Construction Environmental & Social Management Plan



Design, Supply, Installation, Testing & Commissioning of 230 kV & 132 kV Transmission Lines in Western Zone on Turnkey Basis (Package - 4)

Contract No.-PGCB/ADB/3853-BAN/TL/Package-4, Date-30.06.2021.

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Abbreviations

➢ 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
➢ EXIM	Export & Import Bank, India.
➢ 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
- TLL — Transrail Lighting Limited
- 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
- 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

The CESMP has been prepared to deal with the environmental and social issues arising during Design, Supply, Installation, Testing & Commissioning of 230 kV & 132 kV Transmission Lines in Western Zone on Turnkey Basis (Package - 4). The construction activity will be executed by Transrail Lighting Limited and their subcontractors will be engaged for said construction activity.

The purpose of this construction environmental and social management plan CESMP is to provide a consolidated summary of all the environmental and social (E&S) commitments pertaining to construction phase of the project. The measures focus on environmental (such as air emissions biodiversity and environmental contamination) and social aspects (such as protection of human rights communication with local stakeholders, safety of workers and communities). This CESMP also gives an overview about E & S management system that is being implemented to ensure the systematic and effective execution of these commitments including the roles and responsibilities. The ESMP can be updated as this progress through details design and construction phase and will incorporate the discussion held with stakeholders and include the updated E & S developments.

2. Project Description & Scope of Work

Project Name.: Design, Supply, Installation, Testing and Commissioning of 230 kV & 132 kV Transmission Lines in Western zone on turnkey basis (Package - 4).
Contract No: PGCB/ADB/3853-BAN /TL/Package-4 dated 30.06.2021
Client: Power Grid Company of Bangladesh Ltd.
Location: Bangladesh.
Route Length: 191.5 KM

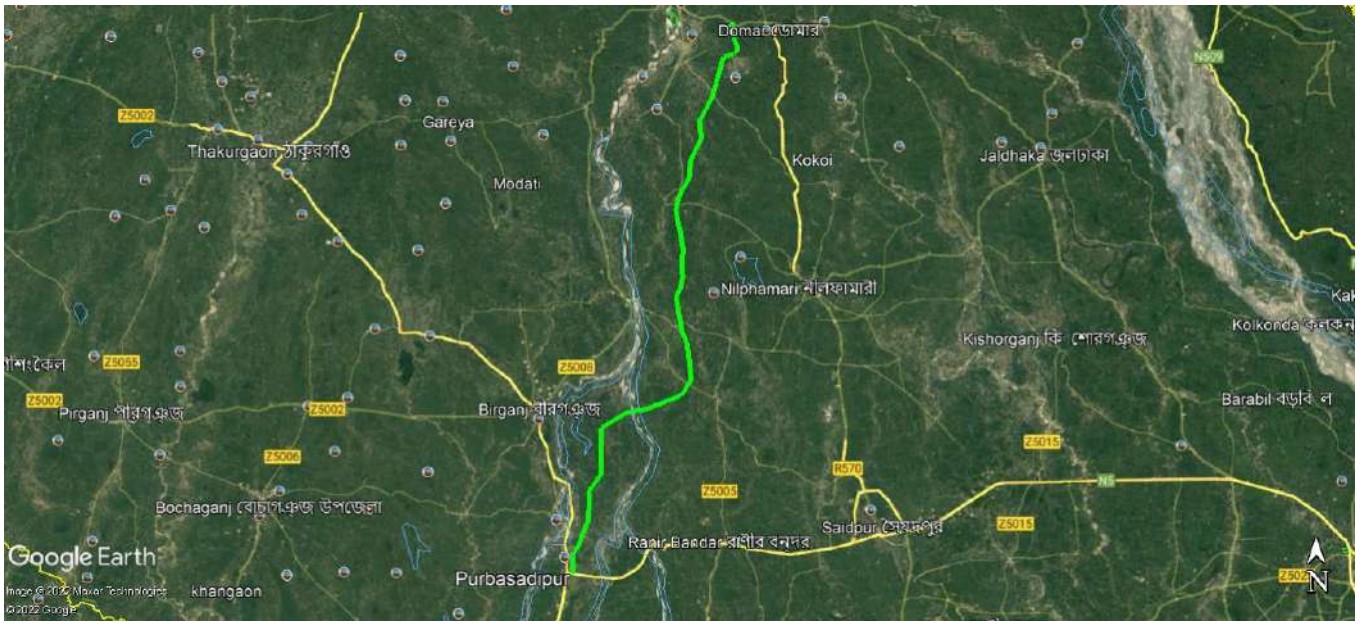
Scope	Line Name	kV	Length (kM)
A	Purbasadipur - Domar D/C Line	230	46.50
B	Gopalganj – Shibchar D/C Line	230	25.00
C	LILO of Barishal-Bhola-Borhanuddin D/C line at Bhola Substation	230	1.00
D	Niyamalpur-Patnitola D/C line	132	32.50
E	Domar-Hatibandha D/C line	132	35.00
F	Bagherhat-Pirojpur-Bhandaria D/C Line	132	49.50
G	LILO of Madaripur - Faridpur D/C line at Bhanga S/S	132	0.50
H	LILO of Barishal - Bhandaria D/C line at Jhalokathi S/S	132	1.50
Total Line Length (kM)			191.50

2.1.1 Scope of Work in Tabular Format Including Site Details:

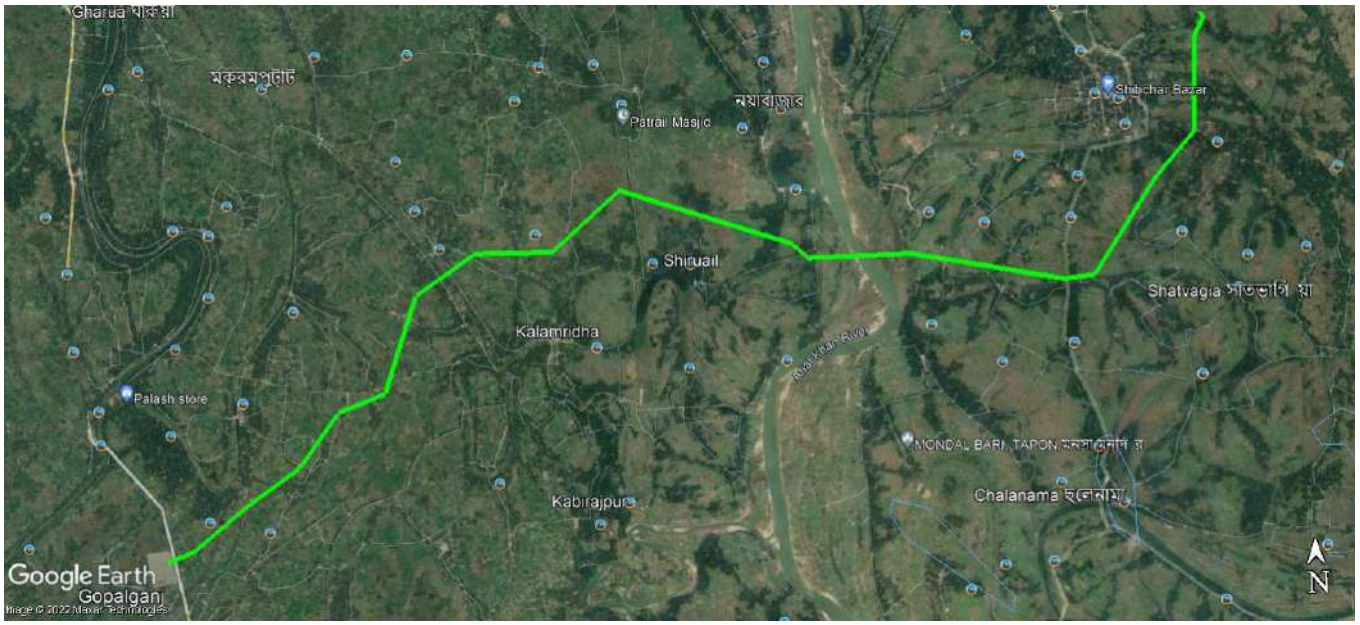
Scope	Name of Line	Name of District (Passing Through)
North Bengal		
A	Purbasadipur – Domar 230 kV D/C Line	Dinajpur
		Nilphamari
		Panchagar
D	Niyamatpur – Patnitola 132 kV D/C Line	Naogaon
E	Domar – Hatibandha 132 kV D/C Line	Nilphamari
		Lalmonirhat
South Bengal		
B	Gopalganj(N) – Shibchar 230 kV D/C Line	Madaripur
		Gopalganj
		Faridpur
F	Bagherhat – Pirojpur – Bhandaria 132 kV D/C Line	Bagherhat
		Pirojpur
C	LILO of Barishal – Bhola – Borhanuddin 230 kV D/C Line at Bhola S/s	Bhola
G	LILO of Madaripur – Faridpur 132 kV D/C Line at Bhanga S/s	Faridpur
H	LILO of Barishal – Bhandaria 132 kV D/C Line at Jhalokathi S/s	Jhalokathi

2.1.2 Route Map:

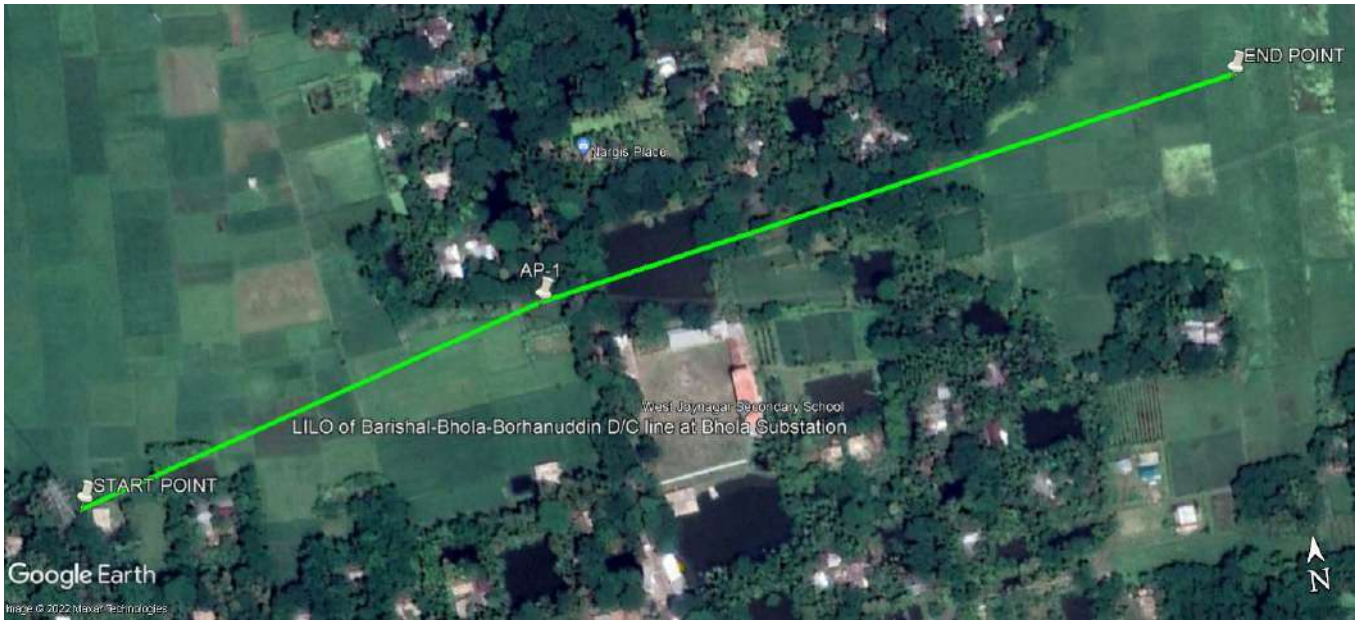
Scope-A: Purbasadipur-Domar 230kV double circuit line



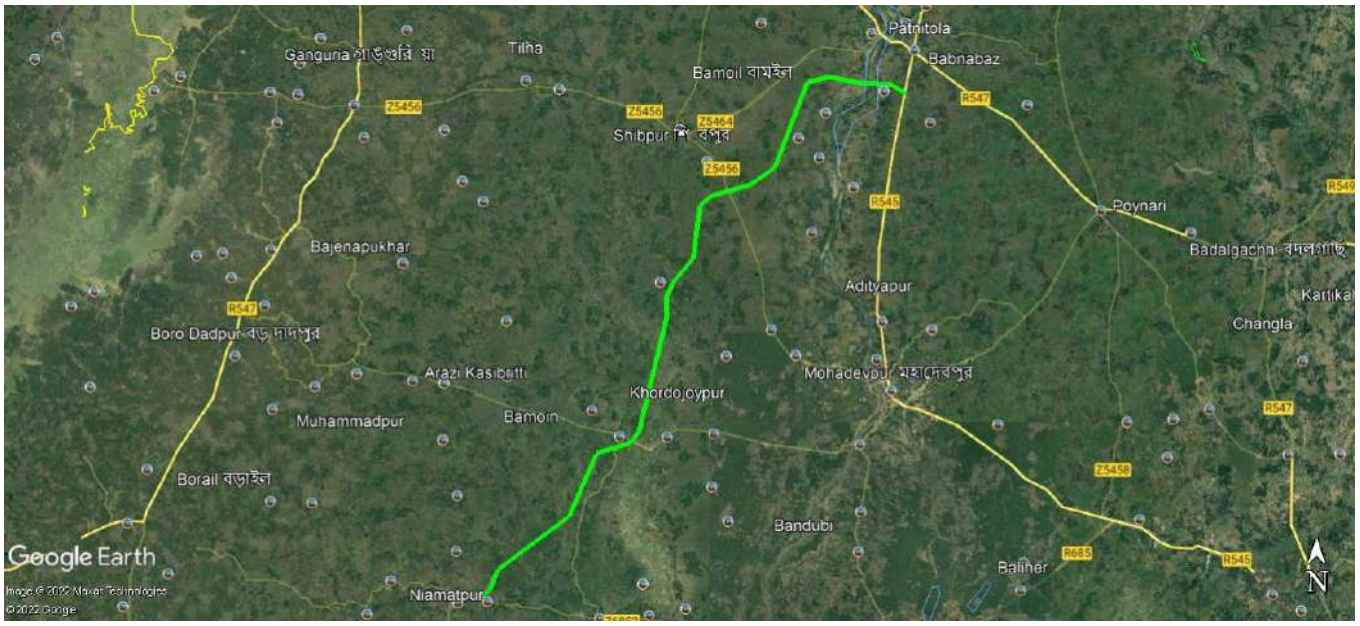
Scope-B: Gopalganj(N)-Shibchar 230kV double circuit line



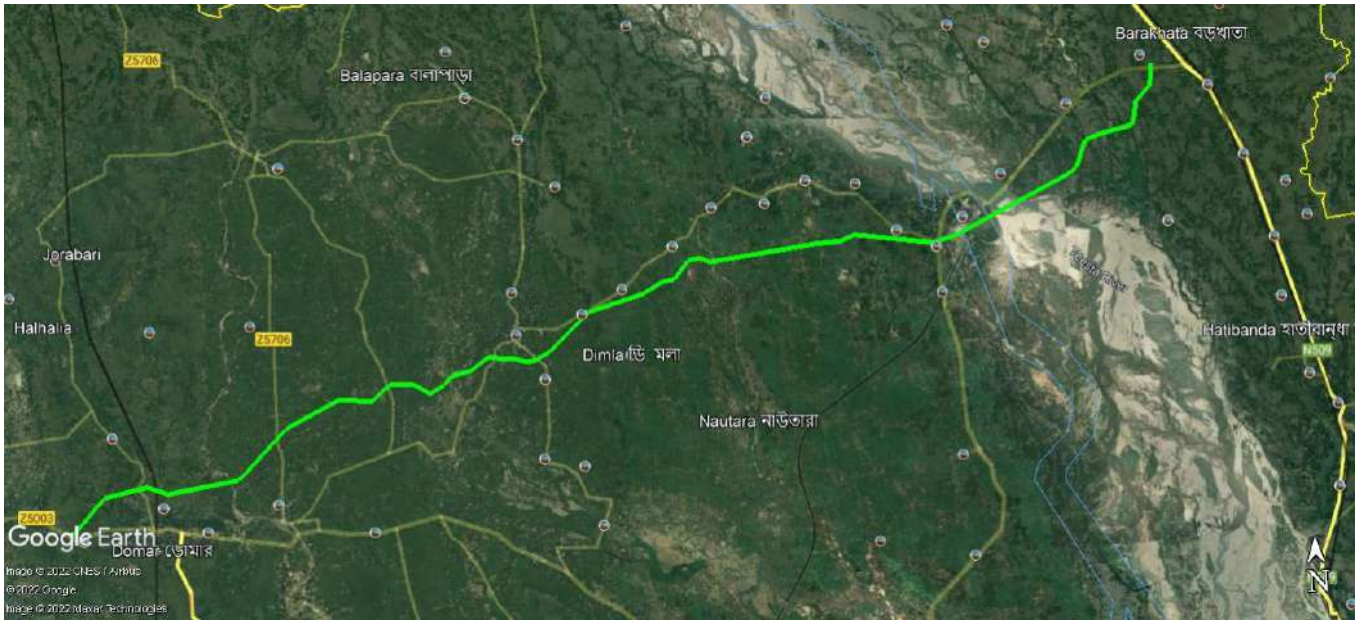
Scope-C: LILO of Barishal-Bhola-Borhanuddin 230kV D/C line at Bhola Substation



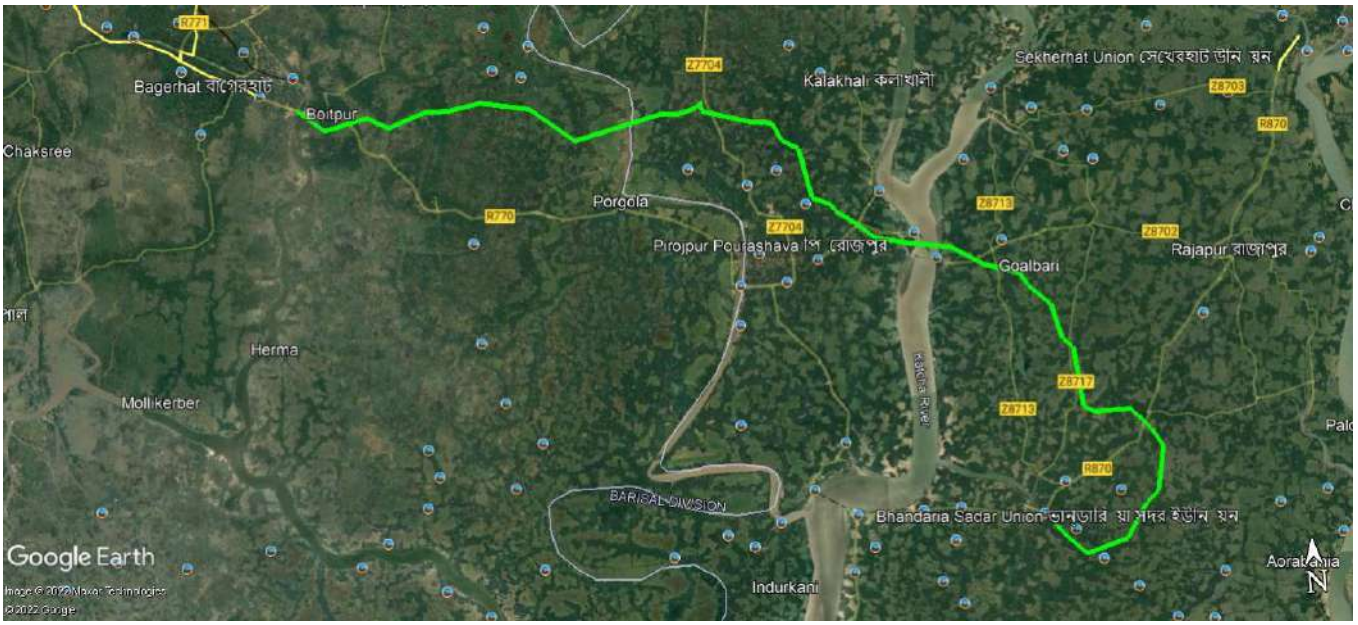
Scope-D: Niyamatpur-Patnitola 132kV double circuit line



Scope-E: Domar-Hatibandha 132kV Double Circuit line



Scope-F: Bagherhat-Pirojpur-Bhandaria 132kV double circuit line



Scope-G: LILO of Madaripur-Faridpur 132kV double circuit line at Bhanga Substation



Scope-H: LILO of Barishal-Bhandaria 132kV double circuit line at Jhalokathi Substation



2.2 Crossing Details:

2.2.1 River Crossing Details

There are several river crossings in this transmission line. The details of rivers and their crossing point with the coordinates are mentioned below.

S/N	Line Details	River Name	Place of Crossing	Coordinate	River Width	Crossing Span
1	Scope-A,230 kV Double Circuit Purbasadipur-Domar Transmission Line	Atrai River	Thana:- Birganj District:- Dinajpur	Loc No:-7/0(E: 672146.054,N: 2861166.164) Loc No:-8/0(E: 673429.129,N: 2861374.398)	315 M	Location No: 7/0 to Location No: 8/0
2	Scope-B,230 kV Double Circuit Gopalganj(N)-Shibchar Transmission Line	Arial Khan River	Thana:- Shibchar District:- Madaripur	Loc No:-11/0(E: 205434.500,N: 2581829.500) Loc No:-12/0(E: 207158.326,N: 2581809.814)	335 M	Location No: 11/0 to Location No: 12/0
3	Scope-D,132 kV Double Circuit Niyamatpur-Patnitola Transmission Line	Atrai River	Thana:- Patnitola District:- Naogaon	Loc No:-18/0(E: 675401.018,N: 2769263.267) Loc No:-19/0(E: 676675.900,N: 2769250.370)	120 M	Location No: 18/0 to Location No: 19/0
4	Scope-E,132 kV Double Circuit Domar-Hatibandha Transmission Line	Teesta River	Thana:-Dimla District:- Nilphamari	Loc No:-31/0(E: 703915.42,N: 2896053.74) Loc No:-32/0(E: 706985.53,N: 2897591.79)	840 M	Location No: 31/0 to Location No: 32/0
5	Scope-F,132 kV Double Circuit Bagerhat-Pirojpur-Bhandaria Transmission Line	Bhairab River	Thana:- Bagerhat Sadar District:- Bagerhat	Loc No:-1/0(E: 787812.731,N: 2506857.457) Loc No:-2/0(E: 788843.000,N: 2506021.000)	250 M	Location No: 1/0 to Location No: 2/0
		Kacha River	Thana:- Pirojpur Sadar District:- Pirojpur	Loc No:-25/0(E: 193909.432,N: 2500209.940) Loc No:-26/0(E: 195524.927,N: 2499889.752)	860 M	Location No: 25/0 to Location No: 26/0

2.2.2 Road Crossing Details

Details of Road Crossings are mentioned below along with Coordinates.

S/N	Line Details	Road Name	Place of Crossing	Coordinate Details	Crossing Span	Road Width	Remarks
1	Scope-A, 230 kV Double Circuit Purbasadipur-Domar Transmission Line	N-05	Thana:- Birganj District:- Dinajpur	Loc No:-TT-1(E: 668286.40,N: 2849688.4) Loc No:-TT-1/1(E: 668301.29,N: 2850004.30)	Location No: TT-1 to Location No: TT-1/1	10 M	Rangpur-Dinajpur Road
		Z-5003	Thana:- Domar District:- Nilphamari	Loc No:-33/0(E: 679478.00,N: 2888691.00) Loc No:-End Point(E: 679734.00,N: 2888686)	Location No: 33/0 to Location No: End Point	10 M	Domar-Dabiganj Road

2	Scope-B 230 kV Double Circuit Gopalganj(N)-Shibchar Transmission Line	N-08	Thana:-Muksudpur District:-Gopalganj	Loc No:-TT-1(E: 194413.015,N: 2577340.003) Loc No:-1/0(E: 194819.364,N: 2577484.405)	Location No: TT-1 to Location No: 1/0	10 M	Bhanga to Barishal Hwy
3	Scope-D 132 kV Double Circuit Niyamatpur-Patnitola Transmission Line	Z-5456	Thana:-Mahadevpur District:-Naogaon	Loc No:-13/2(E: 669920.98,N: 2764596.12) Loc No:-13/3(E: 670231.66,N: 2764691.25)	Location No: 13/2 to Location No: 13/3	10 M	Mahadevpur to Porsha Hwy
		R-545	Thana:-Patnitola District:-Naogaon	Loc No:-19/0(E: 676675.90,N: 2769250.37) Loc No:-End Point(E: 677351.99,N: 2768874.72)	Location No: 19/0 to Location No: End Point	10 M	Mahadevpur to Patnitola Hwy
4	Scope-E 132 kV Double Circuit Domar-Hatibandha Transmission Line	Dimla to Jaldhaka Road	Thana:-Dimla District:-Nilphamari	Loc No:-18/0(E: 692402.00,N: 2893031.00) Loc No:-18/1(E: 692595.70,N: 2893132.51)	Location No: 18/0 to Location No: 18/1	10 M	Dimla to Jaldhaka Road
		Dalia to Jaldhaka Road	Thana:-Dimla District:-Nilphamari	Loc No:-30/0(E: 703293.00,N: 2895871.00) Loc No:-30/1(E: 703601.91,N: 2895960.89)	Location No: 30/0 to Location No: 30/1	10 M	Dalia to Jaldhaka Road
5	Scope-F 132 kV Double Circuit Bagerhat-Pirojpur-Bhandaria Transmission Line	R-770	Thana:-Bagerhat Sadar District:-Bagerhat	Loc No:-2/3(E: 789702.08,N: 2506227.02) Loc No:-2/4(E: 789900.13,N: 2506274.52)	Location No: 2/3 to Location No: 2/4	10 M	Pirojpur-Bagerhat Hwy
		Z-7704	Thana:-Pirojpur Sadar District:-Pirojpur	Loc No:-15/0(E: 803547.00,N: 2505766.00) Loc No:-16/0(E: 805230.00,N: 2505285.00)	Location No: 15/0 to Location No: 16/0	10 M	Pirojpur-Nazirpur Road
		Z-8702	Thana:-Kawkhali District:-Pirojpur	Loc No:-24/0(E: 195524.927,N: 2499889.752) Loc No:-25/0(E: 196781.706,N: 2499065.016)	Location No: 24/0 to Location No: 25/0	10 M	Bekutia-Noikathi Road
		Z-8717	Thana:-Kawkhali District:-Pirojpur	Loc No:-25/0(E: 196781.706,N: 2499065.016 Loc No:-26/0(E: 198039.898,N: 2498637.781)	Location No: 25/0 to Location No: 26/0	10 M	Bekutia-Bhandaria Road

2.2.3 Railway Crossing Details

Details of Railway Crossings are mentioned below along with Coordinates

S/N	Line Details	Railway Name	Place of Crossing	Coordinate Details	Crossing Span	Crossing Width	Remarks
4	Scope-E,132 kV Double Circuit Domar-Hatibandha Transmission Line	Dhaka-Nilphamari-Chilahati	Thana:- Domar District:- Nilphamari	Loc No:-2/0(E: 681804.51,N: 2889941.74) Loc No:-2/1(E: 682093.63,N: 2889835.34)	Location No: 2/0 to Location No: 2/1	4 M	Dhaka-Nilphamari-Chilahati Railway Crossing

2.3 Scope of Work:

Sl. No.	Item Description	Unit	Quantity
1	Detailed Survey/ Check Survey	Km	191.5
2	Foundation/ Erection	Nos	634 / 634
3	Stringing	Km	191.5

2.4 Project Surrounding:

- The project is a Greenfield development. 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.

2.5 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 Land
- Agricultural fields.
- Near Small and Big 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, 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

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 Dhaka, and Current land owners/users.

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

Name of External Stakeholder	Engagement Schedule	Name of internal Stakeholder	Engagement Schedule
Government of Bangladesh	As & when required	Employees	As & when required
PGCB	As & when required	Managers	As & when required
Asian Development Bank	As & when required	Board of directors	As & when required
District Authorities	As & when required	Investors	As & when required
Current landowners	As & when required		

3.1. Stakeholder Engagement & Grievance Mechanism

Transrail 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.

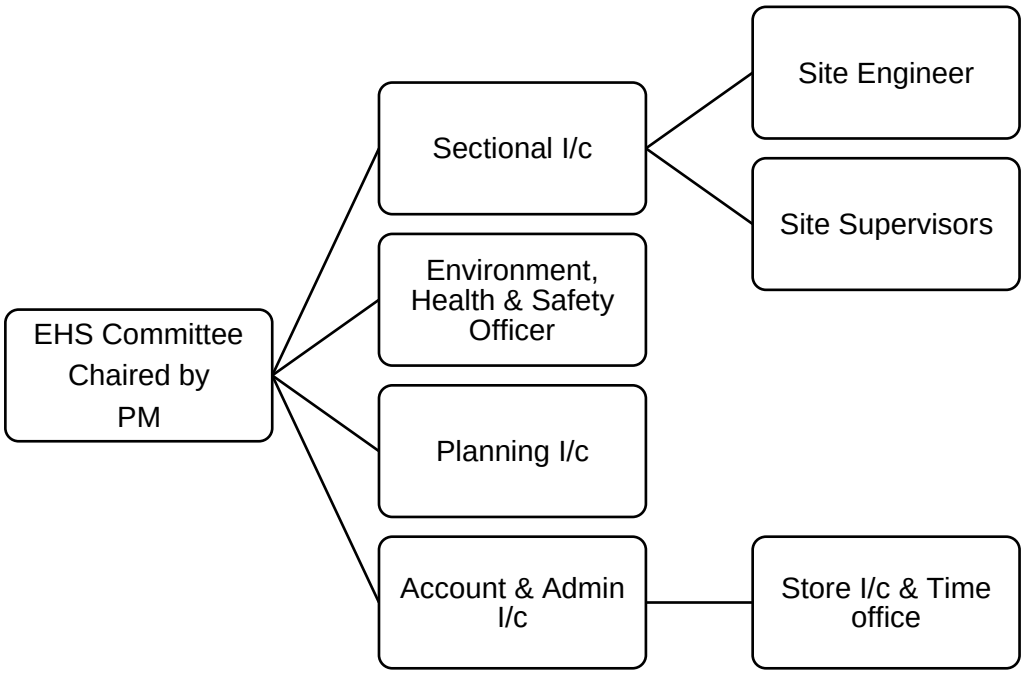
As part of its community liaison process, we will implement a Grievance Mechanism to ensure that all stakeholder comments, suggestions, and objections are captured and considered. It will allow the affected community and the workers to express their concerns and any complaints directly.

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.

4. Project Implementation Arrangements

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

Implementation supervision for the project 230 kV / 132 kV Transmission Line will be carried out by the Transrail Lighting Limited with assistance and guidance by the Power Grid Company of Bangladesh (PGCB). A project steering committee will be formed with representative from Transrail and PGCB to act as overseer of the project, this committee will meet once in quarter to monitor the progress and implementation status.



4.1 Roles & Responsibilities

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

4.1.1 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.

4.1.2 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.

4.1.3 Site Engineer / Supervisor / Foreman

- Implement the Construction Environmental Management Plan at offsite (Camp and Temporary utilities) and onsite 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.

- Project I/C, Sub-Contractors, Supervisors, Engineer and Workers must recognize that, they each have a role in the OHS process. Project Management has a responsibility to provide their employees with a safe and healthful work environment. Project Management must also ensure that employees have the proper tools, personal protective equipment and other resources needed to execute their work safely.
- Supervisors, engineer has the responsibility to ensure that each of their subordinates clearly understands how to perform their work safely and that they follow safe work practices.
- Workers shall make sure they understand how to perform the work and shall have the tools and protective equipment they require to perform the work following approved safe work practices.

4.1.4 Sub-Contractor / Vendors

- It is the obligation of all subcontractors/Gang to become familiar with and adhere to the provisions of TLL Health & HSE Policy and contractual obligation to provide a safe and healthful working environment to their employees and to the persons at the site who may be affected by their work.
- The subcontractors/Gang shall follow the rules as per Management HSE guideline and provision in work order.
- Comply all the regulation of HSE plan any regulation applicable to work Comply with the construction method statements and any TLL document provided in the interest of Environment health & HSE.
- Ensure that all of their employees designated to work on site are properly trained & competent to work.
- Ensure that all plant and equipment they bring on site has been inspected and serviced in accordance with legal requirement and manufacturers or supplier instructions.
- Make arrangement to ensure that all employees designated to work on or visit the site present them for site induction prior to commencement of work.
- Ensure that a responsible person accompanies any of their visitor to site.
- 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 TRANSRAIL site Foreman / Supervisor including spilled oil, overflowing waste, excessive dust generation, wastewater overflowing etc.

4.1.5 Employees

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

- To be HSE & Health Conscious.
- Observe HSE rules, procedures & codes of practices.
- Use with reasonable care, the tools, equipment, HSE equipment provide by the company.
- Maintain the tools, equipment, & HSE equipment provided by the company in good order.
- Participate enthusiastically in HSE training programmes.
- Report potential hazards.
- Take Active & personal interest in promoting OHS at work.
- 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.

5. Project Standards (National & International)

5.1 Government of Bangladesh (GoB)

5.1.1 Relevant Acts, Regulations and Guidelines

5.1.1.1 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".

5.1.1.2 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.

5.1.1.3 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.

5.1.2 Environmental, Social and Natural Resources Protection

5.1.2.1 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.

5.1.2.2 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:

5.1.2.2.1 The National Environmental Quality Standards (EQS) for ambient Air, Surface Water, Ground water, Drinking water, Industrial effluents, Emissions, Noise and Vehicular exhaust.

5.1.2.2.2 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.

5.1.2.2.3 Procedure for obtaining environmental clearance.

5.1.2.2.4 Requirements for undertaking IEE and EIA's as well as formulating EMP's according to categories of industries/development projects/activities; and

5.1.2.2.5 Procedure for damage-claim by persons affected or likely to be affected due to polluting activities or activities causing hindrance to normal civic life.

5.1.2.2.6 According to the latest amendment of ECR 2017, transmission line above 50 km falls under Orange B category. So, the concern project will fall under Orange B category.

5.1.2.3 Acquisition and Requisition of Immovable Property Act 2017 (ARIPA)

The Act is the latest amendment of Acquisition and Requisition of Immovable Property Ordinance, 1982. The Act is regarding Acquisition & Requisition of Property immovable property. Whenever it appears to the Deputy Commissioner that any property in any locality is needed or likely to be needed for any public purpose or in the public interest he shall cause a notice to be published at the convenient places on or near the property in the prescribed form & manner stating that the property is proposed to be acquired.

5.1.2.4 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:

5.1.2.4.1 Maintaining ecological balance and ensuring sustainable development of the country through protection, conservation, and improvement of the environment.

5.1.2.4.2 Protecting the country from natural disasters.

5.1.2.4.3 Identifying and regulating all activities that pollute and destroy the environment.

5.1.2.4.4 Ensuring environment-friendly development in all sectors.

5.1.2.4.5 Ensuring sustainable and environmentally sound management of the natural resources; and

5.1.2.4.6 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.

5.1.2.5 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:

5.1.2.5.1 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.

5.1.2.5.2 All industries shall be subject to an EIA and the adoption of pollution prevention/control technologies shall be enforced.

5.1.2.5.3 Hazardous or toxic materials/wastes shall not be imported as raw materials for industry.

5.1.2.5.4 Import of appropriate and environmentally sound technology shall be ensured; and

5.1.2.5.5 Dependence on imported technology and machinery should gradually be reduced in favour of sustainable local skills and resources.

5.1.2.6 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:

5.1.2.6.1 Identification of key environmental issues affecting Bangladesh.

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

5.1.2.6.3 Improvement of the natural environment.

5.1.2.6.4 Conservation of habitats and biodiversity.

5.1.2.6.5 Promotion of sustainable development; and

5.1.2.6.6 Improvement of the quality of life of the people.

5.1.2.7 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:

5.1.2.7.1 Quiet Area – for example school or hospital.

5.1.2.7.2 Residential Area – an area primarily occupied by dwellings.

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

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

5.1.2.7.5 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.

5.1.2.8 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.

5.1.2.9 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.

5.1.2.10 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.

5.1.2.11 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.

5.1.2.12 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.

5.1.2.13 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.

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

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

5.1.2.13.3 Recycling means the use of waste itself as resources.

5.1.2.14 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:

5.1.2.14.1 **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.

5.1.2.14.2 **Comprehensive disaster management**

To further strengthen the country's already proven disaster management systems to deal with increasingly frequent and severe natural calamities.

5.1.2.14.3 **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.

5.1.2.14.4 **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.

5.1.2.14.5 **Mitigation and low carbon development**

To evolve low carbon development options and implement these as the country's economy grows over the coming decades.

5.1.2.14.6 **Capacity building and Institutional strengthening**

To enhance the capacity govt. ministries, civil society and private sector to meet the challenge of CC.

5.1.2.15 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.

5.1.2.16 Vehicle Act, 1927, the Motor Vehicle Ordinance 1983

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

5.1.2.16.1 Exhaust emission.
5.1.2.16.2 Vehicular air and noise pollution.
5.1.2.16.3 Road/traffic safety.
5.1.2.16.4 Vehicle Licensing and Registration.
5.1.2.16.5 Fitness of Motor Vehicles.
5.1.2.16.6 Parking by laws.

5.1.2.17 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 inter- woven 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.

5.1.2.18 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. TRANSRAIL will refer to the applicable provisions in this Act.

5.1.2.19 New Electricity Act 2018

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.

5.1.2.20 New Electricity Rule 2020

The generation of Electricity Rule 2020 is empowered by the Electricity Act 2018 (7th Act of 2018) sub-section 59. The Electricity Rule is a document that governs the boundary between the licensee and users and establishes procedures of operations of facilities that will use the transmission system. The gadget specifies criteria, guidelines, basic rules, procedures, responsibilities, standards, obligations for the operation, maintenance & development of the electricity transmission system of Bangladesh to ensure a transport, non-discriminatory and economic access and use the rule, whilst maintaining a safe, reliable & effective operation, of the same to provide an equally and secure electricity supply as reasonably as practicable. Compensation process for those will be affected by the transmission line are also explained in this rule. (Point 3,7,10 & 51)

5.1.2.21 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 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.

5.1.2.22 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.

5.1.2.23 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. TRANSRAIL will ensure compliance to relevant provisions of this Act.

5.2 Relevant International Environment Agreements

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

5.2.1 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. Transrail will ensure compliance to relevant provisions of this Act.

5.2.2 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.

5.2.3 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.

5.2.4 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.

5.2.5 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.

5.2.6 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.

5.2.7 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.

5.2.8 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.

5.3 Donor Agencies

5.3.1 ADB Safeguard Categories

5.3.1.1 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.

5.3.1.2 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.

5.3.1.2.1 Indigenous Peoples

The impacts of an ADB supported project on indigenous peoples are determined by assessing:

the magnitude of impact in terms of

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

5.3.1.2.1.2 socio-economic status.

5.3.1.2.1.3 cultural and communal integrity.

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

5.3.1.2.1.5 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
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.

5.4 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.
-

5.4.1 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.

5.4.1.1 Procedure for obtaining EC from DoE, Bangladesh.

The ECR 1997 has classified projects to be assessed by the DoE in four categories based on the severity of impacts on IECs:

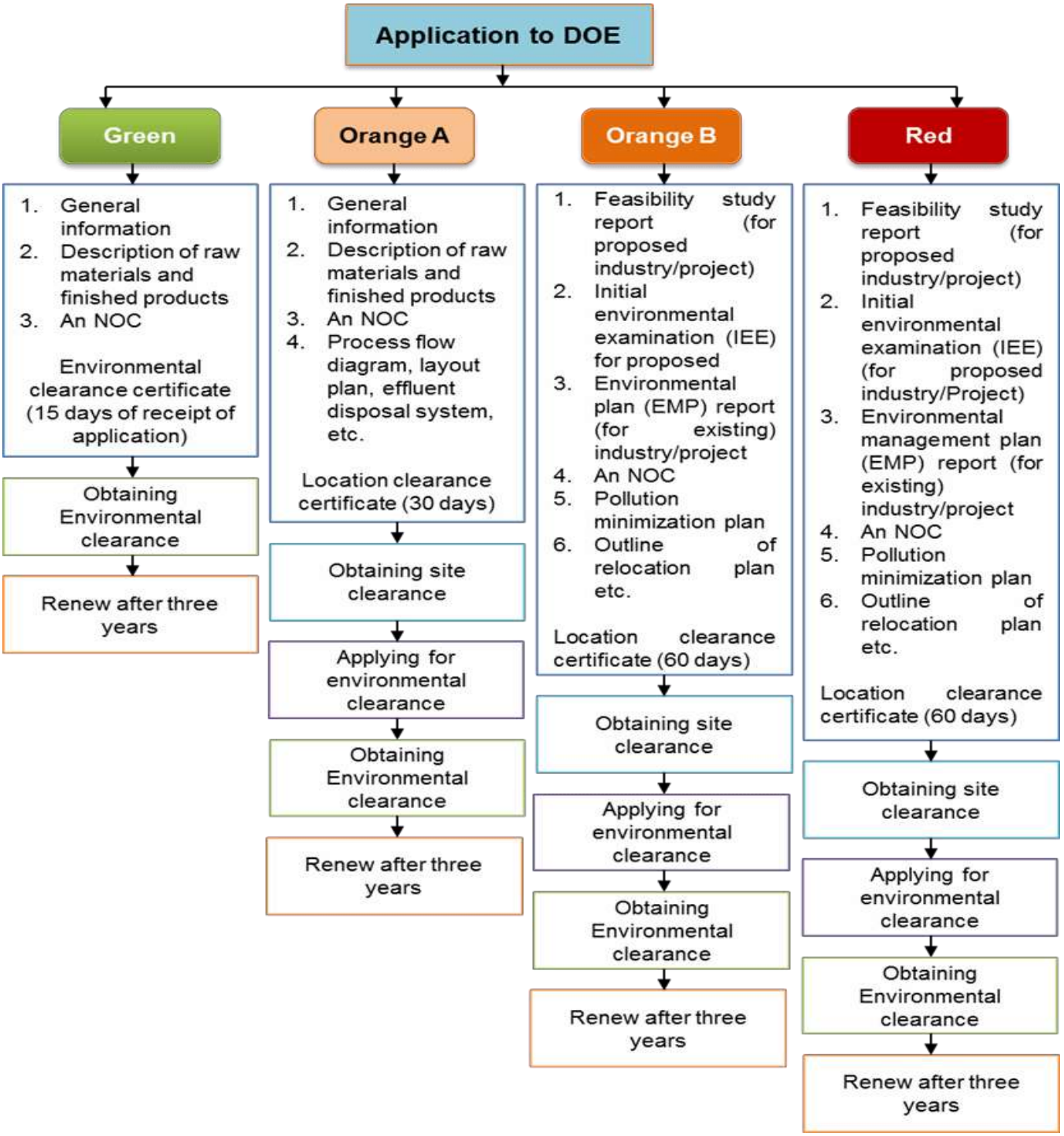
- Green: Nil;
- Orange A: minor; • Orange B: medium; and
- Red: severe.

The applicability of environmental clearance and the process in Bangladesh is described in below figure. The EIA process consists of three stages, screening, IEE and detailed EIA:

- Projects categorized as Green and Orange-A requires no IEE or EIA for environmental clearance however, the proponent has to submit an application in a prescribed format along with specified documents.

- Projects categorized as Orange-B require an IEE to be submitted to the DOE along with an application in a prescribed format and other specified documents; and

- Red category projects require both IEE and EIA. An IEE is required for the location clearance and an EIA is required for the environmental clearance



DOE Environmental Clearance Applicability and Procedure

Source: DoE, Bangladesh

6. Environment 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.

6.1 Training / Awareness Orientation

Transrail 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 subcontractor 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.

6.2 Environmental Reports

The maintenance of environmental reports and records during execution of the project is part of normal good project management. TRANSRAIL 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
- Environment checklist
- Env. Tool box / Pep talk

- Environmental consent and / or licenses.
- Environmental Inspection and Corrective actions.
- Relevant photographs

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

6.3 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 it 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. Sites walk through and inspection will be carried and daily and weekly basis as per the requirement. Audit will be conducted against CEMP as 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.

6.4 Environmental Incidents

All environmental incidents will be recorded if any and investigated in the Environmental incident report.

6.5 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 Transrail Lighting Limited Company Company shall implement additional measures as necessary to ensure the better noise reduction and control measures required by Bangladesh Government laws and regulations. Transrail Lighting Limited Company 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.

6.5.1 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.

6.5.2 Noise Monitoring

TRANSRAIL 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.

6.6 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.

6.7 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.

6.8 Emergency Spill Response & Management

6.8.1 Purpose

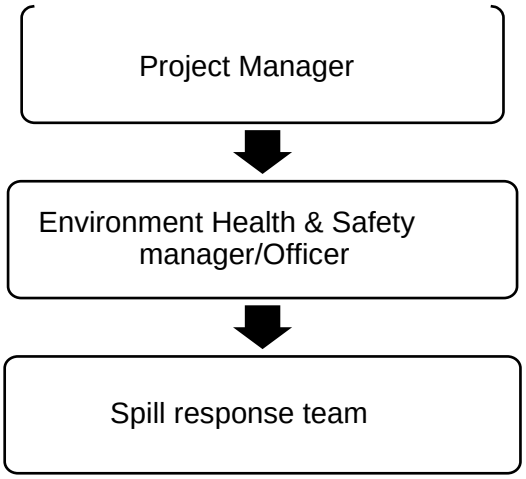
Purpose of this spill response and control management plan is to establish a management plan which covers overall spill prevention, spill response and control plan for executing the projects by means of complying client's EHS standards, national and international environmental regulations and environmental procedures of Transrail Lighting Limited Company Effective implementation of this plan will help to avoid the environmental impact over the soil and ground water. Transrail Lighting Limited Company 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 Transrail Lighting Limited Company 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.

6.8.2 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

6.8.3 Emergency Spill Response & Management Response Team



6.8.3.1 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.

6.8.3.2 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.

6.8.3.3 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 TRANSRAIL EHS Department

  (Cell: +880 1323878810)
- 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.

6.8.4 Sources of Spill

Fuel tanks, vehicles, equipment, plant, and machinery are the possible source of spillage in connection with TRANSRAIL project activity. One fuel tank with the required capacity will be installed in the identified area. TRANSRAIL will try to get the power source from the electricity service provider in order to avoid the usage of diesel generator. TRANSRAIL 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.

6.8.5 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.

6.8.6 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.

6.8.7 Control Measures for Spill Prevention and Monitoring

TRANSRAIL 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 pr 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.

6.8.8 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 1323878547/ +880 1323878810).** An initial incident investigation report will be prepared by TRANSRAIL 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 Transrail 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 TRANSRAIL Country EHS Manager within a week.

6.8.9 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.

6.8.10 Reporting

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

7. Resources of EHS Inspection

There will be two categories of Inspection.

1) Internal
2) External

Internal: The internal inspection will be conducted by the TLL Management. Auditors are as mentioned below:

Name	Designation	Contact
Manish Shende	HSE GM	+91 9970394574
Mangesh Raut	Snr HSE Manager	+91 9890613831
Javed Khan	HSE Manager	+91 9423407364
Md Tarek Hassan	Environmental Manager	+88 01712002102

External: The External Audit will be conducted by DNV (TLL got approved all the Certifications 9001, 14001 & 45001 from DNV)

The EHS audit checklist is as mentioned below:

SR. NO	DEPT.	STANDARD	CLAUSE	AUDIT QUERY	YES	NO	NA	REMARKS
1	Construction	ISO 45001:2018	8.1.2	Whether double string/hook safety harness and other PPE's is used at construction sites?				
2	Construction	ISO 9001: 2015	7.1.5.2	Whether measuring instruments calibrate as per requirement? (T&P Testing)				
3	Construction	ISO 9001: 2015 ISO 14001: 2015 ISO 45001:2018	7.5.3	Whether all IMS documents are controlled?				
4	Construction	ISO 45001:2018	8.2	Whether emergency exit route is identified in the Office/Store building.				
5	Construction	ISO 45001:2018	7.5	Whether First Aid Box and its monitoring list is available in the Office/Store/Location?				
6	Construction	ISO 45001:2018 ISO 14001 : 2015	6.1.2	Whether risk register & aspect/impact register is reviewed/revised copy available?				

7	Construction	ISO 9001: 2015 ISO 14001 : 2015 ISO 45001:2018	7.5.2	Whether Apex Manual, Procedure Manual, Customer Complaint Manual, ICOM Chart ,Work Instruction ,SOPs, Measurement Criteria, Risk Register, Aspect/Impact Register, MRs appointment letter, Schedule of Internal Audit, NCRs of previous internal audits, Audit findings / summary of audit conducted by DNV etc. is available in the office ?				
8	Construction	ISO 45001:2018	9.2.2	Whether NCRs of previous Internal Audits are closed?				
9	Construction	ISO 45001:2018	8.2	Whether all employees are aware about assembly point or emergency situation?				
10	Construction	ISO 45001:2018	8.2	Whether mock drill is conducted?				
11	Construction	ISO 14001 : 2015 ISO 45001:2018	6.2.1	Whether Measurable objectives for EMS/OH&S are identified?				
12	Construction	ISO 14001 : 2015	6.1.3	Whether linking of legal requirements are evident in aspect/impact register?				
13	Construction	ISO 45001:2018	6.2.1	Is there any system for near miss reporting?				
14	Construction	ISO 9001: 2015 ISO 14001:2015 ISO 45001:2018	7.5.3	Whether obsolete copy of IMS documents found in use?				
15	Construction	ISO 9001: 2015 ISO 45001:2018	7.1.4	Whether proper housekeeping is maintained at Office/Store?				
16	Construction	ISO 14001:2015	6.2.1	Whether paper consumption is reduced?				
17	Construction	ISO 45001:2018	6.1.2	Whether all machineries/office equipment's are included in Risk Register?				
18	Construction	ISO 45001:2018	6.1.2	Is Risk register indicates latest revision / issue status?				
19	Construction	ISO 45001:2018	4.3	Whether proactive and reactive OH&S performance criteria are defined for OH&S performance?				
20	Construction	ISO 45001:2018	7.5	Whether monthly safety performance report is available?				
21	Construction	ISO 45001:2018	7.4.2	Sharing of Incident between different units/sites are done to				

				ensure preventive action at all units/ locations?				
22	Construction	ISO 45001:2018	10.2	Whether all incidents are recorded at HSE dept. and investigation promptly?				
23	Construction	ISO 45001:2018	6.1.2	Whether risk register is reviewed / revised after actual occurrence of incident?				
24	Construction	ISO 45001:2018	6.2.1	Whether number of injuries reduced comparing to previous period?				
25	Construction	ISO 45001:2018	7.5	Whether check list for safety and other documents available at location/store.				
26	Construction	ISO 45001:2018	8.2	Whether firefighting equipment's are accessible easily at site stores?				
27	Construction	ISO 9001: 2015 ISO 14001 : 2015 ISO 45001:2018	8.1	Whether SOP is being followed at working area or not?				
28	Construction			1. Foundation: - Excavated soil / Fixing of concreter mixture machine properly / Template support jacks / Shuttering; if required / Removal of sand, metal from location after completion.				
29	Construction			2. Erection: - T&P checking visually / Inner diagonal / anchoring of guy rope properly / Protection of wire rope / PP rope by gunny bags / Uses of winch machine / Uses of advanced equipment's. i.e Binocular / Horizontal fall arrester rope /Induction buzzer in shut down work.				
30	Construction			3. Stringing: - T&P and other equipment thoroughly checked / tensioner & Puller properly earth or not / Proper positioning of conductor drum / back stay arrangement to the tower; if required. Area barricaded for general public. (Shut down arrangement, if required)				

8. Compensation:

PGCB would deploy third party separately for evaluation & disbursement of compensation against damage of standing crops & trees during execution stage.

9. Land Cleaning & Removal of Vegetation

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. 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.

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.

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.

10. CONSTRUCTION

10.1 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 neighbours, 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.
- The Aspect Impact Registered has given for Transmission line activity below.

