fulfilled, resources such as manpower, personal protective equipment (PPE) etc., not made available on time, any abnormal situation / emissions beyond the threshold limit value (acceptable limit) prescribed as per the relevant acts & rules.

Corrective actions are identified from

Complaint / opportunity for improvement noted by external & internal customers and other interested parties;

- Complaint / opportunity for improvement noted by the other staff of EHSD;
- Opportunity for improvement noted by the functional head himself in his functional area;
- Internal / external audit results;
- Analysis of data;
- Incident investigation;
- Any other condition that does not comply with the documented IMS manual.

(Annexure 3 – Corrective Action Register)

(Annexure 4 – Environment Incident / Non-conformance report)

(Annexure 5 - Environmental incident investigation report)

8.4.5 Occupational health & hygiene inspection

This procedure is applicable to all temporary establishments at sites, which shall include but not limited to workmen camp, site office, stores including P&M workshop, storage yard, canteen, wash area.

Responsibility – industrial relation officer & EHSO

Pre-medical examination: -

Industrial relation officer arranges for the pre-medical examination for the workers at critical operations such as drivers, workmen those who will work at height, special operators such as crane, hoist, before deployment and maintains the records of workmen medical examination. The engagement of workmen in job are confirmed only after they found to be medical fit.

Industrial relations officer and EHSO decides on the date and time to carry out the inspection. The frequency shall be minimum once in a month.

- Conducts physical inspection of all the temporary facilities within the scope of this procedure by referring to the points in the inspection report of this procedure.
- Identifies all conformities and non-conformities in respect of physical conditions & practices and specifies them with positive / negative remark on the inspection report as the case may be.
- Circulates copy (duly signed by EHSO) of the Inspection report to Project Manager, Accounts & Administration In-charge and the Industrial relations officer.
- Review and follows up implementation of the suggested measures and records his findings on the Inspection report form.

8.4.6 General EHS inspection

- EHSO and concerned Site Engineer / EHS committee members -
- Decides on the time and date to carry out the inspection as required preferably along with the concerned Workplace in-charges/ engineers/supervisors.
- Conducts physical inspection of the workplaces using the standard checklist as a guide and also look for any other unspecified hazards. The EHS standards for the activities shall be in adherence to the norms given in the EHS manual.
- Identifies all conformities and non-conformities in respect of physical conditions, practices and document the findings in the project EHS inspection report.
- EHSO circulates a copy of the EHS inspection report to project manager and the concerned workplace Engineers/Supervisors for necessary corrective action.
- EHSO reviews and follow up implementation of the suggested measures and record the findings on the Project EHS inspection report form.
- EHS inspection shall be conducted at least once in a week.
- EHSO shall ensure the compliance status of EHS inspection.

8.4.7 Store EHS inspection

To measure the EHS performance of the project stores, where the project construction materials are stored/ stacked, and all/some plant, machinery and vehicles are located on designated places as per standard requirements.

- EHSO informs the store in-charge of his inspection verbally. In absence of store in-charge, concerned, Project Manager will nominate a staff to undertake such activity along with EHSO. The said nominated staff will also be responsible for the corrective action.
- Store In-charge & EHSO of the project will jointly do the inspection.
- EHSO carries the Store inspection report for his general guidance but restricts his attention to common salient safety features.
- EHSO highlights unsafe conditions to the Store in-charge accompanying him on the spot for corrective action
- EHSO records the findings in the Store inspection report form and forwards the same to Store in-charge with a copy to the Project Manager.
- EHSO shall ensure the compliance status of store inspection.

8.4.8 Equipment fitness certification

- All plant & machinery and equipment including vehicles shall be subjected to equipment fitness certification before deployment.
- EHSO receives the information of arrival of new equipment shall co-ordinate the certification process.

- A team comprising of P&M Engineer and EHSO checks the fitness of the equipment with respect to safety aspects as mentioned in the equipment fitness report. In absence of P&M staff at site, PM / CM will nominate a staff to undertake such activity along with EHSO.
- The findings are entered in the equipment fitness report, with a recommendation of whether the equipment is fit for use or not.
- Only those equipment's, which are found FIT, are allowed for deployment.
- Equipment's which were found UNFIT are rejected for deployment. This equipment shall be checked for fitness once again after necessary rectifications are carried out.
- EHSO maintains a record of equipment fitness certificate issued.

8.4.9 Electrical safety inspection

All areas and installations shall be inspected in detail for electrical safety at least once in a month.

- For conducting the inspection, EHSO informs the P&M in charge about his inspection schedule verbally to get participation of one of the members of the P&M staff in the exercise. In absence of P&M Staff at site PM / CM will nominate a Staff to undertake such activity along with EHSO. The said nominated staff will also be responsible for the corrective action.
- EHSO conducts the inspection with cross-reference to the electrical safety checklist dealing with primary electrical hazards.
- The unsafe conditions and unsafe acts are identified & brought to the notice of P&M personnel on spot for corrective action.
- EHSO records the findings in the electrical inspection report form and forwards the same to P&M In-charge with copy to Project manager.
- Findings registered in the RCCB register shall be summarised and recorded in the electrical inspection report.
- EHSO shall ensure the compliance report on electrical inspection and maintain the record.

8.5 Labour management Plan

For the construction of the said project all the workmen will be engaged by sub-contractor and the necessary amenities will be provided as per applicable and wherever possible.

The Labour Management Plan (LMP) for **230kV & 132kV Transmission Lines in Western Zone (ADB-Package-3)** Transmission Line Project has been prepared to meet the objectives and requirements of the national Labour Law. This LMP assesses the potential risks and impacts of assignment of labour for the Transmission Line Project and addresses them through mitigation measures in light of Labour policies and provisions.

8.5.1 Overview of Labour use on the Project:

The labour management plan applies in to all Project workers whether full-time, part-time, temporary, seasonal or migrant workers. The labour management plan is applicable to the Project in the following manner:

- Direct Workers. People employed or engaged directly by L&T on its behalf to work specifically in relation to the Project;
- Contracted Workers. People employed or engaged by sub-contractors to perform work related to core function i.e. construction of Pile Foundation, Tower Erection, Conductor Stringing regardless of location;
- Primary Supply Workers. People employed or engaged by project's primary suppliers of goods and materials for its core function.

8.5.2 Characteristics of Labour Force:

Given that the majority of Transmission Line activities will revolve around executing work at height, it can be assumed that there will be mostly semiskilled and skilled construction labours. Based on experience, it is also assumed all workers will be over 18 and would likely be of average age of 25-30 years. There will be no child or forced labour assigned for the project.

8.5.3 Assessment of Key Potential Labour Risk:

As with any other construction project, following are the key labour risks that have been identified by the environmental and social assessment:

- Employment practice that are not compliant with labour law. For example, not providing written documents of assignments, wages not proportionate with tasks performed or industry standards, excess workload without provision of adequate rests and leisure, lack of hygiene facilities.
- Assignment of child and forced labour and use of unscrupulous labour practice.
- The conduct of hazardous work, such as working at heights, use of heavy machinery, or use of hazardous materials.
- Lack of Occupational Health and Safety (OHS) practice and procedures.

8.5.4 Brief Overview of Labour Legislation: Terms and Conditions:

Terms and Conditions of employment are guided by The Bangladesh Labour Act, 2006 and Amendment 2013 that illustrate the basic conditions of employment. 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.

8.5.5 Brief Overview of Labour Legislation: Occupational Health and Safety:

Chapter 6 of The Bangladesh Labour 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.
 - Personal protective equipment (PPE). Makes it mandatory to supply workers with PPE.
- Chapter 7 of the same Act (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.

8.5.6 Responsibility of Staff and Procedure:

Various aspects of the responsibility with respect to worker management have been described in details in the EHS Plan.

8.5.7 Policies and Procedures:

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 Labour 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 labour issues, OHS requirements etc.

8.5.8 Age of Employment:

Chapter III of Bangladesh Labour Act 2006 describes provisions related to Employment of Adolescent Worker. It details the restrictions of using child labour, where adolescent labours (age between 14 and 18, chapter- I, Labour 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 Labour 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 officials is obliged to abide by the requirements of Chapter III of the Labour Act 2006. As per the Labour Act 2018 and ESF 5, no one below the age of 14 (minimum age) will be employed as a labour. 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. 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.

8.5.9 Terms and Conditions

The terms and conditions of employment in Bangladesh are governed by the provisions of Bangladesh Labour Act 2006, Labour Law (Amendment) 2013, Bangladesh Child Labour Elimination Policy 2010.

Chapter II of the Labour 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 Labour 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 Labour 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.

8.5.10 Grievance Redress Mechanism:

The Labour 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.

8.5.11 Gender Issue

Based on the nature of transmission line construction activity, engagement of adult women workmen is not suitable due to numerous challenges like terrain condition and in scattered area with routed through river and paddy areas. The workplaces will be shifted and shuffled based on the completion of tower foundation, erection and then stringing, so the workmen camp will be on temporary basis and will shift as per the working locations.

However, the engagement of adult women workmen in certain applicable activities like store will be considered based on approval obtained from concerned and client PGCB.

The project management and organization is giving same priority to adult women workmen along with men workmen and not indicating any gender issue as per ILO and other necessary applicable legal norms of Bangladesh.

8.5.12 Gender Concern:

Outsiders' incoming into the locality and construction of labour camps nearby the community and vehicular movement may also hamper everyday life style. Besides, women may feel shy for their regular movement in the construction area. Apart from that the influx of a large number of workers from other parts of the Country can potentially cause conflict between the project personnel and the local community. This could be because of differences in culture, religion, social norms, acceptable social behaviour etc. Furthermore, during construction phase, number of women both skilled and unskilled workers may be employed and their safety and security in the work place is also a major concern.

8.5.13 Mitigation Measures:

- Construction camps will be located at least 500 m away from the communities. Entry of the site personnel in the local communities will be minimized to the extent possible/appropriate.
- No child labour will be engaged by the project or its contractors.
- Liaison with the community will be maintained;
- Privacy of women will be respected; routes and places used by women will be avoided as much as possible.
- If any permanent women worker is deployed, separate labour shed, toilet facility should be in place for them.

Residual Impacts:

With the help of above mitigation measures residual impact will be Low.

8.5.14 COVID-19 preparedness for Workmen

8.5.14.1 Arrival of new workmen

In the circumstances where a workman is placed in self-quarantine for 14 days from the date of arrival at site.

Screening of New Workmen: -

New worker to be identified and screened strictly by infrared thermometer for body temperature with follow to below questionnaires:

- Have you travelled from any foreign country or from any state - COVID 19 hotspot area in last 14 days?
- Have you ever met any person in last 14 days, who has infected by COVID 19 or any confirmed case in last 14 days in the Hospital / Home / any other place?
- Are you currently living with a confirmed case of Corona since last 14 days?

Provide the information on precautionary measures against COVID – 19 (make it as part of induction training)

8.5.14.2 COVID 19 mitigation plan for workmen camp

Activity	Mitigation Plan
Cooking	Daily thermal screening and symptom checking of cooks. Cleaning and disinfection on daily basis once the cooking is over
Dinning	1. Staggered Timings shall be adopted to limit the no of workmen using the hall to maintain social distance 2. Increase the Space of dining facility where possible 3. Hygiene conditions shall be ensured during serving of foods in Guest houses / Messes / Workmen Stay Places, so that common serving spoons etc. are not touched by all the staff/workmen taking food 4. Only Persons serving food shall be allowed to handle the serving spoons, common utensils, etc
Usage of common facility	Areas or places of high risk for transmission of virus such as doorknobs, handles, latches, handrails in common facilities shall be cleaned and disinfected at regular intervals
Disinfection	Disinfection of the workmen habitat in all the places shall be carried out on a periodical basis and closely monitored by camp boss and verified by IR officers

Separate dwelling for new workmen	1. New workmen shall not be accommodated in the same rooms as the existing workmen 2. Dwelling units / rooms shall be suitably organized to ensure the avoidance of proximity of the workmen groups
Resources at workmen habitat	1. Limiting the number of workmen in dwelling units 2. As far as possible, Grocery shop, Saloon, and other items shall be made available 3. within the workmen habitat to avoid the movement of workmen outside the habitat.
Restriction of workmen from habitat.	1. To avoid infection from outside the community, workmen exit access shall be restricted 2. Any workman goes out of the habitat shall get a gate pass from camp boss 3. A hand washing facility shall be kept at the entrance of the habitat, any people entering the habitat shall be asked to wash their hands and enter the habitat
Hand Washing Facility	1. Dedicated hand washing facilities with soap shall be kept at conspicuous locations in the workmen habitat with sign boards for DO's and DON'T's in hand washing
Promoting Self Hygiene & Cleaning	1. Pictorial posters in local language shall be placed across the workmen habitat to create awareness on maintaining self – hygiene and respiratory hygiene

9 COVID 19 Preparedness and Action Plan

The following terms and acronyms are used throughout the Emergency Management Plan.

9.1 Definitions

Terms or acronym	Description
COVID-19	Acronym for Corona Virus Disease 2019. A mild to severe respiratory illness that is caused by a coronavirus (<i>severe acute respiratory syndrome coronavirus 2</i> of the genus <i>Beta coronavirus</i>), is transmitted chiefly by contact with infectious material (such as respiratory droplets), and is characterized especially by fever, cough, and shortness of breath and may progress to pneumonia and respiratory failure.
Emergency	A serious, unexpected, and potentially dangerous situation requiring immediate action. A situation declared by concerned authorities such as Civil Defense, Police, Health Authorities, National Disaster Management or at initial stages by facility management as “Emergency” where people need assistance and moved to safety. Such an “Emergency” can be a situation created by natural disasters such as earthquakes, floods, storms or

	accidental events such as fire accidents or outbreak of viral infections or manmade situations such as arson, terrorism and criminal.
ERP	Acronym for Emergency Response Plan. A plan containing systematic instructions and procedures that clearly detail what needs to be done, how, when, and by whom before and after the time and anticipated emergency event occurs
Infectious disease	A disease transferable to others by human beings or by animals, insects, foodstuffs, places or other things and substances contaminated by the microbes and toxins of the infectious disease. Also known as Communicable disease or Contagious disease
Mitigation	The lessening or limiting of the adverse impacts of hazards and related disasters.
Pandemic	A worldwide spread of a new disease. An influenza pandemic occurs when a new influenza virus emerges and spreads around the world, and most people do not have immunity.
Prevention	The outright avoidance of adverse impacts of hazards and related disasters.
Self - quarantine	To refrain from any contact with other individuals for a period of 14 days during the outbreak of a contagious disease usually by remaining in one's home and limiting contact with family members
WHO	World Health Organization.

9.2 Reference Documents & Websites: -

The following documents have served as a reference and support this Emergency Management Plan.

1. **Govt. Of Bangladesh**
2. **World Health Organization**
3. <https://corona.gov.bd/press-release>

9.3 WHO guideline

9.3.1 Overview: -

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness. The best way to prevent and slow down transmission is to be well informed about the COVID-19 virus, the disease it causes and how it spreads. Protect yourself and others from infection by washing your hands or using an alcohol-based rub frequently and not touching your face. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it's important that you also practice respiratory etiquette (for example, by coughing into a flexed elbow)

9.3.2 Prevention

To prevent infection and to slow transmission of COVID-19, do the following:

- Wash your hands regularly with soap and water, or clean them with alcohol-based hand rub.
- Maintain at least 1 metre distance between you and people coughing or sneezing.
- Avoid touching your face.
- Cover your mouth and nose when coughing or sneezing.
- Stay home if you feel unwell.
- Refrain from smoking and other activities that weaken the lungs.
- Practice physical distancing by avoiding unnecessary travel and staying away from large groups of people.

9.3.3 Symptoms:-

COVID-19 affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization.

Most common symptoms:

- fever.
- dry cough.
- tiredness.

Less common symptoms:

- aches and pains.
- sore throat.
- diarrhoea.
- conjunctivitis.
- headache.
- loss of taste or smell.
- a rash on skin, or discolouration of fingers or toes.

Serious symptoms:

- difficulty breathing or shortness of breath.
- chest pain or pressure.
- loss of speech or movement.

Seek immediate medical attention if you have serious symptoms. Always call before visiting your doctor or health facility.

People with mild symptoms who are otherwise healthy should manage their symptoms at home.

On average it takes 5–6 days from when someone is infected with the virus for symptoms to show, however it can take up to 14 days.

9.4 GOB Guidelines for COVID-19

9.4.1 For Construction Industry-

9.4.2 For Low Risk Area

1. Before starting the work, necessary COVID -19 PPE and others materials like nose mask, liquid hand wash, sanitizer, infrared thermometer made available at work site.
2. Body temperature of workmen needed to be recorded twice in a day. Those who will be found with fever, cough, breathing in difficulties need to be treated timely.
3. Ensure proper ventilation in the office room, work site, and ensure proper working of AC for a closed office room. Also prevent entry of exhaust air inside the room.
4. Keep surroundings neat and clean. Use air tight container for keeping every day waste.
5. Common toilet should be cleaned properly every day using disinfectant, liquid hand wash and sanitizer should be distributed to workmen.
6. Maintain healthy lifestyle. Raise awareness for frequent hand sanitization and others health guidelines. During coughing cover mouth with tissue paper or use elbow.
7. Disinfection needs to be done at work site, workmen camp and office.
8. Frequently usage things like switches of lift, door handle should be disinfected regularly.
9. 'Point to Point' vehicle should be used for bring back workmen to the project site. Workmen who have come from high risk area should be monitored closely for their health.
10. Movement between different groups and mass gathering should be prohibited.
11. During closed proximity of workmen, personal protective equipment like nose mask should be used.
12. The entire canteen utensil should be disinfected regularly. Keep safe distance during taking food at canteen.
13. Ensure an emergency place. If someone found with COVID-19 symptoms, quarantine him in the emergency place and ensure proper treatment.
14. Ensure disinfection of all the places if COVID-19 positive patient found.
15. Motivate all the staff for paper less and touch less office culture.
16. Avoid personal gathering and reduce meeting or training to avoid gathering.