10.2 Register of E & S Aspect:

ASPECT IMPACT REGISTER FOR TRANSMISSION PROJECT (Activity wise contents include in Env. Aspects)

FORMAT NO.: F/ENV/001

TRANSRAIL

TRANSRAIL LIGHTING LTD.

REGISTER OF ENVIRONMENTAL ASPECT IMPACT - CONSTRUCTION T/L/ POLE SITE

S.NO.	PROCESS	ACTIVITY	ASPECT	Condition	ENV. Impact	Quantity	Occurrence	Sevrity	Legislation	Detection	Control	TOTAL	Criteria	Control	Legislation
1	Excavation	During Excavation work	Removal of Top soil	N	SC	1	2	3	1	1	1	6	NS	Env. SOP Point No 13, (i) Page no 15	NA
			Vehicular Movement/operation	N	SC	1	2	3	1	1	1	6	NS	Env. SOP Point No 8 (iii) Page No 10	NA
2	Concreting	Transportaion of Concrete and pumping of concrete	Excessive emission from transit mixer/ diesel operated concrete pump	N	AP	2	2	1	1	1	1	4	NS	Env. SOP Point no 10 (i, k) Page No	NA
		Operation of transit mixer or electric/disel operated concrete pump	Consumption of electricity/disel	N	RW	2	2	3	1	2	1	24	NS	Env. SOP Point no 12 (H) Page No 14	NA
		Operation of transit mixer OR diesel operated concrete pump	Oil spill during operations or maintenance activities	N	LC	1	1	3	1	1	1	3	NS	Env. SOP Point no 17 (> 6) Page No 17	NA
3	Piling	Piling operation through machine	Noise genration during operation	N	NP	2	4	2	1	1	1	16	NS	Env. SOP Point no 11(k) Page No 11	NA
		Generationof Sludge	Natural resource wastages	N	RW/SC	2	1	3	1	2	1	12	NS	Env. SOP Point No 12 B, Page No 12	NA
4	Foundation	Feeding of Constrution material l e r	Loss of Cement (wet Cement)	N	RW	1	3	4	1	1	3	36	NS	Env. SOP Point no 10, Page No 10	NA
5	Foundation	Lean Concreting	Dusty working condition due to flying of cement	N	RW	1	3	4	1	1	3	36	NS	Env. SOP Point no 20, Page No 20	NA
6	Foundation	Back filling	Air pollution due to dusty environment and land contamination due to Lasting material/concret If not back fill or elliminate	N	AP	2	2	2	1	1	3	24	NS	Env. SOP Point no 10, Page No 10	NA
7	Earthing	Feeding of material i.e. finally broken coke and salt in case of pipe type earthing	Flying of coke dust leading to air pollution	N	AP	2	2	2	1	1	3	24	NS	Env. SOP Point no 10, Page No 10	NA
8	Earthing	Back filling of excavated earth earth	Air pollution due to dusty envioronment.	N	AP	2	2	2	1	1	3	24	NS	Env. SOP Point No 10, Page No 10	NA
9	Storage of Empty bag (Cement/others)	storage of empty cement bag, others at site store	Air pollution, Land contamination, disposal issue	N	AP/LC	2	2	2	1	1	3	24	NS	Env. SOP Point No 17, Last point. Page No 17	NA
10	Material Handling/	During handling and storage of oil, Paint at store/work area	Land contamination due to Oil ,Paint Seepages	N	LC	1	2	4	1	1	3	24	NS	Env. SOP Point No 20, Page No 20	NA

11	DG Set	During the operation of DG	Air Pollution due to smoke	N	AP	1	3	2	1	1	3	18	NS	Env. SOP Point No 10, (h) Page No 10	NA
		During the operation of DG	Generation of Noise	N	NP	1	3	3	1	3	1	27	NS	Env. SOP Point No 11, (j) Page No 11	NA
		During the operation of DG	Oil Spillage	N	SC	1	1	3	1	1	1	3	NS	Env. SOP Point No 17, (j) Page No 17	NA
		During the operation of DG	Fuel Consumption	N	RW	1	3	3	1	1	1	9	NS	Env. SOP Point no 12 (h) Page No 12	NA
12	Demolition	Demolition of old structure, Blasting	Dust formation/waste genration	N	SC/LC	1	3	1	1	1	1	3	NS	Env. SOP Point No 20, Page No 20	NA
		use of explosive	Exposer to soil and water	N	WP/SC	1	3	3	1	1	1	9	NS	Env. SOP Point No 13, Page No 15	NA
13	Vehicular Movement/ Transportaion	Vehicle/ Equipement transpo-rtation	Fuel Consumption	N	RW/RD	2	4	1	1	3	1	24	NS		NA
		Vehicle/ Equipement transpo-rtation	Exhaust Emission	N	AP	2	4	3	1	1	1	24	NS	Env. SOP Point No 10, (h) Page No 10	NA
		Vehicle/ Equipement transportation	Noise generation	N	NP	2	4	5	1	1	1	40	NS	Env. SOP Point no 11(k) Page No 11	NA
14	Blasting, Explosive Transportation, Handling & Storage	Disposal of Explosives	Exposure to land / water	N	SC/WP	1	1	3	1	1	1	3	NS	Env. SOP Point no 12 Page No 12	NA
		Blasting operation	Dust formation	N	AP	1	1	5	1	1	1	5	NS	...	NA
		Blasting operation	Noise due to opreation	N	NP	1	1	2	1	1	1	2	NS	Env. SOP Point no 11 (K) Page No 11	NA
15	Office Activity	Routine office work	Consumption of water	N	RW	1	1	1	1	1	1	1	NS	Env. SOP Point no 2 (b) Page No 4	NA
		Routine office work	Consumption of electricity	N	RW	1	1	1	1	1	1	1	NS	...	NA
		Routine office work	Generation of Waste Water (Mess waste water and Sanitary)	N	WP	1	3	3	1	3	1	27	NS	Env. SOP Point no 12 (j) Page No 15	NA
		Routine office work	Generation of Paper Waste and other Waste materials	N	RW	1	3	3	1	3	1	27	NS	...	NA
16	Clearing & Grubbing	Trees cutting during work./for set-u	Deforestation	D	RW	2	1	4	1	2	1	16	NS	Env. SOP Point no 4 G Page No 8	NA

Abbreviation:-

D - Direct	**LC - Land Contamination**	**RW - Resource Waste**
I - Indirect	**SC - Soil Contamination**	**REW - Resource Electrical Waste**
A - Abnormal	**NP - Noise Pollution**	**RD - Resource Depletion**
N- Normal	**AP - Air Pollution**	**NS - Non Significant**
E - Emergent	**WP - Water Pollution**	**NA - Not Applicable**

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10.3 EHS Inspection

SR. NO	DEPT.	STANDARD	CLAUSE	AUDIT QUERY	YES	NO	NA	REMARKS
1	Construction	ISO 45001:2018	8.1.2	Whether double string/hook safety harness and other PPE's is used at construction sites?				
2	Construction	ISO 9001: 2015	7.1.5.2	Whether measuring instruments calibrate as per requirement? (T&P Testing)				
3	Construction	ISO 9001: 2015 ISO 14001: 2015 ISO 45001:2018	7.5.3	Whether all IMS documents are controlled?				
4	Construction	ISO 45001:2018	8.2	Whether emergency exit route is identified in the Office/Store building.				
5	Construction	ISO 45001:2018	7.5	Whether First Aid Box and its monitoring list is available in the Office/Store/Location?				
6	Construction	ISO 45001:2018 ISO 14001 : 2015	6.1.2	Whether risk register & aspect/impact register is reviewed/revised copy available?				
7	Construction	ISO 9001: 2015 ISO 14001 : 2015 ISO 45001:2018	7.5.2	Whether Apex Manual, Procedure Manual, Customer Complaint Manual, ICOM Chart ,Work Instruction ,SOPs, Measurement Criteria, Risk Register, Aspect/Impact Register, MRs appointment letter, Schedule of Internal Audit, NCRs of previous internal audits, Audit findings / summary of audit conducted by DNV etc. is available in the office ?				
8	Construction	ISO 45001:2018	9.2.2	Whether NCRs of previous Internal Audits are closed?				
9	Construction	ISO 45001:2018	8.2	Whether all employees are aware about assembly point or emergency situation?				
10	Construction	ISO 45001:2018	8.2	Whether mock drill is conducted?				
11	Construction	ISO 14001 : 2015 ISO 45001:2018	6.2.1	Whether Measurable objectives for EMS/OH&S are identified?				

12	Construction	ISO 14001 : 2015	6.1.3	Whether linking of legal requirements are evident in aspect/impact register?				
13	Construction	ISO 45001:2018	6.2.1	Is there any system for near miss reporting?				
14	Construction	ISO 9001: 2015 ISO 14001:2015 ISO 45001:2018	7.5.3	Whether obsolete copy of IMS documents found in use?				
15	Construction	ISO 9001: 2015 ISO 45001:2018	7.1.4	Whether proper housekeeping is maintained at Office/Store?				
16	Construction	ISO 14001:2015	6.2.1	Whether paper consumption is reduced?				
17	Construction	ISO 45001:2018	6.1.2	Whether all machineries/office equipment's are included in Risk Register?				
18	Construction	ISO 45001:2018	6.1.2	Is Risk register indicates latest revision / issue status?				
19	Construction	ISO 45001:2018	4.3	Whether proactive and reactive OH&S performance criteria are defined for OH&S performance?				
20	Construction	ISO 45001:2018	7.5	Whether monthly safety performance report is available?				
21	Construction	ISO 45001:2018	7.4.2	Sharing of Incident between different units/sites are done to ensure preventive action at all units/ locations?				
22	Construction	ISO 45001:2018	10.2	Whether all incidents are recorded at HSE dept. and investigation promptly?				
23	Construction	ISO 45001:2018	6.1.2	Whether risk register is reviewed / revised after actual occurrence of incident?				
24	Construction	ISO 45001:2018	6.2.1	Whether number of injuries reduced comparing to previous period?				
25	Construction	ISO 45001:2018	7.5	Whether check list for safety and other documents available at location/store.				
26	Construction	ISO 45001:2018	8.2	Whether firefighting equipment's are accessible easily at site stores?				
27	Construction	ISO 9001: 2015 ISO 14001 : 2015 ISO 45001:2018	8.1	Whether SOP is being followed at working area or not?				

28	Construction			1. Foundation: - Excavated soil / Fixing of concreter mixture machine properly / Template support jacks / Shuttering; if required / Removal of sand, metal from location after completion.				
29	Construction			2. Erection: - T&P checking visually / Inner diagonal / anchoring of guy rope properly / Protection of wire rope / PP rope by gunny bags / Uses of winch machine / Uses of advanced equipment's. i.e Binocular / Horizontal fall arrester rope /Induction buzzer in shut down work.				
30	Construction			3. Stringing: - T&P and other equipment thoroughly checked / tensioner & Puller properly earth or not / Proper positioning of conductor drum / back stay arrangement to the tower; if required. Area barricaded for general public. (Shut down arrangement, if required)				

10.4 Labour Management Plan

The labours are leaving in rented house available nearby the site instead of leaving in labour camp. The labour leaving with proper facilities and amenities available there during the project work. There is permanent set up with all arrangement available at every house so that there is no question of sewage waste discharge arise here. The labour rented the houses nearby the project site/ transmission line.

Individual Unit IC is assigned for every labour quarter & labours are briefed on the Covid SOP & the guidelines provided by the WHO & GOB on Covid-19.

GOB Guidelines for COVID-19

For Construction Industry-

For Low Risk Area

1. Before staring the work, necessary COVID -19 PPE and others materials like nose musk, 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 mas gathering should be prohibited.

11. During closed proximity of workmen, personal protective equipment like nose musk 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.

For High Risk Area

17. Outside workmen should not be allowed in the work site. Workmen present in the area should not be allow to go outside.

18. Increase number of shift and ensure proper rest for the workmen.

WHO Guidelines for COVID-19

Ministry of Health (https://corona.gov.bd/press-release) and website of WHO provide information on current and emerging communicable disease outbreaks possibly affecting the country, the World Health Organization prepares for emergencies by identifying, mitigating and managing risks (www.who.int). Educate the workmen as per the provided information. RESPONSIBILITY- MATRIX.

Process	PD/PM	Accts & Admn	Section IC	All staff	EHSO	ERT Team	Supervisor	Camp Boss	Workmen
Conducting Meeting regarding this SOP before restarting the Works	A	R	R		R	R			
Preparing a site- specific action Plan	A	R	R		R	R			
Screening of workmen		A	R	R	R		R		R
EHS Induction		R			A		R		R
Access Control measures		A	R	R	R		R		R
Training on COVID 19 response		R		R	A	R	R		
Disinfection		A		R	R		R	R	
Risk Control in Workmen Camp		A						R	
Social distancing in site office & Facilities	A	R	R	R	R	R	R		
Pre start up checks location /area wise	A	R	R	R	R		R	R	
Promoting Self Hygiene & Respiratory Hygiene		R		R	A		R	R	
Display of posters for COVID-Response	R	R			A				
Organizing resources for COVID-19 response		A	R	R	R				
Maintaining social distance	A	R	R	R	R	R	R	R	R
Monitoring of compliance	A	R	R	R		R	R		
Reporting in case of symptoms		A	R	R	R	R	R	R	R
Checks for COVID during safe to start activities				A	R		R		
Periodical review	A	R	R		R	R			
Emergency Response	A	R	R		R	R		R	

Activity	Local Labour (Total, Male and Female)			No of Labour Camps	Migrant Labour			Labour camp facilities (temporary camp such as tents)		
	T	M	F		T	M	F	Covered Accommo-dation, lighting.	Drinking Water	Latrines and bathrooms
Foundation										
Erection										
Stringing										
Store Activity										

N.B.: Number of labour will depend on the site & activity.

10.5 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 activity.

11. COVID 19 Preparedness & Action Plan

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

11.1 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 (s*evere acute respiratory syndrome coronavirus 2* of the genus *Beta coronavirus*), 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 Defence, 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.

Reference Documents & Websites: -

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

- Govt. Of Bangladesh
- Travel advisory by Govt. of India - http://tourism.gov.in/covid-19-travel-advisory
- World Health Organization
- https://corona.gov.bd/press-release

11.2 COVID 19 SOP & Other Implementation Part

11.2.1. Cause

Coronavirus disease (COVID-19) is an illness that can affect the lungs and airways. It's caused by a virus called coronavirus. As a type of virus and as a group, coronaviruses are common across the world. The current type, COVID-19, is a new strain of coronavirus first identified in Wuhan City, China in December 2019.

The current understanding about how the COVID-19 virus spreads is largely based on what is known about similar coronaviruses. As COVID-19 is a new disease, there is more to learn about how it spreads, the severity of illness it causes, and to what extent it may spread globally.

Like other types of coronaviruses, the incubation period of COVID-19 disease is between 2 to 14 days. This means that if a person remains well 14 days after contact with someone with confirmed coronavirus, they have not been infected.

11.2.2 Transmission

For the moment the virus is thought to spread mainly from person-to-person who are in close contact with one another (within about 1 meter). It is furthermore likely that the risk increases the longer someone has close contact with an infected person.

Respiratory droplets produced when an infected person coughs or sneezes containing the virus are most likely to be the main means of transmission. There are 2 main routes by which people can spread COVID-19 disease:

- Infection can be spread to people who are nearby or possibly could be inhaled into the lungs; and
- It is also possible that someone may become infected by touching a surface, object or the hand of an infected person that has been contaminated with respiratory droplets and then touching their own mouth, nose, or eyes (i.e. touching door knob or shaking hands then touching own face). From the 2 main routes of transmission this is not thought to be the main way the virus spreads
    - Also, that people who are without symptoms are infectious to others.
    - There is no perceived increase in risk for handling mail, items or packages.

11.2.3 Symptoms

The following symptoms may develop in the 14 days after exposure to someone who has COVID-19 infection:

- Fever, tiredness, and dry cough
- Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhoea

  (These symptoms are usually mild and begin gradually)
- Difficulty breathing

Generally, these infections can cause more severe symptoms in people with weakened immune systems (i.e. elderly people, and those with long-term conditions like high blood pressure, heart problems, diabetes, cancer and chronic lung disease).

11.2.4 Diagnosis

A nose swab, carried out by a certified medical institution, can be done as early assessment of the virus. The nose swab is then analysed in a laboratory. Result will be available after diagnosis and test.

11.2.5 Treatment

At present, vaccination is started by BoD to prevent the COVID-19 disease. Still, the best treatment for the virus is by providing good nutrition and hospital care to let the patient recover. This is likely to work for a vast majority of patients.

11.2.6 Emergency Response Model

Preparedness Plan for Workplace Against Novel Corona Virus (COVID – 19)

In current scenario, we are suffering with pandemic situation by a new disease known as Novel Corona Virus (COVID-19). The virus is invisible and very much dangerous for people with all ages because of its contagion nature. Therefore, this is the document that details will provide safeguard for our workplace to protect us. According to the update of WHO (World Health Organization), this document has prepared for our safety, so that we can finish our work in a simple way and keep ourselves safe at work place. All the following information sourced from WHO (World Health Organization) Central/ State Govt. and its Preparedness plan to execute.

In what way Virus (COVID-19) works:

- The new Corona Virus is a respiratory virus which spreads primarily through droplets generated when an infected person coughs or sneezes, or through droplets of saliva or discharge from the nose or close talking with a person. The droplets may be inhaled directly by a healthy person.
- This virus spreads by touching contaminated surfaces or objects – and then touching their eyes, nose or mouth as well as may its transference by handshakes or hugging.
- People with COVID-19 generally develop signs and symptoms, including mild respiratory symptoms and fever, on an average of 5-6 days after infection. Self-life of virus is 14 days after passed into body. The virus can damage pulmonary or breathing system, which may cause of death if not managed properly within first fourteen days.
- Most people infected with Corona Virus have mild disease and recover.

To Know: Most Common Symptoms	Precautions for Prevention of infections / Spreading	Actions required at Project/Loc.	Do's & Don't

• Cold & Flu • Fiver • Tiredness • Dry Cough Patients may have; • Aches and pains, • Nasal congestion, • Runny nose, • Sore throat or diarrhea. • Most of the people recovers from the disease without need special treatment. • People gets COVID-19 becomes serious ill due to breathing difficulties with fever dry cough & throat infection. • These symptoms are usually mild and begin gradually. • Some people become infected but don't develop any symptoms and don't feel unwell. • Older Person and those with high blood pressure, heart problems or diabetes, are more likely to develop serious illness.	• Regularly and thoroughly clean hands with an alcohol-based hand rub or wash them with soap and water. • Maintain at least one & half meters (Five feet) distance between person who is coughing or sneezing. • Avoid touching eyes, nose and mouth. • Avoid handshake with others • Make sure everyone around follow good respiratory hygiene by covering mouth and nose by nose mask or handkerchief at the time of coughing or sneezing. Then dispose the used tissue immediately. • Safe to stay at home if anyone having mild fever cough and difficulty while breathing & seek medical assistance as soon as possible. Strictly follow all guidelines of local health authority.	Create Awareness & Communication • Inform on Covid-19 precautions to all workers, staff, visitors, Sub – contractors (if any) and as well as transporters. • Intensive Communication and Training on good hygiene practices to be delivered and also display signage and advisories to wash hands at visible places. • Arrangement of non-contact infrared thermometer to conduct temperature checks regularly before enter into location or to check at camp. • If body temperature found more than 37C° / 98.60F during checking then advise them for further medical consultation to nearest medical center. • Minimum Manpower (50%) Resources to be utilized to start the work. • Manage one meter distance between two	Do's • Immediately report if any person noticed with COVID-19 symptoms or any non - routine health conditions • Report to Project authority or HSE person if travelled overseas in past 30 days even without any symptoms. • Wash the hands frequently with an alcohol based sanitizer • Always stay hydrated. • Wash both hands thoroughly with soap or water till elbow. • Maintain good hygiene for immunity. • Track the suspect or identified person until get recovers from COVID-19. • Drink penalty warm water at least half of cup in every two hours. • Only one person shall take full space in double designed seat to maintain the

	• Keep up to date on latest COVID - 19 News of areas where it is spreading widely. • Avoid traveling especially senior citizens, diabetic patient and having heart or lung diseases. • Social distancing is most important. Must avoid some serious activities against COVID-2019. It can be more harmful: • Smoking • Using unhygienic masks • Taking antibiotics • Engaging in huge crowds • Attending parties • Close movement with recent travelers • Hiding travel history with employers doctors & collogues. • Hiding or not disclosing non routine health conditions. • Closely moving with family members while suffering with common symptom • Avoid outside food • Carelessness in personal Hygiene	members while enter into security gate during checking.(Store/Substation) • Social distancing to be maintained during lunch timing and also work. Minimum one Hr. Gap to be maintained during lunch. • Without wearing of nose mask/Scarf person shall not be allowed for any work or entry at working location. • All individual shall sign in the register for self-declaration after scrutiny body temperature. • To maintain the Social Distancing at Labour camp, the Quantity of labour camp to be increased. Hygiene - Very Important • Organize to clean toilets & bathroom/office regularly. • Proper Housekeeping/ Sanitization programme at Site store, office,	social distance by travelling in bus/others vehicle. • To Follow the State/Central Govt. Guidelines • Downloading Mandatory of Arogya Setu App by all employees Don't • Don't create panic situation. • Do not encourage to spread rumors. • Don't forward unverified messages. • Don't give wrong data on Travel history or symptoms. • Don't spit or throw trash in Public places. • Don't use unhygienic mask. • Don't throw used tissue papers in open area. • Don't spit in constructed dry floor, wall & public places. • Do not shake hands • Don't seat more than six people in a table to take lunch. • Don't wear same

	• Avoid running Air Conditioner to the extent possible and keep site office more ventilated. • Avoid use of common papers and hard currency handling • Avoid unwanted movement of outsider people to the extent possible.	canteen/Mess, working location and Labour Camp. And also on equipment during Lunch, before work start and after work also. • Ensure hand wash with soap for at least twenty seconds. • Avoid personal meeting & have a conference call. • Avoid crowd by arrangement of various training. Action for Emergency Response • Do the needful to eliminate panic Situations & baseless beliefs. • Organize for Provision to isolate the Identified person to prevent spread of virus. • Display & communicate the Contact Details of ERT, Govt. Hospital / camps nearby handling COVID - 19 cases and helpline numbers • Establish a communication protocol	clothes continuously for two days. • Strict ban of Gutka, tobacco etc. and spitting should be strictly prohibited.

		• Support to shift the effected persons by ambulance as soon as possible. • Ensure to organize sanitation of Isolate area & all the places where the affected person moved & come in contact with different surfaces (doors, handles, walls, materials etc.). • Inform family member & track the development of the Shifted case to medical assistance. • Immediately update the information to Project I/C, Head Office (HSE Head) and ADMIN Department after verification. • Display preventive measure in local or English language for better communication and understanding among masses.	

CONSTRUCTION ENVIRONMENT & SOCIAL MANAGEMENT PLAN

To get the Proper result, following things need to be ready:

Sr.	Description	UOM	Qty.	To be Distributed at Location / Project
1	Cotton Handkerchief /Scarf	Nos.	10	For each worker & staff member
2	Soap (Small Size)	Nos.	05	For each worker & staff members
3	Hand Sanitizer (500 Ml.)	Bottles	05	At each gang, Store, Vehicle, Office and also at Location.
4	Hand Gloves/Head cap	Pairs	10/05	For Office Boy.
5	Lemon	Nos.	15	To squeeze in water while use to drink.
6	Vehicle	Nos.	01	For labours transporting from Camp –to Location
7	Infrared Thermometer	Nos.	02	To observe body temperature at security gate.

Being ready to respond to an acute infectious disease (COVID-19 disease) requires engaging in a continuous cycle of activities that focuses on four (4) phases during the pre-emergency planning: - Prevention / Mitigation, Preparedness, Response, and Recovery (*figure 1*).

Prevention / Mitigation includes all activities that attempt to avoid or prevent a COVID-19 disease outbreak or reduces the chance of such an outbreak happening (prevention) or reduces the impact of COVID-19 disease outbreak (mitigation).

Preparedness combines planning and training for response, such as the development of this Acute Infectious Disease - COVID-19 Emergency Management Plan, (awareness) training for employees, and service provider employees.

Response addresses the short-term impact of COVID-19 disease outbreak. This includes immediate actions taken to protect life.

Recovery includes all activities that focus on restoring the situation after an acute infectious disease emergency to normal.

11.2.7 Prevention

Prevention is the key to acute infectious disease emergencies, such as COVID-19 disease, and requires assessing the potential hazards and risks and identifying what actions need to be taken to prevent or reduce their impact on our organization and project sites.

11.2.7.1 General Precautions

There is currently no vaccine to prevent COVID-19 disease. The best way to prevent infection is to avoid being exposed to the virus and follow general precautions against flu to prevent people from catching and spreading COVID-19 disease:

- Avoid shaking hands. Instead use different ways to greet each other.
- Regularly and thoroughly wash your hands with soap and water or clean your hands with an alcohol-based hand rub.
- **Social distancing: -** Maintain at least 1-meter distance between yourself and anyone who is coughing, sneezing, or do not feel well.
- Follow good respiratory etiquette. This means covering your mouth and nose with your bent elbow or tissue when you cough or sneeze. Then dispose the used tissue immediately.

  But the use of face mask should be made compulsory.
- Avoid touching eyes, nose and mouth. Your hands touch many surfaces and can pick up viruses. Once contaminated, hands can transfer the virus to your eyes, nose or mouth. From there, the virus can enter your body.
- Clean and disinfect frequently touched objects and surfaces.
- Inform your superior when you do not feel well, especially if you have a fever, cough and/or difficulty in breathing.

In addition to the above we have taken additional measures to prevent employees from catching and spreading COVID-19 disease:

- **Download and install the mobile app – "CORONA TRACER BD"** launched by govt. of Bangladesh.
- Infrared thermometer for screening of body temperature
- Disposable masks
- Disposable/surgery hand gloves

- Disposable shoe cover
- Disposable head caps
- Goggles (full eye cover)

For the latest information on precautionary measures taken by our organization, see internal communications like e-zine broadcast, circulars, govt. websites – https://corona.gov.bd/and WHO website also.

11.2.7.2 Maintaining Social Distancing

- It is recommended that one representative can be nominated from each group to manage social distancing all times
- Staff and workmen when entering any house for meter connections etc, should wear a face mask and ensure social distancing norms are followed
- Mixing of workmen between gangs should be strictly avoided
- All the team members shall carry soap/sanitizer and water along with them for handwash at frequent interval and the same shall be kept available in their conveyance vehicle

11.2.7.3 Sanitization

- Hand sanitizers shall be kept available for all workmen at prominent locations
- Adequate quantity of hand sanitizers shall be available in the conveyance vehicles and in the First aid kits at site.
- Workmen should be made aware about the hand sanitizers effects on fire (NOTE: One should avoid open flames, e.g. gas stoves, immediately after using alcohol-based hand sanitizers, as they are highly flammable and there have been reports of people sustaining severe burns.

11.3 Covid SOP

Towards An Organized, Safe & Sustainable Re-Start of Work

STANDARD OPERATING PROCEDURE
(Covid-19)

As all of are aware that, Corona Virus (COVID19) is pandemic virus and very epidemic in nature. It is speedily spreader and dangerous.

Hence, Central/State government declared total lock down across the country to save the life and break the chain of virus. After the efforts of all and the way all obeyed the lock down, government is allowing to start the work on some respective locations with certain precautionary measures.

Now, all are returning to their respective workplaces after the lockdown, it will be important for each and every member of "Transrail Family" to start and continue the work as per the guide lines and precautionary measures issued by respective government to protect ourselves as well to protect from the spreadation of virus. We have to adopt it and follow seriously.

A) Precaution for Prevention of Infection

- Regularly and thoroughly clean the hand with alcohol base Sanitizer or wash the hand with Soap and water at least for 20 second once in 2 - 3 hrs.
- Keep the Sanitizer handy with you (if possible) and use it very often in following circumstances;

a) When we come in contact with other person having the Cough, cold or Fever.
b) After opening or closing the door or others part
c) After use of ATM Machine

- To maintain at least one and half meter (five feet) distance between person who is coughing or sneezing or any other person.
- Avoid touching Eyes, nose & Mouth frequently, especially during travelling & crowded area.
- Avoid handshake with others
- To wear compulsory mask/Scarf or handkerchief during work/at labour camp/office / store or interaction with each other. Without wearing of nose mask/Scarf/ handkerchief person shall not be allowed at working area or entry at working location.
- Neatly wash used Scarf/handkerchief to reuse.
- Safe to Stay at Home/Labour camp if anyone having mild cough/ fever or cold and seek medical assistance as soon as possible.
- Keep up to date on COVID-19 News of area where it is spreading widely / of your area.
- To maintain social distancing at work place, labour camp and also during movement by vehicle.
- Special care to be taken by office boy after housekeeping; like –Proper cleaning of hand or

whole body during the service to others.

- Proper housekeeping and sanitization programme to be made at Project, for office, store, working location, toilet, bath room, equipment, canteen/mess, labour camp and vehicles. This should be done before starting the work, during lunch and after closing the work and if possible in any break of work at site.
- Maximize digital Interaction/communication through phone/mail/VC or other medium with client/sub-contractor to avoid physical meeting.
- Vehicles including transportation vehicles should be sanitized before use.
- Transport parcel, Courier, packages should not be opened / handled for 12 hrs.

B) Must Avoid some serious activities

- Smoking
- Using Unhygienic mask
- Taking antibiotics
- Close movement with recent traveler
- Hiding travel history with employer, doctor and collogues
- Hiding or not disclosing non routine health condition
- Avoid outside food
- Carelessness in personal hygiene
- Avoid running Air Condition to extent possible and keep site office more ventilated.
- Avoid unwanted movement of outsider people to extent possible at Project office, mfg. Plants, Offices, work locations, stores etc.
- Avoid common use of papers and hard currency handling
- Avoid biometric Punching till further instructions.
- Avoid personal meeting and have a conference call
- Avoid crowd by arrangement of various trainings with proper social distancing.

C) Awareness and Communication

- To Inform on COVID-19 precaution to all workers, staff, visitors and Sub-contractor and transporters.
- Intensive Communication and Training on good hygiene practice to be delivered, Signage's and advisory to be displayed at various visible places.
- Thermal scanning of every employee and outsider (if any) to be done on daily basis at all work places.
- If temperature found more than 37C* to 98.60F during checking, then advise them for further medical consultation to nearest nominated medical center of COVID-19.
- Minimum manpower resources to be utilized to start the work and follow govt. guidelines time to time being issued. Further as a precaution not to add new Gang or worker at site from

outside up to 3rd May'20, also not to allow replacement of any worker.

- To maintain 1.5meter distance between two members while entry into security gate of all work places.
- To maintain social distancing during lunch (by taking at own desk / work place / by staggered lunch breaks).
- All individual shall submit Self declaration form in prescribed format enclosed to this SOP to Project authority / concerned officers at work places at the time of joining the duty.
- To maintain social distancing at labour camps by increasing quantity of labour camps if necessary.

D) Action for Emergency Response

- Do not be panic and baseless belief's
- Organize to isolate the identified Covid symptom person to prevent the spread of virus
- To display and communicate the respective contact details of ERT, and Government hospital of COVID-19 at various places of works (Labour camp, offices, store, Mfg. plants, working locations, vehicles etc.)
- Establish the communication protocol.
- To ensure and organize sanitization of isolated area and all places where the affected person moved and come in contact with different surfaces (doors/handles/wall/materials etc.)
- Inform to family member and track the development of shifted case to medical assistance.
- Immediately inform to ADMIN/HSE Head / HR head / Plant Head / Project Incharge / Covid marshal of respective work places.
- To display preventive measures in local and English language for better understanding and communication among masses.
- Medical Insurance to be ensured for all Employees
- Site Level Committee must be formed (PM, HSE Person, Commercial I/C and Section I/C) and they will decide Site operation, roster duty, isolation of sick staff and other COVID-19 measures at site. Similarly, mfg. plants and offices should form committees for their respective areas.
- To nominate covid19 marshal for each site / factory / office who will be monitoring all the covid19 precautions at site & taking ownership of the same. This person will be directly reporting to chief Covid marshal / Business Heads.

E) DO'S & DON'T

Do's

- Immediately report if any person noticed with COVID-19 symptoms or non-routine health condition.

- Always stay hydrated
- Wash both the hand thoroughly with soap till elbow.
- Maintain good hygiene for immunity
- Drink plenty of warm water.
- Only one person shall take full space in double designed seat to maintain the social distance while travelling in bus or others vehicle. (as suggested in signage)
- To follow the Central/State government guidelines being issued time to time.
- To download the Arogya Setu app in your Mobile and update the data.
- To conduct the Medical Check-up of each employees before starting the work. (Cold, Cough and fever)
- Proper coordination with Local administrative authority for any kind of assistance
- All garbage to be removed and properly disposed-off at Isolated area

Don't.

- Do not create panic situation
- Do not encourage to spread the rumors
- Do not give wrong data on travel history or symptoms
- Do not spit or throw trash in Public Places or in working area /location/offices.
- Do not shake hands
- Do not wear same cloth continuously for two days.
- Strict ban on liquor, Gutka/tobacco etc. and spitting should be strictly prohibited and punishable as per the law.

F) Records / documentation. (as per the prescribed formats provided)

- Self-declaration form
- Medical check report. (by the doctor)
- Daily check list (including thermal scanning data)
- Daily pep talk record of covid.
- Daily sanitization record.
- Daily attendance.
- Symptoms record.

List of the facilities / Equipment to be sanitized:

- Sanitization and upkeep of common places / utilities, utility areas, drainages, waste bins, etc are cleaned and sanitized on daily basis.
- Ensure that all doors / windows/ fittings of common places are sanitized frequently.
- Special attention be given to washrooms / toilets by periodical cleaning, disinfecting and maintaining dry.

- Site vehicles/ cranes are to be sanitized on periodic basis.
- Agents: Depending on permissible chemicals /agents such as the compounds having quaternary ammonium, sodium hypochlorite or hydrogen peroxide as active ingredient shall be used for area disinfection.

Security procedures at entry gates	a. **Wearing face mask is mandatory** for each employee entering TRANSRAIL b. Offices/Store/Sites **On-line Self-declaration form** stating that the individual is fully fit and has no Covid 19 symptoms should be **mandatory for all persons entering the campus**. c. **Compulsory screening** of all persons irrespective of cadre / status entering through gate with thermal scanner d. **Stoppage of any employee /person** found **having fever/cough /breathing problem** and inform concerned department / contractors. Such employees to be referred to Govt. Hospital only **e.** Every **person entering gate** shall be permitted inside only if he/she is **wearing a face mask** f. **List of persons prohibited from entering** the campus (refer Annexure-B)
Sanitization during Entry	a. **Hand sanitizers shall be kept ready in the entrances** and people after entry shall sanitize their hands before proceeding to their work spots **b. (NOTE: One should avoid open flames, e.g. gas stoves, immediately after using alcohol-based hand sanitizers, as they are highly flammable and there have been reports of people sustaining severe burns.)**
Attendance system	**a. Bio-metric (Finger touch)** swiping for attendance is **temporarily discontinued.** b. Alternate arrangements for attendance will be made.

11.4 Response

n case of an acute infectious disease emergency, the Emergency Response Plan is 'activated'. It is therefore essential that everyone is familiar with the content and know what to do and where to go.

11.4.1 Actions to be taken by the IR & Admin, PM/CM

When not feeling well and/or exhibiting signs and symptoms of the virus (i.e. fever, cough, or difficulty breathing), the employee shall:

1. Immediately inform to IR & Admin, PM/CM and report sick.
2. Consult a physician as soon as possible for a physical exam and diagnoses.
3. Obtain a sick leave certificate from the physician and provide their manager with a copy of the sick leave certificate.
4. Stay at their accommodation / home for the duration of the sick leave granted.
5. Report back for work once recovered or the first day following the last day of sick leave granted as per sick leave certificate from physician.

   In case of Workmen: -

   - Immediately inform to IR & Admin, Site engineer/EHSO.
   - Consult a physician as soon as possible for a physical exam and diagnoses.
   - Stay at temporary isolation camp provided near the concerned workmen camp.
6. Based on the physical exam by physician, employee may
   (a) receive a sick leave certificate or
   (b) when the physician has reason to suspect COVID-19 infection,
   the employee will be referred for further tests.
   a. Depending if sick leave is granted or not, employee to return to work or to stay at their accommodation, or alternative accommodation arranged by the ADMIN, until fully recovered.
   b. Employee to stay at hospital or medical facility for the duration of further tests.

- When test results are negative for COVID-19 disease, employee to return to work or recover at accommodation until fully recovered.
- When test results are positive for COVID-19 disease, follow the below procedure: - https://corona.gov.bd/

11.4.2 In Case, Employee Is Diagnosed Positive for COVID 19

Laboratory testing for COVID-19 disease can only be carried out by appointed health care providers with accreditation from Govt. of Bangladesh.

Any employee, tested and diagnosed positive for COVID-19 disease, the health care provider shall:

1. Reporting to Staff (Admin/PM) for further coordinated response
2. **Any emergency matters w.r.t to Covid 19 may please immediately be brought to the notice of DRT (Decision Response Team). The Help Desk Contact No and email id to reach the DRT is 020 67344311.**
3. Confirmed COVID-19 case to be further undertaken by government / local health Machinery.

National Helpline number - 999

Helpline Numbers		
Sl no	**Nearest health complex**	**Helpline numbers**
1	Doctors quarter, sheksaherakhatun MCH(50), Kashiani new hospital(5), Muktijiddhacomplex,moksedpur(5), Tungipara UHC new building(5), Kotaliparasheklutfur Rahman adorshocolledge(5)	Gopalgonj -01880081111
2	Upzila health Complex	Faridpur-0631-63331
3	District Hospital, Naogaon	Naogaon -01911970948

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

Actions Plan by Admin and PM/CM

Upon being informed that an employee is diagnosed positive for COVID-19 disease, the PM/CM shall:

1. Inform client representative on the confirmed COVID-19 disease case, providing employee name, staff number and contact details.
2. Immediately remove the employee from the workplace to avoid any further contact with others.
3. Place the employee under quarantine at a medical facility until fully recovered.

   ***Note**: At medical facility employee will be tested for COVID-19 disease every 48 hours until 2 consecutive test results come back negative.*
4. Vacate and cordon-off accommodation, if provided by company, and immediate section of the workplace of the employee diagnosed positive for COVID-19 disease.
5. Have the workplace and accommodation exposed to confirmed COVID-19 disease case cleaned and disinfected.
6. Inform direct colleagues of employee diagnosed positive for COVID-19 disease of potential signs and symptoms and arrange for a COVID-19 test.
7. Request employee to provide details of direct colleagues and other persons he/she engaged with over the previous 2 weeks (contact tracing).
8. Initiate contact tracing and COVID-19 testing based on information provided by the employee and the "stone-in-the-pond" principle:

a. **First line contacts**. Individuals with close and lengthy contact with the employee tested positive for COVID-19 disease. Typically, persons who share the same accommodation (apartment).

b. **Secondary contacts**. Direct work colleagues of the employee tested positive for COVID19 disease.

***Note**: Extent contact investigation to thirdly or less intensive contacts will take place if transmission under first line and secondary intensive contacts have been demonstrated.*

c. **Thirdly contacts**. Individuals with incidental or sporadic contact with the employee tested positive for COVID-19 disease or individuals sharing the same accommodation (apartment) with a direct work colleague of the employee tested positive for COVID-19 disease.

Actions to be taken by Admin: -

Upon being informed by the health care provider that an employee is diagnosed positive for COVID-

19 disease, below mentioned action to be initiated immediately: -

1. Initiate pre-approved communication to inform all employees on the new and actual situation.

Inform family members (emergency contact details) of employee diagnosed positive for COVID19 disease and provide them with name, address, and contact information of medical facility. Liaise with concerned to inform direct colleagues of employee diagnosed positive for COVID-19 disease of potential signs and symptoms and arrange for a coronavirus test at health care provider in coordination with Ministry of Health

APPENDICES

Appendix -1
Safety Plan

REFERENCE:

The following standards are referred in the Specifications: (National/International)

i) IS Codes, HSE Codes and HSE Manuals as applicable to activities of the Project work.

ii) OHS guidelines and provisions issued, if, any by the Management.

iii) HSE guidelines and provisions issued, if any, by the statutory and Regulatory Authorities, Local bodies.

iv) ISO -14001:2015: Environmental Management Systems (EMS)

v) ISO - 45001:2018: Occupational Health & HSE Management System (OHSMS)

vi) Safety Manual (TL/SS/Railway/Monopole/RE/Civil)

vii) HSE Management Book

viii) All Format & Procedure.

ix) Client Guideline

CONSTRUCTION ENVIRONMENT & SOCIAL MANAGEMENT PLAN

A. PROJECT HIGHLIGHT

This Safety Plan is a dynamic document for (G-479) 230kV / 132 KV Transmission Line Project, package for polling station is located in Gopalganj, Naogaon and Faridpur district of Bangladesh. It is based on ISO 45001 system, It will be updated / modified as per the situational need considering the requisite HSE aspects. The (G-479) 230kV / 132 kV Transmission Line to established transmission system for evacuation of power. The (G-479) 230kV / 132 kV Transmission Line has 191 km in length. The project duration is Approx.36 months.

GENERAL

TLL site believe to operate in a manner, which will serve primarily to protect all employees, including Contractors' employees, from injury, illness and fire.

The objectives of this document are to ensure that the rules for creating safe and efficient work environment, are enforced to protect all personnel employed on the Project and that all works are undertaken in a safe and orderly manner.

The global commitments towards achieving the HSE goal become a part of the TLL Safety manual and procedures.

These rules do not exempt the subcontractor from statutory duties but are intended to assist in attaining a high standard of compliance with those duties.

The rules specified herein are in no way intended to relieve the sub-Contractor from any obligation or liability under the Contract, nor is it intended to relieve the sub-Contractor of any of his legal obligations.

In all matters arising in the performance of the Contract, the TLL sub Contractor / Gang shall conform to all Statutory Regulations and By-Laws made with statutory authority by Government Departments or by Local or other Authorities or TLL site that shall be applicable to the Works.

It is mandatory to follow all norms to TLL site staff & subcontractor in this Plan

The TLL site in the performance of the Contract shall not endanger the HSE or unlawfully interfere with the convenience of the public in any manner.

The TLL's representative on Site shall communicate details of these rules to all employees and to all Subcontractors and Subcontractors' employees employed on the Site.

Purpose of the Project Safety Plan

- To establish & define chain of command for resolution of all the hazard prevention issues.
- To define individual hazard prevention & HSE promotional responsibilities at each level of the construction job for the team.
- To identify highly hazardous operations within the scope of work & specify integrated
- Preventive measures to mitigate the same.
- To determine broad parameter of HSE management at the site level.

ORGANISATION POLICY ON HSE

To comply with the requirement of HSE in all its activities, TLL has formulated its "Safety Policy" and has compiled this HSE Specifications along with the Safety Manuals.

TRANSRAIL

SAFETY POLICY

We believe that all Health Hazards are containable and all accidents are preventable. To achieve these we shall

- Conduct all operations safely and follow relevant statutory requirement for safely.
- Maintain Machinery & Equipments in proper working order.
- Identity control and eliminate possible hazards and take appropriate measures to prevent risk to our employees.
- Inculcate a high sense of responsibility by conducting training programmes so as to maintain clean environment.
- Provide necessary safety appliances while at work to carry out all operations safely.
- Carry out periodic audit to ensure implementation of suggestions to achieve best results.

Date : 01-05-2017

D.C. Bagde
Managing Director

TRANSRAIL LIGHTING LIMITED
Corporate & Registered Office :
Registered Office : 501, A, B, C, E Fortune 2000, Block G, Bandra Kurla Complex, Bandra East, Mumbai - 400 051. Maharashtra, India
Tel. No. : +91 22 61979600, Fax No. : +91 22 61979666, Web : www.transraillighting.com, CIN: U31506MH2008PLC179012.

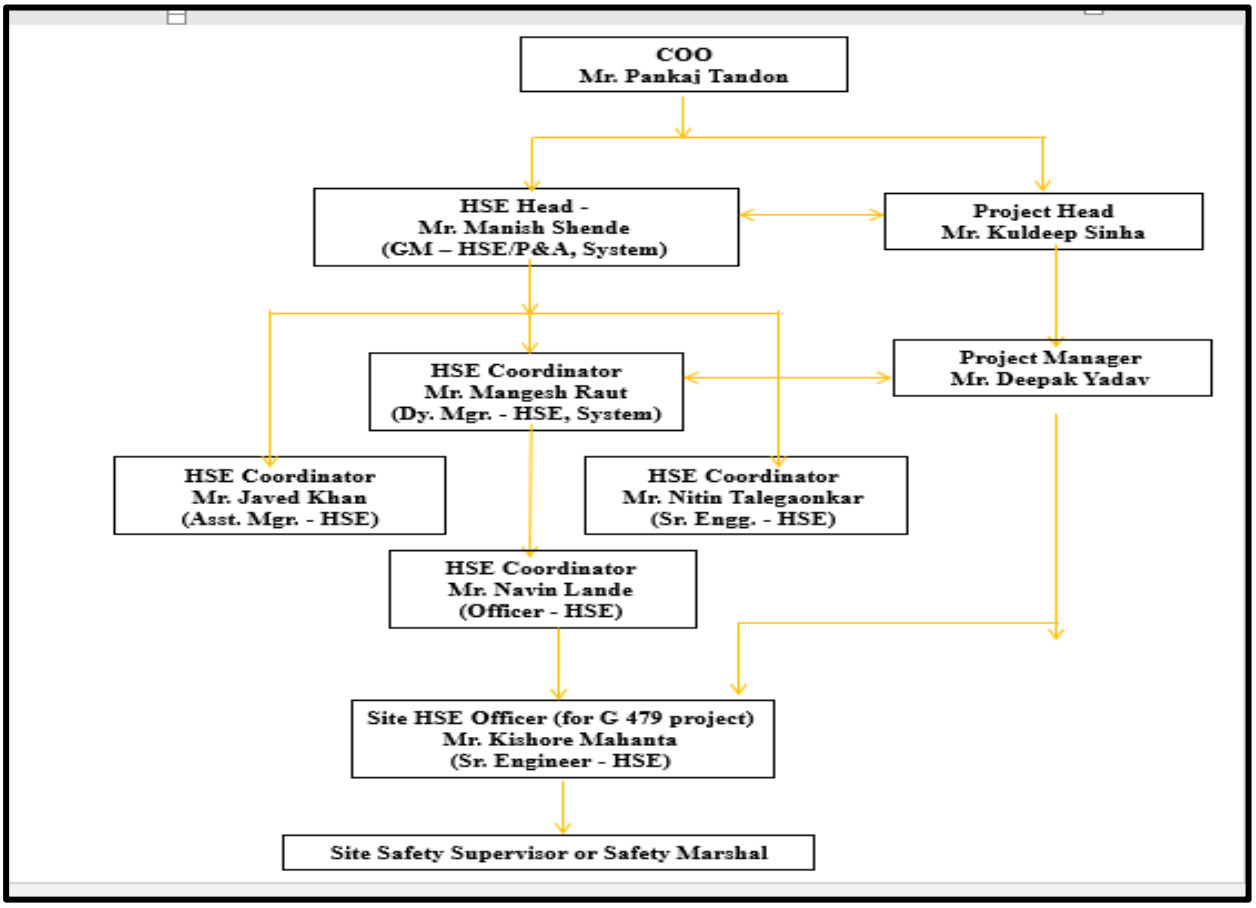
B. ORGANIZATION STRUCTURE & CHART

Internally, the management will be the responsible for the HSE, providing the essential resources for the implementation, control and improvement. Ultimate responsibility for HSE rests with top management. The Chief Operating officer will appoint a member of the management with particular responsibility for ensuring that the HSE management system is properly implemented and performing to requirements in all locations and spheres of the operation. The appointee shall have defined role, responsibility and authority for:

Ensuring HSE management system requirements are established, implemented and maintained in accordance with HSE Plan.

Ensuring that reports on the performance of HSE management system will be presented to Top management for review and as a basis for improvement of the HSE management system.

HSE organization reporting Structure



HSE MANAGEMENT

- Skilful HSE Management involves knowing :
  - What is to be done?
  - Who is to do it?
  - When it should be done
  - How it should be done
- A Project Employee's needs to know the rationale for each requirement as well as how to implement the requirement itself.
- The Project/ Construction Site is responsible for initiating, maintaining and supervising all HSE precautions and safe practices in connection with the performance of the OHS related personnel and property in keeping with Safety Policy of Company.
  - IS codes, OHS codes, HSE management book and Safety Manuals as applicable to all activities of the project work.
  - HSE Guidelines and instructions.
- The HSE Procedures and Check list/ Format are covered in the HSE Management book.

1. HSE checklist for foundation work
2. Permit Procedure for Blasting
3. Permit Procedure for Height work
4. HSE Checklist for Erection work
5. HSE Checklist for Stringing work
6. Individual Checklist for Site supervisor/HSE Officer/Section I/C
7. Code of conduct/Guidelines/procedure for HSE

OTHERS

- In addition to HSE practices/Site shall maintain & follow the OHS requirement as per ISO 45001. **OHSMS Aspect;**

1. Risk Register
2. Vender Assessment
3. Management programme
4. Legal Register
5. Construction Objective
6. Other (if any)

SAFETY MANUAL (Safe Operating Procedure)

The site is having Safety manual based on various construction activity of project; TLL site HSE manual contain following aspect.

- HSE Policy
- HSE Procedure of activity
- Personal Protective equipment
- Inspection of T & P
- General and Other HSE Part

C. COMPANY RESPONSIBILITY (TLL)

1. Take all reasonable practicable steps to ensure best possible working environment.
2. Allocate sufficient resources.
3. Take steps to ensure that all known HSE factors are taken into consideration during design, construction and operation of Sub Station and Transmission.
4. Ensure adequate HSE instructions are given to its employees.
5. Provide required PPE's.
6. Inform its employees about any material, process, and equipment known to be potentially hazardous.
7. Regularly review all processes and methods to make necessary changes in the light of experience and latest knowledge.
8. Provide appropriate facilities of first-aid and prompt treatment for work place injuries.
9. Provide appropriate instructions, training, retraining and supervision on OHS and first-aid issues and ensure adequate publicity.
10. Ensure implementation of fire prevention and firefighting services including training facilities for the personnel.
11. Make available professional advices for potentially hazardous areas.
12. Collect, analysis and present data's on accidents and dangerous Incidents with a view to taking Corrective and preventive actions.
13. Promote participation of employees on HSE matters.
14. Publish/notify instructions, regulations and notices in common languages understood by the employees.

15. Prepare OHS rules for different operations.
16. Ensure regular periodic HSE inspections of sub-stations, equipment's, workplace and operations.
17. Coordinate with contractors to ensure implementation of OHS system.

RESPONSIBILITY AND ACCOUNTABILITY (Project Responsibility)

- Project IC, Sub-Contractors, Supervisors, Engineer and Workers must recognize that, they each have a role in the OHS process. Project Management has a responsibility to provide their employees with a safe and healthful work environment. Project Management must also ensure that employees have the proper tools, personal protective equipment and other resources needed to execute their work safely.
- Supervisors, engineer has the responsibility to ensure that each of their subordinates clearly understands how to perform their work safely and that they follow safe work practices.
- Workers shall make sure they understand how to perform the work and shall have the tools and protective equipment they require to perform the work following approved safe work practices.

HSE is an integral, full time component of each individual's responsibility.

EMPLOYEE'S RESPONSIBILITIES

- To be HSE & Health Conscious.
- Observe HSE rules, procedures & codes of practices.
- Use with reasonable care, the tools, equipment, HSE equipment provide by the company.
- Maintain the tools, equipment, & HSE equipment provided by the company in good order.
- Participate enthusiastically in HSE training programmes.
- Report potential hazards.
- Take Active & personal interest in promoting OHS at work.

SUB-CONTRACTOR'S/GANG RESPONSIBILITIES

- It is the obligation of all subcontractors/Gang to become familiar with and adhere to the provisions of TLL Health & HSE Policy and contractual obligation to provide a safe and healthful working environment to their employees and to the persons at the site who may be affected by their work.
- The subcontractors/Gang shall follow the rules as per Management HSE guideline and provision in work order.