9.4.3 For High Risk Area

17. Outside workmen should not be allowed in the work site. Workmen present in the area should not be allowed to go outside.
18. Increase number of shift and ensure proper rest for the workmen

Confirmed COVID-19 case to be further undertaken by government / local health Machinery.

National Helpline number - 109

<u>Helpline Numbers of States & Union Territories (UTs)</u>		
Sl no	Name of test labs	Helpline numbers
1	Kushtia Medical College	+880 1755201950
2	Dhaka Medical College	+880 1553306518
	<u>Nearest health complex health line</u>	<u>Numbers</u>
1	Kushtia Medical College	+880 1755201950
2	Faridpur Medical College	+880 063161744

Using govt. ambulances only as far as possible for transporting suspected cases to health care facility. If a govt. ambulance is not available, an emergency vehicle needs to be on standby to be used for transporting staff to the nearest hospital

10 Health & Safety Plan

10.1 Objective:

The objective of this project H&S plan is to facilitate safe execution of the works by incorporating Health & Safety factors into construction program in a structured way as per the various requirements of the job. The plan is prepared to accomplish the following objectives.

To determine broad parameters of H&S management at site.

Establish & define chain of command for resolution of all hazard prevention issues.

Define individual hazard prevention & safety promotion responsibility at each level of the construction team.

Identify highly hazardous operations within the scope of work and specify integrate preventive measures to mitigate the same.

To ensure compliance with relevant applicable legislation.

10.2 Major Plant & Machinery to be deployed: -

- Truck / Lorry / vehicle
- Pick & carry Crane
- Tractor with trolley
- Backhoe machine (JCB)
- Earth Movers (Excavator with Rock breaking attachment)
- Conductor Stringing - Tensioner & Puller Machines (18 Ton Cap)
- OPGW Stringing - Tensioner & Puller Machines (04 Ton Cap.)
- Hydraulic Joint Compressor Machine
- Motorized winch machine (05 Ton Cap.)
- Air Compressor with Rock driller.
- Concrete Mixer Machines, Self-loading Transit Mixer Machines
- Vibrators with needle
- Welding Machines
- Drilling Machines
- Diesel & Power Generator etc

10.3 Key Plan

MOBILIZATION

The location of the site office, stores, Cement god own, access road etc. shall be planned and located such that the operation in each area do not cause hazard to anyone.

10.4 SITE OFFICE SAFETY

- Cooking of food in office units is prohibited, unless the unit was designed for such a purpose.
- Office units shall be provided with adequate fire protection.
- All fixed electrical equipment in office units shall be an approved standard; no occupant shall modify or interfere with installed electrical equipment.
- All electrical equipment owned by occupants and used in the office units shall be correctly terminated and connected to the power outlets provided.
- All the Electrical connections shall be routed through ELCB of 30mA sensitivity wherever applicable. (In case of rented house so its depend upon the willingness of landlord)
- No rubbish shall be allowed to accumulate around or under office units. Rubbish containers located around the office area shall be provided with a solid, tight fitting cover and empty of the containers shall be on a regular basis.
- Chairs, tables and shelves must not be used as a means for climbing. Proper type ladders or other safe supports must be used to reach material at high elevations.
- Desk drawers, cabinet doors and files should be closed while not being used.
- Heavy materials should not be placed on top of file cabinets.
- Employees should not run in hallways or on stairways. Handrails, where provided should be used. Be alert while going around corners and through doors.
- All exposed moving parts of power driven office machines should be covered with suitable guards.
- Machines in Running / working motion should not be cleaned, adjusted, oiled or repaired. Stop all machines before attempting any maintenance/ Repair work..
- Pins must not be used to fasten papers together; staples or clips are provided for the purpose.
- Broken glass, pins, bits of metal or their sharp edged objects shall not be placed in waste paper baskets without first being heavily wrapped.
- Pointed objects such as uncapped fountain pens, pencils, knives, or scissors should not be carried with the points exposed.
- Arrange telephone, electric machine cords so that they will not present a tripping hazard.
- Paper cuts and punctured wounds such as those caused by pens, pencils, pins, etc., must receive first aid.
- Gummed strips of envelopes should be moistened with suitable device, not with tongue. Avoid opening envelopes with fingers and sliding hands along edges of paper.
- Messenger carriages, trolleys or similar vehicles must not be left in front of elevators, doors or at blind corners or hallways so that these will not constitute a hazard.
- Smoking materials or matches shall not be discarded in waste baskets.
- Adequate fire protection and first aid facility to be ensured.
- Maintain neat and hygiene conditioned toilets in the office.
- All the vehicle drivers shall have valid driving license and two – wheelers always use crash helmet.

Objective:

Store Layout:



- Responsibility:**

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- Accounts In-Charge for Providing,
- Total administrative support
- Process Control and Periodic Monitoring
- Random inspection at stores for ascertaining compliance as per procedure.
- Establishment of store is the first and foremost task of every project, which has its own impact on the overall progress of the job.

IDENTIFICATION OF LOCATION: Following points are to be considered

- Scope of work
- Volume of materials to be handled
- Proximity of line to be constructed
- Crossing of HT/LT electric Lines
- Level of the ground
- Transport
- Availability of Electricity
- Infrastructure Etc

Procedure:

- Project manager and Accountant along with stores In charge (SI) and planning Engineer/Logistic Engineer identifies the location for establishing the “SITE STORE “.
- PM, Accountant, Surveyor, PE/LE along with Store In charge prepares the store Lay-out-plan, i.e. locations for the storing different type of materials and office.
- PM, Accountant, PE/LE & SI submits the finalized store Layout plan to COH for approval.
- On approval of Lay-out-plan by COH, Store in charge arranges for making wide approach road for easy movement of Truck/Tailor & Hydra crane inside & around the store.
- PM, Accountant, PE/LE along with the SI review the Lay-out-plan periodically to suite the requirements.
- Site Accountant is accountable for providing necessary resources for establishing the entire infrastructure of store as per Lay out plan.
- Site office is established to an area as per layout plan for working of store keeper & assistance and also for maintaining the records.
- Store In charge educates all the personal working in the store about the layout details.
- Closed shed to an area as per layout plan is established to store safety gadgets, bolts & nuts, Aluminium Hardware, Tools & Tackles and other high value items.
- The materials are stacked with passage to reach them. The aisle is marked. Materials should not protrude beyond the marked area posing tripping hazard.
- Name boards shall be displayed to mention the place for every item.
- The racks installed must be supported well to prevent from falling.
- Part of closed shed shall be used for repairing / maintain of tools & tackles.
- Vertical stacking of materials should not exceed the prescribed norms, posing falling hazard because of imbalance.
- Store In charge provides adequate lighting facility around the store area.

- Establishes the scrap area in the layout or stacking the scrap separately & also to avoid the mixing of good and rejected materials.
- Provide toilets and other basic amenities.
- Flammable materials like dissolved acetylene, paints, diesel etc are stored under well-ventilated shed. Electrical connection in these locations should be proper and maintained well such that they do not cause short circuit.
- Smoking, carrying matchbox or any other fire causing materials is prohibited in these areas.
- Caution / Sign Boards shall be displayed at areas where there is a sign of Explosion / Burn Hazards etc.
- Sufficient fire extinguishers are kept at conspicuous places and the path to reach them shall not be blocked anytime.
- Nail pullers shall be used wherever necessary to remove nails from boxes. Metal strapping should be cut with proper safety tool.
- Barrels and drums shall preferably be placed on end. If placed on their side, these shall be provided with racks or blocked so these cannot roll.
- Oil, grease and paints shall not be open exposed.
- The scrap and junk material shall be kept at Scrap yard. Extreme care shall be used in handling scrap material to prevent personal injury.
- All T&P issued to the site to be ensured in safe working conditions by a competent person and damaged T&P should be identified and placed at a marked place.

STORAGE OF FOUNDATION MATERIALS

Reinforcement Bar:

- Re-bars are stocked size wise and grade wise in the designated area as per the store lay out plan.
- Re-bars are stocked on bricks/RCC/Stone blocks /concrete blocks elevated at least 300mm from the ground to avoid contact to earth and do not use bricks to elevate the heavier items like re-bars, tower parts, etc.,
- Re-bars are stocked on bricks/RCC/Stone blocks /concrete blocks to be provided with 2m interval towards length of re-bar, so that bending due to self-weight shall be avoided.
- Description Boards for all the sizes are put for easy identification.
- Identification board should contain size & grade of rebar.

Cement:

- The cement bags are stacked inside the godown on elevated platforms /over tarpaulins and stacked 1 foot away from the wall so as to avoid setting of cement.
- The cement bags are stocked not more than 1000 bags are in a lot and up to 10 bags height with sufficient space for ventilation and easy access.
- Store In charge insures that the cement bags are stocked batch wise and in such way that (FIFO) First in First Out shall be followed for issues.
- Cement shall be stored fully wrapped with tarpaulin & kept away from water at site.

DIESEL / PETROL STORAGE AREA

- Approved quantity of diesel / petrol is stored.
- Diesel drums are stored on a hard surface preferably on a concrete floor. The floor is sloped towards a corner where a sump is made for collection of the spilled oil.
- They are kept under a shed.
- Avoid stacking of barrels one over the other.
- Adequate numbers of foam type fire extinguishers are installed.
- Housekeeping should be maintained. The area inside and around the shed should be clear from litters.
- Caution Boards on fire hazards like, “NO SMOKING” should be displayed.

STORAGE OF LINE MATERIALS

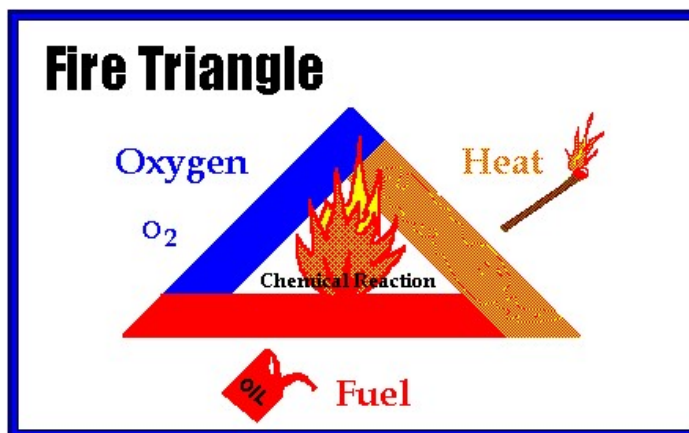
- The tower parts received as bundles are stocked at their designated locations as per approved store lay out plan
- All the tower bundle is to be stacked as per the sequence, i.e. Tower Type wise, panel number wise & bundle number wise at the designated locations identified in the layout.
- Store In charge arranges to stack the tower parts bundles (particular type) panel wise (+0 mtr base, cage, cross arms and peak) at the location identified in the lay out plan.

10.6 FIRE PREVENTION & PROTECTION ON STORAGE AREA

The following two tables give the different classes and guidance on suitable extinguishers and their use.

Fire is an exothermic reaction, which burns the carbon vapours in combination with the atmospheric oxygen present in the air.

FIRE TRIANGLE



Fire is a triangle whose basic sides is Fuel, Oxygen & Ignition without any of these basic sides it is difficult to form a triangle. The chain reaction makes fire continue to burn.

Class of Fuel's

1. Class “A”: Solid fuels.

2. Class "B". Liquid fuels.
3. Class "C" Gaseous fuels.
4. Class "D" Fires in Metal.

Types of fire extinguishers

1. Sand
2. Water
3. Carbon –di-oxide Fire extinguishers
4. Dry Chemical Powder Fire Extinguishers

Type Fire Extinguishers	Class "A"	Class "B"	Class "C"	Class "D"
Sand	✓			
Water	✓			
CO ₂	✓	✓	✓	
DCP	✓	✓	✓	
Special Dry Powder.	✓	✓	✓	✓

HANDLING & TRANSPORTATION OF MATERIALS:

- Only identified crew does the loading and unloading of the materials.
- The supervisor and the crew should be aware of the weight of the materials they are to handle.
- Proper and reliable tackles like slings, D-shackles, etc. shall be used for material handling.
- **Red flag** is tied on structures extending beyond the trailer body. At night reflectors to be fixed.
- Structures extending beyond the cabin height are prohibited from transporting.
- The driver should be aware of the path to the terminal he is to transport the material and ensure no blockades are there.
- The supervisor should know the specific spot for unloading the materials.
- Two tag lines shall be tied to the end of the structures while handling by crane.
- Workmen should not travel along with the loaded material.
- One gang should be engaged for loading and another gang made available for unloading. This will reduce the traveling of workmen on transport vehicles.
- Display of Load Chart in Crane is necessary (Capacity of the Slings / Ropes with respective to their Diameter) The Hydra used shall be in good condition with all appropriate "SAFETY SYTEMS" like guarding, Sensor system, Limit switches, additional reflective mirrors etc.

SAFETY SIGNS

- Safety warning signs shall be placed to provide adequate warning of hazards. Sign shall be removed or covered when the hazard no longer exists.
- Warning signs shall indicate the cautions to be observed regarding the hazards concerned and the necessary information and, also, actions employees are required to initiate.
- Signs shall be in English & Local language where located near public highways and facilities.
- Sign required to be seen at night shall be illuminated. Kerosene and open flame pots shall not be used for illumination.

MEDICAL FACILITY

The detailed information of hospitals and their location is to be displayed in the office, stores and a copy to be handed over to the entire site in charges / site engineers & subcontractors.

10.7 CROSSINGS: -

CANALS & SMALL RIVER CROSSING

- The river should be crossed through road by vehicle & ensure to cross by road without any hesitation.
- The depth of the river should be identified from the local villagers nearby.
- More careful about the water current. It is better to come to the other side by a circuitous route or through canal/river bridges.
- Engage boats for crossing of river if required.
- Select and keep minimum two trained swimmers in the survey team during the necessity of rescue operation.
- Do not take any short cut route / method.
- Always keep first-aid box while crossing the river; not to keep it in jeep.

RAILWAY CROSSING

Number of Railway Crossing Details-

One number Railway Crossing

Work Procedure

Prior approval shall be obtained from railway authorities through client PGCB.

Work men / surveyors are not to be allowed to cross the tracks without the concerned railway department (safety) permission / advice. Railway must depute their representative, while working with other agencies during crossing of railway track.

Railways may advise to use flagmen with red flags with a minimum orientation by them. The surveyor should adhere to it without fail.

Trespassing is avoided until you have a clear idea and permission.

Work shall be carried out during day time under clear sunlight.

Written permission shall be taken where ever necessary.



ROAD CROSSING

Number of Highway Crossing Details-

Four number Highway Crossing & Two number Major Road Crossing(Crossing details has not been fixed yet)

Work Procedure

- Prior approval shall be obtained from highway authorities through client PGCB.
- Both the sides of the road rigid scaffolding structure shall be provided as per requirement and applicability for preventing of accidental chances of falling of conductors on road.
- Permission shall be obtained from traffic police & avail their help for controlling traffic.
- Adequate skilled manpower shall be deployed during road crossing of towers.
- Following up of traffic management procedures.
- Use proper communication systems like whistles, flags etc.
- Displaying of Caution board Saying “ MEN AT WORK – GO SLOW “
- Follow “Road works” checklist.



10.8 SELECTION OF SUB-CONTRACTOR:

- ✓ Project Manager / Planning Engineer, who proposed to engage new Sub-contractor in the project, directs them to the EHSO;
- ✓ EHSO and PM conducts Sub-contractor's initial EHS assessment based on project activity;
- ✓ Contractor should specify the number of skilled fitters & helpers required for the activity.
- ✓ EHSO briefs the "EHS Code of Practices" and make them aware of the following:
 - Their roles & responsibility,
 - Importance in achieving conformity to the EHS policy & procedures and to the requirements of the EHS Management system,
 - The site safety regulations
 - PM, CEHSC/M / EHSO gets the acceptance by obtaining the signature in the form
- ✓ IR & Admin, Site engineer and EHSO screen them before allowing them to take up the work. The height work fitters should be minimum of 2 years' experience.
- ✓ Screening team to verify the work method from the contractor as well as from the skilled fitters.
- ✓ The main contractor should insist the required work methodology to be oriented for implementation.
- ✓ A height pass should be issued to all the workers especially to the fitters working at heights. The significance of the height pass must be explained

EXCAVATION AND FOUNDATION WORKS

PLANNING

While planning for excavation work, ensure to check the following points:

- Collapse of the sides,
- Material falling on the people working in the excavation,
- People, animals and vehicles falling into the excavated pit,
- People being struck by plant and machinery.
- Access to work in the excavated pit.
- Fumes, Toxic gas.
- Underground utilities.
- Accidents to the workmen while getting IN & OUT of the pit.
- It shall be ensured that necessary equipment needed such as trench sheets, props, etc. are available on site before work starts.

PRECAUTIONARY MEASURES:

- Before starting excavation, it is to be checked whether there is any underground utilities present like electrical power cables, water pipe line or any other service line in consultation with the client and consultant.
- Gumboots, Safety Helmets and hand gloves should be worn by the workmen.
- Stepped or sloped excavation should be adopted according to angle of repose of the soil. Shoring should be provided in case of non-maintaining of excavation slope.
- Undercutting must not be allowed under any circumstances.
- Supply to any electrical dewatering pump / lights must be routed through ELCB as per requirement and applicability.
- Ladder should be provided in each pit. It should be projected one meter out of the pit.
- Excavation area should be barricaded 1meter away from the edge of excavation pit.
- No materials should be stacked at edge of the excavation pit.
- Excavated earth should be kept at least 1.5 M or half the depth of the pit, whichever is more, away from the edge of the pit.
- There should not be any vehicle movement close to the edge of the excavation pit. Stoppers may be placed around the pit.
- Proper reflectors & caution boards are to be fixed to caution the outsiders.
- Before starting the work, the pit should be thoroughly checked daily by an experienced and competent person. In case there is a possibility of pit collapse, all activities must be stopped immediately. Work can be started only after ensuring adequate precaution against the danger.
- Where water logging or it has rained, the chances of earth collapse is more. Concerned supervisor should inspect and then allow employees into the pit.
- Lone worker should not be allowed to work in excavation and foundation area.
- Female coolies must not be allowed to bring their children at work area.
- Goggles shall be used during breaking of rocks.

STUB SETTING:

- Ensure the props are as per required dimension and placed firmly along with weight on the base.
- Jacks used are to be greased periodically.
- Jacks are to be placed on a level & firm surface. During monsoon place the jacks on the sand bags / clotted cement bags.
- Adequate number of the jacks to be provided.
- Ensure that all the bolts and nuts are available in the template and also cross members in order to avoid slippages.
- Ensure that Jacks to be placed at a safe distance from edge of the pit.

SHUTTERING

- Shuttering shall be done as per the drawing given and under supervision.
- Before it is cleared for concrete pouring the concerned person shall inspect for the reliability of the shutters.
- Shuttering oil should be applied gently over the shuttering plates.
- Care should be taken while placing the shuttering plates down (using rope the shuttering plates shall be lowered.)

CONCRETING

- Safety helmet, gloves, Nose mask and gumboots shall be used during concreting.
- Eating or drinking or keeping foodstuff near the machine shall not be allowed.
- Only skilled / trained operator shall work on mixer machine. Nobody shall be allowed to work near mixer machine with loose clothing. Moving parts of the machine shall be guarded.
- The access from the point where concrete is supplied to the area to be concreted shall be properly made and free from obstructions i.e. long and tough chute arrangement.
- Before starting the concrete works the formwork engineer or foreman shall check the reliability of the formwork done and give his approval for concreting.
- Movement of the employees and concreting process shall be pre-determined and informed to the concreting gang.
- Proper work platform shall be made for the concreting work.
- Concrete mixers are to be placed away from the edge of the pit and rotating parts shall be guarded.
- Follow the checklist – Safety checklist for Tower Foundation Works.

TOWER ERECTION

- Selection of tools and tackles including PPEs.
- List out the tools required for the tower erection activity like:
- Derricks, Pulleys, Slings, Ropes, Safety belt – double lanyard, Rope grab fall arrestors and Safety Helmets with chinstraps etc.
- Purchase the items from reputed manufacturers who give guarantee of the items to be supplied.

- Refer and follow the Checklist (TOWER ERECTION CHECKLIST) during Tower Erection works.

SELECTION OF THE WORK AREA:

- Ensure that foundation area has been back filled properly.
- Ensure one first aider in the gang, or, the supervisor of the main contractor should be trained for first aid.
- Segregated tower members to be kept in order to facilitate erection sequence and also to avoid injuries due to strike against the in-orderly scattered tower members.
- Ensure that the area shall be free from undulations for safe movement of the tractor.

WORK FORCE

- Only experienced gang should be engaged.
- Ensure the tower erection workers are free from ailment before engaging them at height works.
- Competent and experienced supervisor should remain present during the entire erection work.
- Work should not be carried out under inclement weather conditions such as thundering, lightning, rainfall, etc.
- Avoid tower erection at night.
- Tractors should not be used for transportation of the workers.
- The gang leader should have prior information about the availability of nearest hospital / doctor in the vicinity.
- Ensure only the Trained and Height Pass holders should work at height.

USE OF PPE'S:

- All supervisors / workmen at erection site must always wear Safety Helmets with chinstrap.
- Workmen working on tower must use Full body harness with double lanyard.
- Supervisor must ensure that workmen always keep one lanyard tied with the structure during movement on tower.
- Tool bags should be used for carrying spanners, bolts & nuts.
- Ensure usage of Mobile Grab Fall Arrestor while ascending / Descending of the towers.
- Ensure usage of 14 polyamide rope for lifeline.

ERECTION OF TOWERS:

- Derricks and other load bearing tools e.g. Wire rope, PP rope, D – shackles, pulleys etc. must be inspected daily before use.
- Periodical greasing & tightening of the bolts of the pulleys to be done on daily basis.
- Towers are to be erected in a sequential manner and to be erected as per the procedures. Work on the upper section must not be allowed to start until all the members and bracings of the lower section have been fully erected and all nut bolts are properly tightened.
- Fixing of two or more main leg members at ground level and erecting the same must not be allowed. One main leg section at a time should be erected.
- Derricks are to be provided with three guy ropes.

- Guys provided during erection are to be anchored to a strong anchorage point.
- One anchorage point should be supported for one Guy.
- Maximum permissible angle between the guy rope and horizontal plane should be 45 degrees.
- Main leg members should be lifted with step bolts fitted and fully tightened.
- Lifting of material must be done by hand winch / diesel engine / power driven winch.
- Under inclement weather conditions like thunder storm, lightning, raining is approaching; the work should be stopped immediately.
- Gunny bags shall be used to protect the Ropes/ Slings from sharp edges of the tower.
- Follow the Tower Erection checklist & Work instructions.

OTHERS

- Ascending and descending from the tower should be through step bolt. The practice of ascending and descending through tower member must not be allowed.
- First aid box with sufficient medicines should be made available at every location.
- At least two members of each gang should have thorough first aid training.
- One vehicle should be available at site for providing immediate medical help to the injured.
- Workers should not be allowed to stand underneath the suspended load.
- The tower erection area shall be demarcated during working.
- The materials should not be thrown from Height, Use rope pulley system.

STRINGING:

WORK FORCE:

- Screening of the skilled persons by site engineer and EHSO.
- Ensure adequate number of workmen in the gang.
- Concerned engineer should brief the scheme for stringing to the stringing gang and implementation during operation / working.
- Stringing gang should be screened thoroughly and briefed about the Safety requirement.
- Ensure competent and experienced supervisors all the time.
- Ensure all the tower members are fixed and bolt & nuts are tightened properly.
- Proper arrangements (Tripod / crane etc.) should be made available at site for safe loading / unloading of conductor drums.
- Place the drum loading jacks on the plain ground level.
- Only new generation pick n carry crane to be used to place the conductors over the drum loading jacks

TOOLS & TACKLES:

- The Tools & Tackles used shall be checked.
- Inspect all the tools tackles for its physical condition / fitness before start of the work on daily basis.

HANDLING CONDUCTOR WIRE DRUMS

- The drums shall be loaded & unloaded by Hydra or Crane. If Tripod is used, ensure the SWL of pulleys, wire rope, chain pulley block, winch etc.
- Conductor should be transported by trucks / trailer / lorry. Loading into trucks can be done either by having ramp (Excavated slope) such that body of the truck will be at ground level or by using cranes. Whenever cranes are used, slings should be of adequate capacity. In many cases drums will be far away from the crane approach point. While deciding the capacity of the crane, Safe working loads for the particular boom angle to be checked up. This is very important to avoid
- Accidents. After loading the drums into vehicle, proper wedges are to be provided and to be tied properly to avoid rolling.
- While rolling the drums care should be taken to roll in proper direction. Otherwise cable will get loosened and cause problems while lying. Before rolling the drum soil condition is to be checked up. Otherwise there is a possibility of sinking on one side and toppling. While rolling the drums in slopes, wedges should be provided at regular intervals to avoid drum picking up uncontrollable speed. Persons handling the drums should be always behind and on the sides of the drums and never in the front. This precaution is very essential and non-observance while handling the drums at slopes can be dangerous.
- Never use cast iron pipes as shaft. Jacks should have proper and wide base to avoid tilting of jacks. Whenever the height of drum is more, and packing is required, proper sleepers should be used.
- Proper cordoning is to be done while high voltage test is carried out on conductors.
- Most important, thing to ensure is that the gang leader should have basic knowledge of rigging work.
- Load chart- capacity of the Slings shall be displaced in the hydra or a copy of chart to be with the Gang leader.

TOWER CHECKING:

- Ensure that all the Towers on which the Stringing must do is permanently earthed.
- All the anchor towers should be provided with adequate nos. of guys. One guy for every cross arm & one guy for earth-wire point.
- The guys (back stay) should be more than 45 degrees to the ground. Back staying should be of 18 mm steel rope. Anchoring for guys should be strong enough to withstand the intended load. Anchoring area should be fenced, and watchman should be posted.
- Guy ropes are to be checked every day. When the gang moves from one anchor point to the next section, keep a watchman round the clock near the anchored guy ropes for the avoidance of misuse by un-authorized people.
- Guying, back-staying is to be provided for one side stringing of D-type towers.
- Guying back-staying arrangement should have a provision (turn buckle) for adjustment of tension of the guy wires.
- Discharge rods should be of best quality and avoid using non reliable materials. All the skilled workers at height and the operators should wear hand gloves.

- If the line is going parallel to any other line, the skilled workers will have inductance effect on the conductors. Hence, earthing to be done at both the ends of the section and one or two locations in between also.

PAYING OUT:

- 12mm wire rope, 22 mm / 24mm PP rope shall be used as pilot wire for pulling of conductor. The pulling of conductor shall be carried by tractor or diesel operated winch.
- Knowledgeable & licensed person shall drive the tractor.
- Sequence of paying out should be from Earth wire, Top, Middle & Bottom.
- Walkie-talkie should be used compulsorily by the drum point person and puller point person and in between supervisors. Battery level should be checked every day for walkie-talkie. Keep spare battery at site.
- Check the winch machine, Tension puller machine are placed on a level ground and shall be earthed.

WORK ON THE CONDUCTOR (FINAL SAGGING):

- When the workmen must move on insulators, they must hook the RETRACTABLE FALL ARRESTOR with full body harness & full body harness shall be hooked with lifeline. (Do not wrap the harness lanyard around the insulator) and move.
- Only after releasing the four-sheave pulley skilled and experienced fitter shall move on the conductor for releasing the clamps provided on conductors.
- Man, responsible for verifying the sag of conductor / earth wire should be knowledgeable & well experienced in respective area
- In case of any entanglement in lead wire of four-sheave pulley at height, no workmen shall be allowed to go on insulator to release.
- First lead wire will be made tension free then allow for releasing the entanglement at height.
- While doing tensioning work, fitters should stand inside tower body parts and not to be allowed to stand on the cross arms.
- Follow Stringing work checklist and instruction.

OTHERS

- Local public should not be allowed in stringing area.
- Check-up or ensure all the towers of the stringing section should be thoroughly checked for complete erection with all the bracings, tightening / punching of nut bolts and back filling of foundations.
- Children playing around the area should be removed from the region.
- Work should not be executed in inclement weather likes lightning, thunder, & raining.
- Wear helmets with chin straps and double lanyard safety belt.
- Ensure proper housekeeping.
- Client, Engineer, main contractor, and contractor workers should understand work methodology.
- Keep first aid box & one trained first aid persons in the gang.

- While doing tensioning work, fitters should stand inside tower body parts and not to be allowed to stand on the cross arms.
- Necessary permits to be obtained from respective authorities like highway, railway and forest department, etc.
- All the towers of the stringing section should be permanently earthed.
- Jumpers are to be left disconnected until all the work of the line is completed.
- For crossing any existing charged line, shut down and permit to work on the existing line must be taken. Multi tester also shall be used to check the induction or Induction Testers shall be issued to the workers working on the line.
- All the insulator strings should be thoroughly checked for any cracks, and also availability and placement of all split- pins (lock pins) etc.

ADDITIONAL PRECAUTIONS:-

For stringing in the vicinity of charged overhead lines and in areas where induced voltage is anticipated:

- All winches, pulleys and tensioner / puller must be properly earthed.
- All the conductors at both ends of the section are to be earthed through running earths.
- Before breaking the continuity of the conductor at any point, it must be ensured that the conductor at both ends is properly earthed. Earth shall also be provided at both sides of the working point and shall remain in position until the conductor is reconnected.

SHUT DOWN PROCEDURE FOR HT / LT CROSSINGS

- The Construction Manager / Project Manager should give requests for shutdowns for each area of work involving LT / HT crossing, working near charged line etc., separately, to PGCB, at least 2-3 day prior to the day of work.
- The Construction Manager shall approve detailed action plan of work (PTP) already prepared.
- PGCB must confirm the shutdown availability date and time, only after receiving of LC from PGCB i.e. PTW to construction manager.
- The construction manager will confirm to site engineer or section in charge after receive the LC-PTW from PGCB.
- The site engineer or section in charge will confirm the PTW to site supervisor or safety steward to confirm the LC to gang leader.
- Site supervisor or Safety Steward shall receive the work permit before Start of the Job along with the keys for the various padlocks provided in the switching points, after the switches have been earthed and padlocked. (The accountability to ensure that padlocks are locked and rest with the Supervisor).
- The site supervisor or Safety Steward shall authorize the gang leader to start the work and indicate to him the boundary limits within which the gang leader should work. The site supervisor or Safety Steward should also inform the gang leader regarding Time Duration of the shutdown within which he has to complete the work.
- Red colored flags & Caution (Danger) boards / LOCK & TAG are provided at all the switching points, which can be inlet points for switching ON of the electricity to the Net Work, under shut down.

- Each worker, who has to climb-up on the Tower, shall be given a token before start of work, by the gang leader. A list of tokens issued shall be given to the Supervisor.
- The worker before climbing the tower should ensure that there is no supply in the conductors by using the induction tester.
- After completion of the work as per the work procedures, the following checks shall be completed before energizing the line:
- The gang leader shall ensure that all the tokens issued prior to the work are returned to him by all workers, personally.
- After receiving all the tokens, the gang leader shall inform to the group members that the line is being energized and the workers should not do any further work on the line or near the line portions.
- The gang leader shall discharge the work permit and return the same to site supervisor or safety steward along with the tokens.
- The Site supervisor or safety steward shall return the all work permits for the area (in case of more than one gang), tokens, as well as the keys of various padlocks to the engineer.
- The engineer shall re-confirm that the tokens as listed have been received by him, remove the caution boards as well as red flags on the various poles and then discharge the permit at his level and return the permit to the Construction manager. One copy of discharged work permit shall be given to the Construction Manager along with list of tokens.
- Caution boards shall be removed only by the person who had fixed it. In the event of his being not available for removal, this should be done only by the person involved in this matter, after ascertaining safety systems.
- The PGCB is then free to switch ON the system.
- During shut down, an extra care is to be taken to see that the earthing provided is of certain standards & in a proper sequence.
- At the time providing the discharge rod, it should be connected to the earth point first & then to the conductor, so that the residual current will pass through the earthing to the ground.
- At the time of removing the discharge rod, first to be removed from the conductor & then from the earth point.
- All the shutdown principles must be strictly adhered like Work Permit System, Lock and Tag system. For giving clearance and for cancelling the shutdown, the concerned engineer / supervisor should ensure that all workmen and tools are removed from the area.

AUTHORIZATION FOR RECEIVING or ISSUING OF LINE CLEARANCE (LC)

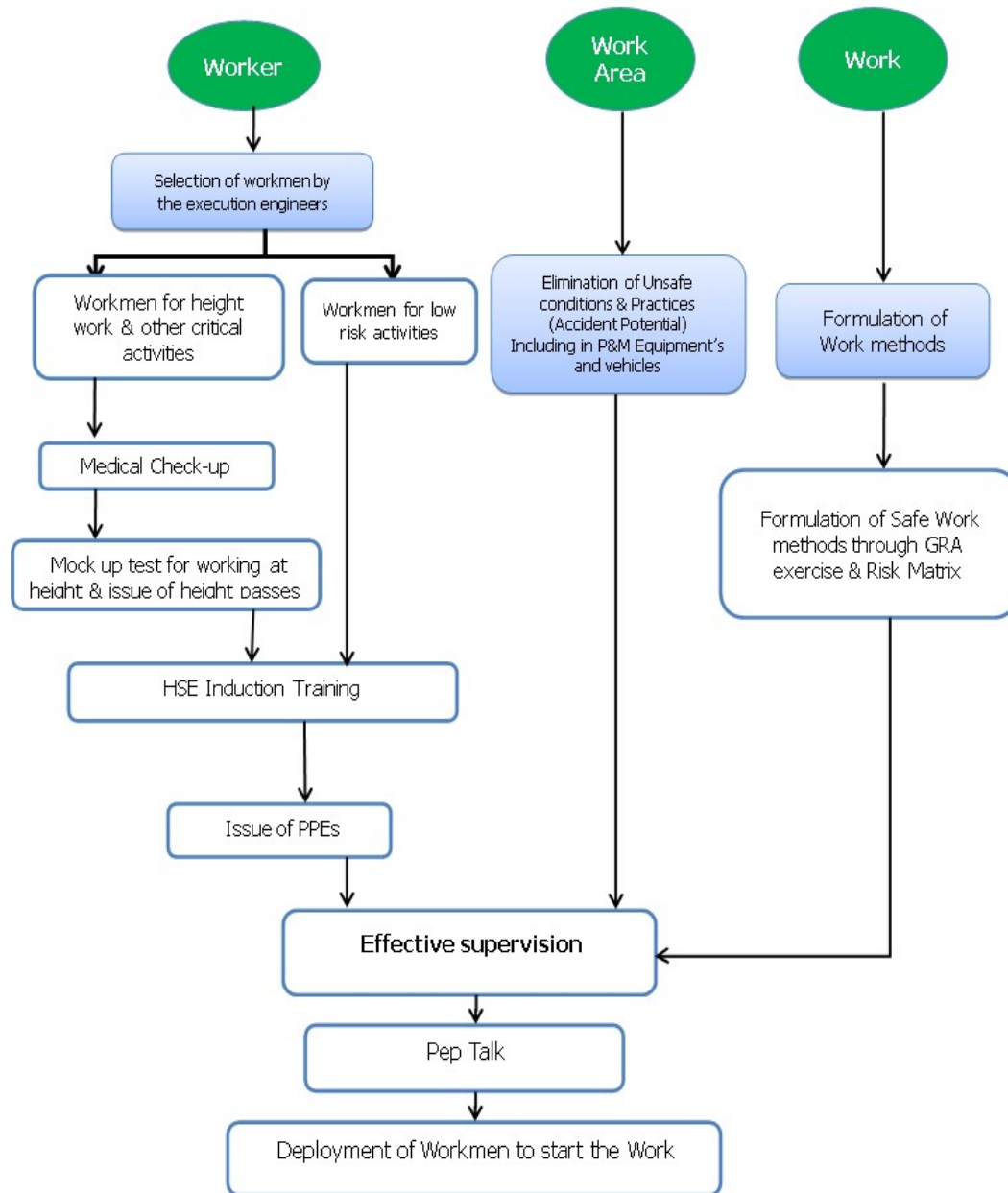
- The concern construction manager / site engineer / section in-charge only authorized to take / issuing of LC from client/sub-contractors.
- No sub-contractors are authorized to take LC directly from client for any activity on live work.
- The department workmen / supervisor or safety stewards are not authorized to sign the LC documents.