- Comply all the regulation of HSE plan any regulation applicable to work Comply with the construction method statements and any TLL document provided in the interest of Environment health & HSE.
- Ensure that all of their employees designated to work on site are properly trained & competent to work.
- Ensure that all plant and equipment they bring on site has been inspected and serviced in accordance with legal requirement and manufacturers or supplier instructions.
- Make arrangement to ensure that all employees designated to work on or visit the site present them for site induction prior to commencement of work.
- Ensure that a responsible person accompanies any of their visitor to site.

NOMINATION OF HSE OFFICER/PERSON & EMERGENCY CONTROLLER

- Site has Nominated Mr Kishore Mahanta (Sr. Engineer - HSE) for project to look after OHS aspect.
- Project I/C and HSE person shall nominate Emergency controller team for G479 (230kV /132 kV Transmission line project.

D. DUTIES OF HSE REPRESENTATIVE

- To advise the management to fulfil its obligation, statutory or otherwise, in prevention of personal Injuries and to maintain safe working environment.
- To advise workers in planning & organizing measures to prevent personal injuries.
- To advise on HSE aspects of construction work.
- To carry detailed OHS studies.
- To check and evaluate the effectiveness of actions taken to prevent injuries.
- To advice in purchasing of PPE.
- To ensure that quality of PPE conform to national standards.
- To conduct HSE inspection of construction work.
- To advice on measures for removing unsafe conditions.
- To advice on measures for preventing unsafe actions.
- To investigate all fatal and other selected accidents
- To investigate all dangerous occurrences.
- To investigate all cases of occupational diseases.

- To advise on maintenance of all necessary records in respect of accidents,
- Dangerous occurrences and occupational diseases.
- To promote working of HSE committees

E. SELECTION, EVALUATION & CONTROL OF SUB CONTRACTORS/COMPANY GANG

SELECTION OF SUB-CONTRACTOR

When selecting a contractor & awarding a contract; TLL Site shall be using HSE scoring card to engage the contractor or contract award in working new season along with technical work criteria. This scoring card is based on last HSE performance of respective sub-contractor/Gang and only those sub-contractor/Gang shall be allowed/awarded the contract, those who have more than 7 marks (Out of 10).

Major Point of Scoring Card

1. Quantity of HSE violation in last season.
2. Repetitive major HSE violation.
3. HSE performance (Site arrangement, Practices)
4. Accident status
5. Behaviour towards OHS Part
6. Methods and Practices
7. Sufficient skill manpower
8. Involvement In training Part

F. PROJECT HSE TEAM (HSE COMMITTEE)

In order to realize the HSE targets, TLL site along with subcontractor Established an Independent HSE committee who has common understanding of HSE requirements. This would enable all participants to recognize their restrictions and site conditions.

a) Composition of the HSE Committee

HSE Committee shall consist of all representatives including labour.

- Chairman – Project Manager
- Secretary – Site HSE Person
- Other Representative Member
  - Section In charge
  - Site Engineer / Site Supervisor
  - Store I/C
  - Commercial In charge / Site ADMIN Person
  - Workers Representative / Invitee – Store / Site workers
  - Worker's Representative / Invitee (Sub contractor/ Gang leader)

b) Functions of the HSE Committee

- Make periodical inspections of the work site and all its equipment in the interest of OHS and hygiene.
- Oversee the compliance with official regulations relating to OHS.
- To secure the cooperation of all the employees and workers to the awareness of OHS on the site.
- Drawing up of the HSE rules at project level.
- Evaluate circumstances and causes of all accidents occurring on the site.
- Make necessary recommendations for preventing the Occurrence or recurrence of accidents.
- Recommend imposition of penalty on the worker/subcontractors / staff who do not comply with the HSE rules.
- To review HSE training
- To review Monthly HSE report.
- To suggest of measure to improve welfare facilities.

Meetings

- HSE Committee meetings shall be held minimum once a month, and in addition, immediately after the occurrence of an accident or incident affecting OHS.
- Project I/C shall arrange suitable meeting place to allow members of the committee to attend the meeting.
- Agenda shall be prepared for every meeting and circulate in advance to all member.
- Minutes shall be distributed as soon as possible after each meeting.
- TLL site is having the HSE committee format to facilitate the site HSE committee meeting.

The agenda broadly cover following

- Confirmation of minutes

- Chairman's review /overview of site HSE performance/condition
- Previous month HSE statistics
- Last month Major HSE Violation & incident (If any)
- Action against HSE violation by Supervisor, HSE person (Yes or Not)
- Incident accident Investigation/dangerous occurrence /near misses report
- If any Internal / External HSE Inspection / Audit / Visit; then its Compliance / Review / action for Improvement.
- HSE Induction and Daily Pep Talk of workers to be ensured.
- Motivational HSE Program / planning to improve HSE performance and efficiency.
- Any specific HSE Legal requirement apart from regular or suggested by Client / Govt. body / others.
- Required PPE's / HSE equipment's and its proper usages / control during work
- Report from Employer/ Client.
- Health & Hygienic part of labor camp / 1st aid part / Health awareness training & others.
- Matter arising
- Any other Points.

The chairman shall inform the member of outstanding issues in the meeting and in case repeated offence /noncompliance by some members or other co/subcontractors; then propose suitable disciplinary action including provisions of monitory penalty as per rules.

G. OHS TRAINING AND AWARENESS PROGRAM

1. Awareness Program

- Awareness Program shall be an integral part of HSE Management. The awareness needs both of the Gang/sub- contractor's worker as well as the departmental staff. It is to be identified in relation to the job will be executed and awareness plan accordingly made and conducted.
- This will be done through company Induction program which is design for staff and subcontractor /Gang worker.

2. HSE Induction Training

- Project site personnel and sub- Contractor/Gang Workmen shall undergo HSE induction/training sessions with the aim of familiarizing them with the requirements of the health, HSE and environment as detailed in work procedure of OHS.(skill matrix procedure and Induction training, Pep talk and other).
- Sub-Contractors' workers & New employees shall be given proper induction regarding HSE practices while at work before being allowed to work at project sites. (By HSE person / Project Manager)

(Ref.: Transrail/Const/IT/014 – HSE Induction Training)
(Ref.: TLL/HR/001 – Skill Matrix Report)

3. Meeting

Periodical HSE meetings schedule shall be prepared to discuss HSE matters. Decide HSE targets and conducts site OHS events for motivating and improving consciousness among all participants.

Review HSE performance and statistics of all participants, evaluate the causes and consequences, study and suggest necessary improvement. Highlight high-risk works and coordinate necessary measures for improvement.

TLL site to conduct pre-construction meeting with all the subcontractors to express the OHS requirement and necessary preparations for each subcontractor.

4. Various Training

This shall include details of training programme to be implemented at project site. This shall provide a list of training topics to be covered in training and frequency of such programme shall be mentioned in HSE training matrix of OHS Assurance Plan.

This shall spell out the procedure of initial site orientation / induction of all workmen / supervisory personnel on HSE practices before allowing them to commencing work at site. All required training to be provided for various categories of Employees. (Refer – Training Plan)

5. Tool box talk

Toolbox talk shall be conducted every day to all high risk and normal works workmen every day

On spot practical skill development training on height HSE including Scaffold HSE crane HSE, welding HSE, electrical HSE, traffic HSE for marshal shall also be conducted to all Gang Leader / workmen who were associated to the concern jobs.

All vehicle drivers including hydra operators shall be trained on defensive driving And all drivers all undergo HSE training n defensive driving once in six month.

The HSE training program to all employees will be conducted once in quarter as per their work.

This shall also describe the frequency of toolbox talks to be conducted for workers and identify topics related to construction activities and precautions for those works. List of topics of toolbox shall be modified as per the ongoing activities at site.

7. Skill Mapping (Competency)

- SOP FOR SKILL MAPPING AND TRAINING & DEVELOPMENT OF OPERATIVES.

1. Objective

Skill Mapping is a process which facilitates in identifying **"Threshold skill and Skill Gap"** in the site for Job/Role Holders, which collectively attributes in achieving Business Objectives. This process is also imperative under IMS.

2. Scope

This procedure shall cover:

1. Project sites – Operatives engaged in critical activities like Erection / Stringing.

A. Project sites – Operatives engaged in critical activities

Sr. No.	Activity	Responsibility		Accountability
		Primary	Secondary	
1	Identification of Skills in consultation with Project In-charge	HSE and Admin Head for Sites	Site HSE In – Charge	HSE and Admin Head for Sites
2	Assessment of skill on pre-defined rating scale	Project In-Charge	Site HSE In – Charge	HSE and Admin Head for Sites
3	Storage of Skill assessment record	HSE and Admin Head for Sites	HQ - HR	HSE and Admin Head for Sites

✓ **Period of Assessment:**

Threshold skill assessment will be done at the time of his engagement, considering selection criteria as defined under:

- Medically fit as per Company Occupational Criteria
- Age not less than 20 years
- Experience :

Fitters: 2 + Years of experience of working at Height in T/L
Asst. Fitters: 1 year experience of working at Height in T/L
Re-assessment of the skills would be done on completion of **one year** of service

✓ **Retention of Skill assessment record** :

Retention period would be till the time gang doesn't get transferred/closure of project, whichever is early.

3. Training Need Identification

Data generated in the process shall help in identifying the gaps in skills for each job / position holders.

4. Conduct training

On the basis of gap analysis, inputs shall be given to bridge the gap, in form of training. It could be of two types:

- ✓ On job learning
- ✓ Class room learning

Responsibility Matrix for arranging training:

Location	Responsibility
Operatives at Project Sites	HSE In-charge at site in consultation with HSE and ADMIN Head for Site.

5. Rating scale

1 - I don't know I can't do
2 - I don't know but I can do
3 - I know I can do
4 - I know I can do I can teach

Required Threshold level for skill is defined as 3.

(Ref.: Skill Matrix Report)

H. Pre- Work Review Meeting/Planning Work (For Critical Job)

- As per the critical Job/work, Pre work review meeting shall be conducted by project I/C, HSE person, Supervisor or Engineer at their level in advance for ensuring HSE aspect/measure.
- A construction project cannot depend on experience from previous projects to resolve its detailed design, erection and co-ordination problems. Therefore, there is no need to do detailed planning of all construction work to identify and plan ahead for the special problems and challenges that will arise.
- Planning enhances HSE by identifying in advance any special equipment, tools, or HSE devices needed to do the job properly and safely. This means the necessary equipment required for particular work to be done must be present on site, in good working order and ready to use. This level of preparation will ensure that people will not be tempted to use unsuitable equipment for fear of causing delays to the work schedule.

Do not leave it to the last minute:

Consideration must be given to –

1. Programming of construction work to show important stages of work so that one

Subcontractor does not create hazards to another subcontractor;

2. The need to provide information, instruction and / or training to people directly or indirectly Involved with the working principle, method statements should include a risk assessment and Identify actual / potential hazards with suitable precautions to avoid such hazards.

Proper planning includes developing a safe system of work before work commences. Actual and potential hazards should be clearly identified and the best control measure utilized. Typical control measures in order of importance include:

- Hazard elimination
- Substitution
- Use of Barriers
- Rules / standards
- Use of warning systems
- Use of personal protective equipment.

I. HSE AUDIT / INSPECTION

HSE Audit

HSE audit with the purpose of identifying state of cleanliness, unsafe condition, unsafe practices, and any infringement of HSE, health and environment aspect shall be carried out on monthly basis at each project by the following:

- Project I/C
- HSE Officer
- Third party

- The Quarterly (Internal)- Joint audit by the Project I/C and the HSEO shall be conducted at site; so that the site is inspected once in a Quarter.
- Joint-audit by the Section I/C and the HSEO shall be conducted once in a month.
- Audit reports to be circulated to the Sub Contractor/ Gang and project officials concerned
  - Observations made during Audit must be followed up immediately.
  - External Audit will be conducted by external agencies that are competent with OHSMS qualified auditors and recommended by TLL. This audit will be conducted @ Yearly basis throughout currency of the contract. This audit will be conducted as per TLL contract

requirement. It's report to be directly sent to TLL by Third Party agency. (As per Client / in the month of Dec.)

(Ref.: Self Audit Inspection / IMS/HSE Internal audit inspection Point)

HSE INSPECTION

Planned general inspections are performed at predetermined interval and it usually involves with the representation from both subcontractor and the Employer HSE Officer.

These types of inspection include:

1. Monthly inspection by HSE officer/Project In charge or Section in charge.
2. Weekly OHS inspection by construction supervisor & to cover this inspection; supervisor Must be used individual HSE checklist.
3. Daily OHS inspection by HSE Officer/section in charge/supervisor through Individual HSE checklist
4. Routine inspection is often referring to the inspection of work Site, equipment and Temporary structure performed by Site.

This type of inspection include:-

1. Daily inspection plant n equipment by operator
2. Weekly inspection of Scaffold by Scaffolding supervisor
3. Yearly inspection of lifting machinery, lifting appliance, equipment and gears by Govt. approved competent person
4. Specific inspection are performed on activities without a predetermined date.

The following are example that will be commonly performed as required on construction sites. This type of Inspection generally performed by competent supervisor

- Inspection perform before heavy lift operation.
- Inspection performed before & after the entry of person into a confined space.
- Inspection performed before & after welding & cutting operation Etc.

Other inspection includes the following:

1. Mandatory inspection by Labour Department / Any Government Dept.
2. TLL- HO HSE Management team.

All deviation shall be rectified within the agreed period. Weekly HSE inspection Report shall be recorded and submitted to the Project Head/HSE In charge of HO, site in charge, site

supervisor of the applicable work, and all subcontractors. These reports shall be used in the constriction meeting /progress meeting to discuss and confirmed that deviations are rectified with in the agreed period.

SAFE WORK INSPECTION

- Field Engineers, Supervisors and gang leader shall inspect work areas prior to the start of work, and on a frequent basis during the work execution, to identify existing or potential hazards for analysis. They shall also monitor the job site activities under their control to assess the effectiveness of their HSE measure /implementation and to identify hazardous conditions or activities that need immediate correction or require additional awareness programs.
- Transrail's site representative and HSE Officer will have authority to remove a person (fitter) from site who is not obeying HSE Instructions and will not be allowed to climb on the towers. In his place, his substitute (amongst the identified fitters only) will be allowed to climb on the tower.
- Section In-Charge will visit minimum 4 gangs as per day and maintain a log book of his visit and furnish report to Project Manager as per format No.**Transrail/CONST/IND-CHKL/013-B** (Individual HSE Check list) particularly, Mentioning about the HSE Issues".
- Section In-Charge will get feed - back report from Transrail's representative and based on this feed- back he will decide about continuation of erection gang or decide penalty to the sub-contractor in consultation with Project Manager.
- HSE Officer: He will carry out random / surprise visits to ensure that above mentioned procedures are being followed and he should give report on every Monday to Project Manager with a copy to Regional Office and HSE In-Charge in Head Office, in Format No.**Transrail/CONST/IND-CHKL/013-C** (Ind. HSE Check List).

CONTRACTOR'S/GANG RESPONSIBILITY IN CONTEXT TO INTERNAL/ EXTERNAL HSE AUDIT/ INSPECTION

- Irrespective of inspections/Audit carried out by Project I/C & HSE Officer, Internal/External audit team; the Sub-Contractor / staff will take all HSE related precautions and measures to keep all project personnel and public at large in absolutely safe condition at all times from any action taken by him/them for execution of work.

J. Prevention of Accident Incident

- Accidents do not simply result from “bad luck ". They are generally caused by persons who indulge in unsafe practices or create unsafe conditions. Most accidents can be prevented if every employee conscientiously tries to avoid and eliminate unsafe practices and conditions.
- Every employee has the responsibility to act positively to prevent accidents from occurring.
- Every project employee/sub-contractor/engineer and worker has to follow the rules/Guideline / procedure during work ;
  - OHS work system
  - Guidelines for site HSE aspects.
  - Work Procedure for HSE Implementation
  - Guidelines for site, HSE person and staff
  - Travel Guideline/ Traffic Management
  - Procedure for of permit to work

ACCIDENT REPORTING

- In the accident case (Fatal/Major-Disability Matter): The Site HSE Person & project I/C shall report to HSE Head and Construction Head within 4 Hours of its occurrence.
- HSE I/C shall report to management immediately on getting the information from site within 8 hrs.
- Similarly HSE I/C/, Site HSE Officer shall report to respective govt. department in prescribe format as per time bound Procedure.
- The accident report shall be submitted to project I/C and HSE I/C at HO in company
- Prescribed format. **(Ref.: F/Const./FOR/009A & 016)**

Incident Investigation and Analysis

The purpose of the Incident Investigation and analysis is to ensure that every accident Thoroughly to determine its cause and corrective and preventive measures is implemented to Prevent recurrence of similar accident.

The following aspect of the dangerous occurrence/accident incident shall to be covered.

a) Was the accident due to unsafe condition/unsafe act?

b) Was the accident due to lack of knowledge/skill/training?
c) Was the accident due to carelessness on the part of employee?

Accident Investigation:

- Accident shall be investigated as per procedure available in Incident Investigation procedure as per IMS system laid down by management.
- Similarly, Investigation Team to be formed as per procedure at site.
- Near miss, first aid Investigation to be investigated at site by SO and other.
- The accident investigation report shall be submitted at HO within 7 days from the date of Accident in prescribed format. **(Ref.: F/Const./FOR/009)**

K. PENALTIES AND REWARD/AWARD SYSTEM (Action Plan)

Penalties

- This procedure describes for remedies which need to be invoked in cases of serious HSE violation & accident. It is given in work procedure in respect to HSE part.
- Accident results in loss of life and/or property damage. It also damage reputation of company. Most of accident are avoidable and cause preliminary due to negligence. Site will penalize sub-contractor/ Staff and Individual working on project sites for violation of TLL HSE norms. If HSE violation continues then serious action will be initiated against the offender as per action plan. (Sub-contractor employee/Gang employee/Staff/subcontractor.

K.1 Action Plan for HSE Violation

STEP:-

1st Instance - Warning Letter through Violation Slip.
In 2nd – Penalize the contractor/Gang through Violation Slip. (Bangladeshi Taka 500/- against each person and violation) from contractor's bill, for major violation or in repetitive nature.

3rd Instance – Work Stop

And 4th Instance - To issue show cause notice thereafter; Removal the gang/contractor from project.

Action against staff for Safety Violation:-

Project Manager or Mgmt. person will be authorized to issue warning letter to offender (Staff) and 500/- Bangladeshi Taka Penalty. If more than 4 violation committed by any staff in a month, then he will be losing bonus/KRA and in serious part Removal also.

Safety Violation Slip – Format…

K.2. Action Plan for Accident

FOR FATAL/DISABILITY ACCIDENT:-

Accident	Fine - (Bangladeshi Taka) from Employee Salary	Responsible
FATAL	10000	Project In-charge
	5000	Supervisor/Engr. or any employee posted during the incident at location
	5000	HSE Person
	5000	Section In-Charge
DISABILITY	10000	Project In-charge
	5000	Supervisor/Engr. Or any employee posted during the incident at location
	5000	Person

ACTION PLAN FOR FATAL ACCIDENT AGAINST SUB CONTRACTOR:-

Accident	Penalty Amount (Bangladeshi Taka) will be deducted from RA Bill	Responsible
FOR FATAL ACCIDENT	25000	First Incident.
	50000	For Second Incident & Removal from the company.

L. Reward/Award System

Similarly; to motivate or appreciate the valuable efforts of project people / worker/ sub-Contractor / gang towards Safety/Health/Environment. TLL is having the Reward/Award System.

HSE AWARD/REWARD CRITERIA: - (Subcontractor /Company Gang / Staff)

HSE Award - Project – On Completion part only

Category -

For Best Project in HSE ---- Trophy & Appreciation certificate.

For Best HSE Officer - -----do----

For Best New Entry in HSE - -----do----

Provision for HSE in Annual Appraisal System - As per Mgmt. Guidelines, 20 Marks for

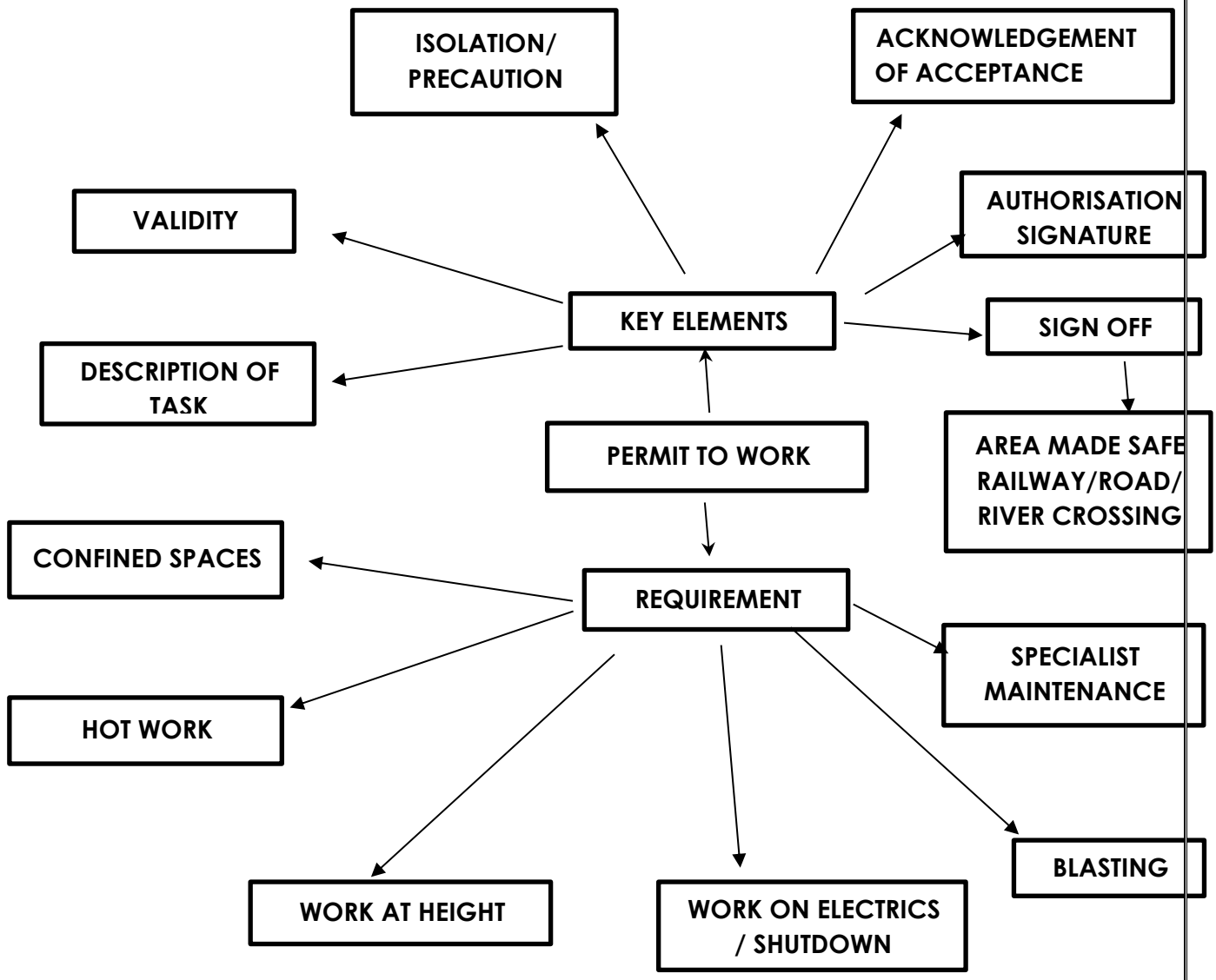
HSE / IMS Works.

Reward -

A) For Transmission Line :-	**Working Period**	**HSE Criteria**	**Reward**
Foundation work - 150 Nos. Up to 220 kV And 100 No's for 230 kV & above (On Continue Basis)	1st Sept'- 30th June.	Without any accident, Major HSE Violation. And Proper Implementation of HSE Part during work	Trophy and Certificate
Erection Work :- 700 MT up to 220 kV And 1350 MT for 400KV & above (On Continue Basis)			
Stringing Work: - 100 Km. UP TO 220 kV And 60 Km for 400KV & above.(On Continue Basis)			
For Sub contractor/Gang --- Trophy and Appreciation Certificate.			
For Monitoring Staff (Supervisor/HSE Officer/Section I/C & Project Manager) - Trophy & Appreciation Certificate.			

M. Permit to work System (Height/ Blasting/ Shutdown)

- PERMIT TO WORK SYSTEM:-



M.1 Height work Permit

Process:

To carry out the Height work Job, HSE person of site/Section I/C/ Engg. /Supervisor shall issue the Height permit to Gang Leader/particular fitter/person.
Work Permit (Height) person shall fill up height permit clearly and completely and ensure personally safe working condition. Along with permittee, issuer need to conduct Pre-task meeting for particulars permit job or conducted TBT/Pep Talk on only permit issuing matter.
Work permit receiving person shall instruct to follow the HSE requirement to the person who will do the job. After Completing the Job, receiving person shall fill up the permit and hand over copy to Site Person (Gang leader).
Location I/C shall check the completed job and sign the copy and hand over the copy to Site HSE person for record purpose.

The Validity of Height Permit shall be seven days from the date of issue if job and person involved in the works remains same otherwise new permit to be prepared and issue.

M.2 Blasting Work Permit

Process:

For carrying out the job of Blasting at location; Project authority (site) shall issue the permit to particular sub-contractor/Gang. (Respective Project I/C, Section I/C & HSE Person) Work permit issuing person shall fill-up permit clearly and completely and ensure personally safe working condition given in permit.
If more than one job permit is required; then Project I/C and only HSE person shall issue the permit to each job.
Permitted shall instruct to follow the HSE requirement to the person who will do the job.
After Completing the Job; receiving person shall fill up the work permit and sign and hand over to HSE Person for record purpose.

The Validity of permit for two days if the job and person involved in the job remains same otherwise new permit to be prepared/issued.

Blasting Permit ---------- (Transrail/Const./BLS/05 +Loc. Checklist)

M-3. & M-4. Work Permit (Shut down/ Hot work)

Process:

For Carrying out the Shut Down/Hot Work & other work Job, HSE person of site/Section I/C/ Eng./Supervisor shall issue the work permit to Gang Leader/particular fitter.

Work Permit (Shut down/Hot work/other) person shall fill up permit clearly and completely and ensure personally safe working condition.

Work permit receiving person shall instruct to follow the HSE requirement to the person who will do the job.

After Completing the Job, receiving person shall fill up the permit and hand over copy to Site Person (Gang leader).

Location I/C shall check the completed job and sign the copy and hand over the copy to Site HSE person for record purpose.

The Validity of work Permit (For, Shut down/Hot work & other) shall be Two days from the issuing date, if the job and person involved in the work remains same otherwise new permit to be prepared and issue.

Similarly; for shut-down activity (Electrical), approval /clearance to be obtained by client or Project /site (if applicable) from respective SEB authority. And then, as per HSE requirement work to be done in shut –down activity (Ref –Precaution. For LT Line)

Work Permit (Shut Down/Hot Work & Other) --- Transrail/Const./WP-SDHP/017.

N. TRAVEL GUIDANCE & TRAFFIC MANAGEMENT

- **Travel Guidance**

TRAVEL/ TRANSPORT HSE GUIDELINE FOR COMPANY EMPLOYEE

AT THE STAFF BUS STOP:-

1. Always walk on left side to the bus stop.
2. Walk on the sidewalk. If there is no sidewalk, walk on the left facing traffic.
3. Always go to the bus stop about five minutes before the bus is scheduled to depart.
4. At the bus stop, wait in a safe place.
5. Never speak to strangers at the bus stop and do not take lift from them.
6. While crossing the road look to left side & then to right side.

INSIDE THE BUS:-

1. Go directly to a seat and remain seated in the same place in the entire journey and be alert in the journey.
2. Talk slowly so that the driver will not be distracted.
3. If you need to talk to the bus driver; wait for the bus to stop.
4. Never throw anything's inside or outside the bus. Never play with the emergency exits.
5. In case of emergency, listen to the driver and follow the instructions.
6. Do not pip or put your body part outside the window, when the bus is running.

EXIT THE BUS:-

1. While getting down from the bus; to walk (not run). Stay away from the bus wheels.
2. Only get in and down from the bus at your destination stop. If you need to reroute the bus Somewhere else, you need to have a note from HR and Admin Dept.
3. If you leave/forget something in the bus, do not run towards the bus and if possible collect from the next stop/day.

GENERAL HSE GUIDLINE (DURING THE TRAVELLING):-

1) Travel by Train is preferred if the distance is more than 200 KM. Otherwise Travel by Bus up to 200 Km.
2) To provide the information about your tour/destination to respective HR / ADMIN Dept., HOD and guardian with all required details like address, phone number and if possible, hotel address.
3) Emergency Number should be displayed inside the company Bus/Vehicle.
4) 1st-Aid Box with the required material should be available inside the vehicle at desecrated location.
5) Avoid the carrying large amount Cash and try to use Debit or Credit Card while travelling for tour expenses.
6) Overtake the vehicle only; where it is absolutely safe & vehicle is opposite direction is at safe distance.
7) Do not mix drinking and driving.
8) Do not use mobile phone while driving.
9) Stop your vehicle on red signal and drive caution when the signal is in orange colour
10) Keep safe distance between two vehicles while driving.
11) Always wear seat belt while driving the four wheeler and suggest the other passenger to wear seat belt.
12) Always wear helmet while riding two wheeler.
13) Do not exceed the speed limit while driving.

i. Speed Limit for Vehicle; 80km/hrs. (as per condition)
ii. Speed Limit for Bus; 60km/hrs. (as per condition)
iii. Speed Limit for two wheelers ; 50 Km.

14) Always maintain the log-book and vehicle maintenance register.
15) Traffic Rule must be followed by Driver and Traveller.
16) If you want to over stay on tour at any place, kindly inform to your guardian, HR Dept. and HOD.
17) Try to use Potable drinking water on Tour.

18) All the documents/records of vehicle must be available inside the vehicle. Like; Insurance, Driving License, RC Book, PUC & Body fitness certificate etc.

HSE GUIDELINE FOR VEHICLE/ CAR FOR ATTENDING OFFICE WORKS:-

1) Make sure that the car you're renting is in good condition.
2) Wear seat belts and keep the doors locked at all times.
3) Do not pick up stranger.
4) If you see suspicious looking people around, do not get down from vehicle.
5) Do not park the car in a remote area at night.
6) Try and avoid driving at night after 12 'O' Clock (midnight).
7) Before traveling, make sure that 1st Aid box is available with required materials at dissipated location.
8) Do not mix drinking and driving.
9) Do not use mobile phone while driving.
10) Stop your vehicle on Red Signal and drive carefully when the signal is in orange colour.
11) Keep safe distance between two vehicle while driving
12) Driver should fill-up Diesel/Petrol on his side when he drives the bus/car. To avoid the accident not to change or cross the road to fill-up the Diesel/Petrol.
13) Driver must be medically fit.
14) If you want to move the vehicle from pre decided destination to another destination, kindly inform to HR and your HOD.

TRAVEL HSE GUIDELINE FOR TRAIN JOURNEY:-

1) Always buy railway ticket from railway station or from authorized railway ticket counter/Travel agent.
2) Give the information about your tour to respective HR / ADMIN Dept., HOD and guardian with all required details like address, phone number and if possible, hotel address.
3) Always reach the railway station at least before 15 min.
4) Always mention your contact address on the luggage
5) Always carry ID proof (Voter card/Driving license, etc.) with yourself.
6) Do not take food from unknown person.
7) Always carry water bottle.
8) Do not stand near the door, if the train is running.
9) Do not take your hand outside.
10) Do not carry flammable product on train.
11) Always carry medicine (Vomiting/Headache/Stomach Pain/Antiseptic cream etc.) with yourself.
12) Follow the HSE rules provided by railway.
13) Do not get down from the train till the train stops.
14) Always carry railway travel guide, if there is any emergency you can change your travel plan.
15) Please contact to Railway Police for any difficulties or problem.
16) To listen the music inside the train, use earphone so that other passenger will not be disturbed.
17) If you are carrying any office material (heavy) during travelling, kindly take the receipt from **Railway authority to avoid any problem/difficulties during travelling.**

TRAVEL GUIDELINE FOR AIR/FLIGHT:-

1) Give the information about your tour to respective HR / ADMIN Dept., HOD and guardian with all required details like address, phone number and if possible, hotel address.
2) Always reach the Airport before one hour & for International travelling before two hours.
3) Flammable liquids and solids such as lighter refills, lighter fuel, matches, paints, thinners, fire-lighters, lighters should be avoid during journey.
4) Do not take alcoholic drink (wine) during the journey.
5) Use the airsickness bag when required.
6) Avoid sleeping during take-off & landing.
7) Pinch your nose and blow - especially during descent.
8) If you have a cold or ear infection, see your physician before flying. Use of Nasal Drops (as prescribed by your physician) is recommended before take-off & landing in these cases.
9) The boarding pass must be checked before boarding the flight.
10) To ensure your baggage tag and it should be corrected
11) Check the boarding/departure time on the boarding pass. Always listen the public address announcements.
12) Follow the security and HSE regulations provided by Air line.
13) Ensure your mobile phones are switched off during the Air journey.

INCIDENT:-

In case of Incident, same should be reported immediately to the respective supervisors/HOD by phone and investigations carried out and actions taken to prevent recurrence. In case accident happened by company vehicles then; driver shall familiarize themselves with the emergency response procedure associated with travel.

- **Traffic Management**

All construction workers/staff should were high visibility jackets with reflective tapes as most of viaduct/tunnelling and station works or either above or underground of way.

The guideline principles to be adopted for HSE in construction Zone are to

- Warn the road user clearly and sufficiently in advance.
- Provide safe and clearly mark lanes for guiding road user
- Provide safe and clearly mark buffer and work zone
- Provide adequate measures that control driver behaviour through construction zone.

- **Legal Permission**

Wherever operation undertaken are likely to interferes with public traffic ,specific traffic management plans shall be drawn up and implemented by contractor in consultation with the approval of local police authorities and /or the concern metropolitan /civil authorities as the case may be.

- **Regulatory Signs**

Regulatory signs impose legal restriction on all traffic. It is essential therefore, that they are used only after consulting the local police and traffic authorities.

- **Warning Signs**

Warning signs in the traffic control zone shall be utilized to warn the drivers of specific hazards that may be encountered.

- **Traffic Cones and Cylinders**

Traffic cones of 500 mm, 750mm and 1000mm high and 300mm to 500mm in diameter or in square shape at base and having red & white retro-reflectorized shall be used wherever required.

- **Barricade**

Vehicles used solely for transporting of tools and equipment may be allowed / access to/from the working area(s) for unloading/loading only through the authorized gate. All vehicles shall return to the authorized car park after unloading.

Owners of vehicles parked illegally will have their car pass taken off them and told to remove the vehicle from site. They may have their site pass withdrawn and be refused further access to the Construction Site.

All drivers shall hold a current driving license – which shall be produced on request – appropriate to the vehicle they are driving / asked to drive. The TLL / subcontractor shall

Keep a log of these and note pertinent information, eg., expiry dates, grade of vehicle license Covers, disqualifications. The Contractor also shall be responsible to intimate the drivers to Observe all speed and traffic regulations. (The speed limit on site is 25 kms on the approach Roads and 15 kms. in the construction areas). The vehicles should be fitted with an operating Audible warning alarm while reversing. All vehicle drivers including heavy vehicle operators shall be trained on defensive driving.

- All vehicles should have a well-maintained, self-start system.
- All vehicles entering the site for the delivery of the materials should have Fitness Certificate, Emission Testing Certificate, and Insurance & Registration Certificate. Without these valid documents the vehicle shall not be allowed inside the site.
- All vehicles parked on the Site and in the Temporary Construction Car Parks are at the owners' or drivers' risk. Site cannot be held responsible for any damage to, or any loss of a vehicle, or its contents.
- Delivery times may be restricted, by Site / Owners without prior notice.

Risk Assessment

Policy

Risk assessment to be carried for all activities inclusive of routine as well as non-routine activities. In respect of complex and/or inherently hazardous activities the risk assessment carried shall clearly identify the hazards and /or potential risks & specify the steps to be taken to eliminate or minimize the risk & shall be appended with the respective method statement.

Risk assessments will effectively identify foreseeable hazards and either eliminate or mitigate associated risks.
Risk assessment will be carried out to identify hazards in the workplace and assess the risk to employees and others.
The content of the risk assessment will be communicated in the pre-work briefing to the work group.

Definitions:

1. **Risk Assessment**:

A risk assessment is an assessment carried out by or on behalf of an employer, which assesses the hazards inherent in an operation and the risks to the workers & all others who may be affected by the work to be carried out. It will involve identifying the risks present in a work operation & evaluating those risks, taking into account whatever precautions are already in place to establish the measures that need to be taken to perform an activity safely.

2. **Method Statement**:

Method statement / SOP is closely related to a risk assessment and provides the means of transmitting information to those who will be doing the work. When starting a method statement, record the task activity & how you are going to do it. With your knowledge & experience you will know the hazards, risks and the job itself and you will know how to avoid problems, injuries, damage and illness. Think about:

- A safe system of work
- Information
- Instruction
- Training
- Supervision
- Providing suitable and adequate plant/ equipment and personal protective equipment.

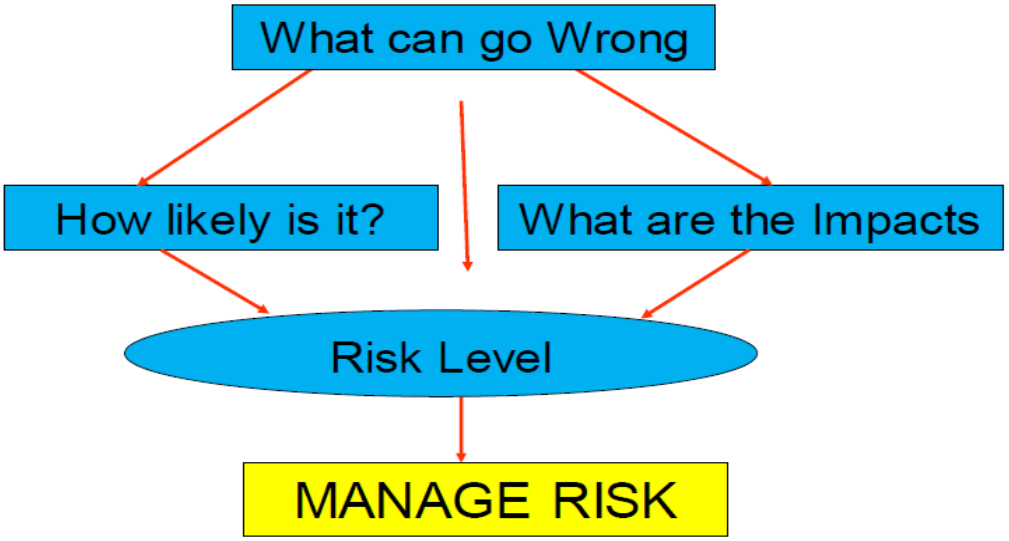
Once the method statement has been written, it will be necessary to prepare a risk assessment to make employees aware of the hazards, risks, procedures and precautions required to protect employees, occupiers and the public.

Risk Assessment:

The risk assessment consists of-

- The careful check of what in the work could injure people, damage property or affect the environment.
- And whether enough precautions have been taken to prevent such harm occurring.

Before commencing any risk assessment a common approach can be adopted.



Risk management also includes control and monitoring of risks, as well as communicating these risks

Stage 1: Preparation: Take time to prepare. Think. Read HSE literature, material HSE data HSE ets, procedures, manuals and make notes of the hazards likely to be in your workplace. Use the experience and knowledge within your business-discuss with other people. Check your accident reports.

Stage2: Touring the work place: Check the area where the work is to take place to confirm amend or add detail to your list of hazards. Identify equipment hazards. Observe your employees and not hazards that confront them. Talk to employees and make use of their experiences.

Stage 3: Completing the Risk Assessment:

Before you considering the controlling hazard, first try and eliminate it by replacing it with something safer (for example use water based paint instead of a solvent based paint).

For each hazard identified/ listed site need to decide whether enough has been done to control the risk.

The health and risk assessment form includes the following steps:

- Hazards
- Risks (Consequences)
- Controls to be introduced to reduce the risk.
- Control measures done by supervisor

Procedure

- A risk assessment must be carried out on any activity that creates the potential to harm the HSE of persons, damage to property or the environment.
- Each supervisor plans his work at least 2 weeks ahead. He needs to know: The tasks to be done
- The materials required, their availability and location.
- Any additional tools or HSE equipment that are required, their location and availability.
- Any drawings or other documents (method statement) that are needed to do the work.
- Any support work from other work groups or sub-contractors prior to or during the proposed Work.

Carry out a Risk Assessment to: -

- Identify the hazards / risks associated with the proposed work.
- Prepare a method statement incorporating applicable controls.
- Prepare the workplace, people and equipment before starting the work.
- Document the risk assessment on the OH &S Risk assessment form
- The front line supervisor then uses the completed form to give a pre-work briefing to those persons who are going to do the work. The work group needs to know the hazards and precautions before work is started.
- Once the pre-work briefing has been done, the attendance shall also be entered. Provision is available for any comments from the work force. The original form should be returned for HSE records. The front line supervisor should retain a copy with him for all the duration of the work. He should make this available to anyone so requesting.

- Check the workplace, tools & equipment & make sure that these are safe before starting work.
- Monitor work performance & correct any unsafe behaviour and /or unsafe Condition as necessary.

Work must be performed in accordance with the method statement and / or risk assessment (HIRA). It cannot be changed without reference to the approving authority.

The inventorying and assessment of OHS risks and critical tasks are provided and updated at least once in six month, or when the conditions for the project change.

Risk assessment will be carried out by the senior staff based on the procedures for hazard identification and risk assessment described above for all areas defined in the project during the planning stage for every activity and it shall be included in the method statement which gives standard procedure for work at site taking into consideration of all risks involved and their respective preventive and corrective actions.

The risk being the product of severity of hazard & the probability of its occurrence, is rated as below

Severity: The severity is rated in the scale of 1 to 3 as follows

Probability: The probability of occurrence is rated in the scale of 1 to 3 as follows:

Risk = Severity × Probability

Evaluation: The evaluation is done as follows:

First step in risk assessment is hazard identification. Identification of hazards should be achieved by critical review of all site activities.

The hazard should be identified and then an assessment of the risk arising from the hazards made. Table shows a simple /preliminary method for estimating Risk level. Once the hazard & risks have been identified, decision can be made on how risks can be eliminated, or controlled. In some cases a further Risk Assessment may be required.

- **MEASUREMENT OF LIKELIHOOD:-**

Level	. Descriptor	Example details description/Frequency
1	Rare	May Only occur in exceptional circumstances (Ex. More than 5 yrs.)
2	Unlikely	Could occur sometime (Ex. Once in 5 Yrs.)
	Possible	Might occur sometime (Ex. Every Year)

3		
4	Likely	Will Probably occur at some time (Ex. Every Month)
5	Almost Certain	Is Expected to occur in many circumstances (Ex. Every Week)

- **MEASURES OF SEVERITY:-**

Level	. Descriptor	Example details description/Implication
1	Insignificant	NO Injuries
2	Minor	First aid Treatment
	Moderate	Medical Treatment Required
4	Major	Extensive injuries (Ex. Permanent Disability)
5	Catastrophic	Fatality

- **RISK ASSESSMENT MATRIX:-**

LIKELIHOOD	SEVERITY				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Almost Certain 5	M (5)	H (10)	E (15)	E (20)	E (25)
Likely 4	M (4)	M (8)	H (12)	E (16)	E (20)
Possible 3	L (3)	M (6)	M (9)	H (12)	E (15)
Unlikely 2	L (2)	L (4)	,M (6)	M (8)	H (10)
Rare 1	L (1)	L (2)	L (3)	M (4)	M (5)

LEGEND:

L – Low Risk – Considered acceptable. NO further action is necessary. **(Scale 1-4)**
M – Moderate Risk – Relatively acceptable. However, further control measure (CM's) should be considered and existing CM's should be monitored. **(Scale 5-9)**
H- High Risk – Unacceptable level of risk. CM's must be developed and implemented in short to medium term. **(Scale 10-14)**
E- Extreme Risk – Unacceptable level of risk. CM's must be immediately implemented or the risk eliminated (i.e Cease activity. **(Scale 15-25)**

The TLL site is having HIRA / Risk Register as per process (activity) at site or location.

On Site Emergency Procedure for Incident and accidents

Emergency Response and preparedness Plan:

- To control Emergency every staff and Workmen has to follow the instruction, direction during

Emergency, which is given by emergency controller/Incident controller.

- Mock drill shall be conducted to check the awareness and preparedness of emergency controller

Team at every project.

- Emergency contact list & emergency service no. connected to emergency shall be circulated and

Displayed by HSE person and other staff will support accordingly.

(Ref.: Transrail/IMS/EPRP/01)

- To control the Monsoon emergency, TLL is also having Monsoon Emergency Plan.

(**Ref.: Transrail/IMS/EPRP/02)**

Appendix -2
Health Plan & Covid-SOP

CONSTRUCTION ENVIRONMENT & SOCIAL MANAGEMENT PLAN

INTRODUCTION:

The terms 'Occupational Health Services' covers services entrusted with essentially preventive function & responsible for advising employee/Sub contractor, the workers and their families on,

A) The requirements for establishing & maintaining a safe and healthy working environment, which will facilitate optimal physical and mental health in relation to work.

B) The adoption of work to the capabilities of Employees in the light of their state of physical & mental health.

PURPOSE:

Identification & assessment of the risks from health hazards in the work place.

Advising on planning and organization of work and working practices.

Providing advice, information, training & education on occupational health, safety & hygiene.

SCOPE:

This Section is applicable to all areas of activities and operations at 230Kv / 132 kV Bangladesh project (G479).

TRAINING & AWARENESS:

Health Pep talk will be conducted on daily basis to create health & hygiene Awareness part at project. Similarly, others Health Training and awareness Program will be conducted by site HSE Persons at Project as per training calendar, Project/ area requirement.

NOMINATION OF HEALTH OFFICER

To monitor & control the health activity at project/site; Project will nominate one health supervisor/ officer.

Probably safety person will be health person.

MEDICAL EXAMINATION

The Organization will conduct the medical check-up of employees (staff/worker) at project, plant, office by competent/registered medical authority.

Health check-up will be conducted based on organization health check-up criteria on periodic basis and record of medical examination to be maintained as per requirement of TLL & BOCW act / other standard at project.

Health Check-up Criteria as follows -

1. Height
2. Weight
3. Blood Pressure
4. Blood check Up (Blood Group, Blood Haemoglobin Blood sugar)
5. Vertigo Test
6. Tetanus Injection/Eye sight / Ear Testing
7. Others, If any (Like; ECG, Available Injury)

LABOUR WELFARE MEASURES

SHELTERS:

Organization will provide suitable shelter to afford protection to the workers in bad weather.

a) For washing
b) For taking meals

TOILET FACILITIES:

Organization will provide adequate toilet facilities to workers/staff at easily accessible places (Ex. At store, office, & base camp & temporary at location.)

For personal cleansing, toilet will have with an adequate supply of water.

Organization will provide adequate washing facilities at toilet area.

If, female staff available at site then arrangement of toilet facility for female staff at project and if not, then no need.

DRINKING WATER:

An adequate supply of potable water will be provided by Site.
Where such water is not available, Admin & SHE officer will ensure that the necessary steps to be taken to make available water fit for drinking/ human consumption.
Drinking water for common use, if stored, shall only be stored in closed containers from which the water will dispensed through taps or cocks.
Where practicable, hygienic drinking water will be provided by site.
Notices prohibiting workers from drinking water with a supply of water that is unfit to drink.
By Regular interval, Liquid medicine to be inserted in water for water purification.
Source of water to be tested by laboratory, based on requirement at site.
Drinking of water will available within reach of employee.

HOUSEKEEPING:

For better health, housekeeping in the area of labour camp to be maintained, it has to be maintained similarly at working area, store, and location also.
Dust shall be kept to acceptable levels for the work being carried out. Waste materials and rubbish shall be cleared up as the work progresses and not left to introduce a safety hazard for other personnel engaged on the works.

Construction materials should never obstruct emergency exit routes; firefighting equipment, emergency alarm call points or other emergency facilities.

Site must engage full time housekeeping crew daily basis. Housekeeping should be treated as continuous operation and not as on activity for end of the day.

From time to time as judged necessary, at the expiration of the contract, or when instructed to do so by TLL site, the site subcontractor shall undertake to clean and tidy his areas of occupation and work to the satisfaction of TLL. If subcontractor fail to do this, TLL site reserves the right to remove all offending materials and debris and to deduct the cost of this operation from the Contract Price. TLL site accepts no responsibility for any materials and/or tools, which may be removed during this operation.

The Site shall ensure the following requirements;

- Ample provision of refuses bins for all rubbish including organic waste such as food wastes, etc.
- Daily clearance of all such bins to the area designated outside the site & approved for this discharge.
- No discharge of deleterious matter such as oils or other industrial waste.

All site offices, toilets, eating facilities, changing rooms, stores, etc, shall be cleaned on daily basis. Housekeeping person shall be appointed by site authority. These facilities shall be checked for vermin on a weekly basis. A report on the subject shall be verified by Project I/C HSE Person.

WASTE DISPOSAL:

Site (TLL) will provide sufficient number of receptacles at suitable places for the disposal of garbage and other waste.
Site will clean waste receptacles and disinfected at suitable intervals.
The content of waste receptacles will incinerate, buried or otherwise harmlessly disposed of at suitable intervals.
Anything, which is unwanted because it is surplus, broken, worn out, contaminated or spoiled in some other way.

Garbage will not place or keep elsewhere than in the containers provided.

MEDICAL CARE AND SUPERVISION

First Aid - General Provision:

Project shall set up a plan for emergency & first aid. In advance for every working area, Site will be informed to every worker/ staff about the plan and instructed accordingly.
Safety person and other responsible personnel will ensure that the plan is strictly adhered to.
Organization will be referred to physician, Medical attendant or person trained in first aid, in case of accident or sudden illness. Medical aid will be available on call.
All injuries, however slight will report, treated and recorded as soon as practicable at the nearest first aid post in prescribed format. (Ref: Transrail/Const./FAR/07)
To spread the 1st aid Awareness, Site/Plant will keep 1st aid Information Book and also display the Poster.

FIRST AID KITS AND BOXES: (Ref: Transrail/Const./FAM/06)

Site will provide appropriate first aid boxes kit as per BOCW act at work place & on motor vehicles and also take care about contamination by dust, moisture, etc.
As per Regulation or standards will be laid down to specify the minimum contents of first-aid kits and boxes. The materials to be available as per 1st aid list.

The Necessary instruction paper will be available inside box.
The responsibilities of first aid box belong to only qualified or trained first aid person.
Regular inspection to be done by safety person for checking the contents of every first aid boxes.
Arrangement of Ambulance at site level or site can used site vehicle for any emergency occurred.

STRETCHERS OR CARRYING BASKETS:

TLL(Site) shall be kept one temporary folded canvas stretcher, Ambu Bag for CPR at every site for medical emergency.

MEDICAL SERVICES:

The organization(Site) will arrange or responsible for emergency medical care working in project/plant, -Like-Ambulance if even the workers/ staff live in the camp, houses at night and it including the provision of medicine and removal to hospital.
The Site will make agreements & tie ups with nearest (5 to 10km) and suitable hospital as per the requirement of project /Plant activity.

RESCUE EQUIPMENT:

TLL Site will arrange rescue equipment as per site requirement, which can be used during emergency.
Suitable transport arrangement will be made by site/Plant to carry the sick or injured workers/staff to the nearby hospital or other equivalent treatment centre.