- LC should not be accepted / confirmed over phone.
- The prescribed LC format should be completely filled by site engineer / section in charge.
- The required LC time to be estimated properly and projected in the LC format keeping a half an hour cushion to cover unwanted incidental delay.
- In case any delay for return of LC in time, the CM/Section I/c or site engineer should be approached the client immediately or before half an hour for extension of LC time.
- Similarly, the same information is to be communicated to sub-contractor / Gang in written.
- Communication with client PGCB shall be single pointed i.e. construction manager or section I/c.

- FRP Ladder should be used ascending & descending over the pole.
- Telescopic discharge rods used for



Flow diagram for the deployment of workmen to start the work



**L&T CONSTRUCTION
POWER TRANSMISSION & DISTRIBUTION- IC
ELECTRICAL SHUT DOWN ACTIVITY – PRE TASK PLAN**

Annexure: 3

PTP No:

Date:

Project:

Work Description:

Task:

From _____ to _____ Length:

1. Sketch showing showing battery limits of work : (Mention Land marks in the sketch)

2. LC requirements (Location): Isolation required at following places:

Line No	Owner	Feeder Name	Type of Line (kV)	Control SS	Isolation Location

3. Earthing to be done at following places:

4. Name of person responsible to fixing of red flag/caution at isolation pole:

5. Name of worker for continues guard at isolation Location /Mobile No.:

6. Name of Electricians authorized to climb on pole:

7. Safety Equipment Requirements:

i.Number OF Discharge Rod:

ii.Number OF Discharge Rod:

iii.Number OF Discharge Rod:

iv.Number OF Discharge Rod:

Risk analysis /Special mention points:

Site Supervisor

Section In charge

EHSO

Project Manager

LINE CLEARANCE CUM WORK PERMIT

Date:

To: _____ M/s. Larsen & Toubro Ltd.

LC Requested for the purpose of _____ Qty: _____

Sub Division:

Unit/O & M:

Feeder:

PTP Reference:

LC Required (**Location**): From:

(**Location**): To:

(**Time**): From:

(**Time**):

To:

Declaration:

I have studied the PTP No. _____ and work area and understand the work area limits, as mentioned in PTP. I have all the necessary PPE with me for entire work force. I hold responsibility for any sort of violation of PTP limits as well as work permit. Hence request you to offer LC/Work permit.

Signature of Piece Rate Worker

Date/Time: _____

Date:

To:

Line clearance and work permit is granted with reference to your request dt: _____, PTP No _____ and LC No _____ on the _____ feeder. The line is discharged and duly earthed. You are requested to proceed with the work duly testing the line with tester, and return the LC after completion of work in all aspects, to enable us to return the LC to SEB.

Site Supervisor

Section In charge

Date/Time: _____

Date/Time: _____

To: _____ M/s. Larsen & Toubro Ltd.

I have completed the works availed against LC No _____ dt: _____ and all men's and materials have been removed from the work spot/work limits, and I return the LC for charging the system.

Signature of Piece Rate Worker

Date/Time: _____

LOCK OUT & TAG OUT (LOTO) PROCEDURE

- A safe lockout and tagging procedure shall be established prior to work on / or near electrical equipment or lines, and lines or equipment containing dangerous or hazardous material, which can be energized, pressurized, activated, or released remotely or inadvertently.
- A safe lockout and tagging procedures is an operating procedure by which a person, action individually or as a member of a maintenance crew, may have a machine or part of a machine or equipment removed from and held out of service until released by that person. A tag indicating "DANGER – DO NOT OPERATE" or the equivalent shall be placed at the power source of the equipment being serviced.
- A safe lockout and tagging procedure shall be strictly followed in securing electrical systems, machinery, pressure systems, and rotating equipment.
- Power shall be turned OFF, tagged, and locked in the open position at the master switch or at the main breaker. Gears, agitators, or transmissions shall be mechanically locked out or disconnected.
- Padlocks shall be used and the person working on the equipment shall be in possession of a key.
- A safe lockout and tagging procedure shall be required on all systems and equipment if the unauthorized removal or return to service could result in injury, damage, or loss.
- Any required safe lockout and tagging procedures shall be included in an activity hazard plan. Safety meetings shall be held to familiarize designated persons on the site with the procedure, including person responsibilities, and the system for safe lockout and tagging procedures. This shall include all signs, tags lockout, and other devices to be used.
- A lockout device that only accommodates one padlock shall not be used as the lockout may involve more than one system
- Padlocks and other accessories to be used shall be materially strong enough so that only excessive force or pressure can break them. Defective padlocks or accessories shall be immediately replaced.
- No key shall fit for more than one lock.
- The person issued with a lock shall only be issued with one key. The spare key and the master key shall be held in a secure place by the supervisor and kept well apart from the primary lock and key storage box.
- Locks shall be distinctly numbered, and no repetition of numbers allowed. Locks can, also be color coded to identify the user's department (i.e. electrical, mechanical, etc.)
- The most basic form of safe lockout and tagging is given below-
- Removing the keys from vehicle ignition locks and placing warning signs instructing employees that the vehicle is under repair.
- Locking – off the power supply to equipment, such as carpentry machinery, to prevent unauthorized use or to ensure complete safety when repairing the machine and power supply point.
- Locking the doors and posting warning signs on areas or locations, where there is a chance of hazard to unauthorized personnel.

- After the switching operation has been performed, the switchman shall, whenever possible, lockout the controller and / or attaches Hold Tags as the case may be. The purpose of Lockouts and Hold Tags is to make sure that the Controller remains open while work is being done and protect the personnel working on the portion of the system being protected by the controller.
- Hold Tags shall not be removed from any device unless authorized.
- Each disconnecting device shall be properly tagged with an approved Hold Tag.
- When Hold Tags cannot be attached to a device, they shall be attached at a conspicuous point, as close to the device as possible. In case of switchgear where Power Circuit Breakers are lowered or rolled out, the control, which would rise or roll the breaker to its operating position, shall be tagged.
- The Electrical work permit system shall be followed. Pl. refer format PM-20G-Rev00.
- After completion of the work, the craftsman will then sign in the hold tag and return it back to the Supervising Operator who will then directly supervise the removal of tags. The craftsman signing the hold tag shall be the same person who requested the hold tag. Unless responsibility transfers, both the Supervising Operator and the Craftsman shall follow the procedure for removal of lockout clips, chain and padlock.

CHECK LIST FOR FOUNDATION, TOWER ERECTION AND STRINGING

L&T CONSTRUCTION POWER TRANSMISSION & DISTRIBUTION CHECKLIST FOR TOWER FOUNDATION:

Name of Site : _____ Date: _____
 Inspected By : _____
 Sub-Contractors Name: _____ Location No: _____

	Sl. No.	Description of Activity	Feedback	Remarks
EXCAVATION	1	Check for HT / LT line present in the vicinity of excavation to maintain adequate clearance.	Yes / No	
	2	Check for any trees to cut before excavation and no person shall allow near the area while cutting the trees.	Yes / No	
	3	No person shall stand near the Swing area of the JCB / excavator.	Yes / No	
	4	Proper slope cut to be checked & ensure accordingly and also De-watering arrangement for waterlogged pits.	Yes / No	
	5	a) Ensure that the excavated soil stacked at a distance of 1.5Mtr from the edge of all pits. b) Ensure that heap of excavated soil must not exceed 1.5Mtr .	Yes / No	
	6	Ensure that the individual pit barricading at a distance of 1Mtr from the edge of the pits.	Yes / No	
CONCRETING	7	Ensure that the construction materials stacked at a safe distance of 5Mtr away from the pits.	Yes / No	
	8	Ensure that the sufficient work force is engaged for fixing up of Stub, Template and Jack arrangements.	Yes / No	
	9	Ensure that the Jacks are placed on a level & hard ground surface to avoid unbalancing and loosing of jacks.	Yes / No	
	10	Ensure that the Concreting mixer machine kept at a safe distance of 1.2 Mtrs with longer chute arrangement.	Yes / No	
	11	Ensure that the proper guarding is provided for all the rotating parts of the Mixer machine.	Yes / No	
	12	Ensure that the sufficient number of rigid ladders of suitable length (12-14 feet) are available for ingress / egress in to the pit.	Yes / No	
	13	Ensure that the proper lighting arrangement made during night works with minimum of Petromax arrangement.	Yes / No	
	14	Ensure usage of appropriate PPE's i.e: Safety helmet , Hand gloves , nose-mask , gum boots etc.	Yes / No	

Name of S/C

Site Supervisor / Engineer

EHSO

**L&T CONSTRUCTION
POWER TRANSMISSION & DISTRIBUTION**

CHECKLIST FOR TOWER ERECTION:

Name of Site : _____ Date : _____
 Inspected By : _____
 Sub-Contractors Name : _____ Location No : _____

No	Description of Activity	Feedback	Remarks
1	Ensure that proper backfilling of soil is made and check for damages or uneven settlement of foundation.	Yes / No	
2	Ensure that proper communication facility is available at site i.e ; whistle , flags (red/green).	Yes / No	
3	Check if any LT / HT Lines present near the tower erection area and take shut down of lines if applicable.	Yes / No	
4	Ensure that the pulleys, clamps-Shackles used before starting tower erection is checked for adequate strength / proper size.	Yes / No	
5	Ensure that the derrick used, before & after starting tower -erection has been checked for physical fitness.	Yes / No	
6	Ensure that the ropes checked for adequate strength and physical condition ie. free from break of strands and knots etc.	Yes / No	
7	a) Ensure that the tractor used at site is in good working condition i.e; Brakes , Self start , horn / reverse horn etc. b) Ensure that tractor driver should have license & only authorized person shall operate.	Yes / No	
8	Ensure the plain surface area for the tractor to move (with out any undulations)	Yes / No	
9	Ensure all the step bolts are fixed before erecting A & C legs.	Yes / No	
10	Ensure that one section is erected singly..	Yes / No	
11	Ensure that all the members and proper size of nuts and bolts of lower section are fitted properly before erection of the upper section is taken up.	Yes / No	
12	Ensure that the usage of gunny bags for the protection of Slings / ropes from sharp edges.	Yes / No	
13	Ensure only erection team members are allowed to stand nearby ,while the erection is in progress and should wear the safety helmet / Safety shoes etc.	Yes / No	
14	Ensure that the working area of the tower has been demarcated during erection.	Yes / No	

15	Ensure that the proper guying arrangement has been made and also to see that proper size of the crow bars has been used which has been fixed at hard surface in case of sandy or loose soil.	Yes / No	
16	Ensure 3-side guying arrangement made for the Derrick pole while erecting tower members.	Yes / No	
17	Ensure that proper arrangement is made while lifting tower members and fixing them at height i.e. Proper size and strength of the "S" hook used for lifting the tower members.	Yes / No	
18	Ensure that the sufficient numbers of guys are made while lifting the assembled cross arm and also avoiding use of single sheave pulleys while lifting the assembled cross arm / heavy load.	Yes / No	
19	Ensure usage of Double lanyard full body harness while working at height.	Yes / No	
20	Ensure that the usage of rope grab fall arrestor with lifeline arrangement while Ascending / Descending from the tower.	Yes / No	
21	Ensure that no material shall be thrown from height(use rope pulley arrangement system)	Yes / No	

Name of S/C

Site Supervisor / Engineer

EHSO

**L&T CONSTRUCTION
POWER TRANSMISSION & DISTRIBUTION**

CHECKLIST FOR CONDUCTOR STRINGING:

Name of Site : _____ Date: _____
 Inspected By : _____
 Sub-Contractors Name: _____ Location No: _____

Activity	No.	Description of Activity	Feedback	Remarks
Tower Inspection	1	Ensure that all the tower members are erected and proper size of nuts and bolts are rigidly tightened and punching / tack welding is done in towers before undertaking stringing job.	Yes / No	
	2	Ensure that the tower on which the stringing has to do is permanently earthed.	Yes / No	
Tools & Tackles Inspection	3	Ensure that the pulleys used before conductor stringing has been checked for its physical condition.	Yes / No	
	4	Ensure that the ropes used in conductor stringing is checked for its physical condition ie. Free from break of strands and knots etc	Yes / No	
	5	Ensure that the lifting tools and tackles i.e. Winch machine, Chain Pulley Block, D-Shackle, Clamps etc. are in healthy condition and has tested periodically.	Yes / No	
Insulator hoisting	6	Check for any LT / HT lines present near the area and take shutdown of lines if applicable.	Yes / No	
	7	Ensure that all the insulator strings are thoroughly checked for availability and proper fixing of cotter/ split pins before hoisting the same.	Yes / No	
	8	Ensure that the usage of Retractable fall arrestor while working on the Insulators.	Yes / No	
Paying out	9	Ensure that proper communication facility is available at site during stringing of conductor i.e: Whistle / Flaos (Red/Green)	Yes / No	
	10	Ensure that the conductor drums, jacks and Shaft used in site are in good condition.	Yes / No	
	11	Ensure that the provision and proper positioning for the guying and back staying during one side loading of tower.	Yes / No	
	12	Ensure that the permit has been obtained from the Competent Authority for stringing of conductor while crossing through Road / Rail / River/ Vulnerable areas etc	Yes / No	
	13	Ensure that all the safety measures has been taken during conductor stringing while crossing the EHV/HV/LT lines (Earthing of existing lines)	Yes / No	
	14	Ensure that proper PTP and LC procedures followed wherever applicable.	Yes / No	
	15	Ensure that the discharge rod is electrically tested before use	Yes / No	

	16	Ensure that only nylon or polypropylene ropes should be used during conductor stringing in the vicinity of live overhead lines.	Yes / No	
Rough sag	17	Ensure that proper scaffolding arrangements made during stringing of conductor while Road Crossing / Power line Crossing / Railway crossing etc.(The structure should be in Lattice form)	Yes / No	
	18	Ensure that the brake arrangement of the TSE Machine is working	Yes / No	
Rough sag	19	Ensure that Stringing machine / Tension puller machine is properly earthed.	Yes / No	
	20	Ensure that PTW has taken from the concerned authority before starting of the work.	Yes / No	
	21	Ensure that before stringing starts check that the villagers do not come underneath the job of the concerned section and conductor is free from any vehicular movement, persons, Animals etc.	Yes / No	
Final sag	22	Check that Sag Board is provided at two locations	Yes / No	
	23	Ensure that the Sag Board arrangement is made by an experienced / trained person.	Yes / No	
	24	Ensure that the approved Sag tension chart is available and followed at site.	Yes / No	
	25	Ensure that tension applied on the dynamometer dial and check values with approved value.	Yes / No	
Clipping / Jumpering	26	Ensure Lifting Tools & Tackles used are of adequate strength / size i.e; 4 sheave pulleys , single sheave pulleys ,slings,PP ropes etc.	Yes / No	
	27	Ensure Temporary earthing is made between tower body and conductor during Clipping of conductor.	Yes / No	
	28	Check the Spacer cycle's physical condition i.e; wheels, brake, PP ropes and adequate manpower etc.	Yes / No	
PPE's	29	Ensure that the usage of full body harness while working at height.	Yes / No	
	30	Ensure that the usage of Rope grab fall arrestor with lifeline arrangement while Ascending / Descending from the tower.	Yes / No	
	31	Ensure usage of Retractable fall arrestor while working on insulator strings.	Yes / No	
	32	Ensure that the Display of safety poster's for awareness of people while crossing through Road / Rail / River/ Vulnerable areas etc..	Yes / No	

Name of S/C

Site Supervisor / Engineer

EHSO

Leadership and Commitment

L&T CONSTRUCTION PT&D Senior Management provides demonstrable management leadership and commitment through active participation in H&S activities.

Their leadership and commitments translate into necessary resources to develop, operate and maintain L&T CONSTRUCTION, PT&D EHS Management System and to attain EHS Policy and legal requirements.

We are committed to manage all its activities, risks to 'As Low As Reasonably Practicable (ALARP).

Visibility

The management will provide strong demonstrable visible leadership and commitments towards EHS by personal example and action. The Management will participate in EHS meetings, conduct site Inspections and EHS Audits, to encourage a positive attitude towards EHS.