NOTICES:

Site will display notices in connection with all kind of emergency at our working places. (Store, office & working location).

a) The position of the nearest first aid box, transport facility, stretcher & the place where the person in charge
b) The place of the nearest telephone for calling the ambulance, telephone number and the name of the person/centre
c) The name, address and telephone number of the doctor, hospital & rescue station

FIRST AID PERSONNEL:

From every gang at least three personnel will be receiving first aid instruction, knowledge similarly all supervisors of site and site and safety coordinator also will be receiving instruction /knowledge.
TLL will encourage worker/staff for taking first aid training whenever available.
First Aid record i.e. Name of first aid trained person, Nature of injury& treatment will be maintained in connection to first aid at project.
Record or register will be only accessible to authorized person. (Ref.: Transrail/Const./FATP/04)

CONSTRUCTION LABOUR CAMP (GENERAL GUIDELINES)

ACCOMMODATION

An area will be allocated for temporary site establishment facilities/services. A suitable level hard core surface in the area allocated for temporary building such as offices, stores, workplace, mess huts, Labour camp & stores compound.
Wherever possible and available; labour will be leaving in rented house nearby site location instead of leaving in labour camp. The labour leaving with proper facilities and amenities available there during the project work. There is permanent set up with all arrangement available at every house so that there is no question of sewage waste discharge arise here.

Individual unit IC (Trained on the Covid SOP as attached) for every living quarter to ensure & maintain required facility for the labour.
So the Layout drawing/Sketches of labour camp are not applicable for the project.

PREVENTION OF MOSQUITO BREEDING

Periodic arrangement for Fumigation/spraying of insecticide shall be done for prevention of mosquito breeding at working site & office area, Labour camp. For this, project can identify the competent third-party member/agency for fumigation/disinfection spreading powder for prevention from mosquitoes & other insects bites.

Labour Camp site will be cleared of trees that might cause danger by falling.
The accommodation shall be effectively protected from weather, ground moisture and surrounding condition. Suitable provision will be made for supplies of drinking water.

OCCUPATIONAL HEALTH IN OFFICE

It is important to create a comfortable working environment so that employee feels less exhausted and stressed in place where they have to spend long hours.

OFFICE ENVIRONMENT AND HEALTH

The site will provide suitable environment to our staff/ worker at office/site and store, it include combination of lighting, temperature, humidity, air quality and decoration.

TEMPERATURE

A comfortable temperature will be maintained.

VENTILATION

Site office, & store and Plant area will be ventilated either artificially or naturally. All windows or door will be checked regularly and will clean on regular basis to prevent growth of bacteria or other organisms.

CONTAMINATED AIR

Site will take appropriate control on following measure for reduction of air contamination.

a) Effective air filtration
b) Ensuring that adequate amount of fresh air enter the building.
c) Maintenance of air- conditioning units including regular cleaning.
d) Preventing the obstruction of vent.
e) Locating equipment, using solvent in non-air conditioning area with substantial air movement and/or installing local exhaust ventilation.

LIGHTING

Site will provide adequate lighting at labour camp. Where possible offices will have natural lighting.

OFFICE FLOORS SPACE

Workstation shall be comfortable with safe and suitable chairs and sufficient space.

Welfare facilities

Organization will provide the arrangement for taking meals inside office or ensure they have reasonable access for to these facilities.

GENERAL HEALTH TIPS/INFORMATION FOR AWARENESS

In addition; organization is having occupational health tips books and General safety & Health awareness available in every working area. (plant, site, offices) which is connected with occupational and general health tips/information for employee and their families.

HIV AIDS/NO SMOKING /NO DRUGS/NO ALCOHOL

Peer educators (1 for 100 workers) will be identified and sending for professional training. These peer educators on completion of training shall serve as the local point for any information, education and awareness campaign among the workmen throughout the Project.

The possession or use of illicit drugs & alcohol, Cigarette, Tobacco on site is not permitted. Anyone who is found possessing or suspected to be, under the influence of either will be removed from site.

TLL is having the policy on HIV Aids, No smoking, No drugs, No Alcohol and through this, we are focusing on subject and ensure that all our employee to be free from diseases.

The Site shall take measures to educate and sensitive the labour force Staff on the risks of Communicable diseases such as malaria, STD's, include AIDS. Male and female condoms shall be distributed to workers/staff.

A. Covid-19 SOP:

STANDARD OPERATING PROCEDURE
(Covid-19)

As all of are aware that, Corona Virus (COVID19) is pandemic virus and very epidemic in nature. It is speedily spreader and dangerous. Hence, Central/State government declared total lock down across the country to save the life and break the chain of virus. After the efforts of all and the way all obeyed the lock down, government is allowing to start the work on some respective locations with certain precautionary measures. Now, all are returning to their respective workplaces after the lockdown, it will be important

for each and every member of "Transrail Family" to start and continue the work as per the guide lines and precautionary measures issued by respective government to protect ourselves as well to protect from the spreading of virus. We have to adopt it and follow seriously. Project / plant should begin operation in a phased manner on receipt of permissions from the concerned authorities and follow the below guidelines during the work.

C) Precaution for Prevention of Infection

- Regularly and thoroughly clean the hand with alcohol base Sanitizer or wash the hand with Soap and water at least for 20 second once in 2 - 3 hrs.
- Keep the Sanitizer handy with you (if possible) and use it very often in following circumstances;

d) When we come in contact with other person having the Cough, cold or Fever.
e) After opening or closing the door or others part
f) After use of ATM Machine

- To maintain at least one and half meter (five feet) distance between person who is coughing or sneezing or any other person.
- Avoid touching Eyes, nose & Mouth frequently, especially during travelling & crowded area.
- Avoid handshake with others
- To wear compulsory mask/Scarf or handkerchief during work/at labour camp/office / store or interaction with each other. Without wearing of nose mask/Scarf/ handkerchief person shall not be allowed at working area or entry at working location.
- Neatly wash used Scarf/handkerchief to reuse.
- Safe to Stay at Home/Labour camp if anyone having mild cough/ fever or cold and seek medical assistance as soon as possible.
- Keep up to date on COVID-19 News of area where it is spreading widely / of your area.
- To maintain social distancing at work place, labour camp and also during movement by

vehicle.

- Special care to be taken by office boy after housekeeping; like –Proper cleaning of hand or whole body during the service to others.
- Proper housekeeping and sanitization programme to be made at Project, for office, store, working location, toilet, bath room, equipment, canteen/mess, labour camp and vehicles. This should be done before starting the work, during lunch and after closing the work and if possible in any break of work at site.
- Maximize digital Interaction/communication through phone/mail/VC or other medium with client/sub-contractor to avoid physical meeting.
- Vehicles including transportation vehicles should be sanitized before use.
- Transport parcel, Courier, packages should not be opened / handled for 12 hrs.
- After arrival the company gang/Sub-contr. or staff at site /store, the necessary KYC documents and COVID Vaccination report must be obtained before engaging people at works.
- If, someone does not have COVID Vaccination report or has received only single dose, then RTPCR test of concerned person must be done.

D) Must Avoid some serious activities

- Smoking
- Using Unhygienic mask
- Taking antibiotics
- Close movement with recent traveller
- Hiding travel history with employer, doctor and colleagues.
- Hiding or not disclosing non routine health condition
- Avoid outside food.
- Carelessness in personal hygiene
- Avoid running Air Condition to extent possible and keep site office more ventilated.
- Avoid unwanted movement of outsider people to extent possible at Project office, mfg. Plants, Offices, work locations, stores etc.
- Avoid common use of papers and hard currency handling.
- Avoid biometric Punching till further instructions.
- Avoid personal meeting and have a conference call.
- Avoid crowd by arrangement of various trainings with proper social distancing.

E) Awareness and Communication

- To Inform on COVID-19 precaution to all workers, staff, visitors and Sub-contractor and transporters.
- Intensive Communication and Training on good hygiene practice to be delivered,

Signage's and advisory to be displayed at various visible places.

- Thermal scanning of every employee and outsider (if any) to be done on daily basis at all work places.
- If temperature found more than 37C* to 98.60F during checking, then advise them for further medical consultation to nearest nominated medical centre of COVID-19.
- Minimum manpower resources to be utilized to start the work and follow govt. guidelines time to time being issued. Further as a precaution not to add new Gang or worker at site from outside, also not to allow replacement of any worker.
- To maintain 1.5meter distance between two members while entry into security gate of all work places.
- To maintain social distancing during lunch (by taking at own desk / work place / by staggered lunch breaks).
- All individual shall submit Self declaration form in prescribed format enclosed to this SOP to Project authority / concerned officers at work places at the time of joining the duty.

- To maintain social distancing at labour camps by increasing quantity of labour camps if necessary.

F) <u>Action for Emergency Response</u>

- Do not be panic and baseless belief's
- Organize to isolate the identified Covid symptom person to prevent the spread of virus
- To display and communicate the respective contact details of ERT, and Government hospital of COVID-19 at various places of works (Labour camp, offices, store, Mfg. plants, working locations, vehicles etc.)
- Establish the communication protocol.
- To ensure and organize sanitization of isolated area and all places where the affected person moved and come in contact with different surfaces (doors/handles/wall/materials etc.)
- Inform to family member and track the development of shifted case to medical assistance.
- Immediately inform to ADMIN/HSE Head / HR head / Plant Head / Project In charge / Covid marshal of respective work places.
- To display preventive measures in local and English language for better understanding and communication among masses.
- Medical Insurance to be ensured for all Employees
- Site Level Committee must be formed (PM, HSE Person, Commercial I/C and Section I/C) and they will decide Site operation, roster duty, isolation of sick staff and other COVID-19 measures at site. Similarly, mfg. plants and offices should form committees

for their respective areas.

- To nominate covid19 marshal for each site / factory / office who will be monitoring all the covid19 precautions at site & taking ownership of the same. This person will be directly reporting to chief Covid marshal / Business Heads.
- If, any COVID Patient is detected at project then based on Severity and symptoms, site authority/Covid Marshal must shift concerned COVID patient to the nearest Covid centre /Hospital.

G) DO'S & DON'T

Do's

- Immediately report if any person noticed with COVID-19 symptoms or non-routine health condition.
- Always stay hydrated
- Wash both the hand thoroughly with soap till elbow.
- Maintain good hygiene for immunity
- Drink plenty of warm water.
- Only one person shall take full space in double designed seat to maintain the social distance while travelling in bus or others vehicle. (as suggested in signage)
- To follow the Central/State government guidelines being issued time to time.
- To download the Shurokkha app in your Mobile and update the data.
- To conduct the Medical Check-up of each employees before starting the work. (Cold, Cough and fever)
- Proper coordination with Local administrative authority for any kind of assistance
- All garbage to be removed and properly disposed-off at Isolated area

Don't.

- Do not create panic situation
- Do not encourage to spread the rumours
- Do not give wrong data on travel history or symptoms
- Do not spit or throw trash in Public Places or in working area /location/offices.
- Do not shake hands
- Do not wear same cloth continuously for two days.
- Strict ban on liquor, Gutka/tobacco etc. and spitting should be strictly prohibited and punishable as per the law.

H) Records / documentation. (as per the prescribed formats provided)

- Self-declaration form
- Medical check report. (by the doctor)

- Daily check list (including thermal scanning data)
- Daily pep talk record of covid.
- Daily sanitization record.
- Daily attendance.
- Symptoms record.

Appendix -3
Environment Management Plan

CONSTRUCTION ENVIRONMENT & SOCIAL MANAGEMENT PLAN

1) Introduction -

Environmental management plan has been prepared, which mainly centered on the understanding of the interactions between the environmental setting, assessment, anticipated impacts of project activities and their mitigation measures.

This Environmental Plan is a controlled document. It represents an outline of the health and safety environment management system to be used for 230kV / 132kV Transmission Line (G479) project covering the requirements of ISO 14001:2004, ISO 14001 Environmental Management System (EMS) is a systematic framework to manage the immediate and long-term environmental impacts of an organization's products, services, activities, and processes. The plan is subject to amendment during the execution of the Works during periodic review and whenever it required.

The EMP would help the construction site to implement the project in an environmentally sustainable manner and where contractors, understand the potential environmental impacts arising from the project activity and take appropriate mitigation measures.

2) Environmental Objectives -

The prime environmental objective is to reduce/ minimise the anticipated impacts and to implement the procedure and guidelines for environmental enhancement and recommend mitigation measure to avoid, minimize foreseen environmental impacts at 230kV / 132kV Transmission Line (G479) project Bangladesh Project. To establish documented common procedure for controlling the activities in various construction departments of 230kV / 132kV Transmission Line (G479) project Bangladesh Project, which have significant Environmental Impacts and all the activity listed in Environment Impact-Aspect register in construction division. The TLL Site will extend their project resources and support for environmental management and provide all inputs of manpower for environmental benefits and maintain the health, safety and environment standard at acceptable level. Site will ensure that it will minimized the energy consumption through optimized techniques and energy conservation methods. The Site will follow all safety rules for the reduction of Occupational health Risks & incidents as well as Environmental incidents and Environmental Impacts. The Site will provide the training and awareness program to workers enhancement through participation and consultation.

3) ENVIRONMENT POLICY (IMS Policy)

Transrail Lighting Limited (TLL) Company is committed to conducting all of its activities including Project Management / General Contractor for Design, Procurement and Construction of Civil, Transmission lines, Substation, Railway Electrification and Rural Electrification with the proper regard for the prevention of pollution and compliance with all applicable legal and other requirement.

TRANSRAIL

INTEGRATED MANAGEMENT SYSTEM POLICY

ASPIRATION

To be a flagship company for EPC, Power Transmission, Distribution, Lighting Solutions, Railway & Other Infrastructures globally.

COMMITMENT

- Protection of environment including prevention of pollution.
- Commitment related to context of organization.
- Fulfilment of customer requirements.
- Compliance with all applicable legal and other requirements.
- Continual improvement in all aspects of operations.
- Provide safe & healthy working conditions for prevention of work related injury & ill health.
- Eliminate hazards and reduce OH&S risks.
- Consultation and participation of workers.

PATH

- Energy conservation.
- Maximum capacity utilization.
- Reduction in occupational health risks & incident.
- Reduction in environmental impacts.
- Enhancement in worker participation & consultation

Date: 15-04-2019

D. C. Bagde
Managing Director

4) RESOURCES , ROLES ,RESPONSIBILITIES AND AUTHORITY

The project management will appoint the management representative with defined roles, responsibility and authority to ensure that Company's Environmental Management System is established, implemented and maintained in accordance with the requirements of ISO 14001:2015 at Project. He shall also report to Management on the performance of the environmental management system for review and process continual improvement.

On this project, 230kV / 132kV Transmission Line (G479) project. The project manager has overall responsibility for all matters related to the environment and has assigned the management of this function to the HSE Section Head. The HSE Personal/Environmental Officer to coordinate and assist in the monitoring and implementation of project's Environmental Plan.

The Project Manager shall ensure that effective means of communication and training programmes are put into place to advice employees on environmental issues. Section Engg. and supervisors are responsible for implementing the environmental management system within their own area of the project.

HSE Department

The project management team will support to the site HSE Department. The HSE Personal shall be designated as the responsible person on project with respect to monitoring and management of environmental issues:

- To develop and maintain environmentally friendly working procedures and environmental plans as necessary for controlling site and associated office activities.
- To investigate any environmental incident.
- To keep and maintain environmental records.
- To recommend changes to the environmental management system as required.

To ensure that a system to record and monitor potentially hazardous substances brought to site should be kept in designated place.

Duties and Responsibilities of HSE Officer

- To provide procedure, operating criteria or work instruction/standard operating procedure establish for the significant environment aspect and same will be provided to project for monitoring and control of environment issue during construction activity for significant environmental aspect.
- Cover situation where their absence could lead to deviations from the company policy & its objective and target.
- Include appropriate maintenance activities, operation.

- Where appropriate, communicate relevant procedure and requirements to suppliers & contractors.

Project will nominate one Supervisor as Environmental officer for environment work.

Responsibility towards Environment

Project site are required to follow the environmental management system by

- Taking reasonable care of protecting the environment and preventing pollution.
- Become familiar with all project environmental plans and procedures and implement all control measures defined by the procedures and risk assessments.
- Verify that all necessary submittals are provided as required (e.g. Material Safety Data Sheets, equipment maintenance records, waste quantities etc.).

A -Environmental Responsibilities of Managers

- To ensure the inclusion of environmental considerations when planning work
- Confirming that all persons, whether employed by the Company are competent to execute the required work without harming the environment.
- Ensuring, within his area of management responsibility workforce and other applicable persons are advised of any potential threats to the environment and that the necessary controls and contingency arrangements associated with the work activities are in place.

B. - Environmental Responsibilities of Engineers and Supervisors

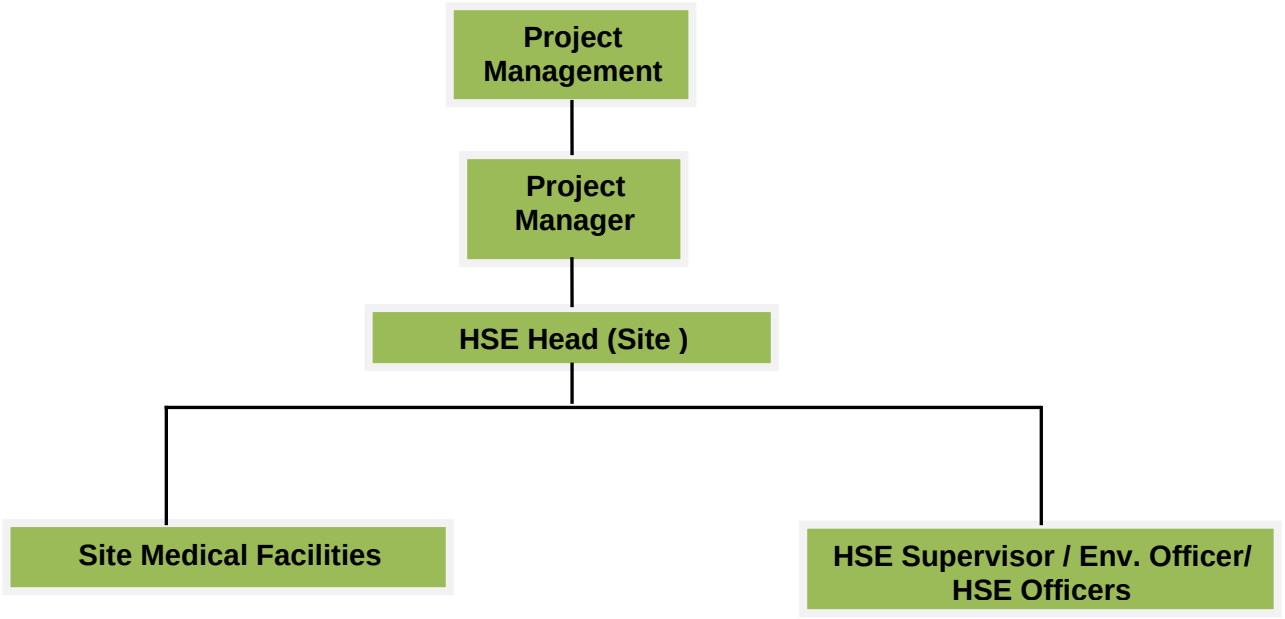
- Taking prompt corrective action on observed non-compliance and substandard industrial practice with respect to the impact on the environment.
- Taking prompt corrective action and notifying line management accordingly with regard to potential adverse impacts on the environment.
- Maintaining, and participating in, the schedule of toolbox talks, meetings, emergency exercises, inspections and supervisory responsibility.

B. - Environmental Responsibilities of All Employees

- To participate in any emergency exercises that takes place at the work location.
- To participate in toolbox talks that is scheduled for his workgroup.

To follow all work instructions relating to the environment that is issued by his Supervisor and Management.

THE ORGANISATION CHART



5) Environmental monitoring & Control (Environment Management)

The Site committed to enhance the environment condition wherever possible by the minimizing the use of natural resources through the reduction of waste, reuse of waste, recycling of waste and the use of appropriate technology. Our environmental management system is therefore an integral part of our daily activities and is managed with the same dedication as project performance and profitability.

The Bangladesh Site 230kV / 132kV Transmission Line (G479) project will ensure that all personnel, including our subcontractors, not only understand the environmental impacts associated with their work through induction and awareness training programs, but also have the appropriate means and controls to prevent environmental pollution.

We are committed to continual improvement of our environmental management system and every employee is actively encouraged to participate in the system by being proactive and to contribute as an individual to its improvement. The company will provide the safe and healthy working environment condition for prevention of hazard associated with work.

The Company's Senior Management as well as project management is dedicated to ensuring that the environmental management system remains effective and that reviews of our environmental performance are held at regular intervals.

All activities are subject to appropriate environmental aspect and impact assessment, incorporating applicable legal and other requirements and providing the framework for establishing our objectives and targets which are reviewed regularly.

Energy Conservation

The conservation and efficient management practices shall be developed at project site towards the energy conservation. We shall use environmentally safe and sustainable energy sources to meet our needs and we will invest in improved efficiency technology wherever available.

Environmental Commitment: We will commit management resources to implement this management system; all employees shall be made aware of their individual responsibilities.

Good Neighbours: The Site will seek to be good neighbours, improve the aesthetic appearance of the site, develop a system for handling complaints and make every effort to provide an efficient and friendly channel of communication. Audit will be conducted. The works will be undertaken in accordance with the applicable National/ international guidelines, standards and specifications on HSE and every contract shall aim to achieve the desire result of following ISO standard:

ISO 45001 - 2018 : Occupational Health and Safety Management System.
ISO 14001 – 2015 : Environmental Management System.

To identify those activities, product, operation and services that are having environmental aspect and impact, assessed and evaluated to identify significant aspects/impact where operational control is required to be implemented and establish a documented procedure for monitoring and measuring of environment performance.

6) ENVIRONMENTAL ASPECTS

The environmental aspects of Bangladesh Transmission line project activities within the defined scope of work with appropriate environmental aspects are identified in environmental aspect and Impact Registered reflecting the activity's impacts and their significance. The Environmental aspects with medium to high impact significance shall be taken into account in determining the appropriate operational controls.

Any other activities on the project site at workshop and the workers' camp shall also adopt environmental friendly work practices in accordance with environmental management system.

The Env. Aspect /Impact register **(Ref: HSE Mgt. Book-F/Const./Env./003)** given below in

Table 1

ENVIRONMENT ASPECT IMPACT REGISTER:-

. No	Activity	D/I	Env. Aspect	Condition N/A/E	Env. Impact	A	B	C	D	E	F	Total (Multiply)	Legal Applicability
1	Heat Treatment Furnace operation	D	Emission of Gas	N	AP	3	5	3	1	5	3	675	Air act section no. consent condition no.
2													

A – Quantity 1 – Very Low 5 – Very High
B – Occurrence 1 – Very Low 5 – Very High
C – Impact 1 – Very Low 5 – Very High
D - Legal compliance 1- Complies 10 – Not Complying
E – Detection 1 – Very Low 5 – Very High
F – Control 1 – Very Low 5 – Very High

CONSTRUCTION ENVIRONMENT & SOCIAL MANAGEMENT PLAN

Sl No	Activity	D/I	Env. Aspect	Condition N/A/E	Env. Impact	Qty A	Occurrence B	Impact C	Legislation D	Detection E	Control F	Total
1												
2												

Quantity (A) Condition 5-1	Occurrence (B) 6-1	Impact (C) 6-1	Legislation (D) 10-1	Detection/ Mechanism 5-1	F-Controls
Score Criteria	Score Criteria	Score Criteria	Score Criteria	Score Criteria	Score Criteria
5- Excessive N- Normal	6-Continous	6-Fatal to human Life	10- Not meeting Legislation	5- More than 24 Hrs.	5- Absence of no effective Controls.
4- High A- Abnormal	5- Several time a day	5–Human health effect	5-Not meeting CTI	4- Within 24 Hrs.	4- Mechanism in Place but not reliable.
3-Moderate Emergent	4-Once a day	4-Affect marine Life Flora & fauna or global issue	1-In compliance/ not applicable	3- Within 8 Hrs.	3- Controls E- need human Intervention
2-Low D/I- Direct / Indirect	3-Once a week	3-Resource Consumption		2- Within 1 Hrs.	2-Has inbuilt Secondary control
1-Negligible	2-Once a Month	2- Caused discomfort or acid rain or noise.		1- Immediately	1- Available & Effective
	1-Very Rare	1- Negligible/Visual Impact			

7) Environmental pollution and control measures

The Project Authority is responsible to ensure that the following prevention and mitigation measures shall be in place for the whole duration of the project operation.

i. Air Pollution
ii. Emission
iii. Noise
iv. Pollutant spill
v. Construction site drainage
vi. Erosion and Sedimentation
vii. Hazardous waste management control
viii. Water Quality requirement at project site.
ix And Other Env. issue Other environmental problem caused by construction camps, quarries and borrows areas.

To control and Proper Monitoring Measure is given in environmental standard operating procedure (SOP).

8) LEGAL AND OTHER REQUIREMENTS – ENVIRONMENTAL COMPLIANCE

The applicable, HSE related, legal and other requirements shall be obtained from the contract documents, and the legislation register maintained and shall be available on site, in a separate file in the HSE office if required.
The Site HSE Personal shall periodically review the applicable HSE related, legal and other requirements and advice the Project Manager regarding any actions and corrective measure to be taken to ensure proper compliances.

PROCEDURE FOR MONITORING & MEASUREMENT OF ENVIRONMENTAL PERFORMANCE

Sr. No	Description	Frequency	Responsibility	Records
1.	Complaints related to environment from interested from parties i.e. Neighbouring organizations and citizens, outsourced service suppliers, employees.	As and complaints arises.	Concerned HOD and P & A dept.	Customer complaint report

ISO 45001- 2018 : Occupational Health and Safety Management System.
ISO 14001- 2015 : Environmental Management System

9) Environmental Assessment

Environmental Impact Assessment (EIA)

It is the process of identifying, predicting, evaluation and mitigating the bio-physical, social and other relevant effect of projects prior to major decisions being taken and commitments made. That potential environmental impacts are mostly temporary, predictable, and reversible, and can be mitigated through adherence to International Standards, and/or implementation of Environmental and Social Management Plan (ESMP), no EIA is required.

Environmental Protection Agency (EPA)

It has the mandate to coordinate, monitor and evaluate the implementation of national environmental policies, programs and projects, including EIA licenses.

OR

The process of identifying, predicting, evaluating a project's positive and negative environmental and social impacts on the biophysical and human environment as well as identifying ways of avoiding, minimizing, mitigating and compensating, including offsetting in the case of the environment and remedying in the case of social impacts, by applying the mitigation hierarchy. During project consultation will be done with direct and indirect stakeholders and the elaboration of an environmental and social management plan detailing the implementation of the mitigation measures.

10) TRAINING PROGRAMME, COMPETENCE AND AWARENESS

The Project Manager shall ensure that adequate resources are available for the internal and/or external training of the workforce in environmental matters.

- Introduction of new technology and/or machinery.
- Refresh training at regular intervals for SOP, ISO 14001 and Energy Conservation.
- Change in system of work for environmental protection
- The main elements of the training and awareness programme are address below aspect.

Subject	Delivered By	Attendees
Environmental Induction	HSE Personnel	All employees, subcontractors & visitors
HSE Duties and environmental Responsibilities	HSE Section Head	Site Staff/ Representatives
Spill Response Training	HSE Section Head	Spill Response Team
Environment Toolbox Talks	HSE personnel	Labour / Staff

11) Mitigation plan of the environmental Issues during construction: (As per IEE Report)

Environmental Issues/ Parameters	Environmental Impacts	Mitigation Measures	Action By
Tree felling, Clearing of vegetation	22,790 trees (>5 m in height) will be directly affected by cutting and trimming, as well as standing crops (if any) and bushes along the RoW will also be affected.	Prior to the start of clearing of vegetation, provide adequate compensation to the owners.	TLL
Requisition of land (loss of 10.6 acres of land for the construction period of about 3- 4 years, and beyond)	Loss of 14.92 acres (6.0 ha) land permanently for 1,140 tower bases of the TL/LILO lines.	Prior to commencement of construction activities, the owners of the affected land must be notified and provided proper compensation as per GoB and ADB guidelines. As per GoB and ADB guidelines, RP should be prepared for land acquisition/requisition/compensation and follow it.	DC
Fauna (Wildlife)	Disturbance of wildlife, especially birds, due to project activities such as moving of project equipment and transports (especially during night time).	Preparation of construction management plan (approved by PGCB before access to site is permitted) by the contractor and follow it. Follow GoB rules and regulations on noise. Project workers should not disturb or kill birds or other animals.	DC TLL
Construction Waste	Generation of construction wastes from the construction materials.	Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time. Provision of facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements Purchase of perishable construction materials such as paints incrementally to ensure reduced spoilage of unused materials Use of building materials that have minimal packaging to avoid the generation of excessive packaging waste. Use of construction materials containing recycled content when possible and in accordance with accepted standards. Adequate collection and storage of waste on site and safe transportation to the disposal sites and disposal methods at designated, licensed, engineered and sanitary landfill shall be provided.	TLL
Noise level	Noise pollution due to construction activities, generators, and construction vehicle movement.	It is recommended that no construction should be allowed during night time (9 PM to 6 AM). Avoid using of construction equipment producing excessive noise at any time.	

		Avoid prolonged exposure to noise (produced by equipment) by workers. Regulate use of horns and avoid use of hydraulic horns in project vehicles. Follow the government rules and regulations, EHS guidelines and WHO noise guidance whoever is more stringent on noise.	
Air quality and dust	Air pollution and dust generation due to construction activities, especially during the underground cabling, generators and construction vehicle movement.	All vehicles (e.g., trucks, equipment, and other vehicles that support construction works) shall be well maintained and not emit dark or smoky emissions in excess of the limits described in the Environment Quality Standards (EQS). Specific training will be focused on minimizing dust and exhaust gas emissions from heavy construction vehicles. Drivers of vehicles used during construction will be under strict instructions to minimize unnecessary trips and minimize idling of engines. Dust suppression facilities (back pack water sprayer) shall be available where earth and cement works are required. Spray water on dry and loose surfaces of the construction sites regularly to minimize dust. Maintain adequate moisture content of soil during transportation, compaction and handling. Construction materials (sand, gravel, and rocks) and spoil materials will be transported in trucks covered with tarpaulins. Sprinkle and cover stockpiles of loose construction materials (e.g., fine aggregates, sand). Dust masks should be provided to all personnel in areas prone to dust emissions throughout the period of construction.	TLL
Soil quality	Soil pollution	Prevention of spillage and leakage of liquid at tower sites.	TLL
Sitting of construction camps (if needed for tower construction)	Temporary loss of land for the construction camps for towers. Clearing of standing crops (if any), grass and bushes. Environmental pollution (such as air, noise, water, wastes and soil) affecting nearby the settlements.	Prior to commencement of construction activities, the owners of the affected land must be notified and provided proper compensation as per GoB and ADB guidelines. As per GoB and ADB guidelines, RP should be prepared for land acquisition/ requisition /compensation. Prior to the start of clearing of vegetation, provide adequate compensation to the owners in time. Locate construction camps away from residential settlements, cultural sites, water bodies etc. (minimum 0.5 km). Try to use fallow land and just after completion of construction, hand over camp sites to the owners as in earlier condition.	TLL

Traffic congestion/ road accident	Traffic congestion and road accidents due to movement of construction vehicles.	Follow Bangladesh Road Transport Authority (BRTA) traffic rules and regulations to develop a traffic plan. Schedule deliveries of material/ equipment during off-peak hours. Engage flagman where needed. Engage experienced drivers to drive project vehicles. Arrange for signal lights at night, for proper traffic management. Avoiding stockpiling of materials, especially at the roadsides, that could hamper traffic movement.	TLL
Pollution due to wastes	Pollution due to wastes (construction wastes from construction activities and general wastes from workers' camps)	Solid wastes collection system will be essential, which should include separation and collection of solid wastes in the dustbins/waste containers throughout the tower work sites. Wastes, such as pieces of rods and wood, newspapers, containers etc. can be sold to vendors and the rest must be taken to the licensed, engineered sanitary landfill by the Contractors or licensed third party. A log of the disposal of toxic and other waste materials is to be kept by the Contractors. Contractor should prepare a waste management plan based on the EMP, for approval by PGCB before access to site reflecting national and EHS guideline requirements.	TLL
Community health and safety (H&S)	Community H&S along the transmission line.	Safety barriers and warning signs surrounding the tower construction site. For structures remaining in the RoW a targeted consultation with residents will be undertaken prior to determining final alignment to discuss the health and safety implications, with education program for residents and communities on how to minimize the risks involved. Given the risk of damage to structures within RoW, during construction the contractor will prepare a construction method statement for installation of transmission lines above structures including community health and safety risk assessment and management plan, and provide compensation for any damage caused. Further, final alignment will be reviewed if structures can be relocated out of the right of way with particular emphasis on avoiding schools. Lightening conductor and earth wire will be installed on the transmission line. Resistance of turbine tower feet will be designed to limit lightning back voltage. Metallic components on structures located within the right of way will be grounded, where directly under transmission line. If there are structures with more than about 500m2 of metal surface, provision for reconstruction in	TLL

		alternative materials. If there are structures used to store highly flammable materials, alternative storage arrangements will need to be provided. Formulate and implement an emergency risk management plan, for approval by PGCB before access to site reflecting national and EHS guideline requirements.	
Occupational health and safety (H&S)	Health and safety risks of construction workers.	An experienced H&S Manager must be engaged on each work package with appropriate qualifications and experience and not doubling up on any other jobs by the contractor prior to the start of construction of the towers. Only permitting trained and certified workers to work with any electrical equipment. Before access to site granted, contractor to prepare EHS plan based on risk assessment for approval by PGCB following national and EHS guideline requirements. Safety instruction by the E&H Manager should be provided for the workers and visitors before they will be allowed to access the site. First aid box and personal protective equipment, PPE (such as helmet, safety shoes, eye protection glass, ear plugs, waist belt, mask, hand gloves, body protective apron, ear muff and insulating boots, as needed) must be provided to the workers, and ensure their use by workers. Safety signs as needed at the tower sites.	TLL
Employment generation/ income	Employment opportunities for the local people, especially for PAPs.	Employ local people, especially PAPs, for the tower construction activities as much as possible.	TLL

12) EMERGENCY PREPAREDNESS AND RESPONSE PROGRAMME (Environmental Contingency plan)

The Environmental emergency preparedness shall follow during environmental incidents and spillages of pollutants at (G 479) Bangladesh project. In the event of an emergency, the emergency contact list for the Government Agencies and will be displayed at the site office and the work areas. An emergency preparedness and response is designed to deal in various emergency situations that could occur within their project site / project work and to mitigate the risk and minimize the valuable resources loss.

The Environmental emergencies are mentioned below:

- Potential pollutant spill scenarios for River/Surface water
- Petroleum Products and Oil Spillage
- Chemical Spill during handling.

- Fire and Explosion
- Medical emergency
- Flooding,
- Landslide, Land slumping
- Earthquake.

SPECIFIC EMERGENCY PROCEDURE:

FLOODING:

Inform the client/ dept. Proceed as per following with instruction from client/government.

- Stop work.
- Report to the personnel involved and alert security.
- Evacuate work area if necessary and move to higher ground.
- For localized flooding, secure all loose equipment and construction materials.
- Inspect drainage system and remove any blockage.
- Construct temporary drains & retention ponds & prevent sediment discharge into waterways.
- Inspect trap ponds after flood event and repair any damage and de-silt the silt traps.
- Inspect and reinstate all damaged embankments and retaining walls.

LAND SLIDE AND LAND SLUMPING:

- Stop work.
- Inform client and proceed as per followings with instruction of client/Government.
- Stop work.
- Report to the personnel involved and alert security.
- Log time and sequence of events.
- Barricade the affected area.
- Contain all loose soil and earth with perimeter earth bunds and drains
- Remove debris from the affected area.
- Ensure the area is adequately drained.
- All drainage not to discharge directly into waterways but into nearest silt trap pond.

PETROLEUM PRODUCTS AND OIL SPILLAGE:

- Smoking is strictly prohibited at the surrounding of the storage area.
- Turn off electrical and diesel-powered equipment.
- Determine the source of fuel or engine oil spillage or sources of leakage.
- Prevent any further leakage and spillage.
- Inform any spillage to the Department.
- Cleaning of the spillage with engagement of specialist's consultants, if necessary.

- Removal and disposal of recovered contaminated soil and waste to approved disposal site/ facility by licensed contractor.

FIRE AND EXPLOSION:

- Sound the fire alarm.
- Report fire location to the nearest personnel.
- If it is safe to do so, extinguish the fire using a fire extinguisher.
- Evacuate if the fire cannot be extinguish or starts to spread.
- Call the Fire Brigade.
- Log time and sequence of events.
- If the fire alarm is activated, all workers will assemble to an assembly area and turn off
- Electricity and diesel powered equipment.
- Head count will be conducted.
- Entry to the site is prohibited until it is safe to do so.

EARTHQUAKE:

- Inform client and proceed as per followings with instruction of client/Government.
- Stop work
- Report to the personnel involved and alert security.
- Log time and sequence of events.
- Barricade the affected area.
- Contain all loose soil and earth with perimeter earth bunds and drains
- Remove debris from the affected area.
- Ensure the area is adequately drained.
- All drainage not to discharge directly into waterways but into nearest silt trap pond.

In the event of an emergency, all control operations shall be under the direction of the HSE Officer. This would involve the key personnel in charge of the project with assistance, if necessary, from outside agencies. When incident involves commitment to any outside agency, or when imminent danger extends to the public area, the relevant agency will take charge

13) PERFORMANCE MONITORING AND REVIEW

Environmental key performance indicators

Environmental Performance Element	Key Performance Indicator	Environmental Monitoring
Elimination/Reduction of environmental incidents	No of Environmental Incidents	Monthly /Quarterly Environmental Monitoring Report
Reduction of use of Natural Resources	Total Water consumption Total Fuel and Lubricants consumption	Monthly Environmental Monitoring Report
Increase Awareness, Training, Communication and Consultation	Number of External and internal training courses Number of Toolbox talks	Environmental Monitoring Report
Review / improvement of Environmental Management System	Number of Audits/Inspection Close out of observations and non-conformity report	Internal and external Audit Reports Daily HSE Inspection Reports

For specific measurements (e.g. Air quality, emissions, noise, water analysis, turbidity etc.) the appropriate equipment shall be purchased, calibrated and used or third party services shall be appointed. The Project Manager in consultation with the HSE Dept. shall identify the applicable legal and other requirements and ensure the availability of the appropriate measurement equipment and services.

14) RECORDS

Project / Site personal shall maintain all environmental records that include following:

- Environmental IMPACT & ASPECT Register
- Environmental Training records and drills reports
- Environmental Permits and Impact Assessments
- Environment Incident reports
- Inspection and observation reports
- Environmental Test Report
- Drinking Water Analysis
- Environmental Checklist/ Formats

All environmental records shall be maintained properly to protect it from damage or loss for duration of the project.

Appendix -4
IMS Policies & ISO Certificates

SAFETY POLICY

IMS POLICY



TRANSRAIL

SAFETY POLICY

We believe that all Health Hazards are containable and all accidents are preventable. To achieve these we shall

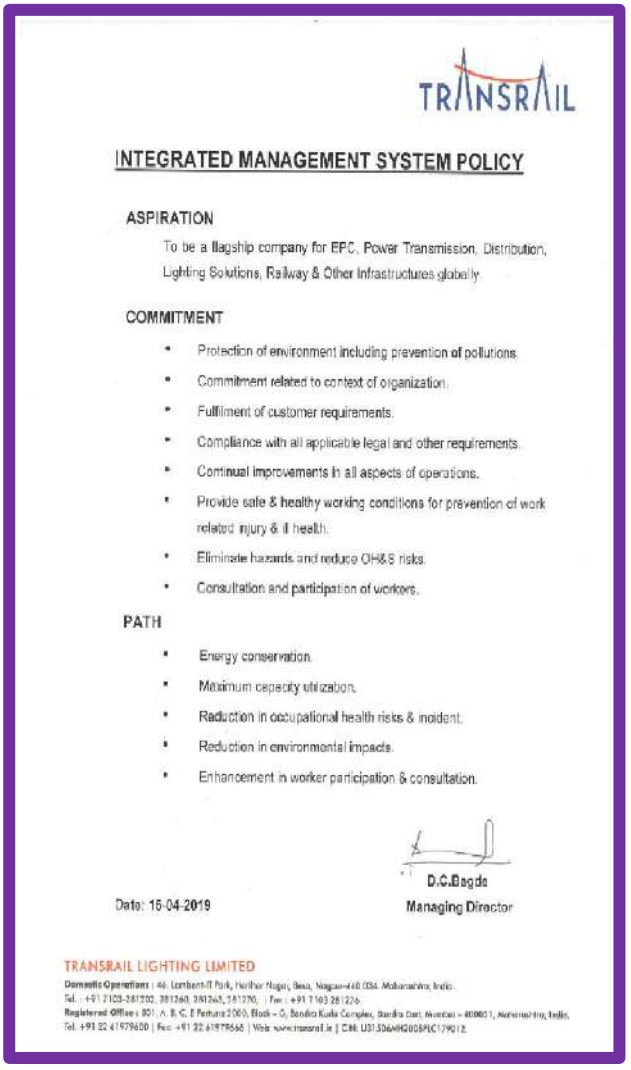
- Conduct all operations safely and follow relevant statutory requirement for safely.
- Maintain Machinery & Equipments in proper working order.
- Identity control and eliminate possible hazards and take appropriate measures to prevent risk to our employees.
- Inculcate a high sense of responsibility by conducting training programmes so as to maintain clean environment.
- Provide necessary safety appliances while at work to carry out all operations safely.
- Carry out periodic audit to ensure implementation of suggestions to achieve best results.

D.C. Bagde
Managing Director

Date : 01-05-2017

TRANSRAIL LIGHTING LIMITED
Corporate & Registered Office :

Registered Office : 501, A, B, C, E Fortune 2000, Block G, Bandra Kurla Complex, Bandra East, Mumbai - 400 051. Maharashtra, India
Tel. No. : +91 22 61979600, Fax No. : +91 22 61979666, Web : www.transraillighting.com, CIN: U31506MH2008PLC179012.



TRANSRAIL

INTEGRATED MANAGEMENT SYSTEM POLICY

ASPIRATION

To be a flagship company for EPC, Power Transmission, Distribution, Lighting Solutions, Railway & Other Infrastructures globally.

COMMITMENT

- Protection of environment including prevention of pollutions.
- Commitment related to context of organization.
- Fulfilment of customer requirements.
- Compliance with all applicable legal and other requirements.
- Continual improvements in all aspects of operations.
- Provide safe & healthy working conditions for prevention of work related injury & ill health.
- Eliminate hazards and reduce OH&S risks.
- Consultation and participation of workers.

PATH

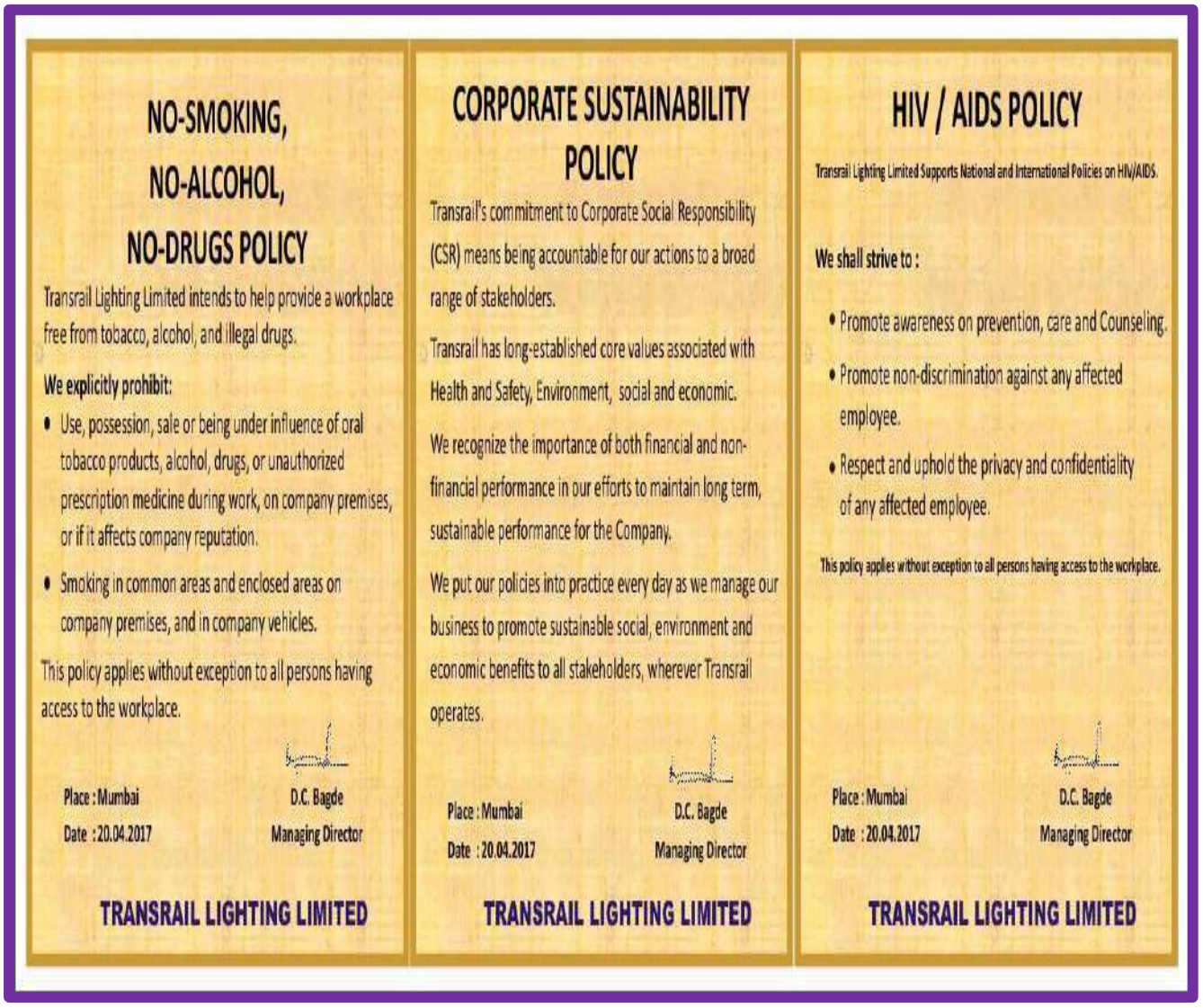
- Energy conservation.
- Maximum capacity utilization.
- Reduction in occupational health risks & incident.
- Reduction in environmental impacts.
- Enhancement in worker participation & consultation.

D.C.Bagde
Managing Director

Date: 15-04-2019

TRANSRAIL LIGHTING LIMITED
Domestic Operations : 46, Lambert-II Park, Hadhar Nagpur, Besa, Nagpur-440 034. Maharashtra, India.
Tel. : +91 7103-281202, 281260, 281265, 281270. | Fax : +91 7103 281226.
Registered Office : 501, A, B, C, E Fortune 2000, Block – G, Bandra Kurla Complex, Bandra East, Mumbai – 400051, Maharashtra, India.
Tel: +91 22 61979600 | Fax: +91 22 61979666 | Web: www.transrail.in | CIN: U31506MH2008PLC179012.

NO SMOKING & CSR / HIV /AIDS POLICY: -



NO-SMOKING, NO-ALCOHOL, NO-DRUGS POLICY

Transrail Lighting Limited intends to help provide a workplace free from tobacco, alcohol, and illegal drugs.

We explicitly prohibit:

- Use, possession, sale or being under influence of oral tobacco products, alcohol, drugs, or unauthorized prescription medicine during work, on company premises, or if it affects company reputation.
- Smoking in common areas and enclosed areas on company premises, and in company vehicles.

This policy applies without exception to all persons having access to the workplace.

Place : Mumbai
Date : 20.04.2017

D.C. Bagde
Managing Director

TRANSRAIL LIGHTING LIMITED

CORPORATE SUSTAINABILITY POLICY

Transrail's commitment to Corporate Social Responsibility (CSR) means being accountable for our actions to a broad range of stakeholders.

Transrail has long-established core values associated with Health and Safety, Environment, social and economic.

We recognize the importance of both financial and non-financial performance in our efforts to maintain long term, sustainable performance for the Company.

We put our policies into practice every day as we manage our business to promote sustainable social, environment and economic benefits to all stakeholders, wherever Transrail operates.

Place : Mumbai
Date : 20.04.2017

D.C. Bagde
Managing Director

TRANSRAIL LIGHTING LIMITED

HIV / AIDS POLICY

Transrail Lighting Limited Supports National and International Policies on HIV/AIDS.

We shall strive to :

- Promote awareness on prevention, care and Counseling.
- Promote non-discrimination against any affected employee.
- Respect and uphold the privacy and confidentiality of any affected employee.

This policy applies without exception to all persons having access to the workplace.

Place : Mumbai
Date : 20.04.2017

D.C. Bagde
Managing Director

TRANSRAIL LIGHTING LIMITED

ISO CERTIFICATE (QMS/EMS/OHSMS): -



DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

Transrail Lighting Limited
46 Lambent - IT Park, Hanrar Nagar, Besa, Nagpur – 440 034, Maharashtra, India

has been found to conform to the Quality Management System standard:
ISO 9001:2015

This certificate is valid for the following scope:
Engineering, procurement and construction of overhead electrical transmission lines, substation, rural electrification, railway electrification, microwave tower and similar structures for turnkey projects



DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

Transrail Lighting Limited
46 Lambent - IT Park, Hanrar Nagar, Besa, Nagpur – 440 034, Maharashtra, India

has been found to conform to the Environmental Management System standard:
ISO 14001:2015

This certificate is valid for the following scope:
Engineering, procurement and construction of overhead electrical transmission lines, substation, rural electrification, railway electrification, microwave tower and similar structures for turnkey projects



DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

Transrail Lighting Limited
Corporate & Registered Office: Fortune - 2000, A - Wing, SEBI/Wockhardt Hospital, Bandra - Kurla, Complex (BKC), Bandra (E) /Kurla (W), Mumbai - 400 051, Maharashtra, India
and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Occupational Health and Safety Management System standard:
ISO 45001:2018

This certificate is valid for the following scope:
Design, Development, Engineering, Procurement and Construction of overhead electrical transmission lines, substation, rural electrification, railway electrification, microwave tower and similar structures for turnkey projects.
Manufacture, Testing and Supply of steel tower for overhead electrical transmission lines, Substation structures, Rural electrification structure, Railway structure, Microwave towers and similar structures and offering services related to testing of towers and monopoles.
Maintaining infrastructure to Manufacture, testing and supply of steel towers for overhead electrical transmission lines, substation structures, rural electrification structure, railway electrification structure, microwave towers & similar structures and offering services related to testing of towers & monopoles.
Design, manufacture and supply of transmission, distribution & other poles, stadium masts, high mast systems, gantries & accessories, other structures, railway structures, design and supply of lighting luminaries
Manufacture and supply of EC & aluminium alloy wire rods and overhead bare conductors for 11 KV to 1200 KV.

Appendix -5
Safety Manual SOP

SAFETY MANUAL (SOP) FOR TRANSMISSION LINE WORK:

1. SAFETY POLICY-



➢ SAFETY POLICY

1. A written document
2. Management recognizes and accepts its responsibility and commitment to safety.
3. Areas of responsibility are identifies and policy decisions are spelt out
4. Responsibilities of both management and employees are documented.
5. Responsibility for implementation is also fixed.

➢ COMPANY'S RESPONSIBILITY

1 Take all reasonable practicable steps to ensure best possible working environment.

2 Allocate sufficient resources.

3 Take steps to ensure that all known safety factors are taken into consideration during design, construction and operation of Sub Station and Transmission.

4 Ensure adequate safety instructions are given to its employees.

5 Provide required PPE's.

6 Inform its employees about any material, process, and equipment known to be potentially hazardous.

7 Regularly review all processes and methods to make necessary changes in the light of experience and latest knowledge.

8 Provide appropriate facilities of first-aid and prompt treatment for work place injuries.

9 Provide appropriate instructions, training, retraining and supervision on safety, health and first-aid issues and ensure adequate publicity.

10 Ensure implementation of fire prevention and firefighting services including training facilities for the personnel.

11 Make available professional advices for potentially hazardous areas.

12 Collect, analysis and present data's on accidents and dangerous Incidents with a view to taking corrective and preventive actions.

13 Promote participation of employees on safety matters.

14 Publish/notify instructions, regulations and notices in common language understood by the employees.

15 Prepare safety rules for different operations.

16 Ensure regular periodic safety inspections of sub-stations, equipment's, workplace and operations.

17 Coordinate with contractors to ensure implementation of safety system.

- **RESPONSIBILITY FOR IMPLEMENTATION:**

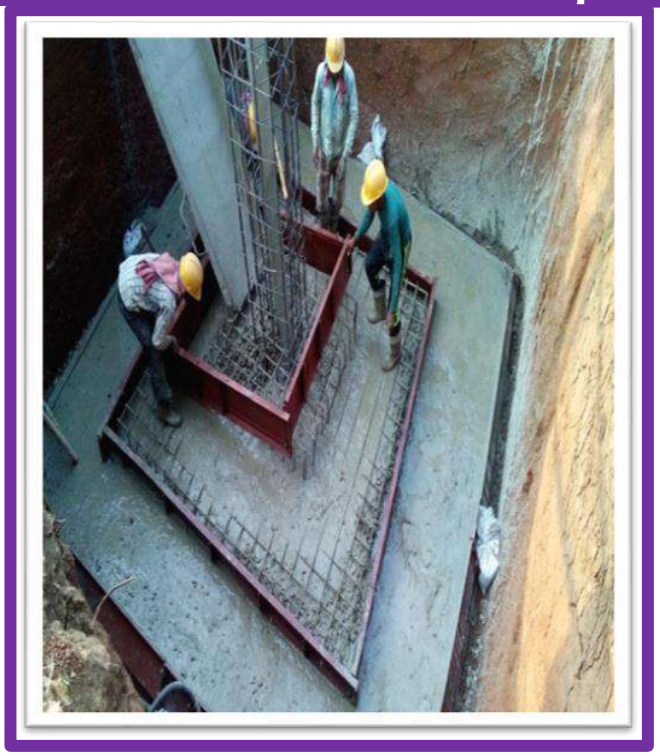
18 Ultimate responsibility is with the management.
19 Corporate personnel division at cc level.
20 Immediate responsibility with the managers / engineers to prevent accidents to the members of their staff and others.
21 Gang & sub-contractor agencies for the work assigned to them.

Safety Manual (SOP) for Transmission Line

II :- SAFETY PROCEDURE







Construction Activity of transmission Line.

A. DURING EXCAVATION AND FOUNDATION

A. SAFETY DURING EXCAVATION AND FOUNDATION:-

1. To check for underground water lines, sewerage lines, electric/telephone cables etc. before start of excavation.
2. Excavated material to be kept at least 1.5 meters or half the depth of the pit, whichever is more, away from the edge of the pits.
3. Boulders etc. to be stacked away to avoid falling back inside the pit.
4. Stepped or sloped excavation in sandy / loose soil locations.
5. The area to be fenced with warning signs (luminous if necessary) closed to villages.
6. Heavy machinery to be placed at least 1.5 mtr. to 2 mtr away from the edge of the pits and anchored.
7. Vibrators should be placed adequately away from pits and anchored.
8. Wheel blocks to be provided to the concrete mixers.
9. Pit should be thoroughly checked daily by an experienced and competent person for development of cracks.
10. Lone worker not to be allowed to work in excavation and foundation area.
11. All workmen working inside the pit must wear safety helmets, gum boots, and hand gloves etc.
12. Shoring and shuttering to prevent pit collapse where necessary.
9. Dewatering pump to be placed adequately away and anchored.
10. Template supporting jacks are to be placed evenly and away from the edge of the pit.
11. Jacks are to be placed level ground on sand bags
12. Supports to be placed below the jacks for distribution of load.
13. Ladders are to be positioned properly.
14. Usages of steel ladders with adequate length for easy movements of workman in and out of the pit.
15. Ladders are to extend at least one meter above the pit ground level.

16. Workmen working above protruding reinforcement bars are to protect themselves.
17. First-aid box should be available at site.
18. Avoid time delay between excavation and foundation activities.
19. All machines/equipment should be guarded during work.
20. Checking the all vehicle documents. Safety/health/legal condition in work order. During work at location proper safety precaution to be taken-like stopper for truck wheel, required distance between from pit, proper supervision.

A. 1) BLASTING OPERATION:-

1. No blasting operations are to commence unless PTW from concern authority has been obtained.
2. Blasting must be carried out only under supervision of competent and licensed persons and by authorized personnel only.
3. All supervisor and work men in charge, engaged in makeup, handling, storage and blasting work must be insured.
4. Blasting shall be carried out during fixed hours of the day.(Early Morning)
5. The site shall be prominently demarcated with red flags for signalling to the worker and villagers about the blasting operations.
6. All routes leading to the blasting area shall be kept under strict vigilance by providing adequate guards.
7. Storage of explosive shall be under the charge of an authorized person, if necessary after his necessary police verification.
8. The loading & unloading of explosive shall be done carefully.
9. The order of the fire shall be given only by the supervisor in charge of the work.
10. This order shall be given only after giving the warning signal three times, so as to enable all the labour and watchmen to reach a safe shelter
11. A whistle with a distinctive note shall be used to give the warning signal. The whistle shall not be used for any other purpose.

12. In case blast has failed to fire or is delayed, sufficient time shall be allowed to lapse before entering the danger zone. The licensed person alone shall go to inspect the Misfire.
13. Re drilling of hole that has misfired either wholly or partly shall not be permitted.
14. At the time of rock drilling workers should wear goggles, gloves, shoes and helmet.
15. No blasting for any purpose shall be done within 300 meters from the boundary of the High Voltage or Extra High Voltage electric supply lines or tower structure without the consultation of the owner of such sub-station or electric supply lines or tower structures; and in case of mining lease hold area, without the written permission of the Chief Inspector of Mines or the Electrical Inspector of mines.
16. Explosive shall not be held in hands when lightening.
17. Stone Breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

A. 2) Pile Foundation

1. All pile-driving equipment should be of good design and construction taking into account as far as possible and be properly maintained.
2. If necessary to prevent danger, long piles and heavy sheet piling should be secured against failing.
3. The work site must be barricaded with appropriate fencing to prevent onlooker and unauthorized person passing into the work site.
4. Display warning notice, signage and safety posters at the pilling location.
5. All workers must wear tight fitting cloths or uniform, helmets, hand gloves, protective footwear and eye protectors.
6. For work, during night the work site shall be well illuminated with at least 100 lux intensity.
7. No material shall be piled, dumped or stacked at random but only in areas specified for the same.
8. Mud/slurry coming out during pile driving shall be stacked/ dumped to designated place.
9. Adequate precautions should be taken to prevent a pile-driver from overturning.
10. Adequate precautions should be taken to prevent the hammer from missing the pile.
11. All holes, which are left unattended, shall be adequately and securely covered or shall have an effective barrier placed as close to the edge as is practicable.

a) <u>Piling Rig Installation</u>

1. There shall be firm level base for pile rig and winch machine.

2. The legs of the tripod shall be firmly spiked in the ground and shall be examined frequently by supervisors as they become unsafe with usage. They shall be replaced, if any physical defects (splits, cracks, knots etc.) are identified
3. The pulleys shall be checked frequently by supervisors. Failure of bolt/pins due to shear is very common in this case. All nuts and bolts which are likely to be loosened due to vibration while piling, shall be checked regularly and tightened.
4. Pile drivers shall not be erected in dangerous proximity to electric conductors.
5. The frame of any rig shall be structurally safe for all anticipated dead, live or wind loads.
6. No pile driving equipment shall be taken into use until it has been inspected and found to be safe.
7. When the rig is not in use; extra precautionary measures for stability shall be adopted to prevent any accidents due to wind, storm, gales and earthquake.
8. Access to the top pulley shall be provided by standard ladders with safety precautions.
9. Exposed gears, flywheels, belts etc. shall be fully enclosed / guarded. Expanded metal or wire mesh of sufficiently small size (approximately maximum 1/2 inch or 12 mm.) opening shall be used all-around the gear box to prevent entry of hands and fingers.
10. A competent person shall inspect pile driving equipment in use at regular intervals. A register shall be maintained at the site of work for recording the results of such inspection.
11. Pulley and other lifting appliances used in hoisting shall be ascertained for the safe working loads. (In case of doubt, actual testing shall be carried out, every hoisting machine and all gears referred to above shall be clearly marked with the safe working load.
12. In case of a hoisting machine having a variable safe working load, each safe working load together with the conditions under which it is applicable shall be clearly indicated. Where electricity is used as power for piling rig, only armoured cable shall be used and the cable shall be thoroughly waterproof by sealing at its ends.

b) Operation of Equipment

1. Piling machine operators should be over 21 years of age and should have sufficient experience.
2. Piles hoisted in the rig shall be so slung that they do not swung around. A hand rope shall be fastened to a pile that is being hoisted to control its movement. While a pile is being guided into position in the leads, workers shall not put their hands or arms between the pile & inside guide or on top of the pile, but shall use a rope for guiding.
3. While pile is being hoisted all workers not engaged in work shall keep a safe distance.
4. Ensure that an operator of every pile-driving equipment is protected from falling objects, steam, cinders or water by substantially covering or otherwise or by other means.
5. All fitting appliances and lifting gear must have certificates of testing.

C) Protection to neighbouring structures and underground services

1. During piling operation, vibration is set up which may cause damage to adjoining structures or service lines depending on the nature of soil condition and the construction standard of such structures and service lines. Accordingly, possible extent of all such damages shall be ascertained in advance by a competent person and operational mode of driving shall be planned with appropriate measures to ensure safety.
2. Wherever, there are old structures, in the vicinity of a site where piling works are to be carried out (which are likely to be damaged), timely precaution to be taken against any undesirable effect.

d) Floating pile-drivers

1. When pile drivers are working over water, all relevant precaution for work over water should be taken and suitable boat should be kept readily available at all times.
2. All member of floating pile driver crews should be trained to handle boats.
3. Floating pile-drivers should be provided with a whistle, siren, and horn or other effective signalling equipment.
4. Floating pile-drivers should be provided with adequate fire-fighting equipment.
5. The weight of machinery on a floating pile-driver should be evenly distributed so that the deck of the installation is horizontal.
6. Deck hatches should have firmly fastened covers that fit flush with the deck.
7. Regular head counts should be taken of the pile-driving crew members.
8. Measures shall be taken to ensure that there is no appreciable movement of soil mass into the bore hole which may cause subsidence to any existing foundation in the close proximity. In wet holes, where such possibilities are likely to be there the same shall be minimized by approved technique and the operation shall be planned.

e) PILE TESTING

1. The testing of pile is conducted under the supervision of a responsible person for such testing.
2. All practicable measures like displaying of warning notices, barricading the area and other similar measures are taken to protect the area where the pile testing is carried out.
3. Entry to a pile-testing area shall be prohibited to general public to ensure safety.

f) Inspection and maintenance of pile-driving equipment

1. Pile-driving equipment should not be taken into use until it has been inspected and

found to be safe.

2. Pile-driving equipment in use should be inspected at suitable intervals.
3. Pile lines and pulley blocks should be inspected before the beginning of each shift.

A. 3) Raise Chimney/Shutter Work

1. Check all shutters are properly aligned and fixed firmly with required lateral supports and ties.
2. Always use wire rope sling and D- shackle with crane for lifting/lowering the shutter material with guide ropes to avoid accidents during handling.
3. Proper staging to be provided.
4. Staging supported properly and well secured.
5. Check all gaps / openings are properly closed to avoid leakage of cement slurry of concrete mix.
6. Strong ladders must be available at site.
7. Check all the spanning members have proper bearing at the supports.
8. Lifting hooks shall be fixed in proper place.
9. All the shutter panels shall be kept vertically on the floor after shifting.
10. Always use wire rope sling for shutter back stay arrangement to avoid accident during handling.
18. All workmen working must use safety helmets, gum boots, and hand gloves & life jacket etc

Safety Manual (SOP) for Transmission Line

1) SAFETY DURING TOWER ERECTION



➢ B. SAFETY DURING TOWER ERECTION

1. Foundation to be properly back filled and compacted.
2. Sufficient area for free movement of men and material.
3. Erection gang should have sufficient skill and experience for the job.

4. Competency & experience supervisors/gang leader should be available with each gang.
5. Derricks and other load bearing T&PS must be of good quality, of sufficient capacity for the job, tested and have proper test certificates.
6. Derricks are to be provided with three guy ropes (and not two as is being followed).
7. T&P'S and PPE's are to be thoroughly checked for their healthiness daily before use.
8. All PPE's should be available at site and checked for their condition daily.
9. All supervisors / workmen at erection site must always wear safety helmets.
10. Workmen should wear Full body harness before climbing on tower.
11. Full body harness to be worn properly.
12. All safety equipment must be CE/ISI marked.
13. Ascending on and descending from the tower should be through step bolts only.
14. Workmen having any injury must not be allowed to work on tower.
15. Towers are to be erected in a sequential manner.
16. Only one main leg section should be erected at a time.
17. Guys are to be anchored to a strong anchorage point.
18. One anchorage point must not support more than one guy.
19. Maximum angle for the guy rope is 45 degree.
20. Main leg members are to be lifted along with step bolts (where applicable)
21. All nuts shall be hand tightened during erection.
22. Heavy sections should preferably be lifted with the help of winch machines.
23. Prior to erection of upper section, tower section shall be completely braced.
24. All diagonals of relevant section shall be in place prior to assembly of upper section.
25. Support of a strong anchorage point to prevent slippage during manual lifting.
26. Work should not be continued under inclement weather conditions.
27. Protect wire rope/PP rope wrapped around tower members by using gunny bags.
28. In theft prone areas tack-welding of b/n to be taken up immediately after erection.
29. First-aid box should be available at site.
30. At least three members of each gang must have been trained in first aid.
31. One vehicle should be available at each site for any site emergency.
32. Prior information about hospital/doctors in the vicinity should be available with the site supervisor.

34. All site engineers/supervisors/gang in charges shall be provided with mobile phones for any exigency.
35. Based on erection stage and requirement; all safety requirement/PPE'S to be provided (belt, helmet, mobile fall arrester rope, horizontal fall arrester rope, retractable fall arrester, safety shoes and safety shoes).
36. Before using of winch machine/gin pole; it must be checked thoroughly.
37. Experience operator to be provided for winch operation.

B. 1) POLE ERECTION

1. Pole erection to be done only by hydra or suitable crane machine.
2. Only experience/skilled workmen and operator to be used during pole erection.
3. Before installation of pole, Pole assembly part to be checked by competent person.
4. Area should be barricaded before work to be commenced.
5. Machine/Hydra must be checked and it must have relevant certified document.
6. After installation, Nut bolt to be fixed properly.
7. First aid box and emergency contact to be kept at working location.
8. Proper PPE's to be used during working like Helmet, gloves, shoes, full body harness etc.
9. Work to be carried out under the presence of competent person.
10. Work not to be carried out in dark light.
11. During installation of pole, it must be check whether HT/LT line is there or not.
12. If yes then required PTW must be taken.

Safety Manual (SOP) for Transmission Line

2) SAFETY DURING STRINGING WORK



C) SAFETY DURING STRINGING WORK

1. Check for completion of erection and tightening & punching of bolts nuts of towers.
2. Sufficient area for free movement of men and material.
3. Stringing gang should have sufficient no. Of skilled & experienced manpower for the job.
4. Each gang shall be headed by competent and experienced engineers/supervisors.

5. TSE and all other load bearing T&P'S must be of good quality of sufficient capacity for the job, tested and have proper test certificates.
6. T&P'S are to be thoroughly checked for their healthiness daily before use.
7. All supervisors / workmen at erection site must always wear safety helmets & other PPE'S.
8. Workmen working on tower should be always use safety belts.
9. Full body harness to be worn properly.
10. Workmen having any injury not to work on the tower.
11. Tensioner and puller must be properly anchored and earth.
12. Reliable and efficient communication arrangement.
13. Stringing should not be taken up; if communication equipment is not working at site.
14. Safe loading /unloading of conductor and earth wire drum using cranes.
15. Ladder and sag bridge to be used.
16. Proper positioning of conductor drums
17. Tuning block (earth) to be provided for both conductor and earth wire during paying out.
18. Earthing of towers in the section to be completed before taking up stringing.
19. For stringing; on one side of the section proper guying and back-stay to be provided.
20. Guying and back-staying of tension towers.
21. Guying and back-staying is to be done by 16 mm Dia. steel wire rope only with anchoring adequately away from tower.
22. If guying and back-staying is to be left for a long duration. The anchoring area is to be fenced and watchman to be posted.
23. Guying and back-staying shall be provided for d-type towers also.
24. Guying and back-staying-provision for adjustment of tension of the guy wires using turn buckles etc.
25. Guying and back staying to be checked periodically.
26. As far as practicable some jumpers are to be left disconnected.
27. Sequence of paying out should be from top; to down for d/c lines.
28. For s/c towers inner phase shall be strung before taking up outer phases.
29. No work should be continued if thunder storm is expected.
30. Protect wire rope/PP rope wrapped around tower members using gunny bags etc.
31. Conductors should not be left in such a position that it may cause danger to general public.
32. Random inspection of hardware fittings.
33. Extra precaution while sagging short spans/single span reaches.
34. Local villagers, especially children should be warned.
35. During final sagging; after the load is transferred to the tower, sufficient time must be allowed for the load to be stabilized.
36. For crossing any existing charged line; shut down and PTW for the existing line must be taken. It shall be ensured that the line is earthen at both sub-stations and locally at site.

37. All the insulator strings should be thoroughly checked before lifting.
38. For working on the conductor or insulator string. Full body harness with twin-lanyards to be used.

C.1) ADDITIONAL PRECAUTIONS FOR STRINGING IN THE VICINITY OF CHARGED OVERHEAD LINES AND IN AREAS WHERE INDUCED VOLTAGE IS ANTICIPATED.

1. All winches, pulleys and TSE must be properly earthed.
2. Conductor running blocks are to be earthed.
3. All the conductors at both ends of the section are to be earthed through running earths.
4. Scaffolds are to be strong enough, should be adequately earthed, provided with anti-climbing devices and warning signs.
5. Sufficient clearance must be maintained from existing charged lines after rough sag.
6. Provision for breaking of paying out of conductor at any point.
7. Earth wire should be earthed before earth bond is fitted.
8. Nylon or PP ropes should be used for hauling/ controlling space ring cycle.

Electrical Safety

Construction operations present a challenging environment to the safe use of electricity due to its changing environment, work outdoors, congestion, heavy plant and movement of materials. Electricity on Construction Sites can give rise to a high level of risk which will only be controlled by effective management and planning.
Electricity can be lethal and statistics show that many accidents involving electricity result in major injury some of which are fatal.
Electric shock is not the only hazard. Where electrical arcing occurs, perhaps as a result of accidental short circuit, the heat generated can be intense and, even if it persists for only a very short time, it can cause deep-seated and slow healing burns.
Temporary electrical connection at site pose potential hazard of short circuit / overheating and may cause fire.

Some of the identified hazards are:

a) Improper cab
b) Arcing.

- People often fail to appreciate the very real risk of injury, which can arise from arcing. The intense ultraviolet radiation from an electric arc can also cause damage to the eyes.
- Arcing, overheating and, in some cases, electrical leakage currents can cause fire or explosion by igniting flammable materials. This can cause death, injury and considerable loss.

Most electrical accidents occur because individuals are working on or near equipment:

(i) Which is thought to be dead but which is in fact live;
(ii) Which is known to be live but those involved are without adequate training or appropriate equipment, or they have not taken adequate precautions.

Risk Assessment

TLL shall have an electrical arc flash risk assessment conducted by a qualified person. The arc flash risk assessment shall be updated whenever significant changes are made to the processes or facility. The risk assessment will include proper identification and labelling of the PPE categories of all of our electrical enclosures.

Based on the results of this assessment, as performed by a qualified person, it can result in the avoidance and or elimination of various elements of the PPE requirements for specific tasks.

1 HAZARDS

Electricity is a serious work place hazard, capable of causing both health hazards (shocks, burns) as well as physical hazards (fires and explosions). In addition, arc flash will be discussed in this section.

There are four main types of injuries: electrocution, electric shock, burns, and falls. Injuries can happen in various ways.

Below are some examples on how an injury may occur.

Direct contact with exposed energized conductors or circuit parts. When electrical current travels through our bodies, it can interfere with the normal electrical signals between the brain and our muscles.

When the electricity arcs (jumps, or "arcs") from an exposed energized conductor or circuit part (e.g., overhead power lines) through a gas (such as air) to a person who is grounded (that would provide an alternative route to the ground for the electrical current).

Thermal burns including burns from heat generated by an electric arc, and flame burns from materials that catch on fire from heating or ignition by electrical currents or an electric arc flash. Contact burns from being shocked can burn internal tissues while leaving only very small injuries on the outside of the skin.

Thermal burns from the heat radiated from an electric arc flash. Ultraviolet (UV) and infrared (IR) light emitted from the arc flash can also cause damage to the eyes.

An arc blast can include a potential pressure wave released from an arc flash. This wave can cause physical injuries, collapse your lungs, or create noise that can damage hearing.

Electrocution/Electrical Shock

The human body will conduct electricity. If direct body contact is made with an electrically energized part while similar contact is made simultaneously with another conductive surface that is maintained at a different electrical potential, a current will flow, entering the body at our contact point, traversing the body, and then exiting at the other contact point, usually the ground. An electric shock can result in anything from a slight tingling sensation to immediate cardiac arrest. The severity depends on the following:

- the amount of current flowing through the body,
- the current's path through the body,
- the length of time the body remains in the circuit, and
- the current's frequency.

Below table provides the effect on the person when exposed to current. Current not voltage causes electrical shock.

Current's Effect on Person	
Current in mill amperes (mA)	**Effect on Person**
0.5 – 3	Tingling sensations
3 – 10	Muscle contractions and pain
10 – 40	"Can't let go!" – Onset of sustained muscular contraction
30 – 75	Respiratory paralysis
100 – 200	Ventricular fibrillation
200 – 500	Heart clamps tight
1,500+	Tissues and organs start to burn, Possible death

Static electricity also can cause a shock, though in a different way and generally not as potentially severe as the type of shock described previously. Static electricity can build up on the surface of an object and, under the right conditions, can discharge to a person, causing a shock. The most familiar example of this is when a person reaches for a door knob or other metal object on a cold, relatively dry day and receives a shock.

Burns

Below are the three types of burns. In some circumstances, all three types of burns may be produced simultaneously.
Electrical burns are the result of the electrical current flowing in the tissues, and may be either skin deep or may affect deeper layers or both. Tissue damage is caused by the heat generated from the current flow; if the energy delivered by the electric shock is high, the body cannot dissipate the heat, and the tissue is burned. Typically, such electrical burns are slow to heal.
Arc burns are the result of high temperatures produced by electric arcs or by explosions close to the body.
Thermal contact burns are those normally experienced from the skin contacting hot surfaces of overheated electric conductors, conduits, or other energized equipment.

Falls

Muscle contractions, or a startle reaction, can cause a person to fall from a ladder, scaffold or aerial bucket. The fall can cause serious injuries or even death.

Physical Hazards

An arc fault is an unintended arc created by current flowing through an unplanned path. Arcing creates high intensity heating at the point of the arc resulting in burning particles that may easily

ignite surrounding material, such as wood framing or insulation. The temperatures of these arcs can exceed 10,000 degrees Fahrenheit (°F). In addition, fires can also be created by overheating equipment or by conductors carrying too much current. In atmospheres that contain explosive gases or vapours or combustible dusts, even low-energy arcs can cause violent explosions.

Static electricity also can discharge to an object with much more serious consequences, as when friction causes a high level of static electricity to build up at a specific spot on an object. This can happen simply through handling plastic pipes and materials or during normal operation of rubberized drive or machine belts found in many worksites. In these cases, for example, static electricity can potentially discharge when sufficient amounts of flammable or combustible substances are located nearby and cause an explosion. Grounding or other measures may be necessary to prevent this static electricity build up and the results.

Arc Flash

An arc flash is the light and heat produced from an electric arc supplied with sufficient electrical energy to cause substantial damage, harm, fire, or injury. Electrical arcs experience negative incremental resistance, which causes the electrical resistance to decrease as the arc temperature increases. Therefore, as the arc develops and gets hotter the resistance drops, drawing more and more current (runaway) until some part of the system melts, trips, or evaporates, providing enough distance to break the circuit and extinguish the arc. Electrical arcs, when well controlled and fed by limited energy, produce very bright light, and are used in arc lamps (enclosed, or with open electrodes), for welding, plasma cutting, and other industrial applications. Welding arcs can easily turn steel into a liquid with an average of only 24 DC volts. When an uncontrolled arc forms at high voltages, and especially where large supply-wires or high-amperage conductors are used, arc flashes can produce deafening noises, supersonic concussive-forces, super-heated shrapnel, high temperatures, and high-energy radiation capable of vaporizing nearby material.

Controls

Electrical accidents result from one of the following three factors:

1. Unsafe equipment or installation
2. Unsafe environment
3. Unsafe work practices

The following controls are ways to prevent these accidents:

Insulation
Guarding
Grounding
Circuit Protection
Safe Work Practices
Labelling
Permits

Personal Protective Equipment (PPE).

Insulation

Insulators such as glass, mica, rubber, or plastic used to coat metals and other conductors help stop or reduce the flow of electrical current. This helps prevent shock, fires, and short circuits. To be effective, the insulation must be suitable for the voltage used and conditions such as temperature and other Environmental factors like moisture, oil, gasoline, corrosive fumes, or other substances that could cause the insulator to fail.
Insulation on conductors is often colour coded. Insulated equipment grounding conductors usually are either solid green or green with yellow stripes. Insulation covering grounded conductors is generally white or grey. Ungrounded conductors, or "hot wires," often are black or red, although they may be any colour other than green, white, or grey.
Before connecting electrical equipment to a power source, it's a good idea to check the insulation for any exposed wires for possible defects. Insulation covering flexible cords such as extension cords is particularly Vulnerable to damage.

Guarding

Guarding involves locating or enclosing electric equipment to make sure employees don't accidentally come into contact with its live parts. Effective guarding requires equipment with exposed parts operating at 50 V or more to be placed where it is accessible only to authorized employees qualified to work with it.
Recommended locations are a room, vault, or similar enclosure; a balcony, gallery, or elevated platform; or a site elevated 8 feet (2.44 meters) or more above the floor. Sturdy, permanent screens also can serve as effective guards.

Grounding

Grounding is the process of removing the excess charge on an object by means of the transfer of electrons between it and another object of substantial size. When a charged object is grounded, the excess charge is balanced by the transfer of electrons between the charged object and a ground. A ground is simply an object that serves as a seemingly infinite reservoir of electrons; the ground is capable of transferring electrons to or receiving electrons from a charged object in order to neutralize that object.

There are two types of grounding:
System or Service Ground: In this type of ground, a wire called "the neutral conductor" is grounded at the transformer, and again at the service entrance to the building. This is primarily designed to protect machines, tools, and insulation against damage.

Equipment Ground: This is intended to offer enhanced protection to the employees themselves. If a malfunction causes the metal frame of a tool to become energized, the equipment ground provides another path for the current to flow through the tool to the ground.
There is one disadvantage to grounding: a break in the grounding system may occur without the user's knowledge

Circuit Protection

Circuit protection devices limit or stop the flow of current automatically in the event of a ground fault, overload, or short circuit in the wiring system. Well-known examples of these devices are fuses, circuit breakers, ground-fault circuit interrupters, and arc-fault circuit interrupters.

Fuse and Circuit Breakers

Fuses and circuit breakers open or break the circuit automatically when too much current flows through them. When that happens, fuses melt and circuit breakers trip the circuit open. Fuses and circuit breakers are designed to protect conductors and equipment. They prevent wires and other components from overheating and open the circuit when there is a risk of a ground fault.

Ground-fault Circuit Interrupters

Using a ground-fault circuit interrupter (GFCI) is one way of overcoming grounding deficiencies. It is used in wet locations, construction sites, and other high-risk areas. A GFCI is a fast-acting circuit breaker designed to shut off electric power in the event of a ground-fault within as little as 1/40 of a second. It works by comparing the amount of current going to and returning from equipment along the circuit conductors. When the amount going differs from the amount returning by approximately 5 mA, the GFCI
Interrupts the current.

Arc-fault Circuit Interrupters

Arc Fault Circuit Interrupters (AFCIs) are required for certain electrical circuits. An AFCI is a product that is designed to detect a wide range of arcing electrical faults to help reduce the electrical system from being an ignition source of a fire. Conventional over current protective devices do not detect low level hazardous arcing currents that have the potential to initiate electrical fires. The objective is to protect the circuit in a manner that will reduce its chances of being a source of an electrical fire.

Safe Work Practices

A majority of electrical accidents are preventable by following safe work practices. The sections below outline the safe work practices based on the equipment or activity except for Lockout/Tag Out and Hot Work Permits, which are provided in separate documents.

Portable Electrical Equipment and Extension Cords

The following arrangement need to be ready;

Extension Cord

Extension cords may only be used to provide temporary power (no more than one month). Portable cord and plug connected equipment and extension cords must be visually inspected before use on any shift for external defects such as loose parts, deformed and missing pins, or damage to outer jacket or insulation, and for possible internal damage such as pinched or crushed outer jacket. Any defective cord or cord-and-plug-connected equipment must be removed from service and no person may use it until it is repaired and tested to ensure it is safe for use.

Extension cords must be of the three-wire type. Extension cords and flexible cords must be designed for hard or extra hard usage. The rating or approval must be visible and are required to be indelibly marked approximately every foot along the length of the cord. Job-made extension cords are forbidden.

Personnel performing work on renovation or construction sites using extension cords or where work is performed in damp or wet locations must be provided, and must use, a GFCI.

Portable equipment must be handled in a manner that will not cause damage. Flexible electric cords connected to equipment may not be used for raising or lowering the equipment.

Extension cords must be protected from damage. Sharp corners and projections must be avoided.

Flexible cords may not be run through windows or doors unless protected from damage, and then only on a temporary basis. Flexible cords may not be run above ceilings or inside or through walls, ceilings or floors, and may not be fastened with staples or otherwise hung in such a fashion as to damage the outer jacket or insulation.

Cords must be covered by a cord protector or tape when they extend into a walkway or other path of travel to avoid creating a trip hazard.

Extension cords used with grounding type equipment must contain an equipment-grounding conductor (i.e., the cord must accept a three-prong, or grounded, plug).

Attachment plugs and receptacles may not be connected or altered in any way that would interrupt the continuity of the equipment grounding conductor. Additionally, these devices may not be altered to allow the grounding pole to be inserted into current connector slots. Clipping the grounding prong from an electrical plug is prohibited.

Flexible cords may only be plugged into grounded receptacles. The continuity of the ground in a two-prong outlet must be verified before use. It is recommended that the receptacle be replaced with a three-prong outlet. Adapters that interrupt the continuity of the equipment grounding connection may not be used.

All portable electric equipment and flexible cords used in highly conductive work locations, such as those with water or other conductive liquids, or in places where employees are likely to contact water or conductive liquids, must be approved for those locations.
Employee's hands must be dry when plugging and unplugging flexible cords and cord and plug connected equipment if energized equipment is involved.
If the connection could provide a conducting path to employees' hands (for example, if a cord connector is wet from being immersed in water), the energized plug and receptacle connections must be handled only with insulating protective equipment.
Locking type connectors must be properly locked into the connector.
Lamps for general illumination must be protected from breakage, and metal shell sockets must be grounded.
Temporary lights must not be suspended by their cords unless they have been designed for this purpose.

Requirements for Temporary Wiring

Temporary electrical power and lighting installations 600 V or less, including flexible cords, cables and extension cords, may only be used during and for renovation, maintenance, repair, or experimental work.
In general, all equipment and tools connected by cord and plug must be grounded. Listed or labelled double insulated tools and appliances need not be grounded.
Feeders must originate in an approved distribution centre, such as a panel board, that is rated for the voltages and currents the system is expected to carry.
Branch circuits must originate in an approved power outlet or panel board.
Neither bare conductors nor earth returns may be used for the wiring of any temporary circuit.
Receptacles must be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit must contain a separate equipment-grounding conductor, and all receptacles must be electrically connected to the grounding conductor.
Flexible cords and cables must be of an approved type and suitable for the location and intended use. They may only be used for pendants, wiring of fixtures, connection of portable lamps or appliances, elevators, hoists, connection of stationary equipment where frequently interchanged, prevention of transmission of noise or vibration, data processing cables, or where needed to permit maintenance or repair. They may not be used as a substitute for the fixed wiring, where run through holes in walls, ceilings or floors, where run through doorways, windows or similar openings, where attached to building surfaces, or where concealed behind building walls, ceilings or floors.
Suitable disconnecting switches or plug connects must be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.
Lamps for general illumination must be protected from accidental contact or damage, either by elevating the fixture or by providing a suitable guard. Hand lamps supplied by flexible cord must

be equipped with a handle of moulded composition or other approved material and must be equipped with a substantial bulb guard.
Flexible cords and cables must be protected from accidental damage. Sharp corners and projections are to be avoided. Flexible cords and cables must be protected from damage when they pass through doorways or other pinch points.

Wet or Damp Locations

Work in wet or damp work locations (i.e., areas surrounded or near water or other liquids) should not be performed unless it is absolutely critical. Electrical work should be postponed until the liquid can be cleaned up. The special precautions must be incorporated while performing work in damp locations*:*
Only use electrical cords that have GFCIs;
Remove standing water before beginning work. Work is prohibited in areas where there is standing water;
Do not use electrical extension cords in wet or damp locations; and Keep electrical cords away from standing water.

Working on De-Energized Equipment

The most important principle of electrical safety is to **assume all electric circuits are energized unless each involved worker ensures they are not.** Every circuit and conductor must be tested every time work is done on them. Proper PPE must be worn until the equipment is proven to be de-energized.
Voltage rated gloves and leather protectors must be worn.
Safety glasses must be worn.
The required Arc Flash PPE must also be worn when verifying the de-energized state. All arc flash and electrical PPE can be removed once the enclosure has been verified as “dead.”
Following are the six steps to ensure conditions for electrically safe work.

1. Identify all sources of power to the equipment.
2. Remove the load current, and then open the disconnecting devices for each power source.
3. Where possible, visually verify that blades of disconnecting devices are fully open or that draw out-type circuit breakers are fully withdrawn.
4. Apply lockout/tag out devices in accordance with a formal, written policy.
5. Test each phase conductor or circuit part with an adequately rated voltage detector to verify that the equipment is de-energized. Test each phase conductor or circuit part both phase-to-phase and phase-to-ground. Check the voltage detector before and after each test to be sure it is working.
6. Properly ground all possible sources of induced voltage and stored electric energy (such as, capacitors) before touching. If conductors or circuit parts that are being de-energized could contact other exposed conductors or circuit parts, apply ground-connecting devices rated for the available fault current.

The process of de-energizing is "live" work and can result in an arc flash due to equipment failure.

Working On or Near Energized Equipment

Working on live circuits means actually touching energized parts. Working near live circuits means working close enough to energized parts to pose a risk even though work is on de-energized parts.

Common tasks where there may be a need to work on or near live circuits include, but are not limited to:

Taking voltage measurements

Opening and closing disconnects and breakers

Racking breakers on and off the bus

Removing panels and dead fronts

Opening electric equipment doors for inspection

Obtaining an Energized Electrical Work Permit from the Director of EH&S or designee.

Precautions

When working on de-energized parts, but while still inside the arc flash protection boundary for nearby live exposed parts:

If the parts cannot be de-energized, barriers such as insulated blankets must be used to protect against accidental contact or PPE must be worn.

Employees shall not reach blindly into areas that might contain exposed live parts.

Employees shall not enter spaces containing live parts unless illumination is provided that allows the work to be performed safely.

Conductive articles of jewellery and clothing (such as watchbands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, metal headgear, or metal frame glasses) shall not be worn where they present an electrical contact hazard with exposed live parts.

Conductive materials, tools, and equipment that are in contact with any part of an employee's body shall be handled in a manner that prevents accidental contact with live parts. Such materials and equipment include, but are not limited to long conductive objects such as ducts, pipes, tubes, conductive hose and rope, metal-lined rules and scales, steel tapes, pulling lines, metal scaffold parts, structural members, and chains.

When an employee works in a confined space or enclosed spaces (such as a manhole or vault) that contains exposed live parts, the employee shall use protective shields, barriers or insulating materials as necessary to avoid contact with these parts.

Doors, hinged panels, and the like shall be secured to prevent them from swinging into employees.

Insulated Tools and Materials

Only insulated tools and equipment shall be used when exposed to energized parts.
Insulated tools shall be rated for the voltages on which they are used.
Insulated tools shall be designed and constructed for the environment to which they are exposed and the manner in which they are used.
Fuse or fuse holder handling equipment, insulated for the circuit voltage, shall be used to removed or install a fuse if the fuse terminals are energized.
Ropes and hand-lines used near exposed energized parts shall be nonconductive.
Portable ladders used for electrical work shall have nonconductive side rails.

Access-Limiting Equipment

Barricades shall be used in conjunction with safety signs to prevent or limit access to work areas containing live parts. Conductive barricades shall not be used where they might cause an electrical hazard. These barricades are designed to prevent un-qualified and/or unprotected employees from entering the electrical hazard area.
If signs and barricades do not provide sufficient protection, an attendant will be assigned to warn and protect pedestrians. The primary duty of the attendant shall be to keep an unqualified person out of the work area where an electrical hazard exists. The attendant shall remain in the area as long as there is a potential exposure to electrical hazards.

Labelling

The label must contain the following information:
At least one of the following:

- Available incident energy and the corresponding distance
- Minimum arc rating of clothing
- Site specific level of PPE
- PPE Category in 130.7(C)(15) for equipment
- Nominal system voltage
- Arc flash boundary

The information displayed on the label should only be present based on the method used to determine the PPE risk assessment. If the table method is used, only the PPE category should appear (1-4). If incident energy analysis method is used the incident energy (cal/cm 2) should appear.



Figure 4 – Sample Equipment Label

GENERAL SAFETY RULES

1. Good workmanship is essential for compliance with this general rules and regulations.
2. All electrical apparatus must be earthed in accordance with Statutory Regulations. Extra care shall be taken to ensure the following steps are taken. Residual Current Earth Leakage Protection shall be installed at the supply point and at other sections of the distribution systems.
   Cables shall not be buried in areas where excavation is to take place. Wherever possible buried cable routes shall be sited adjacent to main roads and tracks.
3. Temporary taped joints or repairs on any cables are forbidden. Other joints in cables should be as few as practicable and should be mechanically and electrically sound.
4. Cables, Plugs and Sockets for site use shall conform to relevant standards as described in the contract. The British Standards and equivalent Indian Standards given below should be followed:

   i) **Supply of cable**: - Up to 3.3 kV shall be in accordance with BS: 6346.

   ii) **Underground cables**: - BS: 6346 for armoured PVC insulated cable.
   BS: 6708 Flexible cables for use at mines and

   iii) **Flexible cables**: - BS: 6007 Rubber insulated cables for electric power and lighting.
   BS: 6500 Insulated flexible cords and cables.

   The equivalent Indian standards should be followed are:

   a) IS: 7098 Part I – Product specification code for electric cables.

b) IS: 9968 Part I - Flexible electric cables.
c) IS: 6708 – PVC insulated cables.
d) IS: 1554 Part I – Rubber insulated, weather and oil resistant cables.

iv) **Plugs and Sockets**: IP 55 Plugs and sockets (International standard) shall only be used in the sites. They shall conform to IEC 309 and BS- EN 60309. The colour coding for the Plugs and sockets as per IP 55 is as follows:

Yellow - 110V

Blue - 230 V

Red - 400 V

5. Care is needed to ensure that the generator is installed safely, and expert advice should be obtained. Generators need to be earthed, by bonding the neutral to the frame and connecting the frame to earth. The impedance of the bonding needs to be low enough to ensure the correct operation of protective devices. Sensitive earth fault protection may be necessary if earthing conditions are difficult. Installations associated with generators shall be treated in the same way as for installations connected to the mains. The cable between the generator and transformer shall be as short as possible.
6. All conductors (including flexible conductors) and apparatus (including portable apparatus) shall be sufficient in size and power rating for the application and shall be constructed, installed and protected so as to prevent danger.
7. No fuse, non-linked switch or non-linked circuit breaker shall be inserted in a conductor connected with earth, & Single pole switches shall be inserted in live conductors only.
8. Every distinct circuit shall be protected against excess current and energy by means of an automatic circuit breaker of adequate breaking capacity suitably located and of such construction as to prevent danger from overheating, arcing or the scattering of hot metal when it comes into operation.
9. Main switchgear, control cubicles, distribution boards and their enclosures must be clearly identified as electrical apparatus.
10. Distribution equipment shall be marked with a designation number or letter and indication of where it is fed. Every outgoing circuit of distribution equipment shall also be identified.
11. Instructions for the treatment of persons suffering from electric shock shall be posted in huts accommodating main switchgear, sub-stations or other places containing main distribution equipment.
12. All electrical equipment, supply distribution points, cables, isolators and main switches must be protected against damage by transport, earthmoving equipment, vandals, children and weather.

13. Main switch areas must be kept easily accessible so electrical supplies to all apparatus can be isolated quickly in case of fire or other emergencies.
14. All contractors must ensure that electrical standards are followed strictly in using temporary electrical facilities. All electrical equipment brought to site shall have an identification number. Before using any equipment contractor shall produce a fitness certificate. Laying of cables from D.G. Sets up to individual equipment will be the responsibility of the contractor. However, before lying of any cable, contractor shall submit a single line diagram of cabling for review.
15. Main switchgear, control cubicles, distribution boards and their enclosures must be clearly identified as electrical apparatus.
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Safety Precaution during Electrical Shutdown

1. For Carrying out the Shut Down/Hot Work & other work Job, Safety person of site/Section/C/Engg./Supervisor shall issue the work permit to Gang Leader/particular fitter.
2. Work Permit (Shut down/Hot work/other) person shall fill up permit clearly an completely and ensure personally safe working condition.
3. Work permit receiving person shall instruct to follow the safety requirement to the person who will do the job.
4. After Completing the Job, receiving person shall fill up the permit and hand over copy to Site Person (Gang Leader).

5. Location I/C shall check the completed job and sign the copy and hand over the copy to Site Safety person for record purpose.
6. The validity of work Permit (For, Shut down/Hot work & other) shall be seven days from the date of issue if job and person involved in the works remains same otherwise new permit to be prepared and issue.
7. Similarly; for shut-down activity (Electrical), approval /clearance to be obtained by client or Project /site (if Applicable) from respective SEB authority. And then, as per safety requirement work to be done in shutdown activity (Ref –Precaution. For LT Line.)
8. Colour system to be used during shutdown- for shutdown operator/worker to be used orange jacket & all Other to be used green jacket.

Additional precautions for stringing in the vicinity of charged overhead lines and in areas where induced voltage is anticipated

- All winches, pulleys and TSE must be properly earthed.
- Conductor running blocks are to be earthed.
- All the conductors at both ends of the section are to be earthed through running earths.
- Scaffolds are to be strong enough, should be adequately earthed, provided with anticlimbing devices and warning signs.
- Sufficient clearance must be maintained from existing charged lines after rough sag.
- Provision for breaking of paying out of conductor at any point.
- Earth wire should be earthed before earth bond is fitted.
- Nylon or PP ropes should be used for hauling/ controlling space ring cycle.

1. Earthing :-

Earthing (grounding) necessity grounding of deenergized transmission lines is to prevent the maintenance personnel from the following electrical hazards.

- By virtue of the inherent property of passive electrical elements of transmission lines they store electrical energy. This energy prevails on the line even if it is de-energized an decays over a period of time depending on the time constant of the line.
- Presence of voltage induced on the transmission line due to electromagnetic coupling with the neighbouring/crossing transmission lines.
- Induced voltages due to lightning.
- Accidental charging.
- All conductors and equipment shall be treated as energized until tested or otherwise determined to be de-energized or until grounded.
- Communication conductors bare wire communication conductors on power poles or structures shall be treated as energized lines unless protected by insulating materials.

- New construction new lines or equipment may be considered de-energized and worked as such where the lines or equipment are grounded.

The hazard of induced voltages is not present, and adequate clearances or other means are implemented to prevent contact with energized lines or equipment and the new lines or equipment.

ATTACHING GROUNDS

- When attaching grounds, the ground end shall be attached first and the other end shall be attached and removed by means of insulated tools or other suitable devices.
- When removing grounds the grounding device shall first be removed from the line or equipment using insulating tools or other suitable devices.
- Grounds shall be placed between work location and all sources of energy and as close as practicable to the work location, or

Grounds shall be placed at the work location if work is to be performed at more than one location is a line section. The line section must be grounded and short circuited at one location in the line section and the conductor to be worked on shall be grounded at each work location

GROUNDING ELECTRODE

- When grounding electrodes are utilized, such electrodes shall have a resistance to ground low enough to remove the danger of harm to personnel or permit prompt operation of protective devices.
- Grounding to tower shall be made with a tower clamp capable of conducting the anticipated fault current.

Dangers

The main dangers when working on transmission lines are –

- The possibility of personnel mistaking, identification of the circuit on which it is safe to work with the one that is still energized.
- Infringing safety clearance before additional earths are applied.
- Inadequate precautions to exclude any induced voltages present in the conductors or fittings.

General precautions before climbing the tower

- One responsible officer should be present
- Circuit under shut down.

- A caution should be identified at the working location(s) with the help of a circuit plate or other reliable method**.**
- All linesmen who work on the Trans tower, conductors or fittings, shall wear and make use of all safety belts/harness and other.

  Safety equipment's provided for their safety and protection.

- The fitness of all t& p and pipes must be ensured once more before climbing the tower.
- One green flag shall be attached at the anti-climbing device level one green flag shall be attached to the side of the tower that supports the circuit under shutdown.
- Six red flags should be attached to all towers at cross arm level to identify the danger zone of the live circuit.
- These green and red flags should be attached to all towers on which linesmen are likely to climb.

TRAILING EARTH

- an earth of sufficient length of earth lead suitable for connection between conductor and the tower when lowering or raising conductors, this can be in the form of additional earth.
- Bridging pole- a short insulated pole with a socket which is used
- For applying and tightening bridging earths first part of earthing pole can be used as bridging pole.

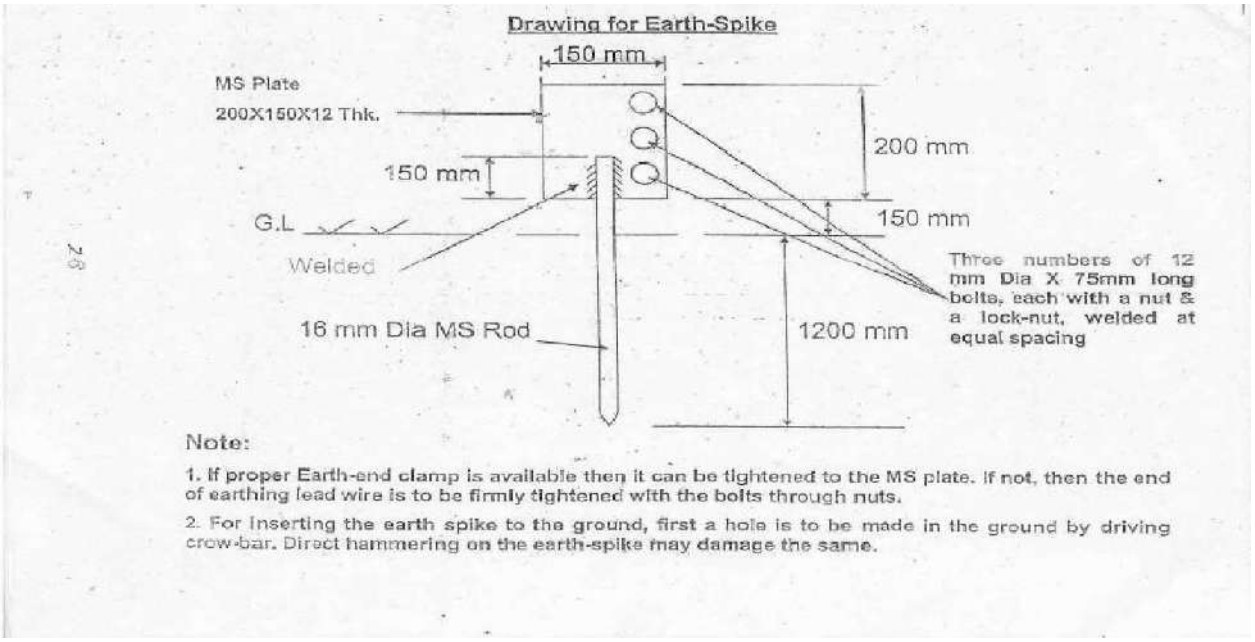
WORKING PHASES –

- the conductor phases on which linesmen will carry out work.
- If during working on conductors, jumpers insulators or fittings, an earth end clamp or line end clamp of an additional earth becomes disconnected for any reason linesmen must shift away from tower/cross arm members to maintain safe electrical clearance. He must not touch the disconnected end of the additional earth in such a case; an extra additional earth shall be fitted in parallel with the faulty earth. Then the disconnected additional earth shall be removed by the use of the telescopic pole.
- On completion of work, the additional earths shall be carried to the ground from the tower in gunny/suitable bags to avoid any damage to them. To avoid damage. No additional earth should be thrown from the tower.
- While coming down from the tower, the linesmen will remove the red & green flags.
- One spare additional earth should be taken to the working tower to provide a spare in case of any contingencies.

Rated voltage (kv)	Safety clearance (in mts)
36	**0.32**
70	**0.75**
132	**1.1**
220	**1.6**
380	**2.5**
700	**5.3**

Instruction

- Check continuity of earth cable.
- In case of telescopic rod pull out the inner tube and lock it at the desired length & in case of detachable rod couple appropriate sections to achieve the desired length.
- Connect earth clamp at proper point.
- Rotate the pin of conductor clamp in anti-clock direction till it attains its maximum unwinding position & then fix it in the rubber holder attached to the top section of the rod.
- Left the rod and make the conductor rest on the jaws/hook of the clamp push up the rod and rotate it clock wise till conductor is safely gripped by the clamp.
- To unlock the clamp from the rod push up the rod slightly (about friction of an inch) and rotate anti clockwise gently and allow it to slide down on its own.
- To disconnect follow the sequence in reverse direction.
- Do not handle the rod with oily/greasy hands
- Use of rubber hand gloves is recommended.
- Clean the rod properly before & after use to remove oily/greasy stains.
- Rub fine emery paper on contact position of clamps if cable particles are noticed.



2. PRECAUTIONS WHILE CROSSING LT/HT LINES (SHUTDOWN)

- Network of the LT lines the vicinity is to be thoroughly checked and adequate precautionary measures taken.
- It shall be ensured that there is no back feed on the line under PTW.
- For crossing the LT lines shut down and PTW for the LT line.
- Only taking of shut down and PTW will not be sufficient.
- The point(s) of isolation of the LT line must be properly protected by manning.
- The point(s) of isolation must be kept under lock and key.
- Both sides of the working area must be protected by providing with temporary earths.
- Proper quality of discharge rods is to be used.
- Discharge rods to be fixed properly.
- Earth end and conductor end to have solid contacts.
- Hanging the hook of the discharge rod loosely on the conductor not to be allowed.
- Discharge rods to remain connected to the LT line until all men and material are removed.
- No one to touch the LT line after the discharge rod has been removed, even if the LT line is under shut own.
- Discharge rods to conform to the relevancy standards.
- Electrical resistance hand gloves to be provided and used.

- LT lines to be crossed and on which shut down need to be availed should be short circuited and earthed at both sides of the area of work immediately after taking the shutdown.
- For additional precaution; induction buzzer to be used in shutdown works.
- Power cable to be used; if permission or approval not obtained from board.
- Lock & tag provided at all isolation point.
- One person is posted at isolation point.
- Proper earthing to be done.
- Work to be done or carried out as per shutdown schedule only.
- Work to be done only their permissible person; & not to allow other person for shut down work.
- All applicable PPE'S to be used during shutdown for ex. Helmet/electrical hand gloves/safety shoes/induction buzzer/safety belt/other.
- Six red flags should be attached to all towers at cross arm level to identify the danger zone of the live circuit.
- These green and red flags should be attached to all towers on which linesmen are likely to climb.