No.	TASK	ACTION BY	COMPLIANCE TARGET	VERIFICATION DOCUMENT
1.	Project EHS Committee Meeting: (Review performance against EHS plans, EHS Objectives & targets and any EHS issues)	PM / CM	Min Frequency: 1 month	Minutes of Project EHS Committee Meeting – IM 5.4.1 - B
2.	Project EHS Committee Inspection	EHS Committee Members	Min Frequency: 1 month	EHS Inspection Report, IM – 9.1.3- B
3.	EHS Review	COH / HO / Section Heads	During their Site Visit	Minutes of Project EHS Committee Meeting – IM 5.4.1 - B
4.	Internal EHS Audit	CEHSM / Internal Auditor	Once in Six Months	Audit Report including NCRs, & Site Observation
5.	Motivation Giving token gift to the “Best safety conscious personnel” of the month to recognise good EHS practices.	PM / CM	Monthly	Copies of Certificates

Proactive in target setting

The site management demonstrates pro-activeness in target setting by :

No.	TASK	ACTION BY	COMPLIANCE TARGET	VERIFICATION DOCUMENT
1.	Jointly developing and discussing improvement targets and indicators for each location with Construction Managers & EHSO. (eg. Training of Workmen – Coverage. Inspection Compliance etc)	PM / CM	Every Quarter	MOM of Project EHS Committee Meeting
2.	Jointly review the Incidence rate of First Aid Cases and set a target for reduction.	PM / CM	Every Quarter	MOM of Project EHS Committee Meeting
3.	Management involvement in Accident review and target setting.	COH / HO / CEHSM	As required / Monthly	Investigation Report

Company Culture:

The management seeks to create and sustain a Company culture in which employees share a commitment to EHS.

No.	TASK	ACTION BY	COMPLIANCE TARGET	VERIFICATION DOCUMENT
1.	Putting EHS as the “First agenda” of all review meetings at Headquarters, Clusters & project sites	VP / BU Heads / COH / HO / PM / CM	All time	MOM
2.	Empowerment to Stop Work Employees are empowered to stop work when the situation warrants immediate action in view of imminent danger to life / property / environment. Project Managers must appreciate and reward those employees whose prompt action helps avoid potential incident.	All	All time	Verbal Verification

Involvement of Senior management: -

Senior management demonstrates its involvement in EHS issues through:

NO.	TASK	ACTION BY	COMPLIANCE TARGET	VERIFICATION DOCUMENT
1.	Review Project EHS Performance and EHS plan implementation in consultation with Project Manager & EHSO.	COH / HO	Half yearly	MOM – Cluster EHS Review Meeting

2.	Ensure adequate professional EHS support is available for effectively implementing the EHS plan, fulfilling EHS targets and attaining EHS objectives.	CEHSM	Project Duration	Jointly decided by COH / HO / CEHSM
3.	Ensure sufficient support and resources are available to meet EHS targets (eg Infrastructure, vehicle, safety steward, communication, PC, etc)	PM / CM	Project Duration	Jointly decided by COH / HO / CEHSM
4.	Imparting necessary EHS training for the Staff & workmen of the project.	PM / CM	As required	EHS Training record

EHS Policy

L&T CONSTRUCTION, POWER TRANSMISSION & DISTRIBUTION top management has established Environment, Health and Safety Policy which is documented and communicated to appropriate levels and available for the interested parties.

EHS Policy in English is displayed at site office, notice board and all staffs made aware of the existence of the policy by discussing in EHS meetings, displaying at site offices, notice boards, workmen camp, canteen and conspicuous locations.



Integrated Management System:

L&T Construction – PT&D IC firmly believes that EHS at work is the responsibility of every employee and promotion of EHS culture is an integral part of all managerial functions. EHS is fully integrated in all its activities and not viewed as a separate entity.

In keeping with L&T's vision, mission and EHS Policy, L&T Construction - PT&D IC has a well-established **Environment, Health & Safety Management System** in accordance to **ISO 14001: 2015 and ISO 45001: 2018 standards** which is documented, implemented, maintained and continually improved.

PT&D IC is committed to the implementation of its Environment, Health & Safety Management System and closely monitors its implementation with a view to improve the EHS culture at all its locations consistently.

As a part of implementing the EHSMS, PT&D IC has:

- Identified processes needed for Environmental, Health & Safety controls,
- Determined the sequence and interaction of these processes,
- Determined the criteria and methods required to ensure effective operation and control,
- Processes that are measured, monitored, and analysed,
- Implemented actions necessary for planned results and continual improvement.

PT&D IC has the following Business Units, and TLT Factories:

- Transmission Lines (TL) BU Projects and TLT Factories (Pondicherry, Pithampur & Kanchipuram)
- Utility Power Distribution (UPD) BU
- Sub-station (SS) BU
- Renewables (RE) BU
- Optical Fibre Cable (OFC) Segment



Bureau Veritas Certification



LARSEN & TOUBRO LIMITED
L&T CONSTRUCTION
POWER TRANSMISSION & DISTRIBUTION IC (DOMESTIC)



HEAD QUARTERS: MOUNT POONAMALLEE ROAD, MANAPAKKAM,
POST BOX NO. 979, CHENNAI – 600 089, TAMIL NADU, INDIA.

This is a multi-site certificate, additional site(s) are listed on the next page(s)

Bureau Veritas Certification Holding SAS – UK Branch certifies that the Management System of the above organization has been audited and found to be in accordance with the requirements of the Management System standards detailed below.

Standards

ISO 14001:2015 & ISO 45001:2018

Scope of certification

**MANAGEMENT OF ENVIRONMENT, OCCUPATIONAL HEALTH AND SAFETY
REQUIREMENTS AT FACTORIES, PROJECT SITES AND OFFICE INCLUDING MUMBAI
METRO RAIL PROJECT FOR ALL BUSINESS UNITS OF
PT&D DOMESTIC OPERATIONS**

Original cycle start date For ISO 14001:	05 January 2011
Original cycle start date For ISO 45001:	05 January 2020
Expiry date of previous cycle For ISO 14001:	04 January 2020
Expiry date of previous cycle For 45001:	Not Applicable
Recertification Audit date For ISO 14001:	22 November 2019
Certification Audit date For ISO 14001:	22 November 2019
Recertification cycle start date For ISO 14001:	05 January 2020
Certification cycle start date For ISO 45001:	05 January 2020

Subject to the continued satisfactory operation of the organization's Management System,
this certificate expires on: **04 January 2023**

Certificate No. **IND.19.8331U** Version : 3 Revision date: **08 March 2021**

Jagdheesh N. Manian

Signed on behalf of BVCH SAS – UK Branch
Jagdheesh N. MANIAN
Head – CERTIFICATION, South Asia
Commodities, Industry & Facilities Division



Certification body address: 5th Floor, 66 Prescott Street, London, E1 8HG, United Kingdom.

Local office: Bureau Veritas (India) Private Limited (Certification Business)
72 Business Park, Marol Industrial Area, MIDC Cross Road "C",
Andheri (East), Mumbai – 400 093, India.



**BUREAU
VERITAS**

Bureau Veritas Certification

LARSEN & TOUBRO LIMITED L&T CONSTRUCTION

POWER TRANSMISSION & DISTRIBUTION IC (DOMESTIC)



Standards

ISO 14001:2015 & ISO 45001:2018

SITE	ADDRESS	SCOPE
HEAD OFFICE	MOUNT POONAMALLEE ROAD, MANAPAKKAM, POST BOX NO. 979, CHENNAI – 600 089, TAMILNADU, INDIA.	MANAGEMENT OF ENVIRONMENT, OCCUPATIONAL HEALTH AND SAFETY REQUIREMENTS AT FACTORIES, PROJECT SITES AND OFFICE INCLUDING MUMBAI METRO RAIL PROJECT FOR ALL BUSINESS UNITS OF PT&D DOMESTIC OPERATIONS.
PUDUCHERRY	LARSEN & TOUBRO LIMITED TLT FACTORY, 103, MYLAM ROAD, SEDARAPET, PUDUCHERRY – 605 111, INDIA.	1. MANUFACTURE OF GALVANIZED TOWERS AND STRUCTURES FOR TRANSMISSION LINES, RAILWAY ELECTRIFICATION SYSTEMS, WINDMILLS, SWITCH YARDS AND TELECOMMUNICATION SYSTEMS. 2. MANUFACTURE OF SECTIONS AND HIGH STRENGTH DEFORMED BARS.
PITHAMPUR	LARSEN & TOUBRO LIMITED TLT FACTORY, 158-B SECTOR III PITHAMPUR DIST., DHAR MP, PITHAMPUR – 454 774, INDIA.	MANUFACTURE OF GALVANIZED TOWERS AND STRUCTURES FOR TRANSMISSION LINES, RAILWAY ELECTRIFICATION SYSTEMS, SWITCH YARDS AND TELECOMMUNICATION SYSTEMS
KANCHIPURAM	TLT KANCHIPURAM WORKS, BANGALORE HIGHWAY, NIRUVALLUR VILLAGE, KANCHIPURAM – 631 561, INDIA.	MANUFACTURE AND TESTING OF GALVANIZED TOWERS AND STRUCTURES FOR TRANSMISSION LINES, RAILWAY ELECTRIFICATION SYSTEMS, WINDMILLS, SWITCH YARDS, AND TELECOMMUNICATION SYSTEMS

Certificate No. IND.19.8331U

Version: 3

Revision date: 08 March 2021

J. Manian

Signed on behalf of BVCH SAS UK Branch
Jagdheesh N. MANIAN
Head – CERTIFICATION, South Asia
Commodities, Industry & Facilities Division



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Certification body
address:

5th Floor, 66 Prescott Street, London, E1 8HG, United Kingdom.

Local office:

Bureau Veritas (India) Private Limited (Certification Business)
72 Business Park, Marol Industrial Area, MIDC Cross Road "C",
Andheri (East), Mumbai – 400 093, India.

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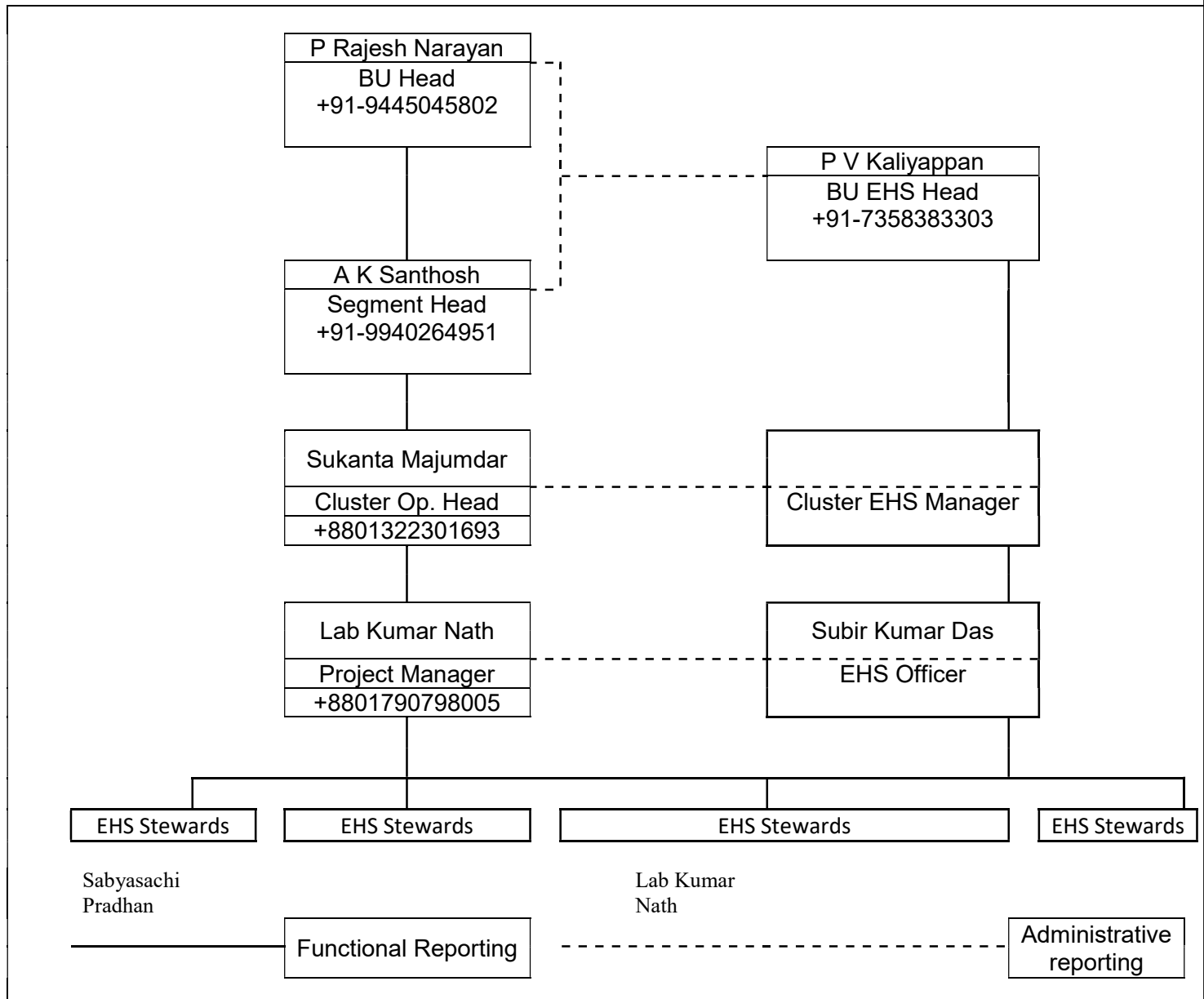


Resource Management & Organogram

EHS Steward deployment: -

EHS Steward shall be engaged depending on Area, criticality of the work carried and work force.
Number of EHS steward may be increased depending upon the risk and work force.

EHS Organogram: -



Responsibilities: -

EHS management is a line responsibility requiring active participation of all levels of management and supervision.

Individual EHS roles and responsibilities, along with task and target shall be distributed to the individuals for action, as described below.

Project Manager: -

NO.	TASK	TARGET	VERIFICATION DOCUMENT
1.	Responsible for completion of the project with total implementation of the company's EHS policy requirement, EHS Management System & requirements of this plan and comply with the relevant statutory rules and regulations.	Project Duration	
2.	Responsible to ensure that all staff & workmen are competent to perform their tasks safely in compliance with L&T CONSTRUCTION EHS Management System and this plan requirement. He shall do so by: – Ensuring the screening of workmen is effectively implemented by the time office & site execution engineers. – EHS Induction provided for all staff & workmen before deployment by EHS Engineer / Officer. – Ensure regular monitoring and organise continuous EHS in-house trainings. – Establishing adequate control measures for the employees fitness to avoid fatigue, stress, extended working etc.	Project Duration	Screening Record of workmen EHS Induction for Workmen EHS Training Record
3.	Ensure sufficient resources are available at site. He shall ensure through: – Reviewing EHS Plan implementation and discuss any outstanding issues in Project EHS Committee Meeting. – Investigating non-compliance and non-implemented items.	Project Duration	1) MOM – Project EHS Committee Meetings 2) EHS audits
4.	Site EHS Inspection and EHS Plan implementation monitoring	Project Duration	Inspection report
5.	Investigate all high potential incidents and non-compliance and ensure immediate remedial action to stop recurrence.	As & when notified	Investigation Reports and action plans

Cluster EHS Manager

NO.	TASK	TARGET	VERIFICATION DOCUMENT
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1.	Supplement Site EHS inspections & relevant EHS training at the jobsites in co-ordination with EHSO.	Once in Six Months	CEHSM Site Visit Report
2.	Investigate all serious accidents / dangerous occurrences & recommend preventive actions at sites.	As and when required	Accident Investigation Report
3.	Co-ordinate purchase and quality control activities related to PPE / safety gadgets.	After receiving MR	Approved Vendor List
4.	Monitor all EHSO activities & co-ordinate with Clients, project In charges, COHMs / HOs, RPLM, Service Unit Heads	As and when required	No documentary evidence
5.	Organise campaigns, competitions & other special emphasis programmes to promote EHS at workplace.	During January & as and when required	Record of Safety Campaign and competitions
6.	Conduct EHS Audit and Inspection during the Project duration.	As per schedule	Audit Report
7.	Evaluating the legal compliances and ensuring applicable legal & other requirements are fulfilled	Bi-Annually	Evaluation of Legal Compliances

EHSO

NO.	TASK	TARGET	VERIFICATION DOCUMENT
1.	Disseminate and Communicate EHS Policy, EHS Management System requirements to site personnel.	Project Duration	
2.	Provide necessary advice, information and support in the effective implementation of the EHS Management System requirements and this EHS plan.	Project Duration	
3.	Updating the EHS Plan to the requirements of the activities being carried out when there is a revision.	Project Duration	EHS Plan
4.	Plan and conduct Internal EHS training programs, initiate drive to promote EHS awareness and performance	Project Duration	EHS Training Records
5.	Carry out EHS inspection of Work Area, P&M Equipment & Machineries, etc. as per the IMS requirement.	As per Monthly Activity Plan	EHS Inspection Report, P&M Inspection Report
6.	Creating EHS awareness through PEP talks.	Every day	PEP talk Report
7.	Advising line management in preparing EHS Risk Assessment for the new activities	Project Duration	EHS Risk Assessment Records

8.	Conduct investigation of all incidents / dangerous occurrences & recommend appropriate corrective measures.	When reported	Investigation Report
9.	Convene EHS Committee meeting & minute the proceedings for circulation & follow-up action.	Min Frequency – Once in a month	MOM – Project EHS Committee Meeting
10.	Advice & co-ordinate for implementation of Work Permit Systems.	When ever work requiring WPS is executed	Completed Work Permit
11.	Plan procurement of PPE & safety devices and inspect before use as per laid down norms.	Project Duration	Requirement & Release of Safety Materials and Delivery Challan Records
12.	Report to CEHSM on all matters pertaining to status of EHS and promotional programme at site level.	Regular basis	
13.	Facilitate screening of workmen and conduct EHS induction.	Project Duration	Screening & Induction Records
14.	Monitoring administration of First Aid.	Project Duration	First Aid Register
15.	Conduct Fire Drill, Procure, inspect and arrange to maintain Fire Extinguishers.	As scheduled in the monthly activity plan	Fire Drill Register and Fire extinguishers list
16.	Organise campaigns, competitions & other special emphasis programmes to promote EHS in the workplace.	As and when required	Record of Safety Campaign & Competition
17.	Register Customer complaints and take corrective action.	Project Duration	Customer Compliant Register
18.	Record, analyse and cascade lateral learning points from First Aid Cases, Near Miss Cases & Accidents to all project personnel and analyse the trends & effectiveness.	Monthly	First Aid Register; Accident Investigation Report
19.	Maintain all EHS related documents Update EHS training records	Continues	EHS related Documents

Section / Area In charge

NO.	TASK	TARGET	VERIFICATION DOCUMENT
1.	Ensure that all the workmen engaged under him are selected through the screening system & have undergone site EHS Induction before assigning any task at site.	Project duration	Screening & EHS induction records
2.	Ensuring compliance of L&T CONSTRUCTION PT&D basic EHS rules and applicable specifications by – Taking prompt action of site inspection and hazard findings. – Closing all the points identified in inspection reports – Ensure EHS Risk Assessment is done for all the jobs under him.	Project duration	EHS Inspection report EHS Risk Assessment Record
3.	Ensure that all near miss cases / Reportable LTI / Dangerous Occurrence / Fatality are reported promptly.	As & when notified	Reports
4.	Participate regularly in EHS meetings.	As schedule	MOM

All Employees

NO.	TASK	TARGET	VERIFICATION DOCUMENT
1.	Report all unsafe acts and condition to the immediate supervisor.	Continuous	
2.	Start work only when conditions are safe and stop work when it is unsafe.	Continuous	
3.	Operate equipment only when authorised and prescribed manner. (If applicable)	Continuous	Inspection records
4.	Report any injury or accident immediately.	Continuous	Reports

Site Engineers

NO.	TASK	COMPLIANCE TARGET	VERIFICATION DOCUMENT
1.	Understanding the EHS requirements of the Project from this Plan, EHS Management Systems, HSE Manual & following the same in execution of the work	Continuous	No of findings in the EHS Inspection
2.	Give Pep talk to the workmen under him	Daily	PEP Talk Report
3.	Ensuring the workmen under him wear the necessary personal protective equipment respective to the job	Continuous	Subcontractor Evaluation Report

4.	Eliminating all unsafe conditions in their work area	Continuous	EHS Inspection Report
5.	Keeping the work area neat & clean	Continuous	EHS Inspection Report
6.	Know the critical activities of his job based on the EHS Risk Assessment and ensure implementation of the control measures.	Project Duration	EHS Risk Assessment Report & Safe work method
7.	Participating with the EHSO Officer or the committee Members in the Project EHS Inspection	As per schedule	EHS Inspection Report
8.	To follow all work permit system as per client requirements or L&T CONSTRUCTION PT&DEHS Management System before starting of similar work	As and when required	Work Permit System
9.	To report all near miss cases / reportable LTI /dangerous occurrences / fatality to EHS Engineer immediately verbally & submitting the preliminary accident report within 12 hours.	As and when required	Preliminary Accident Report
10.	Informing the concerned authority as per the emergency response plan.	As and when required	Emergency Response Plan

Project EHS Committee Members

NO.	TASK	COMPLIANCE TARGET	VERIFICATION DOCUMENT
1.	Attend meeting regularly as per schedule to discuss and decide the ways and means of eliminating the factors affecting EHS.	Minimum once in a month	MOM – EHS Committee Meeting
2.	To analyse all the activities of the forthcoming period and identify the possible hazards and finalizing the precaution to be taken.	Minimum once in a month	MOM – EHS Committee Meeting
3.	To monitor the EHS Performance of the project and suggesting improvements whenever needed.	Minimum once in a month	MOM – EHS Committee Meeting
4.	Actively participate in the EHS Committee Inspections & Assessing Key performance indicators on EHS	As per Schedule	EHS Inspection Report KPI on EHS report

Sub-contractors

NO.	TASK	COMPLIANCE TARGET	VERIFICATION DOCUMENT
1.	Shall understand the EHS code of conduct for subcontractors and sign the same as a token of acceptance before starting the activity.	Before starting the activity	EHS Code for Sub contractors

2.	Subcontractor, his Supervisor and his workmen shall adhere all the laid down EHS rules & Regulations while working at site, follow the instruction / advice of Site engineer & EHSO from time to time.	Continuous	Monthly Evaluation of Subcontractors
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Project EHS Committee

The Monthly EHS Committee Meeting shall be chaired by the Project Manager. Invitations for such committee meetings shall be extended to Client representatives and the committee members.

The EHS Committee meeting members shall comprise of the following personnel.

- Project Manager as Chairman
- EHSOs as Secretary
- Construction Managers as Committee member
- Site Engineers/Section In-charge as Committee member
- Supervisors as Committee member
- P&M In-charge as Committee member
- Store In-charge as Committee member
- Planning In-charge as Committee member
- Finance & Account In-charge as Committee member
- Workmen representative Committee member
- (Sub-contractor representative)

The formation EHS Committee is duly announced through a circular signed by Project Manager.

- The responsibilities of this Committee shall include the following:
- Overall objective analysis of the site EHS activities;
- Good safety practices being adopted/ to be adopted;
- Deficiencies found during safety inspection / audits and measures to be taken to improve the same;
- Incidents/accidents or near misses that have occurred and review of Investigation and recommendation;
- Hazard observed and corrective action;
- Identification of unsafe act.

The committee invites any other person including subcontractor, workmen to the meeting if that person's presence is required to promote EHS.

FORMATION OF PROJECT EHS COMMITTEE

Name of the Project :

BU/Segment/Cluster:

Job Code:

CIRCULAR

Committee

The following EHS Committee is constituted with immediate effect:

Chairman :

Members :

1)

2)

3)

Secretary :

Periodicity

The committee will meet at least once in a month on the day (specify date)

Agenda

Secretary will circulate agenda of the meeting at least two days in advance of the schedule date of the meeting.

Circulation

Gist of the meeting will be minute in the standard format and circulated to the following under the signature of the secretary ---

1. Chairman

3. Invitees

2. Members

4. CEHSM

5. Others concerned

Date:

Signed By: -----

CHAIRMAN

EHS Risk Assessment

Purpose: - To determine the EHS aspect/Hazard and its associated impacts / risks arising out of it's activities, product or services that it can control and those that can influence considering the life cycle perspective.

Guidelines for Hazard identification, risk assessment and determining controls

For hazard identification and risk assessment the followings are considered

- Routine and non-routine activities;
- Activities of all persons having access to the workplace (including contractors and visitors);
- Human behavior, capabilities and other human factors;
- Identified hazards originating outside the workplace capable of adversely affecting the health and safety of persons under the control of the organization within the workplace;
- Hazards created in the vicinity of the workplace by work-related activities under the control of the organization;

- Infrastructure, equipment and materials at the workplace, whether provided by the organization or others;
- Changes or proposed changes in the organization, its activities, or materials;
- Modifications to the OH&S management system, including temporary changes, and their impacts on operations, processes, and activities;
- Any applicable legal obligations relating to risk assessment and implementation of necessary controls

The design of work areas, processes, installations, machinery/equipment, operating procedures and work organization, including their adaptation to human capabilities

The results of these assessments are considered when determining controls.

When determining controls, or considering changes to existing controls, consideration shall be given to reducing the risks according to the following hierarchy:

- elimination;
- substitution;
- engineering controls;
- signage/warnings and/or administrative controls;
- personal protective equipment.

The results of identification of hazards, risk assessments and determined controls are documented and are kept up-to-date.

Methodology for hazard identification and risk assessment.

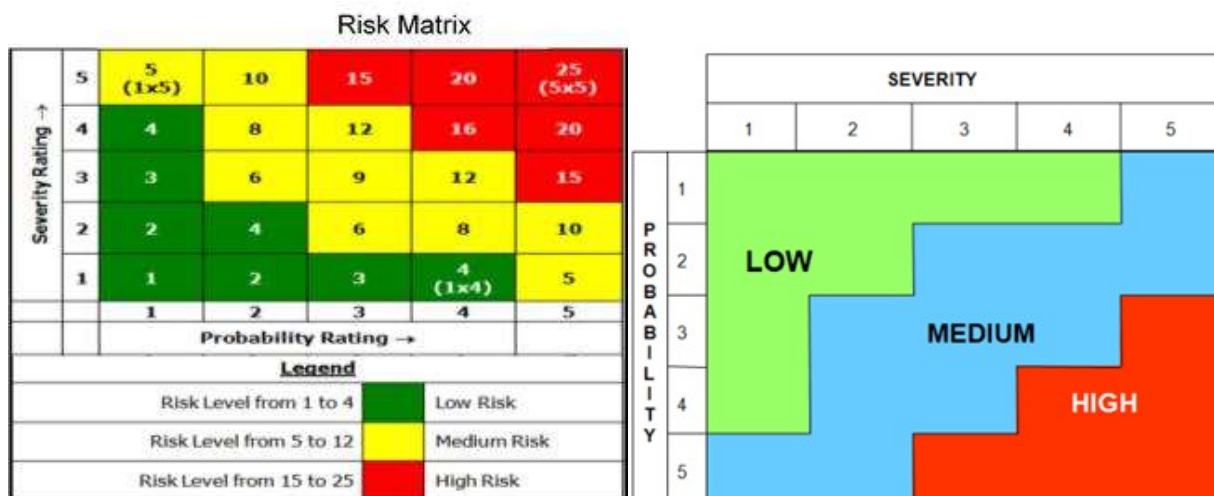
The probability and severity of hazards are determined as per the following table.

Determining the severity of hazards					
Value	Probability	Severity			
		Safety	Heath		Noise Generation
5	Daily / Frequently at site	Single or multiple Fatality	Terminal illness	Exposure of substance requiring permanent treatment when they reach a point where their illness is likely to lead to their death within a short period of time.	101 dB and above
4	Weekly / Occurrence in our IC	Serious Injury requiring hospitalisation	Unemployable due to illness	Major Health impact requiring doctor's attention returning back to work after a month or non-ionic radiations / tolerable residual risk with medication	91 to 100 dB

3	Monthly / accordance in other ICs	Lost Time Injury	Intense health effect	Moderate health impact / requiring doctor's attention. Person can return back to work within a week. Eg. Viral fever or fever due to water contamination etc.	81 to 90 dB
2	Yearly / Occurrence in construction Industry	Injury requiring Medical Treatment but not Lost Time	Minor health effect	Minor health impact / requiring nurse /doctors' attention and person can return back to work next day hours. E.g. Diarrhoea, vomiting, Constipation	71 to 80 dB
1	Very rare occurrence in construction industry	First Aid treatment only	Slight health effect	Momentary discomfort / Nuisance E.g. Headache, Burning of eyes, Giddiness, person can return back to work immediately after rest	60 to 70 dB

Once the probability and severity have been established, the risk level can be determined.

To determine the risk level, select the appropriate row for severity and the appropriate column for likelihood, the cell where they intersect indicates the Risk level.



Criteria for Hazard Identification and Risk Assessment

Control of Risk:

- Based on the level determined, controls should be selected to reduce the risk level to an acceptable level.
- This can be done by reducing the Severity and/or probability.

- As indicated in the risk matrix, when the risk level is “High” or “Medium”, effective and practicable risk controls must be implemented to bring down the High-Risk level to ALARP Level “As Low As Reasonably Practicable”.

Residual Risks

Residual risks are the remaining risks, for which the planned controls are not able to effectively remove or control. It shall be ensured that the residual risks / impacts are acceptable and manageable.

Implementing the Opportunities;

All EHS opportunities will be an input to the IM 6.2 EHS objectives and programme and the action plan will be made and implemented.

The EHS opportunities will be reviewed at periodical intervals for effective implementation of the opportunity.

Review of EHS Risk

EHS Risk Assessment and the safe work method shall be reviewed when

- There is a significant change in work processes that could affect health, safety & environment, for example, the introduction of new machinery or change in work procedure.
- After an accident as a result of exposure to a hazard.
- Significant Change in Legal requirements of OH&S and Environments.

Communication

Employees at the workplace shall be communicated about the possible H&S risk they may be exposed to and / or the environmental impact which may be caused, during the course of work as identified in the risk assessment.

They shall be informed of the following:

- the nature of the risk / impact involved
- the measures implemented to control the risk / impact.

Whenever the risk assessment is revised, or when there is a significant change in work practices or procedures, the employees or other persons who may be at risk shall be informed accordingly.

The communication shall be done through EHS Induction, PEP talk, Training programs or other suitable means.

- **Life cycle perspective**

The following General Guidelines for addressing life cycle perspective are given. This can be used as applicable

Guidelines for addressing the life cycle perspective		
Stages of life cycle	Degree of controls / Influence to be applied	Responsible to address the stages of aspects

Design	Raw material selection at design and development, Consideration of aspect and impacts at various stages of process	Design and development, Engineering, R&D
Raw Material acquisition	Characterize the magnitude of environmental impact of goods and services. Address whether any raw materials are deemed to be critical to any stake holders. Consideration of environmental aspects and Impact due to raw material and actions to minimise environmental impact Consider alternate material, alternate vendors to minimise environmental impacts	Procurement / Purchase dept. / Sourcing
Procurement of material / Equipment	Address impact of purchased goods Procurement of material and equipment which are having minimum environmental impact Eg Energy efficient equipment.	Procurement / Purchase dept.
Production / Execution	Identification of Environmental aspects and Impacts in production process, establishing required controls to minimise environmental impact. Optimum use of material and reduction raw material usage, Minimising process waste Including use of energy	Production dept, Quality
Transportation / Delivery	To consider various mode of transport and select lower impact mode of transport (Ship, Rail, truck)	Despatch Dept, Transportation dept
Excavation	Identification of Environmental aspects and Impacts in excavation process, establishing required controls to minimise environmental impact. To consider minimum environmental impact during excavation, to consider impact on related interested parties	Project Dept, Contractors
Erection and commissioning	Identification of Environmental aspects and Impacts in erection and commissioning process, establishing required controls to minimise environmental impact. To consider minimum environmental impact during Erection and commissioning excavation, to consider impact on related interested parties	Project dept., Contractors
Use of Product	Emission / discharge /consumption during use of the equipment. Reduce environmental impact while use the equipment.	Marketing, Sales, Customer

End of life treatment and Final disposal after use and rejection during processes.	Treatment of material / product at the end of its life. Like incineration, Melting Final disposal of product / material after end of life treatment. Eg disposal to authorised recycler, reuse, reprocess.	Design Dept, Marketing, Sales, Customer. Production Dept
--	---	--

List Of Applicable Legal & Other Requirements

This section is the list of applicable legal & other requirements pertaining to Environment, Health & Safety

Sl. no	Act/Rules Code	List of applicable and other requirements
1	Act 2006 Rules 2015	Bangladesh Labor Act
2	Rules 1991	Gas Cylinder Rules, 1991
3	Act 1974	Bangladesh Petroleum Act 1974
4	Act 2018	Road transport act 2018
5	Act 1927	The vehicle Act, 1927
6		

General EHS Guideline

This section shall detail the general EHS Rules & Regulations to be adopted in the site for the following areas.

- Safety induction is must for one and all at the site
- No one should be engaged in to work without completion of screening & safety Induction.
- Appropriate use of PPE is mandatory.
- Every accident and near miss event must be reported to SAFETY Engineer.
- Any person found to be interfering with or misusing fixtures, fittings or equipment provided in the interest of health, safety and welfare will be excluded from Site.
- Smoking is prohibited at site.
- Vehicle Driver (two wheelers) must wear a Crash helmet always. Vehicles are not to be reversed in construction areas unless under the control of an authorized banks man and with reverse horn.
- Un-authorized operations, entries are to be strictly followed in the site.
- Safety signs and notices must be followed.
- Transistor radios or personal stereos / Walkman must not be used.
- All the Electrical connections should be routed through ELCB of 30mA sensitivity.
- All Site personnel, for their own safety and for the safety of others, are required to fully comply with the agreed safety systems / procedure and working method.
- Site emergency procedures are designed to protect life. They must be followed.
- Only proper access is to be used. NO Shortcuts to be followed / allowed.

- Use the right tools and equipment for the right job, use them safely and replace when faulty.
- Don't Skylark on the job; avoid distracting others. No throwing of objects from height.
- Horse play is strictly prohibited in the site and running is also prohibited unless in case of emergency.
- Good housekeeping is to be maintained always.
- Access, Egress & work station safety.
- When lifting, bend your knees, grasp the load firmly, and then raise the load keeping your back as straight as possible. Get help for heavy loads.

CARDINAL SAFETY RULES



CIRCULAR

Cardinal Safety Rules

All Concerned:

An organization is lawfully bound to provide safe working environment. With increasing trend of incidents, strict implementation of **Cardinal Safety Rules** will help us to control risk of injury or death from workplace hazards.

Cardinal Safety rules should not be bypassed/ violated under any circumstances intentionally or unintentionally. No excuse will be accepted for failure in implementation. Violation will be viewed seriously, and action will be taken.

Cardinal Safety Rule: 1



HOOK THE HARNESS / LANYARD. Properly wear the **HARD HELMET & LOCK THE CHIN STRAP ALWAYS** while working at height.