G. WELDING, CUTTING & BURNING (GENERAL)

1. The primary hazards encountered during welding are Electric shock, burns, radiant energy, toxic fumes, fire and explosions.

2. Avoid burns from electric arcs, gas welding flames, hot slag or touching welded parts before they become cool by the following precautions.

- Suitable goggles or welding helmets shall be worn for protection while welding. Barriers should be erected to protect other persons from rays of electric arcs or welding flames. Ultraviolet, infra-red and excessively bright visible light rays are injurious to eye.
- Clean goggles should be worn while chipping the slag.
- Adequate ventilation shall be provided while welding in confined spaces or While brazing cutting or welding zinc, brass, bronze, galvanized or lead Coated material, Poisonous fumes may be generated during the welding Process by metallic oxides, coatings on the materials bring cut or welded, or by the electrode or flux rod.
- Electrode holder shall be of good quality with proper insulation. The Welder should never be allowed to weld when he is wet. Usage of proper personal Protective equipment shall also be ensured.

- Apron and helmet with welding screen shall be used by the welder adequate Ventilation shall be ensured at the area.
- Combustible and inflammable material shall be removed from the place where welding is to be done. Oil or paint drums shall never be kept in the vicinity of the welding area.
- While welding or cutting in elevated position, precautions should be taken to prevent sparks or hot metal falling on to people or inflammable materials.
- No welding or cutting should be attempted in dusty or gaseous areas where there is a danger of causing explosion.
- Before welding or cutting a pipe, tank or container that has held flammable materials, drain it thoroughly out and fill the container with water or thoroughly wash the container with a caustic solution and spray sufficient Carbon-tetrachloride into the container to fill it with non-explosive vapors.

2. Avoid personal contact with the electrode or other live parts of electric welding equipment's. Alternating currents (AC) are dangerous even at low voltage.

4. In acetylene burning and welding, never allow oil or grease to come in contact with any Cylinder, regulator, connection of gas welding equipment. Oil or grease in the presence of oxygen may cause a violent explosion.

5. Never use matches to light a blow pipe. Use a friction lighter, stationary, pilot flame or other suitable source of ignition.

6. Welding cables shall not be laid along with other electrical cable as, they may damage insulation of other cables.

7 No interval live electrical parts of welding machine are exposed.

1. Machine must be inspected & tagged by competent person.
2. Current regulator to be both primary & secondary side.
3. Flash back arrestor is provided for acetylene & oxygen cylinders.
4. Cutting area should be barricaded & warning boards to be displayed.
5. Availability of PPE (Cutting Goggles, Leather Gloves etc.)

a) TACK WELDING

1) Clear the radius area of 10m (from bushes) below the welding area & cordon off to avoid unauthorized entry.
2) Display suitable warning signage.
3) Welding machine shall be routed through ELCB using industrial rated cables without Joints & using proper plug socket.
4) Disconnect the supply during lunch break or when not in use.
5) Handle zinc rich paint as per MSDS guidelines.
6) Never smell or taste the paint.

WORK PERMIT (SHUT DOWN / HOT WORK/OTHER):-

Work Permit No.:……..
Date of Issue:…… Time of Issue: ……
Date of Completion:……. Time of Completion:……
Department: ……. Location:……
Permit issued by:…… ……
Permit received by:…… ……
Site clearance given by:…… ……
Permit valid from…….. Hrs. To…… Hrs.

Type of work: Shutdown ☐ Hot Work ☐ Other ☐

Job to be done: …….

Stand by Person required: Yes/No : If yes, then Name Mr……..

Electrical Isolation required: Yes/No : If yes, then by whom name Mr……..

Following are the HSE requirement and permit is not valid till they are fulfilled.

1) Safety Goggle	☐	4) Full body harness	☐	7) Helmets	☐
2) Face shield	☐	5) Fire Extinguisher	☐	8) Isolation Tag	☐
3) Electrical Hand glove	☐	6) Do not operate Tag	☐	9) Induction Buzz	☐

Special HSE Precaution:…… ……

Permit for Work (Specific): ……Name & Sign of HSE Officer…….
Work started at ……..Hrs. & Completed at …….. Hrs……..
Name & Sign of Engg. / Supervisor:…… ……
Checked & taken on time at ……Hrs. on ……(Name & Sign of Gang leader)

H) SCAFFOLDING

i) Suitable scaffolds shall be provided for workmen for all Works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra workman shall be engaged for holding the ladder. If the ladder is used for carrying materials as well, suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 0.25 to 1(0.25 horizontal and 1 vertical).

ii) Scaffolding or staging more than 3.6 m above the ground or erected floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise secured at least 0.9 m high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of the materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the structure.

iii) Working platform, Group of companies/Team ways and stairways shall be so constructed that they do not sag unduly or unequally, and if the height of the platform or the Group of companies/Team way or the stairway is more than 3.6 m above ground level or floor level, they shall be closely boarded, and shall have adequate width and shall be suitably fastened.

iv) Every opening in the floor of a structure or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 0.9 m. Employees working on steep slopes or otherwise subject to possible falls from levels not protected by guardrails or safety nets, shall be secured by safety belts.

v) Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9.0 m in length while the width between side rails in hung ladder shall in no case be less than 28 cm. for ladder up to and including 3.0 cm of length. For longer ladders, this width shall be increased at least by 6mm for each additional 30cm of length. Uniform step spacing shall not exceed 30 cm. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the Sites of Work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.

The below measures will be implemented to avoid risk of fall from Scaffolds, Temporary Works
and Working Platforms-

1. For scaffolds, temporary works and working platforms all structural members will be ensured free from visible defects. Structures will be erected vertically plumb with adequate cross bracings. Scaffold structure base will be maintained stable with firm base plates. If the structure ratio is more than 3:1(Height: Base), it will be tied with the other firm adjoining structure.
2. Adequate access and working platform with solid Handrail (both upper and intermediate) will be provided for safe work.
3. Workmen will use full body safety harness for works above 1.8 m height. Overhead anchorage point or Life line will be provided. For horizontal movements the lanyard will hook to the static line.
4. All scaffolds will be provided with ladder along with handrail for safe access. Ladder will be protruding 1.00 m above the working platform.
5. All working platforms will be closely planked, free from damages & debris.
6. All scaffolds & working platforms will provide with guardrail, mid-rail & toe-guard installed at the edges of platform.
7. All materials will be lowered by means of rope or chain pulley. Signalman will be deputed at the time of material lowering.
8. Site will ensure that Scaffolds will not obstruct the approach for Fire hydrants, Fire extinguishers, alarms and emergency exits.

a) <u>Scaffold Tag Procedure</u>

Red Scaffold Tag

Red tag indicates that the scaffold is under preparation/dismantling/not inspected and is unsafe for use other than scaffolder.

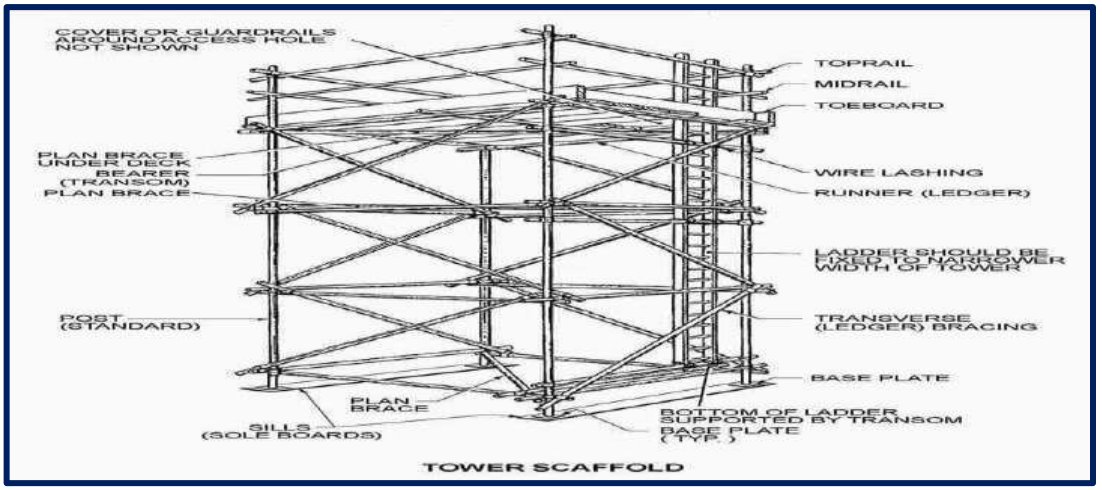
Green Scaffold Tag

Green tag indicates that the scaffold is COMPLETE & SAFE FOR USE. Validity of “Green Tag” is only for 1 week from date of last inspection

Inspection of Scaffolding

Scaffolding will be inspected on weekly basis by authorized person at site. **Green Tags** of the Scaffolding which are found safe will be renewed with date of inspection. If any scaffold is found unsafe for use, **Red Tag** will be fixed.





H) LADDER

1. Safe means of access shall be provided to all working platforms and other elevated working places with the help of ladders.
2. Ladder shall be placed in an inclination not steeper than 1 in 4 (1horizontal and 4 vertical).
3. Every ladder shall be securely fixed at bottom from sliding/slipping.
4. No single portable ladder shall be over 9 m in length.
5. For ladders up to 3m in length, the width between side rails in the ladder shall be a minimum of 300 mm. For longer ladders, this width shall be increased by at least 20 mm for each additional meter of length.
6. The spacing of rungs shall be uniform and shall not exceed 300 mm.
7. Ladder shall be of rigid construction having sufficient strength for the intended loads and made either of good quality wood or metal. All ladders shall be maintained well for safe working condition. The rungs shall be tested periodically as per provisions of IS: 3696 -1991 (Part 2) (Reaffirmed in 2002).
8. Whenever ladder is not securely fixed an extra worker shall be engaged for holding the ladder.
9. Ladders shall not be used for climbing while carrying materials in hands. While climbing, both the hands shall be free for holding the rails. Contractor shall make alternate safe arrangement for lifting of tools and implements for all his workers working at height.
10. Ensure the ladder is based on dry, firm, level surface and secured against slippage and not subject to skidding or slipping. Position the ladder until all feet have firm contact with the floor.
11. Do not use blocks, rocks, boxes, or other items to “level up” or gain height.
12. Do not use a ladder in strong winds, inclement weather or when visibility is poor**.**
13. Ensure appropriate footwear is worn.

14. Only one person on the ladder at a time and the weight limit of ladder is not exceeded.
15. Only carry light materials and tools (up to 10 kg)
16. Keep both feet on the same rung or step throughout the task.
17. Always carry tools on a belt or tool pouch and materials are hoisted.
18. Ensure the ladder is in a safe, clean and tidy state.
19. DO NOT stand on the top step.

I) DEMOLITION

Before any demolition work is commenced and also during the process of the work following precaution to be taken;

i) All roads and open areas adjacent to the site shall either be closed or suitably protected.

(ii) No electric cable or apparatus which is liable to be a source of danger over cable or apparatus used by the operator shall remain electrically charged.

(iii) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the structure shall be overloaded with debris or materials as to render it unsafe.

J) PAINTING WORK

(a) No paint containing lead sulphate of lead or product containing their pigments shall be used except in the form of paste or ready-made paint.

(b) Suitable face masks shall be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.

(c) Measures shall be taken, whenever practicable, to prevent danger arising out from dust caused by dry rubbing down and scrapping.

(d) Suitable arrangements shall be made to prevent clothing put off during working hours, being spoiled by painting materials.

(e) Cases of lead poisoning and suspected lead poisoning shall be notified and shall be subsequently verified by a medical officer appointed by the competent authority.

(f) Instructions with regard to special hygienic precautions to be taken in the painting trade shall be distributed to working painters.

(g) The project shall observe all safety precautions to control the noise on all Sites and also provide all workmen deployed in the affected areas with the necessary equipment for safety against noise.

K) FIRE PREVENTION

(i) All construction areas and storage yards shall be kept clean and well arranged.

(ii) A clear space of 15 meters around the outer boundary of saw mill and lumber storage area may be provided. All lumber shall be stored in sections with fire breaks with a distance of 15 meters between consecutive sections.

(iii) All combustible waste material, wood scaling and soiled rags etc. shall be removed daily and burnt in suitable burning area. The saw mill and lumber yard shall be kept free form accumulation of combustible debris.

(iv) Fires, welding, flame cutting shall in general not be permitted in combustible area. Fire and open flame devices shall not be left unattended.

(v) Smoking shall be prohibited in all fire prone areas, flammable material storages viz. Carpentry, paint shops, garages, service stations etc. “No smoking” signs shall be pasted on all such area.

(vi) Accumulations of flammable liquids on floors, walkways etc. should be prohibited. All spills of flammable liquids shall be cleaned up immediately.

(vii) Flammable liquids, lubricants etc. shall be handled and transported in safety containers and drums which can be kept tightly capped.

viii) Storage of fuels and other flammable materials and liquids shall be set not less than 100 m away from the Works and permanent installations. All storage installations and tanks shall conform to the regulations set out in relevant Indian Standards.

ix) Petrol or other flammable liquids with a flash point below 100 degree Centigrade shall not be used for cleaning purpose.

x) Oxygen cylinders shall not be stored with combustible materials

xi) All electric installation shall be properly earthed. Repairs shall not be made on Electrical circuits until the circuit has been de-energized.

FIRE FIGHTING ARRANGEMENTS AT SITE:

1) Fire extinguishers and fire buckets filled with clean dry sand, painted red, shall be provided at all fire hazardous locations. The extinguishers shall be inspected, serviced and maintained in accordance with manufacturer's instructions. The inspection shall be evidenced by notations on tag attached to the extinguisher.
2) Full reliance shall never be placed on portable hand extinguishers as all of these have a very limited capacity. Water, in ample quantity and under adequate pressure, shall always be available for firefighting.
3) Where a group of work points are located beyond the range of protection from a public water supply, the installation of a water system for private fire protection shall be warranted.
4) Evacuation facilities and fire exit shall be provided at all locations featuring fire hazards.
5) Siren or other suitable fire alarm arrangement shall be made on all Sites. Warning signs shall be pasted at all locations having fire hazards.
6) All staff shall be conversant with the use of all type of fire extinguishing apparatus; In the event of fire on electrical mains or apparatus, the effected part shall immediately be completely isolated from its source of supply of electrical energy.

L) <u>DG OPERATION (PORTABLE)</u>

1. Regular maintenance and housekeeping of dg set should be done.
2. Appropriate place for keeping the dg set should be decided before placing.
3. Electric connection of dg should be checked by experienced person and regularly inspect by experienced person.
4. To use the PPE (rubber hand gloves during the electric connection or electric works).
5. DG set operate only by experienced person.

6. Storage of diesel for dg set should be proper storage and precaution to be taken for keeping or storing the diesel inside store (like fire extinguisher) proper base, proper distance from other material and leakage etc.
7. Required document should be available.
8. Identification board should be kept near to dg set for precaution.
9. Proper earthing should be done as per requirement and should be checked regularly.

M) MATERIAL HANDLING

1. Use proper tools and equipment for heavy lifting work.
2. Do not stand or sit on top of laden moving trucks & tractor.
3. Do not stand under any loads being hoisted by cranes, fork lifts or winches.
4. Do not throw or drop any tools or materials from any height.
5. Precautions should be taken at all stages to protect materials and items from damage and deterioration during material handling/movement and to ensure the safety of the personnel handling the material.
6. All lifting buckle and handling equipment under use, should be tested and qualified before use. They should also be maintained and checked periodically as per standard / procedures.
7. Operators of handling equipment should be qualified by experience or by special training. Handling of flammable items and gas cylinders should be done with utmost care.
8. Work must be stopped if rain, keep 1st aid arrangement ready Also emergency No/Services must available at store, extra care must be taken in rainy season.(regarding-Snake bite; like; Medicine, Torch)

1) GENERAL PRECAUTION FOR EMPLOYEE

(i) Each employee shall be provided initial introduction regarding HSE by the company so as to enable him to conduct his Work in a safe manner.

(ii) No employee shall be given a new assignment of work unfamiliar to him without proper introduction as to the hazardous incident thereto, both to himself and his fellow employees.

(iii) Under no circumstances shall an employee hurry or take unnecessary chances when working under hazardous conditions.

(iv) Employees shall not leave naked fires unattended. Adequate firefighting equipment shall be provided at crucial locations.

(v) Employees under the influence of any intoxicating beverage, even to the slightest Degree shall not be permitted to remain on Work.

(vi) There shall be suitable arrangements on every site for rendering prompt and sufficient first aid to the injured.

(vii) The employees, when working around moving machinery, shall not be permitted to wear loose garments. Safety shoes are recommended when working in shops or places where materials or tools are likely to fall. Only experienced workers shall be permitted to go behind guard rails or to clean around energized or moving equipment.

2) General Precaution during Land Sliding in Hilly Area

Landslides have occurred in almost every state and can cause significant damage. The term landslide describes downhill earth movements that can move slowly and cause damage gradually, or move rapidly, destroying property and taking lives suddenly and unexpectedly. Most landslides are caused by natural forces or events, such as heavy rain and snowmelt, shaking due to earthquakes, volcanic eruptions and gravity. Landslides are typically associated with periods of heavy rainfall or rapid snowmelt and tend to worsen the effects of flooding. Areas burned by forest and brush fires are also particularly susceptible to landslides.

Before Land Sliding -

- Aware about local emergency response and evacuation plans.
- Talk to everyone about what to do if a landslide occurs.
- Create and practice an evacuation plan for your site.
- Assemble and maintain an emergency preparedness plan.
- Become familiar with the land around where you live and work so that you understand your risk in different situations.
- Watch the patterns of storm water drainage on slopes near the site, especially where runoff water converges.
- Create and practice an evacuation plan for the site.
- Material to be shifted manually only.
- Labour to be engaged from local area those who have better exposer and experience of such area and condition.

During Land Sliding-

- If you suspect imminent danger, evacuate immediately. Inform affected neighbours if you can, and contact public works, fire or police department.
- Listen for unusual sounds that might indicate moving debris, such as trees cracking or boulders knocking together.
- If you are near a stream or channel, be alert for any sudden increase or decrease in water flow and notice whether the water changes from clear to muddy. Such changes may mean there is debris flow activity upstream so be prepared to move quickly.
- Be especially alert when driving watch for collapsed pathway, mud, fallen rocks and other indications of possible debris flow.
- If decide to evacuate, then animals must be with person.
- Consider a precautionary evacuation of large or numerous animals as soon as you are aware of impending danger.
- Stay alert and awake. (Many deaths from landslides occur while people are sleeping.)
- Special kind of shoes to be wear to avoid sleep during work.
- Any Changes in natural climate if seen in such area, then immediately work to be stop.
- Hard Barricading to be provided with safe distance to work location.

- Rope support must be available during climbing on hill.

After Land Sliding-

- Stay away from the slide area. There may be danger of additional slides.
- Check for injured and trapped persons near the slide, without entering the direct slide area.
- Watch for flooding, which may occur after a landslide or debris flow. Floods sometimes follow landslides and debris flows because they may both be started by the same event.
- Look for and report broken utility lines to appropriate authorities. Reporting potential hazards will get the utilities turned off as quickly as possible, preventing further hazard and injury.
- Check surrounding land for damage. Damage to foundations or surrounding land may help you assess the safety of the area.

Land sliding getting workers buried floods, Earthquake, Storms & Other Natural Calamities

- Turn off electricity to the building from the mains.
- Sound siren / whistle to alert personnel.
- Shout for help & direct all personnel to assemble outside in an open area, far from any high rise building.
- If people are trapped inside, shout out to them to be calm & that help is in hand. Ask them to stand under the beams of building & to move away from under the doors/ furniture. Attempt to evacuate people with disabilities first.
- In the event of a major collapse, do not attempt to enter the building until it has been declared safe to do so by the district authorities.
- When entering a collapsed building always keep a person as a lookout, so as to alert you in the event of an emergency.
- Attempt to rescue any person trapped inside the collapsed building, by going inside with a rope tied to your waist.

- In the event of any injury to any person try to immediately remove him/ her from the place where there is chance of further collapse, with the least bit of movement and discomfort to the victim, but with maximum speed.
- Call the fire brigade. Inform them the nature and location of the accident with any prominent landmark.
- Call the nearest hospital & inform them of the emergency & the condition of the injured, if any.
- Request for the ambulance, if necessary to rush the victim to the hospital.
- In the event of a fire attempt to put off the fire using minor fire appliances. However ensure a safe distance at all time.
- Inform Project Manager & safety officer at the earliest

Safety Manual (SOP) for Transmission Line

IV : PERSONNEL PROTECTIVE EQUIPMENT'S



PPE's Matrix

- **Whatever PPE / safety Equipment's will be using at Bangladesh project, all will be as per country's standers / CE. and approved by client or supply from authorized vendor. And quantity will be as per available manpower at site.**

PPE/ HSE DEVICES

Helmet

Full Body Harness

Hand Gloves

Nose Mask

Safety shoes

Gum Boot

Fire Extinguishers

Fire Bucket

Mobile Fall Arrester

R. Fall Arrester

Digital Camera

Goggles (Safety glasses)

Walkie- Talkie

Barricading Tape

Flag

Public Announce System/ pamphlet

Binocular

Voltage Induction Buzzer/Tester & Discharge rod

Sag Bridge/Aluminum Ladder

WORKS WISE PERSONAL PROTECTIVE EQUIPEMENT

SURVEY---------- Helmet, Shoes, Gloves, Goggles,

FOUNDATION------Helmet, Shoes, Gloves, Gum Boot, Ladder, Nose Mask, Caution Tape.

ERECTION----------Helmet, Shoes, Gloves, R. Fall Arrester, M. Fall Arrester, Caution Tape, Full body harness with energy absorber.

ADVANCE PPE'S----- Binocular, tool kit Lanyard, Shoulder pad & fall arrester rope in horizontal way.

STRINGING---------Helmet, Shoes, Gloves, Full Body Harness, R-Fall Arrester, Walkie-Talkie, Flag, & Public Announce System.

ADVANCE PPE'S------- Binocular & R-Fall arrester as per the height work, sag bridge, Aluminum Ladder, tool kit lanyard, shoulder pad.

MATERIAL HANDLING----------Helmet, Shoes, Gloves, shoulder Pad.

SHUT DOWN----------Helmet, Shoes, Rubber Gloves, & Full Body Harness with energy absorber, Discharge rod with double hook.

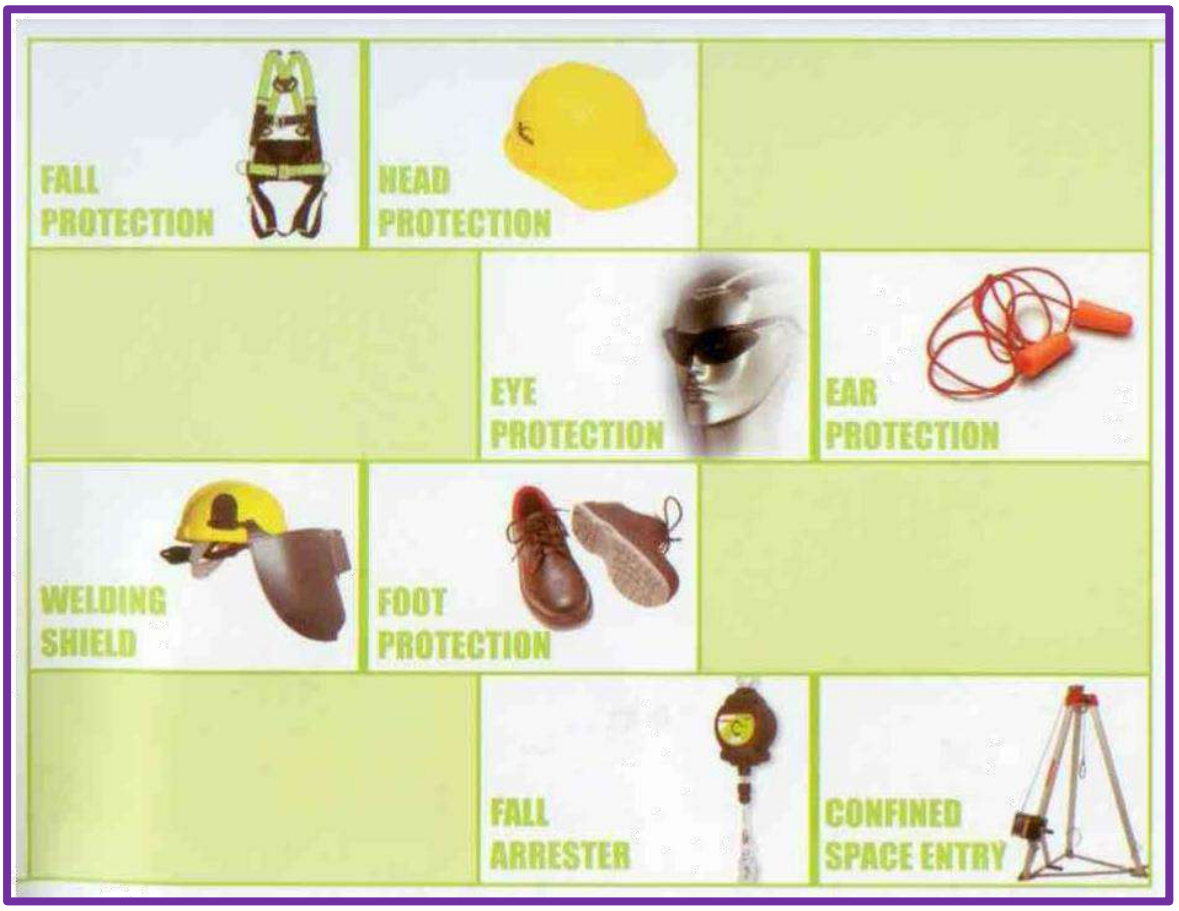
ADVANCE PPE'S-------- Voltage Induction tester/buzzer, Shock proof Electrical hand gloves, Power cable, Insulating tools.

ROAD/RAIL CROSSING---------Helmet, Shoes, Flag, Public Announce System, HSE banner.

EMERGENCY EQUIPMENTS ---- Ambu Bag, Canvas folded Stretcher, diving kit, oxygen kit, Emergency vehicle, 1st aid box etc.

SOME OF THE PPE





PPE IS DESIGNED TO PROTECT THE WORKER FROM HEALTH AND SAFETY HAZARDS THAT CANNOT BE REMOVED OR ENGINEERED OUT THE WORK ENVIRONMENT.

➢ PERSONNEL PROTECTION GROUND RULES

1. PPE'S does not and cannot, eliminate hazards at work.
2. As a barrier between the hazard and the worker PPE can help eliminate an injury or reduce its severity.
3. PPE should be restored to only if absolute removal of the hazard in the work environment is impossible or impracticable.
4. PPE relevant to the hazard should be selected and used.
5. PPE should conform to applicable national standards or codes of practice and good engineering practices.

PRINCIPLE REQUIREMENTS

1. To safeguard the worker from the identified hazard to which he is exposed.
2. To afford reasonable comfort.
3. To permit essential movement of limbs required for efficient job performance.
4. To be amenable to easy cleaning and maintenance.

SOME REASON FOR NOT USING PPES BY WORKERS

1. Quality & comfort are the twin requirements of PPES, which in our country have not been receiving the attention they deserve.
2. Many PPES inconvenient to wear.
3. Many PPES are uncomfortable (particular for long period).

P.P.E COMPLIANCE

1. Awareness & understanding.
2. Report concerns

3. Set an example
4. Encourage correct use
5. Assist with maintenance
6. Investigate complaints
7. Training participants

"DUTY TO INFORM"

It is the responsibility of the employee, supervisor and health and safety representative. To ensure that personal protective equipment is correctly checked, stored and maintained

PROTECTIONS

1. Fall protection
2. Head protection
3. Eye protection
4. Ear protection
5. Hand protection
6. Leg protection
7. Body / skin protection
8. Repertory protection

- **FALL PROTECTION HIERARCHY OF FALL PROTECTION:**

1ST – **ELIMINATE FALL HAZARDS**

- Erect railings, barriers, barricades, walls to prevent entry into fall zone.

2ND – **RESTRAIN- PREVENT FALLS BY KEEPING PERSON AWAY FROM EDGE OF FALL ZONE**.

- Wear Full body harnesses.

3RD – **USE FALL ARREST SYSTEMS WHEN WORK MUST BE PERFORMED IN THE FALL ZONE.**

- Limits free fall hazards to 6' maximum
- Wear full body harness attached by energy absorbing lanyard to a secure anchorage should be as high as possible to limit free fall.

4TH – **WORK POSITIONING OR PERSONNEL RIDING SYSTEM MAY BE USED, WHEN APPLICABLE TO WORK PERFORMED IN THE FALL ZONE.**

- Supports a worker in the fall zone limits free fall hazard to 2' maximum
- Utilizes full body harness & positioning lanyards. Use positioning system in Conjunction with a back-up fall arrest system, not in lieu of fall arrest.

HOW LONG DOES IT TAKE TO FALL?

Height (Feet)	Time (Seconds)
4	0.5
16	1.0
64	2.0
100	2.5
144	3.0
256	4.0
576	6.0
1600	10.0

FULL BODY HARNESS

- The attachment point of a body harness is located in the centre of wearer's back near shoulder level.
- Snap hooks shall be a double locking type.

CHECK BEFORE USE

1. Be inspected prior to use
2. Be protected against being cut or abraded
3. Be of appropriate length
4. Be attached to an anchorage not to itself.

HEAD PROTECTION

1. Helmets and hats for the protection of employees from the impact of falling and flying objects and from limited electrical shock and burn shall meet the specifications of head protection.
2. Shell is designed to absorb some impact.
3. Suspension must be adjusted so shell is 1.5 inches above the head
4. Hard hats are tested to withstand impact of 8 Lb. weight dropped from 5 ft
5. Hard hats must also meet weight, flammability and electrical insulation standards

HEAD PROTECTION – WHY

1. The head is for absorbing knowledge not blows. It houses the command center of our central nervous system that controls all movements' senses and basic bodily functions. An injury to the head can pose a serious threat to the brain. The complex mechanism of the brain in delicately balanced and extremely susceptible the slightest disturbance in its functioning can have grave consequences for the body. Since the brain is housed in the Head. It is of utmost importance to protect it against all injuries and accidents. One single head injury can turn the victim into a veritable vegetable and even rob him of life.
2. The skull with its covering of scalp and hair acts as a natural helmet, cushioning the brain against minor bumps and knocks. However this is no protection against the serious hazards one encounters at construction sites, mining factories, in overhead line construction and maintenance work.
3. The bare head is no proof against a sudden cascade of loose masonry or accidentally dropped tools a trowel or a hammer falling from a height on an unprotected head can prove fatal heavy objects dropping on the head can knock one unconscious.

LACERATE THE SCALP, BREAK OPEN THE SCULL, CAUSE CONCUSSION OR BADLY DAMAGE THE BRAIN.

HEAD INJURY – HAZARDS

1. Collapsing of loose soil kept around the pits for foundation of towers
2. Collapsing cave roofs and walls are the ever- present fears at the back of minors minds. In cold dark confines of mines, remote from expert medical aid, head injuries are to be Avoided at all cost: chances of a victims recovery can be extremely than

PROTECTIVE MEASURES

1. Before you tackle a job, find out the hazards involved and the protective measures available good head protection on the job depends on safe work habits and proper use of protective headgear.

REGULATIONS

1. The employer shall ensure that all persons who are performing any work or services at a bldg... Or other const. Work, wear safely shoes and helmets conforming to the national standards'.

2. All the persons working on tower shall wear safety helmet, safety helmet & safety shoes. Similarly all the persons working on ground shall wear safety helmet and Safety shoes'.

3. No single headgear can offer protection against all hazards there are different protective headgear suited to the needs of particular jobs with their specific Hazards.

SAFETY HELMET

1. Hard shall of the safety helmet is designed to protect the head against impact.

2. It deflects objects and distributes the force of the impact over the whole head, diffusing the gravity of the blow.

3. The peak, a permanent extension of the shell over the eyes, protects the face, and specially the eyes from injury.

4. The brim is a narrow rim surrounding the shell that also helps deflect objects away from the head.

5. The chin strap holds the helmet securely in placed while ventilation holes shall allow circulation of air inside the hard hat, strap should be snugly, but not too tightly In place.

6. Wear the helmet straight, not tilted, on your head. Helmet is the protector of your head and not a receptacle for odds and ends.

7. Do not stash away cigarette packs, cards, and letters etc. In the clearance inside your hard hat and never wear an ordinary cap or hat under it.

SAFETY HELMET – UPKEEP

1. Your hard hat is for the safety of your head, so take good care of it. Don't fling it around carelessly or drop it.

2. Check the shell for cracks dents, signs of wear and for loose or broken straps is vital.
3. Replace damaged, worn-out helmets or those that have taken hard knocks. The harness must be changed at least once a year if the helmet is in regular use
4. Protect your helmet from extremes of heat and cold, chemicals, etc.; as much as possible.
5. PVC helmets are not suitable in very hot locations as they are likely to soften.
6. Remove dirt and moisture after use.
7. Clean the hard hat at least once in a month in warm water and a recommended cleanser and air dry.
8. Do not leave the helmet lying about. Store it in racks inside vehicles or places meant for it.
9. It is important that your helmet is in perfect condition whenever you use it.

OTHER PROTECTIVE HEADGEAR

1. Apart from safety helmets, there is other protective headgear that provides protection against hazards in the workplace.
2. Sundry accessories may be used with the helmet where the nature of the job requires them a chin strap holds the helmet in place where there is a chance of its falling off.
3. Face shield mounts holds face shields in place where there is a danger from flying objects or liquid splashes or heat radiation.
4. Appropriate eye protection should be worn under the face shield.
5. Ear defenders are useful in noisy environments for protection against noise pollution. Some safety helmets have built-in-brackets for attaching ear plugs.
6. A fixture for lamps on the helmet can be of great help to a miner whose hands are engaged while working in the mine the lamp fixed to the helmet lights up the work area for him.
7. Provision for keeping pans of concrete is also available on the helmet.

Type	Characteristics	Protect Against
Safety Helmet	Generally made of aluminium alloy. PVC, fiberglass or vulcanized fibre saddle (Geodetic strap suspension) inside to dissipate impact pressure over wide area of head and to provide clearance between head and shell of helmet. Chin strip or other device to prevent displacement peak and full brim to protect face, Neck, ears etc. Ventillation holes for comfort.	Falling objects, hitting against obstruction such as low ceilings, beams, scaffold members, etc.
Electrical safety helmet	Made of synthetic electrically non-conductive materials (PVE etc.)	Electrical shock when working near live electrical lines
Welding apron	Made of leather with cloth lining inside	Falling welding spatters from above
Crash Helmet	Usually fibre/plastic material, with saddle Inside without peak or rim and with chins Strap. Covers forehead, Temples and lower Portion of head (above neck)	Skull; injuries in road accidents,

EYE PROTECTION

Eyes are our windows to the world. The best means of direct and instant communication that the body has with the environment if eyesight is lost. Certain of darkness descend between us and the world, isolating us physically and emotionally. Eyes are precious, vital parts of our body; we cannot, must not neglect them. Indifference to their care in many cases causes irreversible damage.

1. Extremely vulnerable to injury; vital parts have few natural defences

2. Cornea and the lens have few bold vessels and heal slowly, if injured.

3. Retina, made up mostly of nerves, does not heal if damaged or destroyed.

4. Whenever hazardous work is going on eye protection equipment must be provided. Use them if the equipment does not offer adequate protection against the particular hazards involved in what you are doing, then it is important that you get the proper protection before going on with the job. Wearing the right type of eye protection on the job is the key prevention of eye injury at work.

5. Remember, everyone on the job site needs and must use eye protection- that includes visitors as well.

TYPE	CHARACTERSTICS	PROTECT AGAINST
Spectacle Type Goggle	Plain shatter-proof, toughened glass or plastic lenses. With or without side shields Metal or heat resistance frames.	Flying bodies (dust, Metal chips etc.)
Panorama Goggles	Light in weight, Iron fogging cellulose clear visor ventilation holes on other side soft pliable frames wide enough to wear over prescription glasses.	Oil and paint splashes dust and chip exposures.
Leather Mask	Sweating along edges, ventilation holes.	Smoke, dust foreign particles.
Goggles	With baffles for light and dust. Shatter proof lenses.	Bodies
Chemical Goggles	Acid/alkali-resistant rubber frames with clear lenses and shielded ventilating ports.	Chemicals & toxic dusts.
Gas light Goggles	Airtight fitting without ventilating port.	Irritating fumes, Vapour or gases.
Welding	Similar to panorama goggles with filter ultra violet & infrared.	Gas welding/cutting
Goggles	Glass of suitable grads and indirect ventilation ports.	Flames & Sparks.
Welding Shields	Fibber or fibre glass shield, hand held or suspended from helmet with window for filter glass.	Arc welding/Cutting flames and sparks

CLEANING AND DISINFECTING-

CLEANING AND DISINFECTING OF GOGGLES SHOULD BE DONE WITH UTMOST CARE HERE IS A CHECKLIST:

1. Clean with soap and warm water to remove oil or grease.
2. Keep in hot water or expose to steam for 5 minutes.

3. Expose to formaldehyde vapors, or immerse for 5 minutes in

I. A) Formalin (1 part of 40% formaldehyde solution in 9 parts of water) or

II. B) Solution of 1 part of sodium hypochlorite in 10 parts of warm water.

4. Rinse in cold water and dry in clean area.

PRECAUTIONS

1. Solvents (petrol, thinners, etc.) should not be used for cleaning.
2. Avoid very high temperature of water.
3. Manufacturer's instructions should be followed wherever these are available.
4. Place the cleaned goggles or respirator in a plastic bag or other suitable container with a tag indicating the date of cleaning and dis infecting.

EMERGENCY EYE PROTECTION: CHECK LIST

- **CHEMICAL BURNS**

1. Hold open the eyelid and immediately start and continue flooding with low-pressure water for 15 minutes to flush out or dilute chemicals.
2. Use any available source of water.
3. Pour water on the bridge of the nose of the victim to run down into the eyes. Do not pour directly on eye balls. Get medical help immediately.

- **CUTS, ABRASIONS, PUNCTURES**

Bandage eye lightly, if possible with sterile bandage. Do not wash. Call doctor.

- **FOREIGN OBJECT**

Don't take it out yourself go to a doctor

- **BLOWS**

Get medical help immediately even if there is no pain, reddening or swelling effect may be delayed; internal injuries not apparent to ordinary people may be detected and treated by qualified doctor.

- **GENERAL**

1. Keep first aid station properly equipped and supplied at a convenient location near work place have emergency eyewash stations and goggles cleaning Stations located nearby.
2. Keep handy generous supplies of befogging materials, cleaning tissues etc. along with receptacles for discarding after use.
3. Sweat bands help prevent eye irritation, aid visibility, and eliminate work interruptions for face mopping.

- **EMERGENCY MEASURES**

1. In spite of using eye protection equipment.
   Accident can and do occur be sure you know how to react to emergencies quickly and calmly. Know where the emergency equipment is kept and how to use them.
2. Eye is precious take good care of them you have got only one pair. They cannot be replaced.

HAND PROTECTION

Hands are the two busiest, most important indispensable, invaluable and at the same time vulnerable tools the human body has at its disposable. The versatility of their use sets human apart from other living creatures. We use them constantly for so many diverse jobs that we tend to take them for granted. Our hands and fingers are a set of amazingly dexterous tools with the strength to grasp. Grip, lift, push, pull, squeeze twist and hold things they are sensitive to touch respond to pressure, temperature and pain and have the flexibility and co-ordination to perform highly complicated and intricate jobs.

HAND PROTECTION – INJURIES

MOST COMMON INJURIES ARE

1. Amputation
2. Laceration
3. Burns
4. Fractures
5. Punctures
6. Dermatitis
7. Carpal tunnel syndrome
8. Reynaud's syndrome

Fingers, hands and arms injured more than other parts of the body.

Gloves are the most common protectors for the hands. Barrier creams may be used as hand protection or in conjunction with other hand protection.

TYPES OF HAND PROTECTION

1. Vinyl or neoprene gloves are sufficient when working with most chemicals.
2. Leather or cotton knitted gloves are for handling abrasives, metal or sharp objects.
3. It is dangerous to wear gloves around machinery with rotating parts.
4. Hands protection shall be provided when hands are exposed to such hazards as:

   Skin absorption

   Severe cuts or lacerations

   Abrasions and punctures

   Chemical burns

   Thermal burns

   Temperature extremes

PREVENTION TO HAND INJURIES

1. Be alert on job all the time around machinery
2. Keep your hands well away from moving parts.
3. Use tools properly and only for their intended use.
4. Ensure that machine guards meant for shielding the dangerous parts of the machine are securely in place.
5. Do not fiddle with safety devices like emergency stop.
6. Take off watches, bangles, rings, bracelets etc. while working with machinery.
7. Don't wear loose clothes.

8. TYPES OF HAND PROTECTION

Type	Characteristics	Protect Against
Leather gloves	Plain, cut resistant leather with or without metal, or without metal, mesh at palm	Cuts/burns/ abrasions during handling of metal sheets and other sharp edged object sand sparks
Aluminized fabric gloves	Heat resistant aluminized fabric or other special material.	Flames, intense heat radiation, burn injuries.
Asbestos gloves	Padding inside for comfort and to withstand high temp	Do
Acid/alkali-proof rubber synthetic gloves	Rubber, neoprene or vinyl material	Corrosive chemicals(organic acids or petroleum product)
Lead-lined gloves	Rubber, leather or plastic with lead lining	Ionising radiation (x-rays, gamma rays etc.)
Canvas gloves	Fabric or coated fabric	Grease, oil dust and dirt and dirt which may cause slipping of hands.
Electrical gloves	Made of insulated rubber having required dielectric strength and electrical resistance generally red in colour.	Electric shock

BARRIER CREAM CONTACT DERMATITIS FROM SOLVENTS,

LUBRICANTS AND OTHER OILS. LEG PROTECTION -

Our legs keep us mobile apart from assisting us in our domestic activities; this pair of slender limbs helps us to go out to earn our livelihood. In the process, they are exposed

To various hazards and unfortunately, are often injured, leg accidents account for a large proportion of occupational accidents. And many go unrecorded. A leg accident causes lot of pain and suffering and if sever, may lead to temporary or permanent disablement resulting in absence from work loss of income and medical expenses.

DIRECT HAZARDS

They have the potential to cause injury direct to the feet or leg and can be classified into four major types such as-

1. Mechanical- struck by falling/rolling or flying objects
2. Chemical-coming in contact with acids, alkalis bleaches cutting, oils etc.
3. Heat – exposure to hot surfaces molten metal splashes, direct flame etc.
4. Fungal infection-from prolonged exposure to water.

INDIRECT HAZARDS

1. Indirect hazards may have their origins in appropriate footwear and /or result from environmental factors. They can be broadly classified into 4 categories-
2. Fire/explosion hazards. These include flammable gases, liquids or explosives ignited by sparks from metallic parts of the shoe accumulated static electricity in the body igniting volatile material.
3. Slipping hazards on wet or oily surfaces
4. Electrical hazards: electrocution due to inadequate foot protection.
5. Sanitation hazards: contamination and infection from insanitary conditions.

SAFETY SHOES

1. The basic, universal form of foot protection is the safety shoe special protective features

such as steel tow cap, steel inner sole, special sole, reinforced instep, etc are incorporated into the safety shoe depending on the nature of the hazard it is to protect against.

2. Electrically non-conductive standards safety footwear are used for working on live circuits or equipment.
3. These should be regularly inspected
4. Do not use worn out or defective shoes
5. Must always be kept clean and dry otherwise their insulating property gets affected protection is diminished when they are wet from perspiration and rain.

FOOT PROTECTION

1. Foot injuries are most likely to occur with :

A. Heavy objects falling on your feet

B. Rolling of heavy objects

C. Piercing of objects through soles of your shoe

2. If working around electrical wires, boots/shoes must be metal free and non- conductive.

3. Static free environments require conductive shoes.

4. Rubber or synthetic footwear may be required around chemicals.

5. Avoid leather shoes/boots around corrosives.
6. Foot guards and heel and ankle shields may be required for particular work.

FOOT PROTECTIVE DEVICES

1. Safety shoes, with built-in protective box, are intended primarily to provide protection from heavy falling or rolling objects.

2. Other available safety shoes. Semi-conductive molder's style (for molten metals) safety boots electrical hazard (not to exceed 600 volts)

LIMITATIONS OF PPE

1. Ear muffs with cracked, cut or missing gaskets reduce your protection.
2. Dirty or scratched eyewear could limit your vision.
3. Suspension on hard hats may have loosen or torn cradles.
4. PPE must fit properly to protect you.
5. Learn how to clean and sanitize your equipment.
6. Be familiar with storage and proper handling of all PPE.
7. If equipment is damaged, know how to repair it or when to replace it.

A) SOP FOR HYDRA OPERATION

a. Before placing hydra for material handling work, the condition of hydra should be checked & fitness certificate of vehicle/hydra must be available.
b. 1st aid box must be available inside hydra vehicle.
c. Load certificate of Hook/ rope (For material lifting) should be certificate by competent authority.
d. 'D' cycle & Rope should be checked & certified by competent authority before using for material handling.
e. Experience person must be kept for hydra operation.
f. One or two (as per requirement/condition) supporting people (working) must be provided for material handling works along with proper PPE.
g. Try to avoid hydra operation in Rainy season.
h. Always Take the Extra precaution during the hydra operation.
i. Regular maintenance & housekeeping of hydra should be done.
j. Path/way should be cleared during the material handling by hydra.

k. Pick up the load at its proper Centre.
l. If load is obstructing a clear view, operate in reverse gear.
m. The Crane boom must always remain at least 3m away from wire. The distance shall be computed based on the voltage of HT/LT wires.
n. While working under HT/LT cables, job supervisor must be present throughout the entire duration of the job.

B) SOME IMPORTANT DO'S AND DON'TS

DO'S

a. Do ensure that the load to be lifted / pulled is within the S.W.L of the lifting machine and tackle.
b. Do thoroughly inspect all the lifting machines and tackles before every use if you suspect any defect avoid using such equipment and report to your engineer/ supervisor.
c. Do check the surrounding before lifting/pulling a load.
d. Before lifting any load, do ensure that the same is free.
e. Do ensure that only competent persons operate the lifting machines and tackles.
f. Do ensure that the person operating a lifting machine has a clear and unobstructed view of the load and also of the signaller.
g. Do check that the wire rope slings or chains ride freely on the “seat” of the load hook and not on its tip.
h. Do protect the slings by packing of soft wood, old tyres etc. against the sharp edges of the load or of the structure with which they are tied.
i. Do always “try” a load to check that it is securely slung before taking the “run” never move a load unless it is safe.
j. For equipment like trifor always ensure that the pulling rope, the equipment and the anchorage point are in a straight line before the application of the load.
k. When using multi-leg slings always try to load all the legs evenly. Also consider the angels of the slings to decide the amount of load to be lifted.
l. Keep your hands and fingers well clear of the nips between the ropes and the load.
m. Stand well clear when the load is being lifted or lowered.

DONT'S

a. Do not overload any lifting machine and tackle.
b. Don not improvises any lifting machine and tackle be sure to select the correct equipment for the required job.
c. Do not put into use any equipment without prior through inspection.
d. Do not even attempt to repair any lifting machine or tackle locally. Always consult the manufacturer.
e. Do not over-crowd the loading hook with too many slings. Use a d shackle in such cases.
f. Do not shorten a wire rope or chain by tying a knot on it.
g. Do not join wire ropes or chains with nuts and bolts.
h. Do not drag wire ropes, chains etc., on the floor.
i. Do not allow a load to swing. Ensure that the loading hook is vertically above the load before lifting the same.
j. Do not allow joy ride on lifting machines and tackles.
k. Do not allow a load to be carried over the heads of other persons give warning for them to keep clear.
l. Do not keep a load suspended unnecessarily.
m. Equipment meant for vertical loading should not be used otherwise.

C. LIFTING EQUIPMENT- COLOUR CODING REQUIREMENTS

Sr. No.	Rule	Paragraphs / Particulars	Color Code Requirements	Remarks
1		Color Coding	a. Based on the satisfactory results through inspection/ examination, the color coding shall be painted on every piece of lifting gear. b. The color code indicates to the user through examination has been performed within the prescribed period. (i.e. Quarter based)	

			c. In case of unsatisfactory results/damaged the equipment's shall be colored **RED** if to be disposed & if repairable to be colored **BLACK.** d. A color shall be introduced every 3 Months and each color shall be current a period of 3 months. There are **FOUR** colors in the sequence of yearly cycle. **e. FOR MAR TO MAY – WHITE COLOR** **FOR JUNE TO AUG – BLUE CO** **FOR SEPT TO NOV – YELLOW** **FOR DEC TO FEB – GREEN COLOR** f. If any lifting appliances / equipment's does not have a visible color band or where the color is out of date, shall not be used. It shall be returned to the site store. g. Painting of the color code shall be the responsibility of the store I/C along with the store workmen. h. Monitoring, inspection & checking of lifting appliances / equipment's responsibility of Site Safety persons. If possible; current color code identity board shall be displayed at site store.	

8. METHOD OF STATEMENT OF TRANSMISSION LINE:-

A. METHOD STATEMENT FOR FOUNDATION WORKS

1. MANPOWER INVOLVED

a) Supervisor- 1 No
b) Skilled - 3 Nos
c) Unskilled- 15 No's

2. INPUTS REQUIRED

1. Metal
2. Sand
3. Water
4. Cement

3. Tools and Machines

1. Measuring tape
2. Shovels
3. Crow bars
4. Spades
5. Vibrator
6. Small ladder (Aluminum)
7. Water drum
8. Iron rods

4. PPE REQUIRED

1. Safety helmet
2. Safety shoe / Gumboot
3. Hand gloves
4. Shoulder Pad
5. Nose Mask

5. HAZARDS INVOLVED

1. Improper Material Handling and placing
2. Improper packing of the Material
3. Improper signaling while transportation
4. Poor Approach
5. Loose soil / cave in
6. Machine operation

6. SAFETY RULES FOR FOUNDATION WORKS :

TO DO	NOT TO DO
➢ Use the pathway available along with the pit for handling materials. ➢ All person are using safety helmets, safety shoes (Gumboots), shoulder pad while manual material handling & nose mask for cement concreting work employees. ➢ Keep the tools and plant at least 3m. away from the center line of the pit. ➢ Keep the excavated soil atleast 2 Mtr. From the pit edge. ➢ Shore the pit if necessary to avoid earth collapse. ➢ Work with caution order if implantation is less. ➢ Arrangement of 2 nos. ladder inside the pit.	➢ Don't walk on the pit with or without materials. ➢ Don't keep the tools and plant very near and on the pit. ➢ Don't sit inside the pit when the train moves on the track. ➢ Do not use of wooden ladder.

7. QUALITY PROCEDURE

- ❖ Measure the span length and mark the location number as per layout.
- ❖ Mark the dimension of the pit as per the cross section drawing and volume chart.
- ❖ Excavate the pit as per dimension.
- ❖ Stack the required materials (metals & sand) in the G.I.Sheet near the pit.
- ❖ Bring the required cement bags near to the pit at the time of concreting.
- ❖ After excavation and checking the pit mix the cement and sand proportionate to the mixture.
- ❖ Mix the metal and mixture with water and make concrete and pour into the pit.
- ❖ Use vibrators for good mixing of concrete every 30cm.height.
- ❖ Fill the concrete up to top level.
- ❖ After 6 hours you remove the scroll box and make arrangement for finishing to be done.
- ❖ Make pit cover and close the core hole.

B. METHOD STATEMENT FOR TOWER ERECTION WORK

CONSTRUCTION ENVIRONMENT & SOCIAL MANAGEMENT PLAN

1. SCOPE AND SPECIFIC WORK ACTIVITY

The scope of works for the transmission line projects include, design / engineering, manufacture, testing, supply, delivery, installation, erection, commissioning and handing over of OHL's.