Cardinal Safety Rule: 2



Always follow **LOCK OUT-TAG OUT (LOTO) & One Time Password (OTP) through SHEILD App** for Work Permit System with authority. To ensure a **SAFE ELECTRICAL SYSTEM** follow Thorough Feeder survey (OHL/UG), Pre-Task Plan, Shut down checklist, deploy Discharge Rod on all sides of Battery limits, LOTO, PTW from client and Proper Communication to all stake holders while working near any energized line. Ensure safe clearances as per applicable voltage. **ALWAYS ENSURE POSITIVE ISOLATION.**

Cardinal Safety Rule: 3



SUSPEND THE OUTDOOR WORK IMMEDIATELY when the work area is exposed to **thunder, storm, lightning, rains, flood and earthquake.** **RESUMPTION OF WORK ONLY AFTER AUTHORIZATION/ PERMISSION.**

Date: **06.01.2021**
Place: **Chennai**


T. Madhavadas
Whole Time Director & Sr. EVP-Utilities
Larsen & Toubro Limited

Distribution:

Cc: BU Heads, Segment Head, COH
Cc: Functional Heads/ Service Dept.
Cc: Cluster EHS Managers, EHSOs
Cc: All Job Sites

Work Permit System

The following PTW system to be followed for the project site

Name Of Activity	Permit Required
Tower Erection/Stringing	Work At height safety checklist
Tower Erection/Stringing	Shutdown clearance (HT/LT) cum work permit for transmission line, APDRP and other works
Welding & Gas cutting	Hot Work Permit

Checklist & Reports

Activity	Checklist / Report concerned
Screening and induction	Screening for workmen form
Procedure to work	Safe work procedure or Method Statement
Tool box Talk Report	Tool box talk
Planning for requirement and release of materials	Requirement and release of materials.
Fire Drill	Fire Drill Register
PRE-Task plan	PTP form

Statistics & Reports

- Monthly Project EHS Statistics

Emergency Response Plan

The Emergency Response Plan is prepared as per the guideline provided in the HSE Manual.

PURPOSES: -

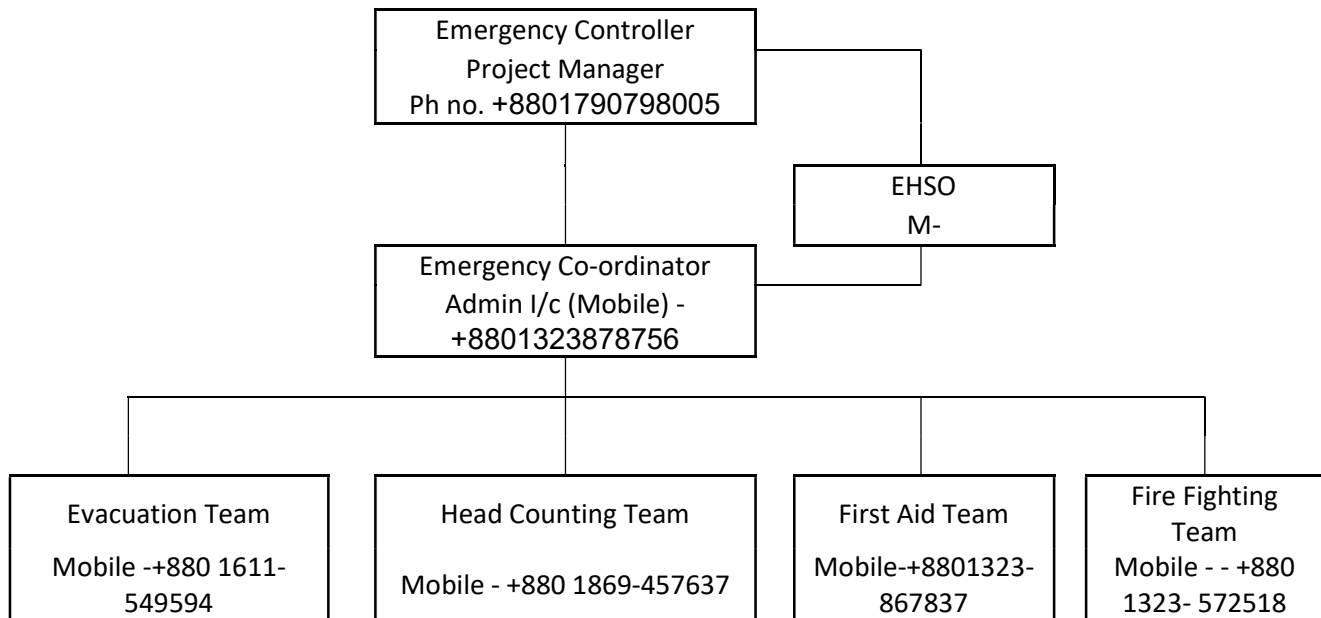
- To identify the potential emergency situations.
- To establish & maintain the procedures to handle such emergency situations in a prompt manner.
- To reduce the downtime and expedite the First aid & Medical treatment facilities to the concerned.
- To effectively evacuate the Staff / Workmen from the workplace

SCOPE

The scope of this procedure covers 230kV & 132kV Transmission Lines in Western Zone on turnkey basis (ADB-Package-3) Transmission Line.

Emergency Organization chart

The Emergency Organization chart gives detail on link between various functional teams & their roles during emergency situation which is given below.



RESPONSIBILITIES

Emergency Controller:

Project Manager (or) Section In-Charge at the scene of the incident will be the Incident Controller. His duties shall include the following: -

- Take overall charge of the emergency or exercise
- Attend the site of accident, assess the situation and issue directions to concerned parties & supervise the emergency response team
- Ensure mutual aid or assistance is sought in time
- Co-ordination of complete emergency operation and returning to normal operation on completion of emergency situation.
- Provide/ arrange additional resources in terms of personnel, equipment and finance for providing emergency response service at site
- Advise the Company Project management regarding the Emergency situation.
- Mobilize resources required to the scene of emergency.

Emergency Co-ordinator:

The Emergency Co-ordinator support the emergency response in the following manner

- Take full control of the situation until the Incident controller takes over
- Check fire wardens have moved to their respective zones and occupants directed to the Assembly Point in a minimum time

- Inform Project Manager/ Construction Manager/ HSE Manager/ Medic or Male Nurse regarding the emergency
- Keep the Incident Controller informed.
- Collect the head count report and inform incident controller, if any discrepancy noticed.
- Maintain the head count report till the investigation is completed and advised.

Evacuation Team:

This team members will alert all the employees & evacuate all employees from job site / work location to 'Emergency Assembly Point' located nearby the site.

Head counting Team:

This team will count all the heads who have assembled at Emergency assembly point.

Maintaining

This team will be trained to deal with eventualities caused due to outbreak of a fire.

Their duties shall include: -

- On hearing the siren/ alarm immediately reach assembly point and wait for instructions from the incident controller
- Assess the situation at the scene (class of fire) and decide the type of extinguishers to be used
- Position in safe place and fight the fire without endangering self.

First Aid Team:

This team will consist of first-aiders. Their duties shall include

- on hearing the alarm, reach the Assembly Point without wasting any time
- wait for the Incident Controller's instructions for further actions
- on reaching the spot, assess the condition of the victim, make the area safe to handle the victim

EHS Officer:

EHS Officer is responsible to ensure that provisions are in place for emergency response, which will include: -

- Assembly points
- Identify the emergency response team and training them
- Set up drills & exercises
- Arrange to procure fire & medical equipment
- Evaluate and decide whether additional resources are required to deal with the incidents
- Liaise with site supervision to withdraw permits at site
- Cordon off the area affected, to prevent unauthorized access
- Prepare report on the incident.

LIST OF EMERGENCIES

INJURY DUE TO FALLING FROM HEIGHT / HITTING ON MATERIALS –

Operation: Material handling & Height work

Nature of Accidents or Emergency Situations: Injury due to falling from height/ Hitting on materials

Emergency equipment / Materials required: Portable stretcher, First aid box & Thin Wooden pieces

Procedure: -

- Shift the victim to a well-ventilated area.
- Give first-aid to the victim as given below
- If it is bleeding, stop the bleeding by using cotton & put bandage over the affected Part.
- If it is a Fracture on hand / leg, place wooden piece under the fractured part & tie it With bandage.
- Call the Ambulance.
- Inform Time office/Section In-Charge/EHSO/PM
- Send the victim to the nearby hospital.

ELECTRIC SHOCK / ELECTROCUTION

Operation: Electrical maintenance

Nature of Accidents Or Emergency Situations: Electric shock

Emergency equipment/Materials required: Portable stretcher & First aid box

Procedure: -

- Alarm people nearby and prevent people entering into the zone.
- Switch off the Electrical power
- Give CPR (Cardio Pulmonary Resuscitation) to the victim as given below,
- Place the victim on the plain surface
- Shake the victim, if there is no response, start 'CPR' immediately.
- Loosen the shirt.
- Tilt the victim's head/Lift the person's chin –to open victim's airway.
- If there are no signs of breathing, pinch victim's nose closed and give two full breaths into victim's mouth.
- If there is no pulse, begin chest compressions as follows:
- Keep your palm at the centre of the chest & Give 30 times heart compression Until the victim gets Conscious
- Call Ambulance.
- Inform Time office/Section I/C/EHSO/PM
- Send the victim to nearby hospital.

FIRE DUE TO ELECTRICAL SHORT CIRCUIT (STORE)

Operation : General Operation

Nature of Accidents (Or) Emergency Situations : Fire due to electrical short circuit

Emergency equipment/Materials required
Extinguisher (DCP – 5kg), Fire blanket (4’*3’)

: Portable stretcher, First-aid box, Fire

Procedure: -

- Alarm people nearby and prevent people entering into the burning zone
- Evacuate all the employees & make them assemble at Assembly point. (Make Assembly point minimum 100 ft away from the Site Location with some Indication board- “Assembly Point”
- Switch off the Electrical power.
- Extinguish the fire by using Fire extinguisher (DCP) nearby.
- Remove if any combustible materials available nearby.
- If there is any victim, give first-aid to the victim as given below,
 - ✓ Pour running water on the burned part.
 - ✓ Don’t apply any ointment.
 - ✓ Put only bandage over the affected part.
- Call Ambulance
- Inform Time office/Section I/C/EHSO/PM
- Send the victim to nearby hospital.

FIRE DUE TO HOT WORK (GAS CUTTING & WELDING)

Operation : Gas cutting & Welding

Nature of Accidents or Emergency Situations

: Fire due to Gas leakage & welding spark

Emergency equipment/Materials required
Extinguishers (DCP / Co2 5kg) & Fire blanket (4’*3’)

: Portable stretcher, First aid box

Procedure: -

- Alarm people nearby and prevent people entering into the burning zone
- Close the Gas cylinder valve
- Put Fire blanket over the Gas Cylinder valve.
- If the fire is not Put off, extinguish the fire by using nearby extinguisher.
- Remove any combustible materials kept nearby.
- If there is any victim, give first-aid as given below.
 - ✓ Pour running water on the burned part.
 - ✓ Don’t apply any ointment.
 - ✓ Put only bandage over the affected part.
- Call Ambulance.
- Inform Time office/Section I/C/EHSO
- Send the victim to the nearby hospital.

SUN STROKE – EMERGENCY PROCEDURE

Operation

: Construction activity /Tower Erection

Nature of Accidents (Or) Emergency Situations : Sun stroke / Heat stroke

Emergency equipment/Materials required : Portable stretcher, First aid box & Retractable fall arrestor

Procedure: -

- Shift the victim to a well-ventilated area.
- Loosen the clothing.
- Sprinkle cold water on the face (or) pour water over the body.
- If the victim is at height, make arrangement for Retractable fall arrestor
- Tie 'PP' rope between two vertical members of the Tower in double fold.
- Hook the retractable Fall arrestor at the centre to avoid any hitting against vertical members while shifting the victim down.
- Don't give anything to drink & Call Ambulance
- Inform Time office/Section I/C/EHSO/PM
- Send the victim to the nearest hospital.

BOMB THREAT

Operation : General Operation

Nature of Accidents or Emergency Situations : Bomb Threat

Emergency equipment/Materials required : Portable stretcher, First-aid box

Procedure: -

- Alert all the site personnel.
- Evacuate everyone to a safe distance (500 metres from the bomb location)
- Inform District Authority / Police department
- During evacuation, if there is any victim, give first-aid as given below,
- If there is any bleeding, stop the bleeding by using cotton & put bandage over the affected Part.
- If there is any Fracture on hand / leg, place wooden piece under the fractured part & tie it with bandage
- Call the ambulance.
- Inform Time office/Section I/C/EHSO/PM
- Send the victim to the nearest hospital.

SNAKE BITE / INSECT BITE

Operation : Material Handling

Nature of Accidents or Emergency Situations : Snake bite / Insect bite (Bee, Wasp & Scorpion)

Emergency Equipment/Materials Required : Portable stretcher, first aid box & anti-venom kit (anti-venom kit is to be arranged at nearby hospital/medical shop. Anti-venom is to be administered by qualified physician only)

Procedure: -

- Shift the victim to a well-ventilated area
- Give first-aid to the victim as given below,
- Tie the bite zone tightly with thin rope just above the
- Bite zone to prevent further spreading of poison.
- Shift the victim by using stretcher. don't allow the victim to walk (or) run.
- Don't give anything to drink
- Call the ambulance.
- If it is Snake Bite Inform particular hospital Management to get ready for the Anti-venom treatment if it is a snake bite.
- If it is insect (Scorpion, Bee or Wasp) bite,
- Remove stinger(s)
- Wash the sting with soap and water
- Apply Ice cubes over the bite zone.
- Time office/Section I/C/EHSO/PM
- Send the victim to the hospital where Anti-venom kit is available.

LIGHTNING / THUNDER

Operation : General Operation

Nature Of Accidents Or Emergency Situations : Lightning / Thunder

Emergency Equipment/ Materials required : Portable stretcher & First aid box

Procedure:

- Stop the work immediately
- Give instruction to workers working on the tower
- Get shelter under the temporary shelter.(Don't get shelter under Tower / Tree / any height pole.
- When there is no shelter, avoid the highest object in the area.
- If only isolated trees are nearby, bend down in the open, keeping twice as far away from isolated trees as the trees are high.
- Avoid leaning against vehicles. Get off bicycles and motorcycles
- Avoid hilltops, open spaces, wire fences, metal clothes lines
- If there is any Lightning victim, Start CPR immediately. (Refer the previous procedure for CPR)
- Time office/Section I/C/EHSO/PM
- Send the victim to the hospital nearby.

CYCLONE / STORM

Operation : general operation

Nature of accidents or emergency situations : cyclone / storm

Emergency equipment/materials required

: portable stretcher, first aid box.

Procedure:

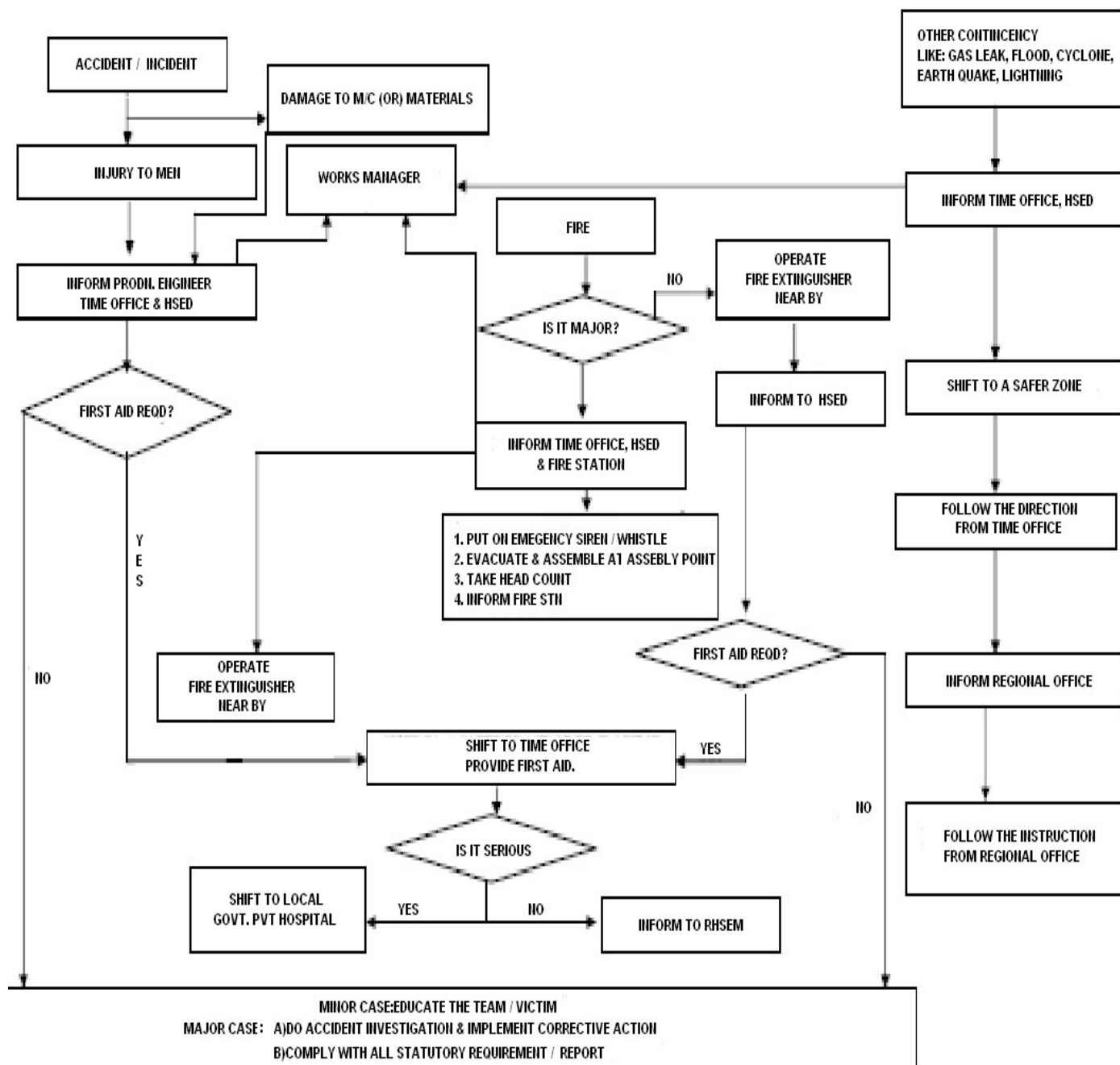
- Get shelter in concrete building.
- Don't allow anyone to go out of the room.
- If there is any victim, give first aid to the victim as given below,
- ✓ If there is any bleeding, stop the bleeding by using cotton & put bandage over the affected Part.
- ✓ If there is any Fracture on hand / leg, place wooden piece under the fractured part & tie with bandage.
- Call the ambulance.
- Inform Time office/Section I/C/EHSO/PM
- Send the victim to the nearest hospital.

EARTH QUAKE**OPERATION**

: General Operation

Nature Of Accidents (Or) Emergency Situations: EarthquakeEmergency equipment/Materials required : **Portable stretcher & First-aid box****Procedure: -**

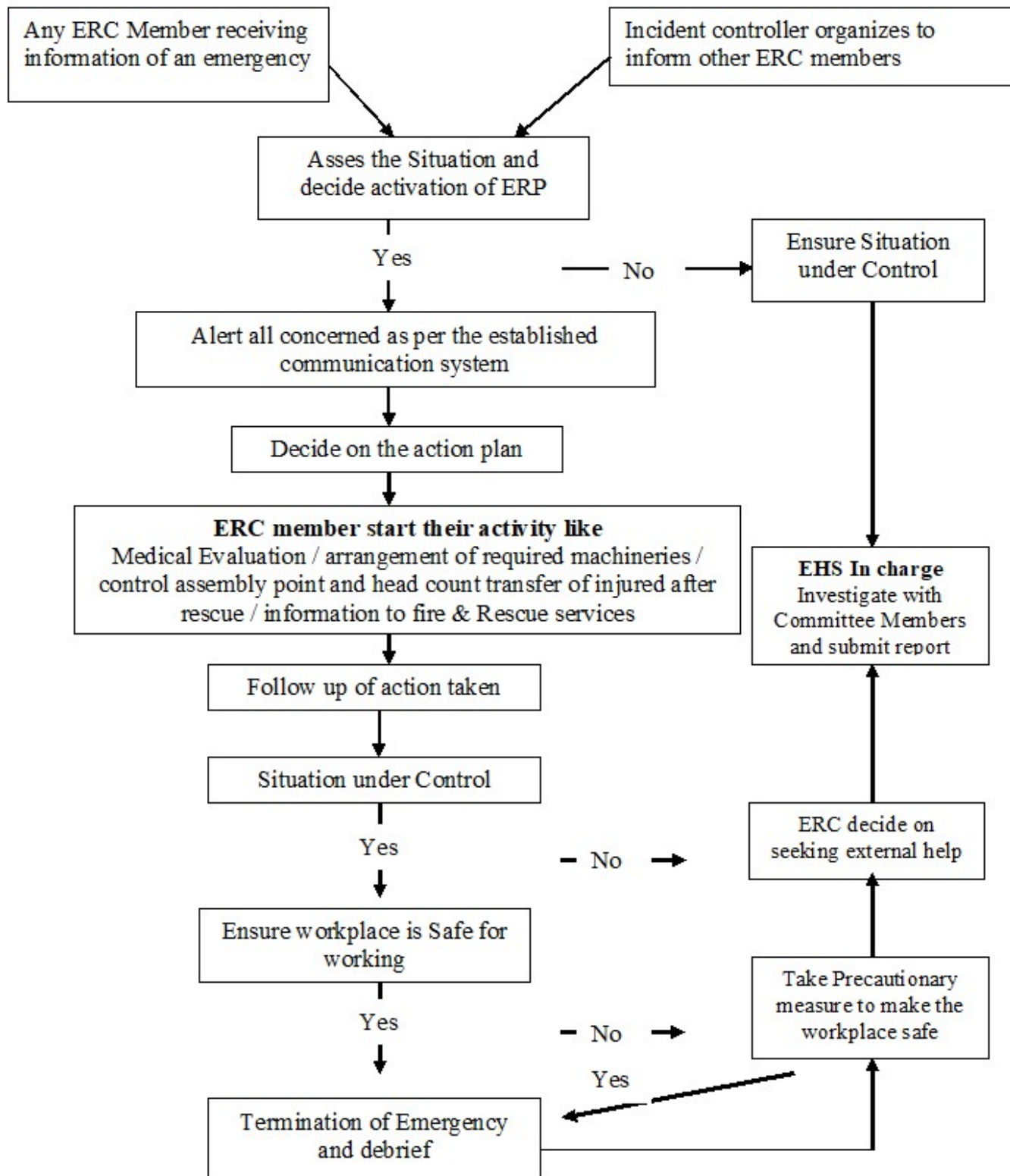
- Alert all the site personnel.
- Evacuate everyone to Plain surface.
- if there is any victim during evacuation, give first-aid as given below,
- ✓ If there is any bleeding, stop the bleeding by using cotton & put bandage over the affected Part.
- ✓ If there is any Fracture on hand / leg ,place wooden piece under the fractured part & tie With bandage.
- Call the Ambulance.
- Inform Time office/Section I/C/EHSO/PM
- Send the victim to the nearest hospital.



Emergency Contact Number

Sl. No	NAME	DESIGNATION	MOBILE NUMBER
1	Mr. Lab Kumar Nath	Project Manager	+8801790798005
2	Mr. Abhijeet Sarkar	Project Accountant	+8801323878756
3	Mr. Vijay Kumar Pandey	Site Engineer	+8801871720040
4	Mr. Subir Kumar Das	EHS in charge	+91 9836704435
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Emergency Response Management – Flow Chart



List of Job Specific PPE to be used In the Site:

Personal Protective Equipment (PPE's) does not stop accident, but it can help to lessen their effects. Employers have a duty to eliminate the hazard and/ or control the risk, so far as is reasonably practicable. PPE therefore represents a last line of defense for the individual. There are many types of PPE's from head protection to foot protection, each type designed to protect different parts of the body against specific hazards.

Use of Personal protective Equipment and safety devices relevant to site activities- Enclosed as

➤ **Head protection:**

Every individual entering the construction work premises shall wear safety helmet.



Colour coding for Safety helmets:

Subcontractor Workmen	-	Yellow
Engineers	-	White
Visitors	-	White (With Visitor Sticker)
Safety Stewards	-	Green
Subcontractor Supervisor	-	Blue
Electrician	-	Red

➤ **Foot protection:**

Suitable foot protection shall be worn by all personnel entering the site.



➤ **Fall Protection:**

- (a) All employees working above 2 m height shall use safety harness
- (b) All employees using safety harness shall anchor its lanyard to a fixed Structure before starting the work at height.
- (c) Fall arrest devices shall be used in conjunction with safety harness. wherever required.
- (d) Retractable type fall arrestor devices, which can be directly attached to safely harness back side anchor points, provide good protection against falls



➤ **Hearing protection:**

Ear plug, ear muff shall be worn by workmen who are working near noisy area



➤ **Protection against Dust:**

Musk should be used wherever dust is polluted



➤ **Hand protection:**

Appropriate hand gloves shall be used for material handling, concreting, welding, grinding, gas cutting electrical works etc



➤ **Eye protection:**

- (a) Suitable goggles shall be used by all personnel deployed for welding, grinding, Chipping, concreting etc.
- (b) Execution & Supervisory staff shall wear safety spectacles.



➤ **Job Specific PPE& other job specific safety gadgets must be used whenever required**

- Though, the PPEs are last line of defence but in our culture, safety helmet & safety shoe are considered as uniform

11 Communication & Reporting

11.1 Cascading Information:

Cascading any EHS messages down the line is vital for the success of any EHS Management System and to ensure that all personnel are aware of EHS issues the following technique shall be adopted.

NO.	TASK	ACTION BY	COMPLIANCE TARGET	VERIFICATION DOCUMENT
1.	EHS NOTICE BOARD EHS Notice board will be fixed at site office and other conspicuous locations for cascading EHS messages such as EHS Notices, Safety Alerts, Posters and accident evaluation etc., shall be regularly updated. Install and maintain EHS performance board showing Safety statistics i.e. days without LTI etc.	EHS Engineer / Officer	Weekly update starting from Mobilisation and Daily	EHS Notice Board
2.	PROMOTION Monthly Incentive Safe Man of the month shall be selected on the basis of EHS performance evaluation and will be given a certificate of commendation along with a token gift.	PM / EHS Engineer	Monthly	Incentive Scheme record

11.2 Reporting

- **Monthly Report on Environment, Health, and Safety:** the contractor will prepare a monthly report covering environmental monitoring, OHS compliance, OHS incidents and accidents, trainings conducted, and any other salient activities carried out during the reporting period. The report will be submitted to CSC.
- **Quarterly Progress Reports on Environment:** The environmental monitoring reports will include environmental mitigation measures undertaken, environmental monitoring activities undertaken, details of monitoring data collected, analysis of monitoring results particularly the non-compliances, recommended mitigation and corrective measures, environmental training conducted, and environmental regulatory violations observed. The environmental monitoring reports will be submitted quarterly during the construction period and annually for three years after completion of construction.
- **Project Completion Environmental Monitoring Report:** One year after completion of construction, the PIU will submit a Project Completion Environmental Monitoring Report which will summarize the overall environmental impacts from the project.

12 Traffic Management Plan

12.1 Purpose and scope of this plan:

The Project is expected to generate relatively very low volumes of traffic during the construction phase in particular. The local road network will only be affected during conductor stringing work over the same. It is therefore important to ensure that traffic is managed in a manner that facilitates efficiency as well as ensuring the safety of personnel and the local community.

12.2 Licensing & Maintenance

Licensing:

- All Project vehicles comply with relevant traffic and transport licensing requirements.
- All drivers of vehicles used during the Project shall have the requisite licenses to operate any vehicle (or machinery) operated by them on Site or on any public roads.
- All Project vehicles shall have valid roadworthy certificates and licenses.

Maintenance:

All vehicles and machinery used during the Project shall be regularly maintained and repaired where necessary. In this regard, all construction and passenger vehicles used during the Project shall be inspected by an appropriately qualified mechanic every six months following the commencement of the Project.

12.3 Routing of Traffic, Speed Limits & Signage:

The movement of all vehicles to and from Site shall be along designated public roads and site access roads. The most appropriate route for road crossing job (such as trucks and small vehicle) transporting equipment, materials, and employees (along public roads) to and from the Site shall be determined by L&T in consultation with the local road traffic authorities.

The Route:

The route utilized for transporting equipment to and from the Site should, as far as possible, avoid peak traffic hours, so that the interaction of local traffic pedestrians with all Site-related traffic will be minimized as far as reasonably possible.

Speed limit :

- The speed limit on the Site and access roads shall be 20km/h for construction vehicles and 40km/h for light vehicles and passenger vehicles.
- All speed limits applicable to public roads shall be strictly adhered to by all drivers operating vehicles as part of the Project.

Signage:

It is the responsibility of the Project Managers in consultation with the Construction Safety Officer to ensure that signage is conspicuously placed at appropriate locations along all access roads, and public roads (in consultation with the relevant traffic authorities) to indicate the following:

- appropriate speed limits.

- turning traffic.
- the Site access.
- routes to be used by construction vehicles, where appropriate.
- that caution should be taken by motorists or pedestrians.
- no-go areas for vehicles; and
- any traffic control information which may be relevant in the circumstances.

Transport of Equipment and Materials

It is the responsibility of the Sub-contractor (for the duration of the construction phase) and L&T (for the duration of the operational phase) to ensure the following:

- All equipment and/or materials transported to or from Site shall be appropriately secured to, or contained in, vehicles.
- No construction vehicles shall be loaded in excess of its manufacturer-specified weight bearing capacity.
- All vehicles used during the Project shall have the appropriate load-bearing capacity for the materials and/or equipment intended to be transported.
- Drivers shall be appropriately trained in driving techniques applicable to specific loads (e.g., hazardous substances) where necessary.

12.4 Emergency Response and Reporting of Hazards:

In the event that any traffic hazard is identified on Site by any person or Project personnel, such hazard shall be immediately reported to the Site Manager who shall take the appropriate measures to avoid an incident or accident being caused.

All project vehicles shall carry first aid supplies which should be adequate to cater for the number of passengers carried on the vehicle in question.

In the event that an accident occurs on-site or off-site, the on-site emergency procedure shall be followed. In the event that an accident occurs off-site, it shall immediately be reported to the relevant emergency service providers by the driver, and in the event that the driver is incapacitated, by any other passenger on such vehicle.

13 ANNEXURE

Annexure 1 - ENVIRONMENT MONITORING REGISTER

Name of the Project:

Job Code:

BU/Cluster:

Date:

Environmental Attributes	Relevant Parameters	Permissible Limit	Test results	Method of Monitoring	Periodicity of Monitoring	Record reference
Air Monitoring						
Water Monitoring						
Noise Monitoring						
Other Factors						

(Name & Signature of EHSO)

Annexure 2 – Environment Inspection Checklist

Name of the Project:

BU/Segment/Cluster:

Job Code:

Location:

Date:

Sl.No	Description	Observation	Measures
I	Land		
1	Land contamination due to storage of inflammable substances		
2	Disposal of oils		
3	Disposal of batteries		
4	Reduction in usage of non-biodegradable items		
5	Disposal of waste		
6	Wood waste		
7	Concrete waste		
8	Food related waste		
9	Biological waste		
10	Others		
II	Water		
1	Water Stagnation (esp. canteen, camps)		
2	Contamination due to run off water		
3	Contamination due to oil spillage		
4	Conservation measures		
5	Quality of drinking water		
6	Sewage disposal		
III	Air		
1	Dust pollution & its mitigation		
2	Exhaust emissions		

Sl.No	Description	Observation	Measures
3	Obnoxious gases release		
IV	Noise		
1	Acoustic arrangement for DG		
2	Noise levels in the workplace		
3	Noise levels outside workplace		

Name & Signature of EHSO

Annexure 3 – Corrective Action Register

Name of Project :

Job Code:

BU/ Segment/ Cluster:

Sl. No	Date	Received from	Nature of complaint / Opportunity for Improvement	Root Cause Identified	Corrective Action Proposed (Fool Proof Action Taken)	Date of action taken	Verification of Effectiveness	Remarks

Name & Signature of EHSO

Name & Signature of Project Manager

Annexure 4 – Environment Incident / Non-conformance report

L&T CONSTRUCTION POWER TRANSMISSION & DISTRIBUTION IC

Issue 2-Rev 00

ENVIRONMENTAL INCIDENT/NON-CONFORMANCE REPORT

Ref.: IM – 10.2.1 E

Filling in this form

- **Part A** of this form is to be **completed** and **signed** by the person reporting the event
- Use a **BLACK** or **BLUE** pen and write in **BLOCK CAPITALS**
- **An example has been completed in RED on pages 3 and 4 (form can be completed by hand & sent through the internal post or completed electronically and emailed to the Environment Manager).**

PART A	
1. Full name	_____
2. Job code & title	_____
3. Were you directly involved in the incident/ non-compliance? <i>If no, state capacity in completing this form</i>	<i>YES/NO</i> <i>CAPACITY: -</i>
4. Date of incident/non-compliance	_____
5. Time of incident/non-compliance	_____
6. Brief description of the location of the incident/non-compliance	

7. What occurred?	☐ Environmental Incident ☐ Environmental Near miss ☐ Non-compliance with relevant legal and other requirements
8. Nature of the occurrence?	☐ Fire ☐ Explosion ☐ Spillage, leakage or uncontrolled discharge of substances (other than special, hazardous or restricted substances) ☐ Spillage of special, hazardous or restricted substances (eg oil, detergent, paint) ☐ Emission to air of gas, dust, fumes or other pollutants ☐ Pollution of water courses, surface water drains, foul water sewers ☐ Contamination of land, flora, fauna ☐ Damage to archaeology, listed building, local heritage etc ☐ Noise, litter, light, odour, vibration or other nuisance ☐ Waste management (escape or improper storage/disposal) ☐ Human health and safety ☐ Other risk <i>(please describe below)</i>

Annexure 5 - Environmental incident investigation report

ENVIRONMENTAL DEVIATION / INCIDENT AND CORRECTIVE ACTION REPORT

1. Details of the Project			
Cluster			
Name of the Project			
Job No			
Business Unit			
Name of the Site Engineer / Section In-charge with P.S. No. (Mandatory)			
Name of the EHSO with P.S. No. (Mandatory)			
Name of the Site In-charge with P.S. No. (Mandatory)			
Name of the COH with P.S. No. (Mandatory)			
Name of Subcontractor			
2. Category of Environmental Impact			
☐ Land Pollution	☐ Water Pollution	☐ Air Pollution	☐ Noise Pollution
3. Details of the deviation / Incident (Write N.A if not applicable)			
3.1) Date & Time of Incident:			
3.2) Exact Location where the deviation / Incident occurred:			
3.4) Name / identity of the P&M / Equipment:			

3.5) Detail of deviation / incident (Add sketches and additional sheets to support the description):

4. Causes of the Incident

4.1) Direct Causes:

4.2) Root Causes:

5. Corrective Action(s)

5.1) Immediate Action

5.2) Corrective Action:

6. Horizontal Deployment (if any)

7. Review of Aspect – Impact Study

Names & Designation of the Investigation Team

Annexure 6: WEEKLY / MONTHLY WASTE GENERATION REPORT

Project Name:

Reporting Duration:

Report Date:

Report Number:

Non-Hazardous	Unit	Quantity			Percentage		
		Reused	Recycled	Wasted	% Reused	% Recycled	% Wasted
Paper & Plastics							
Wood Waste							
Metal Scrap							
Food Waste							
Concrete Waste							
Sewage							
Empty Drums (Metal / Synthetic)							
Other – Please Specify							

Hazardous Wastes	Unit	Quantity			Percentage		
		Reused	Recycled	Wasted	% Reused	% Recycled	% Wasted
Used Oil							
Contaminated Soil							
Cartridge							
Florescent Lamp / Bulbs							
Empty Chemical Containers							
Others- Please Specify							

Annexure: 7

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: 22.02.0000.018.72.055.20 ১৬০

Date: 22/07/2020

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 destroyed.
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 Bhawan (8th floor), Avenue-3, Jahurul Islam City
Afabnagar, 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.