This method statement is related to the specific work activity of Tower erection.

2. TERMINOLOGY

Tower erection is the activity which will be commenced after tower foundation. This activity involves assembly and crane erection of steel lattice members which forms a self-supporting tower structure which is necessary for the stringing works.

3. PURPOSE

The purpose of this method statement is to establish a consistent routine to be applied during the tower erection for overhead transmission lines.

4. DOCUMENT REQUIREMENTS

The required documents to be kept at work site are as under.

1. Tower schedule
2. Tower structural drawings
3. Bill of materials
4. Method statement
5. Check lists

5. PROCEDURE

Work Method:-

1) Transportation of material.

2) Unload of material

3) Sorting of tower parts

4) Tower erection.

Tower Erection:

Tower Erection Method:

There are four main methods of erection of steel transmission towers which are described as below

i. Built-up method or piecemeal method.

ii. Section method

iii. Ground assembly method.

iv. Helicopter method

Built up method

This method is most commonly used in this country for the erection of 66 KV, 132 KV, 220 KV and 230kV Double Circuit Transmission Line Transmission Line Towers due to the following advantages.

i. Tower materials can be supplied to site in knocked down condition, which facilitate easier and cheaper transportation.

ii. It does not require any heavy machinery such as cranes etc.

iii. Tower erection activity can be done in any kind of terrain and mostly throughout the year.

iv. Availability of workmen at cheap rates.

This method consists of erecting the towers, member by member. The tower members are kept on ground serially according to erection sequence to avoid search or time loss. The erection progresses from the bottom upwards, the four main corner leg members of the first section of the tower are first erected and guyed off. Sometimes more than continuous leg sections of each corner leg are bolted together at the ground and erected the cross braces of the first section which are already assembled on the ground are raised one by one as a unit and bolted to the already erected corner leg angles.

First section of the tower thus built and horizontal struts (bet members) if any, are bolted in position.

For assembling the second section of the towers, two derrick poles are placed one each on the top of the diagonally opposite corner legs. These two poles are used for raising parts of second section. The leg members and braces of this section are then hoisted and assembled. The derrick poles are then shifted to the corner leg members on the top of second section to raise the parts of third section of the tower in position for assembly. The derrick pole is thus moved up as the tower grows. This process is continued till the complete tower is erected. Cross-arm members are assembled on the ground and raised up and fixed to the main body of the tower. For heavier towers, a small boom is

rigged on one of the tower legs for hoisting purposes. The members/sections are hoisted either manually or by winch machines operated from the ground. For smaller base towers/vertical configuration towers, one derrick pole is used instead of two derrick poles. In order to maintain speed and efficiency, a small assembly party goes head of the main erection gang and its purpose is to sort out the tower members, keeping the members in correct position on the ground and assembling the panels on the ground, which can be erected as a complete unit.

HSE OFFICER JOB -

1) Only experienced gang should be engaged.

2) Contractor should be specified of the number of skilled fitters required for the activity.

3) Competent and experienced supervisor should remain present during the entire erection Work.

4) From the main contractor side our required work methodology to be oriented for Implementation.

5) A height pass may be issued to all the workers especially to the fitters working at heights. The significance of the height pass must be explained.

6) Ensure the tower erection workmen are free from ailment before engaging them at height Works.

7) Tractors should not be used for transportation of the workers

8) The gang leader should have prior information about the availability of hospital / doctor in the vicinity.

9) Work should not be carried out under inclement weather conditions such as thunder in lightning, rainfall, etc.

10) Avoid erection at night.

11) Ensure workers do not climb with muddy shoes with which they lose grips.

12) It is preferable to have at least one first aid trained worker in the gang, or, the supervisor of the main contractor should be trained for first aid.

13) First aid box with adequate medicine must be available at site

14) 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.

15) All supervisors / workmen at erection site must always wear Safety Helmets with chinstrap.

16) Workmen working on Tower must use double lanyard Full body harness and scaffold hook above shoulder height.

17) Supervisor has to ensure that workmen always keep one lanyard tied with the structure during movement on tower, or during climbing or coming down.

18) It is to be ensured that foundation has been back filled properly.

19) Derricks and other load bearing tools eg. Wire rope, PP rope, D – shackles, pulleys etc. must be inspected daily before each use. Only tested tools with valid test certificates should only be used for erection.

20) Periodical greasing & tightening of the bolts of the pulleys to be done.

21) Towers are to be erected in a sequential manner. Work on the upper section must not be allowed to start until all the members and bracings of the tower section have been fully erected and all nut bolts are properly tightened.

22) Derricks are to be provided with three guy ropes. It is to be ensured that load has symmetrically distributed on each rope.

23) Guys provided during erection are to be anchored to a strong anchorage point.

24) One anchorage point should not support more than one Guy.

25) Maximum permissible angle between the guy rope and horizontal plane should be 45 degrees.

26) Lifting of material must not be done by tractor pulling instead hand winch or diesel engine / power driven winch should be used.

27) Main leg members should be lifted with step bolts fitted and fully tightened. The practice of fixing step bolts after erection of complete tower must not be allowed.

28) 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.

29) Softener (gunny bags etc.) should be used while tying ropes / slings with the tower members.

30) One vehicle should be available at site for providing immediate medical help to the injured.

31) Workmen should not be allowed to stand underneath the suspended load. Precaution shall be taken in case of suspended load.

32) Before lifting any load its actual weight should be ascertained. Center of gravity should be identified and mode of load transfers at slinging point to be considered

33) The common tendency of checking coupling, hole matching etc. by feeling with a finger must be strictly curbed.

34) During erection, only one signaller shall give proper signal. However " STOP" signal should be obeyed whoever gives.

35) While using spanners, hammer etc. at height, they should tie with a rope fixed to nearby structure so that it will not drop in any case of slip.

36) While positioning a structure members, it shall be so held that the employee's hand does not get jammed against other objects.

37) Proper skilled required with experienced persons having C.G. concept & also with trial & error method of slight lifting & resting to lower.

38) Ropes and slings should be protected by providing padding over sharp edges.

39) Slinging should be carefully done so as to prevent the load from slippage.

Welding & Painting:

All bolts/nuts below waist level in single circuit tower or bottom cross arm in Double circuit tower, shall be tack welded to prevent theft of tower members.

Two 10mm thick welding tacks should be done on each bolt & nut in the diagonally opposite direction by suitably selecting welding electrodes of size 1.6mm to 2.5mm equivalent to over cord-S, code AWS-E6013 (Advani-Oerlikon). After removing slag over tack welding, zinc rich (90% zinc content) cold galvanizing paint equivalent to epilux-4 of Berger Paint shall be applied on the



Welding -

Hazards in Welding Operation:

1) Health Hazard
2) Fire & Burns due molten slag
3) Explosion
4) Electric Shock
5) Fall of Person

Precaution:

1) Terminals of the welding cables should be provided with lugs and kept tight.
2) Joints in the cables should be made with terminals, kept tight and well insulated with heat resistant tape.
3) Welding machine must be earthed properly.

4) Electrical welding machine must connected through ELCB.
5) During drizzling, welding operation must be stopped.
6) Shed must be provided over welding machine.
7) Damage welding cable and holder must not be used.
8) In case of diesel welding machine, cap of the fuel tank must be properly placed
9) Never change electrode with bare hands or wet gloves. - 36 -
10) Welding machines should be kept within the visibility of the welders.
11) Provide proper double lanyard safety belt for welders to work at height.
12) Welding bits should not be allowed to drop from height. Provide suitable box to keep the hot welding bits and should be lowered down on daily basis.
13) Molten slag should be not allowed to fall down. Use suitable protections like fire blanket /G.I. Sheet etc to arrest the falling slag.
14) Fire extinguishers should be kept near welding spot and keep a fire watch.
15) Remove combustible materials from the vicinity before under taking welding job.
16) Make sure there is no coated surface within 4 inches of the weld area.
17) First aid box with adequate medicine must be available at site.
18) Inspect the work area. Ensure that sparks or molten metal will not contact flammable or combustible materials.
19) Always use all necessary Personal Protective Equipment (PPE), including, harness and lanyard, eye protection, face protection, gloves, and hot pads. Hazards in painting work:
1) Health hazards
2) Fire Hazards
3) Fall of persons

Precaution:

1) Use of hand gloves is compulsory during painting work.
2) Pint drum shall be stacked away from source of ignition.
3) Before taking food, painter must wash hand properly.
4) Painter must not carry paint drum during ascending or descending from tower.
5) Safety Helmet, double lanyard safety Belt fall arrestor must use.
6) First aid box with adequate medicine must be available at site

Appendix -6
Fire & Emergency Plan

13 ON SITE EMERGENCY PREPAREDNESS PLAN:

1.0 Introduction

1.1 Obligation

1.2 Objective of EPRP

2.0 Anticipated Emergency Situations

2.1 Types of Emergency Situations

2.2 Severity of Emergency Situations

2.3 Potential Emergency Situations

3.0 Preparedness

3.1 Terms & definitions

3.2 Coordination

3.3 Emergency communication system and roles & responsibilities.

4.0 Response

4.1 Accidents (Minor or Major)

4.2 Fire (Minor or Major)

4.3 Public Unrest (minor or Severe)

4.4 Natural Calamities (Catastrophic)

5.0 Mock Drills

6.0 Important Telephone Numbers

6.1 Hospital

6.2 Fire Brigade

7.0 Post Emergency Measures

21. 1.0 Introduction

Accidents can occur in any industry in spite of the best effort to prevent them. The severity of accidents could be ranging from minor to catastrophic resulting in proportionate degree of 'Loss'. All such accidents are therefore to be unwanted.

It is necessary to have an action plan prepared in anticipation of an emergency to prevent losses and to restore the normalcy at the earliest. This plan should aim at controlling the emergency and mitigating its adverse effects.

1.1. Obligation:

Organizations have to prepare the detailed plan to show its competence to manage the possible hazards. It is a statutory need under Section 41B of Indian Factories Act 1948 (Amendment) 1987 and Rule No. 13 & 14 of "Manufacturing, Storage & Import of Hazardous Chemical Rules - 1989. & under the section 36 of B&OCW act 1996(Amendment) 1998 & rules no -38

1.2. Objective of EPRP:

To identify the potential emergency situations
To determine resources to handle such situations and minimize loss
To define the response to such situations
To define how and when the mock drills shall be carried out

2. Anticipated Emergency Situations

2.1. Types of Emergency Situations:

Classification	Description
A	Accidents
B	Fire
C	Public Unrest
C	Natural Calamities

Accidents:

Accidents are situations where loss is caused to human beings, equipment or property and some sort of cognizable external help is required to handle it. It could be even an isolated incident of someone falling down and breaking his leg. It could even be a steel beam falling on ground where nobody is heart.

Fire & Explosion:

Fires can be associated with two basic factors namely sudden contact of combustible material with oxygen (explosion) or slow contact such as electrical short circuit. Extent of damage under similar environment is more in case of former than later.

Public Unrest:

Toxic material either in solid, liquid or gaseous from are sometimes released accidentally. Loss due to toxic release can be minimized if they are prevented from coming in contact with human beings. Militancy

Natural Calamities:

Floods, earthquakes, lightning, Land Slide, tsunami, cyclone, spread of disease/pandemic are typical of natural calamities that can cause loss.

2.2. Severity of Emergency Situations:

Classification	Description
1	**Minor**
2	**Major**
3	**Severe**
4	**Catastrophic**

Minor:

Minor emergencies could be due to accidents where a single individual, an equipment or property is involved. It could also be a minor fire. However in all these cases internal or external help and preliminary level of coordination is required in the post-accident situation. Other persons working in the surrounding areas can continue to perform their regular duties.

Major:

Major emergencies could be due to accidents (including death) where multiple individuals could be involved or the damage to equipment, property is extensive. In all these cases cognizable internal or external help and significant level of coordination is required in the post-accident situation. There is some disruption in the working or other areas as well.

Severe:

In this case the loss to people (including death), property or equipment is extensive. Severe accidents require extensive quantum of resources and high degree of coordination. Work in several sections or areas are affected.

Catastrophic:

The loss is colossal and resources requirement plus their coordination is also of very level. The person working in the construction site need to be evacuated to safer places.

Potential Emergency Situations

Potential emergency situations in our premises are identified as given below considering the activities carried out in different sections.

Type of emergency situations	**Minor (1)**	**Major (2)**	**Severe (3)**	**Catastrophic (4)**
Accidents (A)	A1	A2		
Fire (B)	B1	B2		
Public Unrest (C)	C1		C3	
Natural Calamities(D)				D4

Accidents

Sr. No.	Nature of Work	Nature of Accident	Rating
1	Construction of Tower & material handling work at Location, store, & office File and record Keeping	Person falling from a height	A1 or A2
		Material Falling over human beings	A1 or A2
		Accident with a machine	A1
		Electric shock	A2
		Burn injury	A1
		Damage to the property	A1
		Snake/ Animal Bite	A2
2	Non-adherence to the applicable work instructions Construction, material handling	Injury or death to human being	A2
		Damage to the property	A1
3	Non –adherence to the road HSE rules while driving	Injury or fatal road accidents	A2
		Property damage	A1

Sr. No	Nature of Work	Nature of Accident	Rating
4	Survey of land in the construction division	Chances of tripping and falling due to uneven land topography	A1
5	Earthing work in the construction division	Chances of accidents due to soil collapse	A2

6	Tower erection in the construction division	Chances of accidents due man or structural member falling from height	A2
7	Slinging of conductor in construction division	Chances of accidents due to improper or unsafe work practice	A2

Fire

Sr. No	Nature of Work	Nature of Accident	Rating
1	Improper Cable Insulation or worn out cable insulation	Fire due to improper insulation	B2
2	Burning of Grass in Summer Season Burning the file	Fire due to intense sunrays Fire Due to shot -circuit	B2

Public Unrest

Sr. No.	Nature of Work	Nature of Accident	Rating
1	Unrest in site area of surrounding villages during tower erection in construction division, or Militancy attack during the works/ others time at site/store, office labour camp.	Injury or death to human being	D3

2	Civil commotion during tower erection in construction division	Property damage	D1

Natural Calamities

Sr. No.	Nature of Work	Nature of Accident	Rating
1	Thunder storms & cyclone in the construction site	Injury or death to human being	**E4**
2	Floods due to due to heavy rain in the construction site	Work place getting flooded due to heavy rains	**E4**
3	Earthquake in the construction site/Office	Damage to people or property due to earth quakes	**E4**
4	Thunder lighting in the construction site	Damage to property or employees due to thunder lighting	**E4**
5	Sun Stroke at const. site/store	Affect human body, due to intense sun rays	**E4**

3. Preparedness

3.1. Coordination

Preparedness to handle emergencies involves a high degree of coordination of different activities that are to be performed during these emergencies. Various controllers with defined responsibilities have been appointed to carryout different activities to establish the coordination.

No.	Role	Name of the Controller	Alternative
1	Site Emergency Controller	Deepak Yadav	Santi Ranjan Das/Gulam Mustafa
2	Incident Controller	Kishore Kumar Mahanta	Santi Ranjan Das
3	Shut down Controller	Santi Ranjan Das/Gulam Mustafa	Kishore Kumar Mahanta
4	Transport & Security Controller	Santi Ranjan Das	Md Liyaquat Hossain
5	Safety & Fire Controllers	Kishore Kumar Mahanta	Subrata Khanra
6	Medical Controllers	Kishore Kumar Mahanta	Nittay Gopal Sarkar
7	Facilities Controllers	Deepak Yadav	Arijit Das

8	Communication Controllers	Santi Ranjan Das	Md Liyaquat Hossain
9	Public relation Controllers	Md Liyaquat Hossain	Pervez Alom
10	Power Controllers	Kishore Kumar Mahanta	Santi Ranjan Das

Roles & Responsibilities

Site Emergency Controller: - On receipt of the information of emergency site emergency controller will rush to the emergency control room and handle emergency from Emergency control room. Project Managers office at site are the 'Emergency Control rooms. And for office Corporate Office

- Decide the level of emergency and if required inform Offsite Emergency Controllers (district Collector)
- Ensure emergency services and key persons are put in service.
- Direct the shutting down at site and guide the course of action.
- Direct evacuation of persons.
- Ensure causalities are given proper medical aid.
- Assess continuously all possible developments.
- Liaise with Inspectorate of Factories / Govt. / Police / Fire and other Statutory authorities
- Monitor & control the functioning of other controllers
- Issue authorized statements to media and outside agencies.

Incident controller:

On hearing Information, rush to the spot with all PPE and initiate emergency actions

Direct all operations within the affected area.

Declare emergency

Direct rescue and firefighting operations till HSE and Fire Controllers reaches the spot.

Ensure that all persons are evacuated.

Guides the Rescue Team in search of / evacuate the causalities.

Take charge of responsibilities of site Emergency controller till he arrives at control room.

Report all significant developments to Site Emergency Controller.

Arrange for inquiry.

Any other work assigned by the Site Emergency controller.

Shut down Controllers:

Contact Incident controller / HOD at site.

Decide about the plant/ site to be shut down in the absence of Site Emergency Controller

Give instructions to respective Location for shutdown and follow up the actions taken

Ensure proper shutdown of the location/ site

Inform about the status of plant/site to the Site Emergency Controller frequently.

Any other work assigned by the Site Emergency Controller.

Transport Controllers:

Arrange transport for the injured personnel.

Arrange vehicle to bring the key personnel from their residence.

Arrange transport for shifting of necessary equipment and materials to the Emergency location.

Security Controllers:

Immediately send some of the guards to the affected area to restrict unauthorized entry.

Prepare a report on number of labours & visitors admitted inside the store and location at that point of time and send it to Emergency Control Canter at the earliest.

Allow Emergency Controllers and Emergency team members to reach incident site.

Post one of the security guard to go round the store to guide the security staff and to regulate the movement of visitors / labours / vehicles.

Send some of the guards to incident site to assist the firefighting team.

HSE & Fire Controllers:

On receipt of the information of emergency rush to the site at the earliest and coordinate with the incident controller.

Ensure the availability of all HSE equipment.

Arrange for the search of the missing person.

Ensure preservation of evidences for the investigation of the incident.
Investigation the accident to find out the causes.
Ensure that the on - site emergency operations are carried out safely.
Guide the Fire officer / Firefighting team to control the spread of fire.
Arrange for further equipment / assistance for firefighting, if necessary.
Any other work assigned by the Site Emergency controller.

Medical Controllers:

Inform the hospitals to be ready for receiving the injured persons.
Ensure safe transport of persons to the hospitals.
Ensure proper first aid treatment for injuries in the first aid center.
Mobilize additional medical facilities if needed.
Guide the Medical team members and involve them in giving first aid to the injured persons.
Any other work assigned by the Site Emergency Controller.

Facilities Controllers:

Arrange additional transport if required.
Arrange for needed financial support for the emergency operations.
Arrange for rehabilitation of persons.
Any other work assigned by Site Emergency Controller.

Communication Controllers:

Inform mutual aid members to get Ambulance, Fire tenders etc. if require.
Request help from outside fire services.
Inform hospitals to be ready to receive injured persons.
Answer phone calls from outside, as instructed by Site Emergency Controller.
Provide information to inmates and relatives. (If require)
Guide Communication team members.
Prepare a report on number of employees working inside the company at that point of time and send it to Emergency control canter at the earliest.

Inform Site Emergency Controller about the status of emergency shelters and assembly points.
Inform Emergency throughout the plant.
Any other work assigned by Site Emergency Controller.

Public Relations Controllers:

Maintain good relation with nearby village.
Ensure that the emergency in the plant does not get adverse publicity.
Request help from police, if necessary.
Establish & maintain good rapport with the Government agencies, large-scale Industries in the area and media
Give report to press and public with the concurrence of Site Emergency Controller.
Any other work assigned by Site Emergency Controller.

Power Controllers:

Ensure availability of power for the Emergency operations.
Arrange for safe electrical circuits needed by the Incident Controller / Shut down Controllers
Ensure power supply without interruption for the critical equipment and their function as advised by Shutdown Controller / Site Emergency Controller.

Arrange for Emergency maintenance of electrical equipment /services needed by the shutdown Controllers. Any other work assigned by Site Emergency Controller.

3.2. Internal & External Facilities

General Facilities

- Unrestricted access to this 'Emergency Preparedness & Response plan'
- All personnel are trained in Emergency Procedures
- Adequate numbers of safe assembly points
- Emergency warning system
- Emergency communication system

Fire Fighting Facilities:

- Fire extinguishers are kept all over the plant
- Good layout for easy approach from all the directions.
- Good maintenance practice is followed
- Round the clock posting of security personnel
- Access to common firefighting facility

Medical Assistance Facilities:

- Basic medicines (first aid) and rescue kit available in designated areas
- Access to common external medical center facility

4. Response:

The response will depend upon the different emergency situations and will vary accordingly

Type of emergency situations	Minor (1)	Major (2)	Severe (3)	Catastrophic (4)
Accidents (A)	A1	A2		
Fire (B)	B1	B2		
Public Unrest (D)	D1		D3	
Natural Calamities (E)				E4

4.1 Accidents (Minor or Major)

The person who will see the accident or present during accident shall try reviving the person and if needed shout and call for assistance.

Inform to shift in charge, concerned HOD and Medical Controllers immediately.

If required inform the transport controller and security controller

On getting information shift in charge shall rush to the spot and arrange for first aid

Depending on severity of accident, the person may be sent to nearby hospital immediately.

If needed ask for ambulance from hospital and inform the hospital staff about the nature of accident.

Depending on the requirement call HSE/security officer and ensure there is no crowding.

If needed arises call fireman for rescuing the person such as brining the person from height, rescuing person from gaseous atmosphere.

Inform the security officer to the spot and cordon off the area and ensure speedy evacuation of patient.

Fire (Minor or Major):

- Any one on seeing the fire should try to put out the fire in the incipient stage using fire Extinguisher.
- If fire is uncontrollable he should inform the incident controller, HSE and fire controller, site Controller, shift in charge, concerned HOD and control room immediately
- Depending on severity the site controller should isolate the store area.
- On receipt of information HSE and fire controller should ask for fire tender from the central fire station
- Depending on wind direction fire crew along with auxiliary fire team will start firefighting from up wind direction.
- On hearing the siren firefighting team from other areas rushes to the site and join with fire crew.
- In addition to the initiation of siren by incident controller, all concerned will follow the telephonic Communication network.
- Key personnel should report at emergency control center and take advice of Site controller and act according to the procedure.
- All the employees should reach the safe assembly point or emergency shelter and stay there till emergency call off is given.
- Inform First aid center / Medical coordinator and call ambulance if required
- If required Inform Transport and security coordinator if required
- Inform other plants which are likely to be affected if required
- Alert and evacuate the people working in the plant if required

- Stop all work / maintenance activities by checking permits and ensure evacuation of working group

4.3 Public Unrest (minor or Severe)

In case of Public Unrest the site emergency controller and security controller immediately

The security personnel shall send the security guards at the site

The site emergency controller shall try to calm down the workers / labourers or the persons from nearby villages/location

The security guards shall ensure that the agitated employees do not cause any damage to the equipment's or property

The security guards shall ensure that no untoward incident occurs at site/store

The management of the organization may be called for discussion if required

In case the crowd becomes violent the police personnel may be called for help

The security controller shall try to restore peace at site

After having pacified the crowd the site controller shall try to disperse the crowd from the Site

4.4 Natural Calamities (Catastrophic):

The Site Emergency Controller and Incident Controller should inform people about the emergency situation

Depending upon the type of emergency the people who are likely to be affected by the emergency should be shifted shift to a safer place.

If required the medical controller should administer the first aid and shift the injured people to medical centre and to the outside hospital (if necessary).

The medical controller should inform to outside hospital in advance for preparation at their end.

The public relations controller should call the police/fire brigade and Government agencies if required

The facilities controller shall provide for the welfare facilities (e.g. Food packets, hot beverages, blankets etc) and transport arrangement if need arises

The medical controller should provide for medicines if required and administer the first aid

The medical controller and facilities controller shall arrange to shift the victim to the medical centre at the earliest.

The communication controller shall inform people to stop television & others equipment to avoid property damage.

The facilities controller along with the security controller shall arrange to clear debris from the site.

Mock drill:

Mock drills are being conducted regularly with the purpose of familiarizing the key persons and all employees in emergency preparedness. Mock drills are conducted at different times (Office / non office hours) to know the emergency response and review the plan accordingly. Any shortcoming observed in the drill will be discussed and necessary action will be taken. These will be recorded in emergency mock drill register. Frequency of Mock Drill for a Year: Two different Mock Drill must be covered in year at site. As per site condition or requirement, total six Mock Drill for site;

1) Fire (Site) 2) Material Handling (At Store & Site) 3) Fall From Height 4) Snake / Animal Bite 5) Electric Shock during the shutdown/ Office Working (Site)

The Site controller has identified the potential emergency situations at site. Based on these potential scenarios he has prepared a schedule for conducting the mock drills. As per the schedule the mock drills are being conducted. The site controller appoints an observer and explains to him the whole process of mock drills. After declaration of an emergency situation the observer notes down the actions of concerned people during the emergency and also makes a note of the time required by different personnel to attain to various emergency actions.

Based on the observation report of the observer the site controller reviews the mock drills and suggests any changes if required. The records of the mock drills are maintained by the site controller with a copy of the same with the MR.

Important Telephone Numbers:

6.1 Hospitals:

Sr. No	Name of the Hospital	Telephone Number
1	Naogaon 250 bed District Hospital	01911-970948
2	Gopalganj 250 bed District Hospital	01730-324778
3	Bagerhat District Hospital	01711-458168

Post-Emergency Situations

Even after the emergency is over, a skeleton staff of the Rescue/ Evacuation Team will be available at the site of the emergency for at least 30 minutes to confirm that there is no further scope of escalating the emergency and all personnel have been survived. The site controller will establish a chain of communication and pass the necessary information to the concerned person(s) for restoring normalcy.

After the emergency is over, all the Team Leaders should meet and each team leader should submit a report to the Chief Controller about team performance and other details observed

The Site Controller will carry out an investigation of the emergency. This report shall be submitted within 24 hours of the occurrence to the Chief Controller and the report should be discussed to each of the team member on the next day for about their performance, omission, carelessness etc.

All emergency situations can have some adverse impacts either on individual & population or on the surrounding environment.

Even some of the response actions that are undertaken to tackle the emergencies have negative impact on the surrounding environment.

Post-emergency situations that have adverse impacts on environment

In this plan two different emergency situations are envisaged viz.

1) Fire

2) Natural Calamities

In the first situation the adverse impact includes, people and as well as it surrounding environment The adverse impacts of emergencies like cyclone, flood, earthquake etc. include a large number of people as well as devastating effects on the environment like damages to property, vegetation, agriculture etc. Some response actions even have adverse impacts on its environment viz. use of fire extinguisher for firefighting, use of excessive alkaline medium in case of a large gas release.

Extinguisher for firefighting, use of excessive alkaline medium in case of a large gas release.

DISCIPLINE

Utmost discipline shall be followed in handling the Emergency
The guidelines of DO's and DON'TS are listed below

DO'S

Give attention to all instructions.

Report to your Team Leader and carry out your assignment.

Conduct the visitors outside the emergency zone to designated location.

Only qualified First-aiders shall render first aid wherever possible and wait for the Doctor.

DON'TS

- **Do not panic.**
- **Do not communicate with any external agencies unless instructed by the Site / Incident Controller.**
- **Do not spread unauthorized or exaggerated information to others.**
- **Do not approach the emergency site as spectator.**
- **Do not engage unnecessarily the communication aids like telephone, PA system etc.**
- **Do not disturb the team leader assigned with specific work for the emergency.**

A. MONSOON EMERGENCY PLAN:-

1. OBJECTIVE:-

To ensure a safe & healthy working environment at project sites & achieves zero harm.

2. LEADERSHIP AND COMMITMMENT:-

TLL Site Management shall provide demonstrable management leadership and commitment through proactive participation in EHS activities.

Necessary resources to develop, operate and maintain TLL HSE Management System and to attain HSE Policy and legal requirements.

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

3. PRECAUTION TO BE TAKEN BEFORE MONSOON:-

- Check no loose materials (i.e. any scraps in the form of GI Sheet, wooden planks, nut & bolts pieces of pipes etc.) are on top of structures and platforms.
- Check all power cables for of joints, in case of joints provide the standard insulations and keep the cables firmly.
- Lay all power cables / welding cables over head or over the ground as applicable.
- Ensure proper earthing of each electrical appliance. Double earthing to be provided to all electrical appliances.
- Keep all the outlets and installations comparatively at a higher elevation and arrange sheds for all electrical outlets (Panel Boards, Ext. Boards, Welding Machines, and Winch Machines).
- All the electrical loads will be routed through ELCBs / RCCBs and MCBs / Rated fuse wires. Ensure the tripping of ELCBs/RCCBs at 30 mA and below by an ELCB testing kit.
- Protect the edges of the excavated pits. Keep the excavated earth away from the pits.
- Back fill all minor and major excavated pits which are not required for site execution.

- Barricade (Hard & soft as required) the pits required for execution with suitable fencing and

display warning tape & red light (if required).

- Arrange sufficient lights for night work; keep ready few battery-operated lights.
- Strict use of Diesel operated de-watering pumps should be adhered.
- Proper drainage system must be ensured in sites for avoiding clogging of water.
- Ensure additional bonding along the periphery of excavated pit to stop rain water flow.
- Sufficient number of rest shelter as per site condition must be ensured.
- Do not assemble any temporary structure for rest or any kind of service (For keeping T&P's or other materials, to take lunch or rest in lunch hour & other purpose) Near to River/Nala or down area.
- Make monsoon specific PPE requirements fulfilled like raincoat, gum boots etc.
- Ensure all materials are kept on compacted area.

4. DURING THE RAIN AND THE STORM:-

- Protect all electrical equipment's from water entering it / fall on it.
- Restrict all work at height activities.
- Restrict all lifting and erecting activities.
- Avoid using the telephone / mobile phones, except on emergency cases.
- Avoid metal objects, wide, open areas such as fields and open yard.
- Do not lie flat. This will make you a bigger target.
- Stay at least away from downed power lines.
- Try to get inside a shed. Flying debris can cause injury.
- If any work closed or temporary stopped due to rain & storm at site, all the workers in this

condition to be kept at permanent structure/at rented house at nearby village.

- Not to go any workers here & there during heavy rain especially near to any river or nala bank.
- Evacuate the employees/Workers from the risky areas when any catastrophe is noticed.
- Don't take rest under any crane.

5. AFTER THE RAIN AND THE STORM:-

- Always check all power supply sources first for any damage before starting any job.
- If power lines and poles are down in yard or in the site, always treat them as if they were energized and dangerous. Never touch them! Stay away. Call the electrician to report the location so repairs can be made as soon as possible.
- Disconnect computers and other delicate electronic equipment. Consider attaching surge protectors to such equipment.
- Be alert for damaged plugs and cords on electrical appliances and fixtures. Don't touch or use them if they are damaged.
- No height work immediately after a down pour.
- Scaffolding must be inspected by site engineer along with EHS person before used.

6. ELECTRICAL :-

UNSAFE CONDITION	MITIGATION
Short Circuit	Check for Water ingress before switching On.
Flash over on starting of machines.	Check the cable conditions.
Leakage of current to the outer surface of machineries.	Proper earthing of body to discharge leakage currents.
Malfunctioning of ELCB and earthing arrangements.	Testing of functioning.
Jointing of wire leads for extension for supply cables	To be replaced with continuous cables. No joints allowed.

Using of power tools during rain.	Usage to be restricted to covered areas.
Electrocution during welding in wet condition	Welding to be restricted to dry components & provide shed.
Obstacles to reach electrical installations.	Housekeeping and marking access obstacles free.
Ingress of water into cable joints, electrical machineries and installations.	Shutdown of all electrical machines and drying out.
Moisture free atmosphere inside electrical installations and machineries.	Regular inspections.
Earth pit identification and inspections	Prevention of soil fillings below OHE lines.
Increasing of induction zone of high tensions lines.	

Safety Precaution during Electrical Shutdown

9. For Carrying out the Shut Down/Hot Work & other work Job, Safety person of site/Section/C/Engg./Supervisor shall issue the work permit to Gang Leader/particular fitter.
10. Work Permit (Shut down/Hot work/other) person shall fill up permit clearly and completely and ensure personally safe working condition.
11. Work permit receiving person shall instruct to follow the safety requirement to the person who will do the job.
12. After Completing the Job, receiving person shall fill up the permit and hand over copy to Site Person (Gang Leader).
13. Location I/C shall check the completed job and sign the copy and hand over the copy to Site Safety person for record purpose.
14. The validity of work Permit (For, Shut down/Hot work & other) shall be seven days from the date of issue if job and person involved in the works remains same otherwise new permit to be prepared and issue.
15. Similarly; for shut-down activity (Electrical), approval /clearance to be obtained by client or Project /site (if Applicable) from respective SEB authority. And then, as per safety requirement work to be done in shutdown activity (Ref –Precaution. For LT Line.)
16. Colour system to be used during shutdown- for shutdown operator/worker to be used orange jacket & all Other to be used green jacket.

Additional precautions for stringing in the vicinity of charged overhead lines and in areas where induced voltage is anticipated

- All winches, pulleys and TSE must be properly earthed.
- Conductor running blocks are to be earthed.
- All the conductors at both ends of the section are to be earthed through running earths.
- Scaffolds are to be strong enough, should be adequately earthed, provided with anticlimbing devices and warning signs.
- Sufficient clearance must be maintained from existing charged lines after rough sag.
- Provision for breaking of paying out of conductor at any point.
- Earth wire should be earthed before earth bond is fitted.
- Nylon or PP ropes should be used for hauling/ controlling space ring cycle.

Earthing

Earthing (grounding) necessity grounding of deenergized transmission lines is to prevent the maintenance personnel from the following electrical hazards.

- By virtue of the inherent property of passive electrical elements of transmission lines they store electrical energy. This energy prevails on the line even if it is de-energized a decays over a period of time depending on the time constant of the line.
- Presence of voltage induced on the transmission line due to electromagnetic coupling with the neighbouring/crossing transmission lines.
- Induced voltages due to lightning.
- Accidental charging.
- All conductors and equipment shall be treated as energized until tested or otherwise determined to be de-energized or until grounded.
- Communication conductors bare wire communication conductors on power poles or structures shall be treated as energized lines unless protected by insulating materials.
- New construction new lines or equipment may be considered de-energized and worked as such where the lines or equipment are grounded.

The hazard of induced voltages is not present, and adequate clearances or other means are implemented to prevent contact with energized lines or equipment and the new lines or equipment.

ATTACHING GROUNDS

- When attaching grounds, the ground end shall be attached first and the other end shall be attached and removed by means of insulated tools or other suitable devices.
- When removing grounds the grounding device shall first be removed from the line or equipment using insulating tools or other suitable devices.
- Grounds shall be placed between work location and all sources of energy and as close as practicable to the work location, or

Grounds shall be placed at the work location if work is to be performed at more than one location is a line section. The line section must be grounded and short circuited at one location in the line section and the conductor to be worked on shall be grounded at each work location

Appendix -7
Checklists / Records

Checklist / Record –

List of HSE Formats:-

1. Monthly Project Safety Report (MPSR)
2. Monthly Safety Performance Report (MSPR)
3. Safety Checklist (Foundation/Erection/Stringing)
4. Individual safety checklist (Supervisor/ Section I//C & Safety Officer)
5. Height Permit (Erection/Stringing)
6. Individual checklist (Site Supervisor/HSE Officer & Section I/C)
7. Shut down/Hot work & Other Permit
8. Environment Checklist
9. Head count report
10. 1st aid monitoring report
11. 1st aid trained person report
12. Monthly Safety committee meeting report
13. HSE Induction training for staff/workmen
14. Tool box talk report (Covered HSE Aspects)
15. Skill matrix report
16. Blasting work checklist & work permit (if applicable)
17. Safety belt checklist
18. Vehicle inspection checklist
19. Fire Monitoring Report
20. Self -Safety inspection/audit report
21. Mock drill report – As per schedule.
22. Accident Intimation/Investigation report (if applicable)
23. Near Miss/1st aid investigation report (if applicable)
24. Waste Management Report
25. Other documents with respect to HSE Parts.

Appendix – 8
Biodiversity Management Plan & Integrated Pest Management Plan

Biodiversity Management Plan:

The project has no specific unique wildlife habitats will be get affected by the construction of project, as it will not create any large barriers to wildlife and bird movements. While the said project does not pass through any significant wildlife habitat and is not expected to cause any net loss of species. It is expected that no significant irreversible change in local biodiversity will occur as a result of the project.

Integrated Pest Management Plan (IPMP):

The respective unit IC is assigned to look after the overall cleanliness of the rested staff house. Pests are not expected to raise in the house but several measures are taken to prevent snake/scorpion bite at construction sites.



As Preventive action in the case of Snake/Scorpion bite emergency.

1. To inspect the area (Like; Labour Camp, Store, Work location & Office) on regular basis; specially in the

monsoon season and to ensure the Snake/Scorpion or any reptiles animal presence in the said areas or not.

2. Remove vegetation around the mentioned areas.

3. As a preventive measure, carbolic acid /Themet powder or any preventive chemical or medicine shall be Pouring around the mentioned areas before monsoon season and also regular interval. By pouring, the presence of snake/scorpion will be restricted & safe working area can be provided to employee.

4. While Pouring the carbolic acid/themet powder necessary precaution to be taken by the person like; Proper usages of PPE's. (i.e. Mask or Gamachha, goggles, shoes, hand gloves & apron if available at project/site) Similarly, do not enter in the pouring area at least for 12-15 Hrs. Also, after finishing the work person must take proper bath as a Health preventive measure.

5. If someone bitten by snake/scorpion; then following action to be taken on immediate basis to save the life of victim.

C. Immediately rush the person to the nearest hospital as mentioned in the Emergency services number.

6. Also ensure that whether mentioned hospital is having the facility of anti-snake venom injection or not at hospital and snake bite treatment part.

7. As a preventive measure, Project/site has to preserve anti-snake venom injection at office or any convenient place which is used in snake bite case.

Please be noted, this is the Rare medicine and generally not available at medical store at all time; therefore, this injection must be preserved in advance as a preventive measure and the Quantity of injection must be 2 Nos.

Precautions to avoid snake bite:

- Wear shoes when walking in suspected snake area. Before you wear your shoes, check inside the shoes for any snake/insect hiding inside.
- Be aware of your surroundings at all times. Never sit or step over obstacles without looking carefully.
- Avoid stepping out in the dark, especially during the monsoons, without a torch and shoes.
- Never go near the bushes for attending to natural calls.
- Do not try to chase away, snakes as they become more aggressive. Snakes have many sensing devices to warn them of your presence. Quiet often they move away on hearing noise, movement of people etc.
- Never try to hit a snake or try to catch it. Remember, where there is one, there are likely others!
- Never handle a snake, even if you think it is dead.
- Before lifting any material lying for long on ground with hands, look for snakes/insects hiding inside.
- Always check inside the gunny bags, cartons, boxes before putting your hands inside or lifting them.

Do's & Don'ts for Snake / Scorpion bite Emergency: -

A. Don'ts:

- Do not bleed the wound.
- Do not put ice on the bite.
- Do not eat or drink anything
- Do not engage in strenuous physical activity
- Do not cut or incise bite marks
- Do not apply oral suction to bite
- Do not take any self-medication
- Do not delay seeking medical attention
- Do not remove dressings/elastic wrap until arrival at hospital (laboratory might need to take a swab to identify the snake.

B. Do's:

- Avoid yourself or victim from risk of a second bite.
- Remove tight clothing, shoes, watch or rings near bite area before swelling starts.
- Calm the victim. Virtually all snakebites are successfully treated. Panic can increase the danger to the victim by inducing rapid heartbeat.
- Apply hard direct pressure with gauze pad overbite area
- Soak gauze pad with Beta dine if possible before application
- Wrap affected extremity with 2"-3" elastic bandaging
- Wrap as tightly as one would for a sprain
- Keep the bitten limb below the level of the heart. This slows down the spread of the poison to
  the heart.
- Immobilize affected extremity; use a splint if possible
- Get medical attention as soon as possible.
- Ensure the availability of anti-venom injection in the hospital.

Basic snake bite first aid.

Symptoms of Snake Bite

- A pair of puncture marks
- Severe pain at the bite area
- Redness & swelling around bite
- Nausea
- Vomiting
- Disturbed breathing
- Increased salivation
- Sweating

Appendix – 9
Fuel and Hazardous Substances Management Plan

Purpose

Although there are no hazardous materials will be used on site other than fuel for DG, winch machine & vehicles, still 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.

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.

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.

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.

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.

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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.

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.

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.

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

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.

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 cleanup and restoration of paved, gravelled, or sodded surfaces;
3. Arrangements for remediation are made immediately; and
4. Records of the spill are maintained.

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 cleanup. 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 5. 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.



Colour code for standard hazardous waste bin are maintained on site.

On-Site Collection & Storage of Construction Site Wastes

SL No	Colour Coding of Dustbins	Symbols	Waste Category	Examples
1.	RED		HAZARDOUS FLAMMABLE WASTE	OILY SLUDGE, OILY COTTON WASTE
2.	YELLOW		BIOMEDICAL OR CLINICAL WASTE	FIRST AID COTTON, ADHESIVE TAPE, BAND-AID AND BLOOD SOAKED CLOTHES
3.	GREY/BROWN		HAZARDOUS TOXIC WASTE	TIPS OF WELDING RODS
4.	BLUE		RECYCLABLE WASTE	PLASTIC, GLASS & METAL WASTES
5.	GREEN		BIODEGRADABLE WASTE	FOOD & PAPER WASTE

Pic: Standard signage of Hazardous wastes

Safety Data Sheet of Diesel Fuel will be followed during operation is as attached below:

SAFETY DATA SHEET
Diesel Fuel

1. IDENTIFICATION

Product Identifier	Diesel Fuel
Synonyms:	Diesel Fuel, Motor Vehicle Diesel Fuel, Dyed Diesel, * DieselOne®, * DieselOne® w/Platinum Plus DFX, Low Sulfur Diesel (LSD), Ultra Low Sulfur Diesel (ULSD)
Intended use of the product:	Fuel
Contact:	Global Companies LLC Water Mill Center 800 South St. Waltham, MA 02454-9161 www.globalp.com
Contact Information:	EMERGENCY TELEPHONE NUMBER (24 hrs): CHEMTREC (800) 424-9300 COMPANY CONTACT (business hours): 800-542-0778

2. HAZARD IDENTIFICATION

According to OSHA 29 CFR 1910.1200 HCS

Classification of the Substance or Mixture

Classification (GHS-US):

Flam. Liquid	Category 3	H226
Skin Corrosion/Irritation	Category 2	H315
Aspiration Hazard	Category 1	H304
STOT SE	Category 3	H336
Carcinogenicity	Category 2	H350
Aquatic Chronic	Category 2	H411
Serious Eye Damage/ Irritation	Category 2B	H319

Labeling Elements



Signal Word (GHS-US):	**Danger**
Hazard Statements (GHS-US):	H226 – Flammable liquid and vapor. H315 – Causes Skin irritation. H304 – May be fatal if swallowed and enters airways. H336 – May cause drowsiness or dizziness. H350 – May cause cancer. H411 – Toxic to aquatic life with long lasting effects. H319 – May cause eye damage/irritation.
Precautionary Statements (GHS-US):	P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking. P233 - Keep container tightly closed. P240 – Ground/bond container and receiving equipment.

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P241 – Use explosion-proof electrical/ventilating/lighting equipment pursuant to applicable electrical code.
P242 – Use only non-sparking tools.
P243 – Take precautionary measures against static discharge.
P261 – Avoid breathing dust/fume/gas/mist/vapors/spray.
P264 – Wash skin thoroughly after handling.
P271 – Use only outdoors or in a well-ventilated area.
P273 – Avoid release to the environment.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P303+361+353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse with water/shower.
P308+311 - If exposed or concerned: Get medical advice/attention.
P301+310 - If swallowed: Immediately call a poison center/doctor/...
P331 - Do NOT induce vomiting.
P370+P378 – In case of fire use firefighting foam or other appropriate media for Class B fires to extinguish.
P403+235 - Store in a well-ventilated place. Keep cool.
P405 - Store locked up.
P501 – Dispose of contents/container in accordance with local/regional/national/international regulation.

Other information:

NFPA 704
Health: 1
Fire: 2
Reactivity: 0



3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Composition Information

Mixture

Name	Product Identifier (CAS#)	% (w/w)	Classification
Diesel Fuel	68476-34-6	100	Flam Liq. 3, H226; Skin Irrit. 2, H315; Aspiration 1, H304; STOT SE 3, H336; Carc.2. H350; Aquatic chronic 2, H411
Naphthalene	91-20-3	<0.1	Carc. 2, H351; Acute Tox. 4, H302; Aquatic Acute 1, H400; Aquatic Chronic 1, H410

Additional Formulation Information:

Diesel Fuel consists of C9+ hydrocarbons resulting from distillation of crude oil.

Low Sulfur Diesel Fuel typically contains less than 500 ppm of sulfur

Ultra Low Sulfur Diesel Fuel typically contains less than 15 ppm of sulfur

4. FIRST AID MEASURES

Route	Measures
Inhalation	Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

Route	Measures
Ingestion	Aspiration Hazard: DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Ingestion may cause gastrointestinal disturbances including irritation, nausea, vomiting, and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory failure, and death.
Eye Contact	In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention. In case of contact lenses, remove immediately.
Skin Contact	Remove contaminated clothing and shoes. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and of the area of the body burned.

Most Important Symptoms
Contact with eyes and face may cause irritation. Long-term exposure may cause dermatitis (itching, irritation, pain and swelling).

Inhalation may cause irritation and significant or long term exposure could cause respiratory insufficiency and pulmonary edema.

Ingestion may cause aspiration, gastrointestinal disturbance, and CNS effects.

Immediate Medical Attention and Special Treatment
For contact with skin or eyes, immediately wash or flush contaminated eyes with gently flowing water. If possible, irrigate each eye continuously with 0.9% saline (NS). If ingested, rinse mouth. Do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).

If inhaled, administer oxygen or establish a patent airway if breathing is labored. Suction if necessary. Monitor closely, anticipate seizures. Consider orotracheal or nostracheal intubation of airway control if patient is unconscious or is in severe respiratory distress.

Discard any clothing or shoes contaminated as they may be flammable.

5. FIRE-FIGHTING MEASURES

Extinguishing Media
Foam, carbon dioxide, dry chemical are most suitable

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, C02, water spray, firefighting foam, or Halon. Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other firefighting equipment.

LARGE FIRES: Foam, carbon dioxide, dry chemical. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Specific Hazards / Products of Combustion
Moderate fire hazard when exposed to heat or flame with a very low flash point. Product is flammable and easily ignited when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Combustion may produce smoke, carbon monoxide and other products of incomplete combustion.

Special Precautions and Protective Equipment for Firefighters
Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied firefighting foam.

Fighting Equipment/Instructions
Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH- approved pressure-demand self-contained breathing apparatus with full face piece and protective clothing.

Refer to Section 9 for fire properties of this chemical including flash point, auto ignition temperature, and explosive limits.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY SPCC, SPILL CONTINGENCY or EMERGENCY PLAN.

Personal Precautions
Due to high vapor density, flammable / toxic vapors may be present in low lying areas, dikes, pits, drains, or trenches. Vapors may accumulate in low lying areas and reach ignitable concentrations. Ventilate the area. Use of non-sparking tools and intrinsically safe equipment is recommended. Potential for flammable atmosphere should be monitored using a combustible gas indicator positioned downwind of the spill area. Refer to Sections 2 and 7 for further hazard warnings and handling instructions.

Use appropriate personal protective equipment to prevent eye/skin contact and absorption. Use NIOSH approved respiratory protection, if warranted, to prevent exposures above permissible limits. Refer to Section 8. Contaminated clothing should not be near sources of ignition.

Emergency Measures
As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions. Consider wind direction. Secure all ignition sources (flame, spark, hot work, hot metal, etc.) from area. Evaluate the direction of product travel, diking sewers, etc. to confirm spill areas. Do not touch or walk-through spilled material. For large spills, isolate initial action distance downwind 1,000 ft. (300 m).

Environmental Precautions
Stop the spill to prevent environmental release if it can be done safely. Product is toxic to aquatic life. Take action to isolate environmental receptors including drains, storm sewers and natural water bodies. Keep on impervious surface if at all possible. Use water sparingly to prevent product from spreading. Foam and absorbents may be used to reduce / prevent airborne release.

Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Follow federal, state or local requirements for reporting environmental release where necessary. Refer to Section 15 for further information.

Containment and Clean-Up Methods
Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of firefighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with dry earth, sand or other non-combustible, inert oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container with clean, non-sparking tools for reclamation or disposal. Response and cleanup crews must be properly trained and must utilize proper protective equipment. Refer to Section 8 for appropriate protective equipment.

7. HANDLING AND STORAGE

USE ONLY AS A FUEL.
DO NOT SIPHON BY MOUTH.

Handling Precautions
Handle as a flammable liquid. Keep away from heat, sparks, and open flame. No smoking. Electrical equipment should be approved for classified area. Bond and ground containers during product transfer pursuant to NFPA 70 and API RP 2003 to reduce the possibility of static-initiated fire or explosion. Follow precautions to prevent static initiated fire.

Use good personal hygiene practices. Use only with protective equipment specified in Section 8. Avoid repeated and/or prolonged skin exposure. Use only outdoors or in well ventilated areas. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this

product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves. Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API RP 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage
Large quantities of diesel fuel are stored in tanks or portable containers at an ambient storage temperature. Separate from incompatible chemicals (Refer to Section 10) by distance or secondary containment. Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers that are clearly labeled. Label all secondary containers that this material is transferred into with the chemical name and associated hazard(s). Empty product containers or vessels may contain flammable vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Storage tanks should have a venting system. If stored in small containers, the area should be well ventilated, away from ignition sources and protected from potential damage or vehicular traffic. Post "No Smoking" signs in product storage areas. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code" or applicable building code. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks in Flammable and Combustible Liquid Service" and API RP 2015 "Safe Entry and Cleaning of Petroleum Storage Tanks".

Incompatibles
Keep away from strong oxidizers, ignition sources and heat.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits

Component	CAS #	List	Value
Diesel Fuel	68476-34-6	ACGIH TLV-TWA	100 mg/m3*
Naphthalene	91-20-3	ACGIH TLV-TWA OSHA PEL	10 ppm 10 ppm

*Critical effects; Skin; A3; CNS impairment.

Engineering Controls
Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Intrinsically safe equipment and non-sparking tools shall be used in circumstances where concentrations may exceed lower flammable limits. Grounding and bonding shall be used to prevent accumulation and discharge of static electricity. Emergency shower and eyewash should be provided in proximity to handling areas in the event of exposure to decontaminate.

Personal Protective Equipment

Exposure	Equipment
Eye / Face	Wear appropriate chemical protective glasses or goggles or face shields to prevent skin and eye contact especially caused from splashing.
Skin	Wear appropriate personal protective clothing to prevent skin contact. Gloves constructed of nitrile, neoprene or PVC are recommended when handling this material. Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure.

Exposure	Equipment
Respiratory	A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations. Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.
Thermal	Product is stored at ambient temperature. No thermal protection is required except for emergency operations involving actual or potential for fire. Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

9. PHYSICAL AND CHEMICAL PROPERTIES

Property	Value	
Appearance	Clear or straw-colored liquid. May be dyed red for distribution.	
Odor	Mild characteristic petroleum distillate odor.	
Odor Threshold	<1 ppm	
pH	Not available	
Melting Point	-22 to -0.4 °F (-30 to -18 °C)	
Boiling Point Range	320 to 690 °F (160 to 366 °C)	
Flash Point	> 125.6 °F (52 °C) PMCC	
Evaporation Rate	Slow, varies with conditions	
Flammability	Flammable liquid (OSHA defined)	
Flammable Limits	0.6 % - 6.5%	
Vapor Pressure	0.009 psia @ 70 °F	
Vapor Density	> 1	(air=1)
Specific Gravity	0.83-0.86 @ 60 °F (16 °C)	(water=1)
Solubility	Insoluble in water; miscible with other petroleum solvents.	
Partition Coefficient (N-octanol/water)	Log Kow range of 3.3 to >.6.0	
Autoignition Temperature	494 °F (257 °C)	
Decomposition Temperature	When heated it emits acrid smoke and irritating vapors.	
Viscosity	<3 cSt	
Percent Volatiles	100	

10. STABILITY AND REACTIVITY

Stability
This is a stable material that is flammable liquid (OSHA/GHS hazard category 3). Stable during transport.

Reactivity
Material is not self-reacting. Flammable concentrations may be present in air. Compound can react with oxidizing materials.

Possibility of Hazardous Reactions
Hazardous polymerization will not occur.

Incompatibility
Keep away from strong oxidizers such as nitric and sulfuric acids.

Conditions to Avoid
Avoid high temperatures, open flames, sparks, static electricity, welding, smoking and other ignition sources.

Hazardous Decomposition Products
Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL INFORMATION

Acute Toxicity:
Acute Toxicity (Inhalation LC50)
Diesel Fuel (68476-34-6)
LC50 Inhalation Rat >6 mg/l/4h

Acute Toxicity (Dermal LD50)
Diesel Fuel (68476-34-6)
LD50 Dermal Rabbit >5000 mg/kg

Acute Toxicity (Oral LD50)
Diesel Fuel (68476-34-6)
LD50 Oral Rabbit >5000 mg/kg

Skin Corrosion/Irritation: Prolonged and repeated contact may cause skin irritation leading to dermatitis. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

Serious Eye Damage/Irritation: Causes serious eye irritation.

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Teratogenicity: Not available

Carcinogenicity: OSHA: NO, IARC: Group 3, NTP: NO, ACGIH: NOIC:A3, NIOSH: NO

IARC: Group 3 – Not classifiable as to their carcinogenicity to humans ACGIH: A3 – Confirmed animal carcinogen with unknown relevance to humans

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

IARC classifies whole diesel fuel exhaust particulates (byproduct of combustion of this material) carcinogenic to humans (Group 1) and NIOSH regards diesel fuel exhaust particulate as a potential occupational carcinogen.

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Specific Target Organ Toxicity (Single Exposure): Inhalation exposure may cause drowsiness or dizziness by inhalation exposure.

Aspiration Hazard: The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Potential Health Effects: Vapor irritating to skin, eyes, nose, and throat. Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

WARNING: The burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of

combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

12. ECOLOGICAL INFORMATION

Toxicity:
This material is expected to be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

Data for Component: Diesel Fuel (68476-34-6)

Material is toxic to aquatic organisms based on an acute basis (LC50/EC50 >1 but ≤ 10 mg/L in the most sensitive species tested).

Material is a long-term aquatic hazard based on a chronic basis (LC50/EC50 >1 but ≤ 10 mg/L in the most sensitive species tested).

Persistence and Degradation: This material is not expected to be readily biodegradable.

Bioaccumulative Potential: Not available

Mobility in Soil: Not available

Other Adverse Effects: None known

Other Information: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options. May be considered a hazardous waste if disposed. Direct solid waste (landfill) or incineration at a solid waste facility is not permissible. Do not discharge to sanitary or storm sewer. Personnel handling waste containers should follow precautions provided in this document.

Shipping containers must be DOT authorized packages. Follow licensure and regulations for transport of hazardous material and hazardous waste as applicable.

14. TRANSPORT INFORMATION

US DOT

UN Identification Number	NA1993
Proper Shipping Name	Diesel fuel
Hazard Class and Packing Group	3, PGIII
Shipping Label	Flammable liquid
Placard / Bulk Package	Flammable liquid, 1993
Emergency Response Guidebook Guide Number	128

This product may be re-classified as a "Combustible Liquid" meeting the definition in 49 CFR 173.120 unless transported by vessel or aircraft.
Specific placard requirements must be met for shipments of this product as a Combustible Liquid by rail (See 49 CFR 172.332).
Non-bulk packages (<= 119 gal) of Combustible Liquids in package sizes less than the product reportable quantity are not regulated as hazardous materials if the material does not meet any other hazard class.

IATA Information

UN Identification Number	UN1202
Proper Shipping Name	Diesel fuel
Hazard Class and Packing Group	3, PGIII
ICAO Label	3
Packing Instructions Cargo	310
Max Quantity Per Package Cargo	220L
Packing Instructions Passenger	309Y
Max Quantity per Package Passenger	60L

ICAO

UN Identification Number	UN1202
Shipping Name / Description	Diesel fuel
Hazard Class and Packing Group	3, PG III
IMDG Label	3

IMDG

UN Identification Number	UN1202
Shipping Name / Description	Diesel fuel
Hazard Class and Packing Group	3, PGIII
IMDG Label	3
EmS Number	F-E-S-E
Marine Pollutant	Yes

15. REGULATORY INFORMATION

U.S. Federal, State, and Local Regulatory Information
Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning And Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	Yes
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Clean Water Act (Oil Spills)
Any spill or release of this product to "navigable waters" (Essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA Section 103 and SARA Section 304 (Release to the Environment)
The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts this material. This product does not contain any chemicals subject to the reporting requirements of CERCLA Section 103 or SARA 304.

SARA Section 313- Supplier Notification
This product does not contain any chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372.

EPA Notification (Oil Spills)
If the there is a discharge of more than 1,000-gallons of oil into or upon navigable waters of the United States, or if it is the second spill event of 42 gallons or more of oil into water within a twelve (12) month period, a written report must be submitted to the Regional Administrator of the EPA within sixty days of the event.

Pennsylvania Right to Know Hazardous Substance list:
The following product components are cited in the Pennsylvania Special Hazardous Substance List, and are present at levels which require reporting.

Component	CAS	Amount
Diesel Fuel	68476-34-6	100%

New Jersey Right to Know Hazardous Substance list:
The following product components are cited in the New Jersey Right to Know Hazardous Substance List, and are present at levels which require reporting.

Component	CAS	Amount
Diesel Fuel	68476-34-6	100%

California Proposition 65 WARNING: This product contains chemicals known to the State of California to cause Cancer or Reproductive Toxicity.

Component	CAS	Amount
Naphthalene	91-20-3	<0.1%

U.S. Toxic Substances Control Act
All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30.

CEPA - Domestic Substances List (DSL)
All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

Canadian Regulatory Information (WHMIS)
Class B3 – Combustible Liquid
Class D2A – Materials causing other toxic effects. (Very Toxic)

16. OTHER INFORMATION

Version	6
Issue Date	June 1, 2021
Prior Issue Date	June 26, 2019

Description of Revisions
Update to occupational exposure limit information in Section 8. No changes to hazard information or chemical constituents.

Abbreviations

°F	Degrees Fahrenheit (temperature)
<	Less than
=	Equal to
>	Greater than
AP	Approximately
C	Centigrade (temperature)
kg	Kilogram
L	Liter
mg	Milligrams
mL	Milliliter
mm^2	Square millimeters
mmHg	Millimeters of mercury (pressure)
N/A	Not applicable
N/D	Not determined
ppm	Parts per million
sec	Second
ug	Micrograms

Acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
AL	Action Level
ANSI	American National Standards Institute
API	American Petroleum Institute
CAS	Chemical Abstract Service
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation
EC50	Ecological concentration 50%
EPA	U.S. Environmental Protection Agency
ERPG	Emergency Response Planning Guideline
GHS	Global Harmonized System
HMIS	Hazardous Materials Information System

IARC	International Agency for Research On Cancer	REL	Recommended Exposure Limit (NIOSH)
IATA	International Air Transport Association	RVP	Reid Vapor Pressure
IMDG	International Maritime Dangerous Goods	SARA	Superfund Amendments and
Koc	Soil Organic Carbon	SCBA	Self Contained Breathing Apparatus
LC50	Lethal concentration 50%	SPCC	Spill Prevention, Control, and Countermeasures
LD50	Lethal dose 50%	STEL	Short Term Exposure Limit (generally 15 minutes)
MSHA	Mine Safety and Health Administration	TLV	Threshold Limit Value (ACGIH)
NFPA	National Fire Protection Association	TSCA	Toxic Substances Control Act
NIOSH	National Institute of Occupational Safety and Health	TWA	Time Weighted Average (8 hr.)
NOIC	Notice of Intended Change	UN	United Nations
NTP	National Toxicology Program	UNECE	United Nations Economic Commission for Europe
OPA	Oil Pollution Act of 1990	WEEL	Workplace Environmental Exposure Level (AIHA)
OSHA	U.S. Occupational Safety & Health Administration	WHMIS	Canadian Workplace Hazardous Materials Information System
PEL	Permissible Exposure Limit (OSHA)		
RCRA	Resource Conservation and Recovery Act Reauthorization Act of 1986 Title III		

Disclaimer of Expressed and Implied Warranties

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

** End of Safety Data Sheet **

Appendix -10
Traffic Management Plan

Traffic Management Plan

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.

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.

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 TLL 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 pick 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 TLL (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.

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.

Appendix -11
Waste Management Plan

Construction Waste Management Plan

Introduction

Construction Waste Management Plan describes company's / Site commitment **for 230/132kV Double Circuit Transmission Line** taking all necessary steps to ensure that the collection, segregation, storage, transportation, and disposal of construction waste. The construction waste should be properly handled, isolate, store in a safe and environmentally responsible manner. The Waste management for construction project activity concerning to reduce, reuse, recycle.

Figure 1 3 R Waste Management) of generating waste.

Figure 1 3 R Waste Management Process



Purpose and Objectives

The purpose of this CWMP is to ensure that waste arising from construction activity are managed, reuse, recovered and disposed. It will also ensure that the optimum level of waste reduction, re use and recycling are to be achieved. Waste management priorities of project are based on the principal of the waste management hierarchy as mentioned in the table below.

Source Reduction and Reuse Recycling/Composting	**Most preferred**
Land-filling and Incineration without energy recovery	**Least Preferred**

The objectives of the construction waste management plan confirm that Transrail Lighting Limited Company implements an HSE management system that is an integral part of the Company's integrated management system of ISO-14001, 45001, 9001. The fundamental purpose of this CWMP is to provide an environmental management framework for the mitigation of the construction waste generation and effects arising from the construction activities.

In accordance with the construction waste hierarchy, the following waste management priorities have been established with respect to this facility.

i. Prevent material wastage
ii. Minimise/Reduce the quantity of waste
iii. Reuse of site materials
iv. Recycling of waste
v. Disposal

The objectives of this CWMP are:

- One approach is to develop a construction waste management plan. It is important to understand what excess materials are likely to be generated and then focus on how the generation of those excess materials can either be avoided or the material can be diverted or utilised at construction site.
- Minimise the amount of waste generated as part of the project
- Maximise the amount of material which is sent for reuse, recycling or reprocessing
- Minimise the amount of material sent to landfill.

Details of waste

Construction waste

During the construction there will be a surplus of materials such as off-cuts from small crop and broken concrete blocks. Waste from packaging and over supply of materials will also be generated. Other wastes that will arise from the construction phase of the development will be from the site store.

Main construction Waste Categories

The main non-hazardous and hazardous waste streams that will be generated by the construction activities at a typical site are shown below.

- Soil & Stone
- Concrete
- Steel
- Insulation material
- Wood

It is the responsibility of all personnel on site including, Sub-Contractors and their employees to ensure compliance as per the construction WMP.

Anticipated Hazardous Waste Arising

Soil tests should be carried out on excavated soil if deemed appropriate when excavations are undertaken. Fuels stored on site that will be used during the construction phase are classed as hazardous. There will be fuel stored on site for machinery and construction vehicles. All fuel tanks and draw off points will be bonded. If the fuel is correctly contained and bonded, it is not expected that there will be any fuel wastage at the site.

Responsibility

Project Manager's responsibilities

- The Project HSE Manager has an HSE Supervisor/ HSE officers to assist in the monitoring of the implementation of project's Construction Waste Management Plan.
- The Project Manager may assign responsibility for a particular task or function to a member of his management team, and delegate the authority to enable him to perform his duties.
- The Site Construction I/C will be designated as the responsible person and have overall responsibility for the implementation of the on-site Construction WMP.

Project Health and Safety and Environment (HSE) Personal responsibilities

- To monitor implementation of Environmental Management System and advice on the management of corrective and preventative actions towards waste management.
- To participate in the development and implementation of Waste Management plan.
- To ensure that a system to record and monitor potentially construction waste substances generated at site will be isolate in designated area.

Estimated Waste Arising

Construction Waste Generation

If any contaminated material is encountered during the construction works will isolate separately but this will increase the disposal rate. If possible try to recycle it or make it available for local people so as to utilised at generation point. Any potentially contaminated material encountered will have to be disposed as per waste management plan. The waste storage area (WSA) will have skips and receptacles for all recyclable wastes. The appointed waste contractor/ Agency will collect and transfer the recyclable wastes as and when required. The non-recyclable waste will be transferred by an authorized waste collector to an appropriate facility.

Bedrock, Blocks and Concrete

If bedrock is encountered during excavations, it will either be crushed on-site or to be used for infill during construction and if it is required to be removed from the site by appropriately permitted waste collectors. Rock collected from the site will isolate and store for proper use.

Soil and Sub Soil

The soil and sub-soils excavated during the construction activity will be collected and isolate at the site or it will be recovered off-site. Any fill material excavated at the site, which is deemed to be contaminated (i.e. hazardous) will be stored separately to the inert material.

Scrap Metal

Steel is a highly recyclable material and there are numerous companies that will accept waste steel and other scrap metals. A segregated skip will be available for steel/metal storage on-site pending recycling.

Cardboard Packaging

Cardboard packaging can also be recycled. Card board will be flattered and placed in a covered skip to prevent it getting wet.

Plastics

As plastic is now considered as a recyclable material, much of the plastic generated during project construction will be segregate and recycled and finally disposed it. The plastic will be segregated at source and kept as clean as possible and stored in a dedicated skip.

Hazardous Wastes

On-site storage of any hazardous wastes produced will be minimized with off-site removal organized on a regular basis. Appropriate storage of all hazardous wastes on-site will be undertaken including bonding of fuels, lubricants etc. so as to minimize exposure to on-site personnel (and the public) and to also minimize potential for environmental impacts. Hazardous wastes will be recovered wherever possible and failing this, disposed of appropriately.

W/C utilities Wastes

Regular housekeeping of the temporary workshop/camp areas will be carried out. Removal of domestic waste from the construction each department /section (plants) compound will be

carried out by a permitted waste contractor. Any temporary W/C utilities used on site during the construction phase will be maintained by an approved and permitted project site.

Disposal of construction Waste

There will be a general skip or receptacle for collection of construction waste, which is not suitable for reuse or recovery. This skip will include general wet waste (mixed food waste and food packaging), contaminated cardboard, contaminated plastic etc. Workers on the site will be encouraged to recycle the waste as much as possible i.e. cardboard, plastic, metals and glass. Prior to removal, the waste receptacle will be examined by the foreperson or a member of his team to determine if recyclable materials have been placed in there.

Training Provisions for HSE Person

HSE person will be appointed to ensure commitment, operational efficiency and accountability during the Construction phase.

Site Manager Training and Responsibility

HSE person will be given responsibility and authority to select a waste team if required i.e. members of the site crew that will aid him in the organization, operation and recording the waste management system implemented on-site. HSE person will have overall responsibility to oversee record and provide feedback to the client on waste management. Authority will be given to the HSE person to delegate responsibility to organization where necessary and to co-ordinate with suppliers, service providers and sub-contractors to priorities waste prevention and salvage. HSE person will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on-site. He will also be trained in the best method for segregation and storage of recyclable materials, have information on the materials that can be reused on-site and know how to implement the construction WMP.

Site Crew Waste Management Training

Training of the site crew is the responsibility of the HSE person and as such, a waste training program should be organized. A basic awareness course will be held for all crew to outline the Construction WMP and to detail the segregation of waste at source. This may be incorporated with other training needs (e.g. general site induction, safety training etc.). This basic curse will describe the materials to be segregated, the storage methods and the location of the waste storage areas.
A subsection on hazardous wastes will be incorporated and the particular dangers of each hazardous waste will be explained.

Records

Tracking and Documentation Procedures for off-site waste

HSE representative will maintain a copy of all waste collection permits. If waste (soil & stone) is being accepted on-site, a waste docket must be issued to the collector. If the waste is being transported to another site, a copy of the waste permits. All information will be entered in a waste management system to be maintained on-site.
Records will be kept for each waste material which leaves the site, wither for reuse on another site, recovery, recycling or disposal. A system will be put in place to record the construction waste arising on-site.

HSE person or delegate will record the following:
1. Waste taken off-site for reuse
2. Waste taken off-site for recovery
3. Waste taken off-site for recycling
4. Waste taken off-site for disposal
5. Waste (soil & stone) accepted on-site for recovery.

Review of Records and Identification of Corrective Actions

A review of all the records for the waste generated and transported off-site, as well as waste accepted, will be undertaken mid-way through the Construction phase. If waste movements are not accounted for, the reasons for this will be established in order to see if and why the record keeping system has not been maintained. Each material type will be examined in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved. Waste management costs will also be reviewed. Upon completion of the construction phase a final report will be prepared summarizing the outcomes of waste management processes adopted and the total recycling/reuse/recovery figures for the development. Records should be reviewed by HSE personal on Quarterly and review by project /plant head on half yearly basis.

Consultation With Relevant Bodies

Local Authority

The local authority will be consulted as and when required in order to ensure that all available waste reduction, re-use and recycling opportunities are identified and utilized. If excavated waste material will be useful for construction of their temporary house for

villager / local people than it will be encouraged to use it locally. Similarly, the local authority will be consulted as & when required under the relevant legislation.

Reuse

By re-using materials on-site, there will be a reduction in transport and disposal costs for a waste contractor taking the material away. The construction material will be utilised at site for reuse of material and if possible make it available for land filling or land levelling purpose locally.

Recycling

The Construction waste management, project will be contacted to determine their suitability for engagement regarding the transportation disposal of material. The information regarding the feasibility of recycling of each material will be check for each construction material. The company will be audited in order to ensure that relevant and up-to-date waste collection permits or license are held. The costs of recycling/reclamation and the means by which the wastes will be collected and transported off-site, and the recycling/reclamation process for each material will undergo off-site. A breakdown of the anticipated waste streams arising and there treatment and disposal method to be used are described below.

Anticipated Waste Streams

Waste Item	On-site Storage/Treatment Method	Off-site Treatment / Disposal Method
General (mixed)	Segregated Bin/Skip	Recovery/Disposal
Surplus Excavated Material	Stockpiling Topsoil, fractions to be in separate	Majority to be re-used on-site. Possible beneficial reuse off-site
Plastic	Segregated Bin/Skip	Return to supplier, recycling or disposal
Metal	Segregated Bin/Skip	Deliver to metals merchant

The detail of hazardous and non-hazardous waste generation quantity is monitored monthly with the help of waste management sheet. The waste generation sheet is shown in Appendix 5 Waste management plan.

Appendix -12
Environmental SOP

Standard Operating Procedure (SOP) for Environment

1) ENVIRONMENTAL ASPECT OF DESIGN

The following for Environment features shall be applied:

- Anti-climbing device to prevent climbing of towers.
- Tower-foot earthing for lightning and over voltage protection.
- Design of lower part of tower legs to prevent animals from getting trapped.
- Adherence to statutory electrical clearances.
- Bird guards to prevent insulator contamination by bird droppings.
- At substations, the transformer foundation plinth shall be designed with a sump to trap oil in the event of accidental spillage; the sump shall be sized to accommodate all the oil in the transformer, including allowances for expansion of the oil due to high temperature. The sump shall be covered with a steel grid overlaid by a layer of stones, to reduce oxygen supply and thereby minimise the risk of oil fires.
- The site personal shall maintain the third-party certificate for waste disposal.
- To improve visibility, spans crossing flight paths within 2000m of an aerodrome or airport, the conductors or overhead earth wires shall have spherical markers of diameter not less than 60 cm and spaced not more than 30 m located on the highest line; red or white with orange-coloured markers shall be displayed alternately.

2) GENERAL ENVIRONMENT GUIDELINES FOR CONSTRUCTION

a) The Site shall not establish or undertake any activities that are likely to permanently affect the scenic quality of the works area. Where required, actions should be taken to reduce the adverse effect of such activities on the scenic quality of the environment.

b) The Site uses construction methods and means of protection in order to avoid or minimize adverse effects that are incurred on vegetation, soils, groundwater and surface water, biodiversity, natural drainage and the water quality in areas within any Project Area and its surroundings for the entire duration of the works.

c) Prior to the start of Project activities, the site will ensure work activities will away from boundaries and outside the designated ecologically and archaeologically sensitive areas and wetlands, lakes, ponds, tidal influx areas etc.

d) Prior to construction, the site shall place signs with environmental protection information in areas identified as environmentally sensitive, and other areas where sensitive flora and fauna species are situated immediately adjacent to construction areas and that may be inadvertently disturbed or damaged during construction.

e) Painting or marking of natural features shall not be permitted. Marking for surveying and other purposes shall be carried out only with pegs and beacons.

f) No work shall be carried outside the defined area of the Works without the prior written approval from the client.

g) The Site shall take all necessary actions to ensure that water quality in nearby rivers and streams is not adversely affected. Other than that which must be there for operational reasons, no construction activity will take place within 30 metres of a riverbank, whether the riverbed is dry or wet.

h) The effects of runoff and erosion within construction areas shall be minimised.

i) To minimise air and noise pollution, Sites shall use only equipment in good condition, which shall be properly maintained.

j) On or offsite, workers shall not wantonly kill or injure any creatures except those (such as rats, flies and mosquitoes) known to be vectors of disease.

k) Sites shall at all times exercise due care and diligence not to damage fences, walls, drains, roads, tracks, buildings, fields, pasture, hedges and trees.

l) Disturbance or disruption of the daily lives of local communities and their livelihood, including noise and dust pollution shall be minimised in as far as is practicable.

m) The Site shall ensure that the construction Site is maintained in a neat and tidy condition at all times.

n) All files to be shifted at head office after completion of project for proper disposal and storage

o) Light used for construction area lighting and spot lighting may lit up close surrounding or adjacent areas in undesired way. Such illumination and glare producing sources of light shall be prevented through directional shielding

3) TEMPORARY WORKS (LABOUR CAMP, STORE BORROW AREA, SPOIL DISPOSAL)

I. The Site will use of existing facilities such as access roads and site establishment sites and/or their improvement instead of construction of new one.

II. A minimum of two toilets for temporary camps and full ablution facilities for permanent camps shall be provided. The use of the bush for relieving oneself shall be strictly prohibited. Latrines at camps will be closed and sealed after completion of works.

III. Camps and storage areas shall be located away from drainage courses and wetlands. Wherever possible, they will be sited within urban areas.

V. Camps and work-sites shall be kept clean and tidy.

V. Fuel, lubricants and other chemicals shall be stored in above ground storage facilities such that the entire surface area can be visually inspected. Tanks shall be inspected twice daily and any leakage stopped immediately.

VI. Sumps surrounded by low bunds and floored with impermeable material shall be constructed beneath all oil storage tanks. Other than trivial amounts, oil spilled to sumps will be removed for recycling or safe disposal.

VII. Oil changes in machinery and equipment including vehicles shall take place only in depots (never in the field). Drip pans will be placed under the equipment throughout oil changes and lubrication.

VIII. Construction workers are discouraged from woodcutting and fishing, and shall be dismissed for unauthorised hunting. Sites and their workforce may use local supplies of wood, within moderation.

X. Demobilisation from a site will include removal and safe disposal of all temporary structures and wastes. Stored topsoil shall be restored to site which will be planted with indigenous grasses, where instructed by the Client. No un-drained water will remain on site.

X. Prior commencement of the site shall identify the proposed borrow areas or areas to be excavated, or proposed backfill material stockpile locations or zones designated for the rubble from demolition works, maintenance facilities, storage areas, batch plants, etc.

XI. The site shall take the necessary measures to ensure that pollution to air, water or land is prevented or reduced and mitigated as far as practicable during the construction phase and should be aware about applicable laws about any Environmental pollution

XII. This requirement also applies to the side casting during the construction of linear infrastructure (roads, pipelines, transport routes) and which are included in the category of stockpiling of waste material.

4) BIODIVERSITY

- Site shall ensure about the season for protection of birds and wildlife. So that work can be avoided during that period.
- The Site shall ensure that all personal are informed and aware of the importance to protect species habitats, fauna and flora and are informed about the wildlife encounter procedure
- To ensure that site personnel shall not approach, injure, hunt, capture, possess, feed, transport, rear or trade wild animals and/or collect birds' eggs on the project areas
- The site personal shall avoid where possible breeding, feeding and nesting sites of endangered species as identified by clients.
- To limit the risk of introducing marine invasive species the site shall ensure the ballast water and antifouling system of vessels arriving from other bioregions.
- To ensure trenches or hole created during site work must be covered at night.
- No construction material from the surrounding environment will be used unless permitted by client.
- The Site personal shall not collect the flora and fauna species on the project areas
- The site employee shall report any sighting of finding of dead wildlife killed by the works to the client.
- The site shall protect excavation with temporary fencing to prevent injury to animals. (if possible)
- The site shall release any trapped uninjured animals immediately.
- The Site employee shall report injured endangered / or larger animals to the environment authority.
- To ensure that Site employee shall only use designated roads or paths and abide by speed limit.
- The Site shall not disturb natural habitats outside the project areas.
- To ensure that site shall monitor the impact on flora and fauna at sensitive locations
- The collection of wild plant is prohibited.
- Lighting fire in work area is prohibited.

4.A Vegetation

I) Bush Clearing

A. The Site shall provide for clearing of trees and bush throughout the line.

B. The site shall ensure no bush fires as a result of the burning of any wood along the ROW.

C. The Site shall not clear the line route by bull-dozing or other mechanical equipment unless approval to do so.

II) General Vegetation

The Site shall ensure that all work is undertaken in a manner that minimises the impact on vegetation, outside the immediate area of the Works.

a) Vegetation clearance shall only take place within the way leave.

b) To facilitate line of sight for the line survey, branches may be pruned from mature tees but without chopping down the entire tree; younger and flexible trees shall be pulled as necessary from the line of sight taking due care to avoid permanent damage.

c) No tree or shrub outside the area of the Works shall be felled, topped, cut and pruned.

d) Spoil shall not be heaped directly against trees if in so doing it can damage the stem.

e) To ensure the optimising schedule for forest clearing

Favourable period - December to February

On favourable period - July to November.

Very unfavourable period - March to July

f) No tree or other combustibles outside the area of the works shall be burned for any purpose.

g) Where the Works involve clearing and ground excavation, top-soil and sub-soil shall be selectively removed and stockpiled separately for replacement in the reverse.

h) Trees which have been selected for preservation within or adjacent to any area of the Works shall be fenced around their drip line, and no open fires shall be permitted under these trees.

i) Earth-moving equipment shall be thoroughly washed before bringing to site and the washings caught in a sump and incinerated.

j) Try to avoid burning vegetation at site.

k) To ensure the removed vegetation will be placed far from surface waste, large woody debris will be store along the outside edge of worksites in clear areas. Small twigs, branches and pieces of vegetation shall be used for composting along with biodegradable waste generated in the camp and work areas.

l) Clearing of vegetation shall be limited to that which is strictly necessary.

m) To ensure that cutting of vegetation on steep hillside will be minimal.

n) To ensure that vegetation clearing using chemical should not be done.

o) The Lighting fire in work areas is prohibited unless specifically authorized by the Client. It is prohibited to introduce foreign/non- adapted vegetation to the worksites.

p) Removed vegetation will be placed far from surface water.

q) Large woody debris will be stored along the outside edge of worksites in clear areas.

r) Small twigs, branches and pieces of vegetation shall be used for composting along with biodegradable waste generated in the camp and work areas.

s) Clearing of vegetation shall be limited to that which is strictly necessary.

t) Where possible, cutting of vegetation on steep hill sides will be minimal.

4.B Protection of Fauna

1. The Site or any employees shall not bring any domestic animals onto the Site.
2. The Site shall ensure that the project area is kept clean and tidy and free from rubbish which would attract animal pest species.
3. The Site need to ensure the bird guards for all suspension and tension towers at the insulator attachment points to prevent bird perching.
4. Prohibition of poaching activities on construction site. The site will draw up internal regulation strictly prohibiting all its employees:

- The consumption of bush meat
- Poaching and all forms of hunting
- The capture and resale of wild animals.
- Keeping wild animals alive or dead

4.C Limitation of poaching

Only the consumption of farmed meat will be authorized on the site.

4.D Rare and Endangered Species

Any protected plant species found should be reported to the Client, prior to clearing or stripping any area who will provide specific guidelines for their removal and transplanting.

4.E Maintenance of ecological and hydrological continuities

1. Natural habitat and agricultural areas to maintain passages allowing the circulation of terrestrial and aquatic fauna during the works.
2. The terrestrial fauna will in the maintenance of tree cover along the rivers areas of refuge allowing to cross the corridor discreetly.

4.F Wetland Areas

1. Construction work shall, where possible, be restricted to the late dry season.
2. Wetlands shall be excavated by approved methods, that avoid the development of quagmire conditions and subsurface compaction that would result from the use of heavy machinery.
3. After completing the construction site construction, the natural ground level and drainage pattern shall be maintained.

4.G Trees and Shrubs

Landscape, Greenery and Aesthetics:

- As far as is reasonably practicable, company will maintain ecological balance by preventing deforestation and defacing of natural landscape.
- TLL will, so conduct his construction operations, as to prevent any avoidable destruction, scarring or defacing of natural surroundings in the vicinity of work.
- Where destruction, scarring, damage or defacing may occur as a result of operations relating to Permanent or Temporary works, the same shall be repaired, replanted.
- All work areas shall be smoothened and graded in a manner to conform to natural appearance of the landscape.
- Site will identify the number and types of area that are required to be filled as a result of construction of works.

4.H Felling of Trees

- Site/company will identify the number and type of trees that are required to be cut as a result of construction of works and compensate as per the compensatory plantation requirement.
- All trees, herbs, shrubs, which are not specifically required to be cleared or removed for construction purposes, shall be preserved and protect from any damage during construction, operations and equipment movement. Site/company will not cut /remove/ dispose of any tree or forest produce in any land handed over to him for the construction of works and other related facilities.
- The tree cutting permission will be taken prior commencement of project activities if applicable.
- The project site will ensure that the project work should not disturb the surrounding environmental landscape, Greenery and aesthetics.

1. Trees and shrubs shall be planted as per requirement by the client.
2. Directly after planting, each plant shall be well watered to establish the plant firmly in the soil. After the soil is set, additional soil shall be added where necessary to bring the whole backfill to within 150 mm of the ground surface, in order to re-ensure that sufficient water can be retained. All trees shall be tied to a suitable treated timber stake planted firmly in the ground. After planting, the ground surface around the plant shall be covered with mulch in order to minimise evaporation.
3. The Site shall maintain the trees and shrubs up to completion of project. Maintenance shall include watering and keeping the plants free from weeds and pests.
4. The collection of wild plants is prohibited.

4.I Avoidance and signage of areas deemed sensitive during the works

- Understanding and compliance with the signs installed to delimit sensitive areas,
- Prohibition to drive outside of developed paths,
- Regulated use of the horn,
- Switch off the engines of vehicles and vehicles at a standstill,
- The maintenance, cleaning and refuelling of the machines are carried out more than 60 m from water courses and bodies of water and far from areas of refuge for avifauna,
- During temporary work stoppages, the machinery is stored outside the riparian strip of watercourses (15m from the high water mark).

5) CULVERT

- For temporary crossings and water heights less than 80 cm, log bridges can be put in place: the trunks must be installed in the direction of the water flow and are covered with gravelly clay.
- For higher water levels, temporary bridges are preferred over culverts
- The culverts will be made of galvanized steel tubes. In accordance with legislation
- Regular inspections must be planned to remove plant debris accumulating in front of the culverts created and to ensure that the banks of watercourses do not erode.
- All felled trees or parts of trees must be removed from the stream

6) **PROTECTION OF ARCHAEOLOGICAL AND PALEONTOLOGICAL SITES**

a. The Site shall ensure that key members of site are familiar with archaeological and paleontological materials likely to be found in the project area.

b. Site expose any archaeological artefacts during excavation, work shall cease immediately.

c. Under no circumstances shall archaeological artefacts be removed, destroyed or interfered with by the Site, workers / employee.

7) CONTROL REQUIREMENT DURING THE TRANSPORT OF MATERIAL

1. Precautions include removal of particulate matter from equipment before movement to paved streets or prompt removal of materials from paved streets onto which such material has been dropped. Any deposition of material on public streets by construction equipment should be removed by sweeping.

2. To ensure that vehicles with an open load carrying area used for moving potentially dust producing materials shall have properly fitting side and tailboards. Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards and shall be carried in vehicles fitted with cover lids.

8) MAINTENANCE OF ROADS

i. Site shall be used all public and private roads for suppliers for the construction of the Works shall be kept trafficable and free of excessive dirt and mud arising from the Works.

ii. Public access roads used by the Project shall be maintained in a trafficable, safe and minimum dust condition, at all times. Driving speeds shall be limited to 40km/hr.

iii. Where existing gravel roads are used frequently by the project in any part of the works as access roads for transporting labour, plant and materials, the Project shall contribute towards the maintenance or upgrading of the roads in any one of the following ways: a. Routine maintenance, consisting of gravelling and dust control by watering.

iv. The Site shall periodically water all gravel roads in the proximity of dwellings, where these are heavily used by construction traffic, to minimise dust emission.

9) THIRD PARTY ACCESS

i. The Site shall, at all times, maintain access for the authorised representatives of utility providers and allow emergency operations to be carried out on any utility or service facilities within the site.

ii. The Site shall not use public or private rights of way for depositing or storing plant or materials and shall maintain those parts of the public or private right of way not temporarily occupied by the Works in a clean, passable and safe condition at all times.

iii. The Site shall execute the Works in such a manner that safe access, (including disabled persons access, where they existed prior to site possession), to all properties is maintained at all times. Methods of construction and programming of the Works shall be such that vehicular access to properties affected by the Works is not restricted. Normal access shall be reinstated immediately after completion of the Works.

iv. The Sites and their employees, in all instances shall exercise utmost driving control and driver care.

10) AIR POLLUTION CONTROL

a) To obtain the baseline data for air quality for sensitive site within the work area.

b) To monitor the dust pollution.

c) To Investigate complaint of dust pollution and other air quality issues from operation associated with project.

d) To ensure servicing of all fuel basis engines to control smoke emission.

e) The Site shall take measures, as necessary, to reduce the emission of particulate matter from blasting operations, excavations, road transport, rock crushing, material sieving, borrow areas, and other related construction activities.

f) To maintain record of excessive dust or other air pollution (if applicable the source of pollution)

g) Proper precaution to be taken during earthing so that air pollution can be avoided.

h) To avoid the air pollution from the DG set proper stack height to be maintained if any clearance is required from pollution control authority than need to be obtained.

i) Equipment and vehicles that exhibit excessive emissions of exhaust gas due to poor engine adjustment or other inefficient operating conditions shall not be used.

j) Burning of cleared trees and brush, combustible materials, construction materials and rubbish shall only be permitted when the Client considers atmospheric conditions favourable. Site will use such material in slope stabilisation, erosion control works, site rehabilitation, or made available to local landowner or users.

k) The Site shall exercise care to minimize emissions of dust from its activities, including traffic, at work sites, in residential areas and on access roads. Where it is deemed that dust have an impact on human, plant or animal receptors or where dust may cause sedimentation of watercourses/water bodies or unacceptable levels of soil loss.

l) The Site shall ensure and apply water to the area creating the dust and consider implementing other dust control measures such as using wind breaks, netting screens or semi-permeable fences, controlling vehicle speeds to reduce traffic-induced dust dispersion and re suspension by setting and enforcing speed limits

m) Visual inspection of atmospheric emissions shall be conducted.

n) Reduction of vehicle speed on roads, driveways and within the site.

o) Equipment of vehicles with tarpaulins to cover all loads of fine materials during transport.

p) To ban on the burning of plant residues / debris from land clearing operations, plastics, organic waste / cardboard

11) NOISE POLLUTION CONTROL/ MANAGEMENT

Construction activities such as blasting, operation of plant and equipment, and heavy vehicles will result in noise nuisance to residents and animals in the project area.

a) To obtain baseline data for noise levels for sensitive sites within the works area.

b) To ensure the noise is monitored and controlled in accordance with the provision.

c) Ensuring then control in the noise levels in accordance with the provision which requires

d) Machinery and equipment to be free from the noise pollution and to be checked at regular intervals.

e) Blasting will be carried out using small charges.

f) The site will be scheduling truck loading, unloading and hauling operation; so as to minimize noise impact near sensitive location and surrounding.

g) To use well maintained plant at site, which will be served regularly.

h) Silencers or mufflers on construction equipment will be properly maintained.

i) To prevent the Generation of impact noise and ground vibrations by passing vehicles,

j) Grading of surface will be done whenever possible.

k) The Site will plan high noise generating works (e.g. pile driving, blasting, rock clearing, drilling, percussion drilling) in line with national regulations and respect maximum ambient noise-levels and night time rest hours at the nearest receptor area.

l) To install the emergency generator in a sound proof room.

m) The Site must ensure at project and (inhabited areas and wildlife areas) to reduce the impact of noise and related nuisances.

n) It will be prohibited to travel with construction machinery and trucks in the villages' between8:00 p.m. and 6:00 a.m.

o) Deliveries will be grouped over a fixed time slot and as short as possible.

p) Exceptional convoys will take place between 5 a.m. and midnight.

q) The engines of parked vehicles must be switched off.

r) Night work is strongly discouraged in area close to homes.

s) The jack hammers and compressors will be sound proofed taking into account the technical development of these materials

t) Noisy equipment will be posted as far as possible from homes.

u) Reduction of time slots for the use of certain activities (carpentry, etc) between 8 am to 6 pm.

v) The engine of parked vehicle must be switch off.

11. Plant and Equipment

1. As far as is practicable, the Site shall bring and employ on the works, only environmentally acceptable and quietly operating plant and equipment, compatible with the safe and efficient construction of the Works.

12) WATER POLLUTION AND CONTROL

12-A) General Guidelines

a) To obtain baseline data for water quality for sensitive sites within the works area.

b) To ensure the water quality is monitored and controlled in accordance with the provision.

c) Ensuring for carrying out the works in accordance with the process, in such a manner that soil erosion is controlled, sedimentation and water pollution is avoided.

d) Investigating complaints of water pollution and other water quality issues from Operations associated with the project.

e) Taking appropriate action when water pollution is excessive, including

f) Informing the people under the control causing the pollution that the pollutant levels need to be reduced, Informing the all worker/staff, if they are causing the water pollution and that pollutant levels need to be reduced;

g) The Site shall ensure design and construct, maintain and operate suitable temporary pollution control facilities necessary to prevent the discharge of polluting matter or visible suspended materials into private property, rivers, streams or existing drainage systems.

h) To ensure diverted and pumped water shall be discharged at locations on the surface from which it cannot re-enter the Works, and in a manner which does not cause erosion, pollution or nuisance to landholders or others site.

i) To ensure that disposal of waste oil from workshops and other areas shall not cause pollution. Oil separators shall be employed, where necessary.

j) The burning of plastic material shall not be permitted, and all such material shall be disposed off.

k) To ensure Soil contaminated by cement or other chemicals shall be removed and placed in approved disposal areas.

l) To ensure that before any work is carried out at Project, all specified or directed or approved pollution control measures shall be in place and operational.

m) To ensure that bathing and washing cloths and vehicles /equipment in river or water courses.

12. B) Wastewater Discharge from Works

Wastewater quality standards of effluent from construction sites that shall be maintained for the general protection of public health and the ecosystem.

The Site shall ensure following measure at Project:

- Containment of sludge in the work area by creating retention micro-basins.
- A geotextile membrane at the bottom of the micro-basin to promote the dissipation and percolation of water.
- Drainage of water pumped from excavations of foundations or cable ducts in a vegetation zone located more than 30 m from any watercourse, body of water or wetland. The water can be pumped directly into the bottom of the excavation or inside a galvanized sheet pipe which is driven to a level below the bottom of the excavation.
- Cleaning of concrete mixers permitted only on the site of the concrete plant, where all drainage water from the plant and the cleaning area is directed to a settling basin.
- Recovery of concrete residues from the settling of concrete mixer cleaning water as well as the used geo textile membrane, evacuation and disposal in an approved site.

- To ensure sanitary installations generating high organic loads and requiring treatment systems with suitable sizing.
- To ensure that fuel and hazardous chemical storage area shall not be near to minor and major water course.
- To ensure that all fuel and hazardous chemical storage facilities shall be located on flat on gentle sloping ground (fuel storage point)
- To ensure that any discharge of wastewater into natural surface water must be as per the standards and the environmental, health and safety guidelines.

12. C) Quality of Discharge Water

i. To ensure all water effluent discharge from the Work areas, whether from runoff or construction operations, shall be free from chemical and oil pollution.

ii. To ensure the wastewater or effluent shall contain no other constituents in concentrations which are poisonous or injurious to humans, animals, fish or other forms of aquatic life, or which are deleterious to agricultural use.

iii. To ensure and take appropriate measures for discharges of process wastewater, sanitary wastewater, wastewater from utility operations or storm water to surface water will not result in contaminant concentrations in excess of local ambient water quality criteria.

12. D) Testing

Where there is a risk of pollution of water course from the Site's operations, the HSE People of site shall arrange to take water samples at each discharge point as and when necessary, or as directed by the Client, and shall have the samples analysed for pollutants by an approved laboratory.

To ensure that No effluent is discharged by the site neither into water courses or water bodies including marine environment nor to ground surface or infiltrated into sub soils, without prior treatment and without monitoring quality of the treatment's performance to guarantee the absence of pollution in the effluent. Effluent discharge and flow rates into natural water bodies will be managed to control erosion / sediment freight.

12. E) Groundwater

1. To ensure that removal of ground water shall not cause damage to the Works, or to the property of third parties, and shall not cause nuisance.
2. Significant lowering of the natural groundwater table shall be avoided.

3. Disposal of water taken from the works shall be in a safe and proper manner, and shall fulfil the pollution control requirements.
4. To ensure that temporary works for the control of groundwater shall be removed and the ground reinstated when they are no longer required.

12. F) Silt Traps

Where necessary, the Site shall construct and maintain silt traps to comply with pollution control requirements. Scoured and transported material shall be cleaned regularly from behind the silt traps, and traps damaged by accumulation of material reinstated.

12. G) Sedimentation Ponds

1. To discharge the water from works properly, the Site shall construct, operate and maintain adequately sized sedimentation ponds with suitable oil traps at each point. Construction of the ponds shall take place prior to topsoil stripping or any other construction activity in the areas to be drained.
2. To ensure all water emanating from surface and underground excavations shall be discharged into these sedimentation ponds, to remove sand, silt, cementitious material and other suspended matter.
3. To ensure that Drainage conduits or channels shall be sized to adequately handle the expected flows.
5. To ensure the satisfactory operation of the system, accumulations of silt and oil shall be removed and disposed of by the Site at intervals at identified area.
6. The sedimentation ponds shall be emptied only by discharge from outlet pipes following treatment of the stored water.
7. Natural ground water and storm water from areas outside the immediate area of the Site's activities shall be prevented from flowing into the ponds.
8. To ensure that topsoil erosion to be minimised as far as practical possible. The site needs to be installed erosion matting to provide an immediate protection for slope against erosion.

12. H) Fuel Storage and Workshop Areas

1. Fuel dispensing areas and workshop areas for machinery maintenance shall be provided with concrete hard standing surfaces draining to oil separators.
2. Drainage into watercourses from fuel storage and machinery maintenance areas shall be treated to remove oil and /or fuel.

3. Soil contaminated by fuel and oil leakage shall be removed and disposed of off Site in an approved manner.
4. All platforms where generators, hydrocarbon storage tanks and refueling stations are installed have impervious and chemical resistant surfaces are drained separately and equipped with an oil removal treatment (oil- water-separator) to prevent pollution entering in to the environment.

12. I) Domestic wastewater control

Latrines will be dug on construction sites at a minimum distance of 50 m from watercourses.

The canteen installations must be equipped with a grease trap to prevent clogging of the pipes and poor functioning of the septic tanks.

Any discharge of wastewater into natural surface water must comply with work countries standards and the environmental, health and safety guidelines

13) CONTROL DURING DRILLING AND BLASTING

i. Management of Earthworks, Deposit Areas

Soil protection will be achieved by implementing slope stabilization methods on the one hand, and by collecting runoff water on the other. Different structures can be put in place to control erosion and sediment input into the water environment.

When stripping topsoil (first 10-20 centimetres), it must be stored separately before earth work operations in order to re-use it during site restoration and re-vegetation operations.

ii. Optimizing Land Use

The excavation plan will respect the following principles:

- Make maximum use of existing quarries.
- Reduce the excavated volume linked to the work.
- Reuse as much as possible the excavated material for the realisation of backfill in the immediate vicinity of the work areas and optimise the installation in order to have a natural balance at each site.
- If the volumes of cutting are in excess, make the deposits in the site right of way.

iii. Stockpiles and Spoil Dumps : following part to be ensured;

1. Where no longer required, stockpiles and spoil dumps shall be shaped and re-vegetated to blend with the local topography as far as is practicable.
2. Drainage shall be provided to control base water flow such that migration of fines is kept within the stockpile or dump.
3. Where possible, old borrow pits shall be used for disposal sites in preference to undisturbed sites.
4. Temporary stockpiles in place for more than 60 days are protected against runoff erosion by re-vegetation using fast growing grass species either by direct seeding or hydro seeding or using natural anti erosion cover.

14) BORROW AREAS AND QUARRY SITES

1. Borrow pits and quarry sites shall be excavated in such a manner that water, except for direct precipitation, will not collect and stand therein.
2. When locating borrow pits, all wetlands, archaeological sites, and burial sites shall be avoided.
3. Special care shall be exercised for borrow areas located in stream courses. Similarly additional following precaution needs to be taken.

i. Before removing or preparing to remove river sand from any stream, approval shall be obtained from the relevant authorities.

ii. The Site shall comply as per provision, regulations regarding conditions for abstraction of sand.

iii. Sand abstraction and rehabilitation works shall, where possible, be undertaken in the dry season.

iv. In accessing the riverbed to remove sand, care shall be taken not to damage the stream banks, and where possible existing access routes shall be utilised. In all cases a single route shall be used to access the river. The extraction of sand shall be limited to riverbed deposits. Priority shall be given to desilting operations where possible.

v. The use of plant and machinery in the riverbed to abstract the sand shall be minimised as much as possible. A back-acting excavator, with limited usage of a bulldozer or a shovel dozer, shall undertake excavation and loading.

vi. The Site shall take all measures to minimise water pollution for the protection of downstream users. The measures shall include temporary diversion of the stream, if necessary.

vii. The Site shall avoid stockpiling sand in the vicinity of the sand abstraction site, and shall, as far as possible, load sand directly onto trucks for haulage. If stockpiling cannot be avoided, the sand piles shall be located a minimum distance of 30 m from the riverbanks.

viii. The Site shall rehabilitate the sand abstraction site soon after extracting the required amount of sand.

ix. Boulders shall reinforce unconsolidated bank material disturbed by sand abstraction works or gabions fitted flush with the bank.

x. Slopes on bank approaches shall be adequately protected as appropriate to prevent erosion.

15) EROSION PROTECTION

a. Where tower construction is undertaken on steep embankments of loose soil, measures shall be taken, as approved by the Client, to prevent disturbed soil being washed into the rivers during storms.

b. Slopes may be stabilised with lines of brushwood anchored in place by driven stakes. The stakes shall be of durable timber so as not to rot or be eaten too quickly by termites.

c. The steeper the bank, and the looser the soil, the more deeply shall the stakes be driven in. Where the transmission line crosses streams and drainage paths.

d. Appropriate protection to be given by the site for slope against erosion prevent the washing out of seeds and enhance the micro climatic condition in the soil for plants growth

e. To ensure Topsoil shall be removed from working areas only when absolutely necessary.

Erosion control can be done by through: Seeding and reconstitution of a dense plant cover riprap of embankments, Deviation of runoff in vegetation.

16) WASTE MANAGEMENT

Refuse and Waste Control

a) The single used plastic must not be used during project work activities.

b) Littering shall be avoided. All refuse shall initially be placed in bins provided by the Site for such purposes, and subsequently disposed of in approved refuse dumps. Burning of waste to be avoided.

c) To ensure that all hazardous wastes, materials soiled with hazardous wastes and non-biodegradable matter shall not be disposed of on the Site. All such waste shall be stored in an

approved manner, onsite, and removed at regular intervals to off Site waste disposal facilities designed to handle such hazardous waste.

d) Wooden conductor drums, nails and other waste material deemed to be useful and it must be reused.

e) The site must be ensured the minimum generation of waste.

f) The Site will provide on monthly basis waste management date to the HO and concerned authority.

g) To ensure waste is store separately prior to removal from the project areas, depending on the levels of danger, phase (Liquid Solid Gas).

h) To dump the waste on temporary basis, site shall ensure that the distance or over 100 m from any natural sensitive area and over 500 m from any socio-economic sensitive area (School, healthcare centre, Market).

i) To dispose off non-hazardous materials, the site should confirm the landfill area from client and accordingly disposal to be carried out only.

j) Solvent and batteries will be transported in drums to suitable waste management facilities, if available.

k) To ensure that construction demolition and drilling mud shall be treated, stabilized and disposed off to land fill.

l) Relieving oneself in the bush or bathing and washing utensils, vehicles and equipment in rivers and streams shall be strictly forbidden.

17) HAZARDOUS WASTE MONITORING AND CONTROL:

- To Ensure hazardous wastes produced is monitored to ensure that supervisory staff is aware of what and how much hazardous waste is being produced.
- To ensure hazardous wastes produced on the project are being controlled to ensure; hazardous wastes are contained.
- To ensure that hazardous wastes are properly disposed off.
- To ensure that construction waste will be segregated as much as possible at site to increase feasibility of recycling.
- Sludge from septic tanks will be removed by emptying structures with an environmental permit.

- Used engine oils from machine and vehicle maintenance and floating oily residue from oil separators will be collected in sealed cans for recycling.
- Used chemicals will be stored in cans or drums in the same retention areas as the oils, ensuring compatibility between the products. Otherwise, they will be stored in a secure location protected from the elements.
- On-site reuse will be assessed otherwise they will be returned to the supplier or to appropriate and approved waste treatment facilities.
- Supplies: Cells, vehicle batteries, oil filters, printer cartridges generated on site will be sorted and stored in separate containers. The base camp and the site will be equipped with various labelled bins.
- Medical waste will be stored in appropriate and secure containers at the site infirmary and will be disposed of through the authorised third party.
- Metal or plastic cans that have contained hazardous or toxic chemicals will be recycled (if recycling is possible locally) or returned to suppliers.
- In particular, metal cans should not be given to the local population if they have contained toxic substances.
- Empty cement bag to be disposed off (Re use/ Recycle) through third party

18) ENVIRONMENT TRAINING RECORD

1. A basic understanding of the key environmental features of the Site and its environment.
2. Thorough familiarity with the environmental protection requirements as they apply to the Works.
3. The ability to identify archaeological artefacts, burial sites, special flora and fauna.
4. Awareness of any other environmental matters, which are deemed to be necessary by the Client.

5 Awareness about environment incidents

5. Basic first Aid / Environment pep talk.

Private Property, Schools and Institutions (under Protection of Infrastructure and Pvt. Property)

1) Where possible, the transmission line or any construction work shall be selected to avoid houses and built-up areas, plantations, cattle kraals, orchards, and other valuable private property.
2) The siting of spoil dumps, borrow areas, access roads and labour camps shall avoid areas where valuable private property will be disturbed or destroyed.
3) Where blasting is required, pre-blasting inspections of buildings falling inside the blast pressure zone shall be carried out by the Site to establish and record the status of the buildings.
4) Where possible, the Site shall confine construction work through schools and institutions to periods during school holidays. Where this is not possible maximum care shall be taken when working in and around schools to avoid injuring children and damage to property.
5) Work through crop fields shall, if possible, be carried out during the agricultural off-season.
6) Where fences are breached or sports fields dug up, the Site shall reinstate them immediately after completion of construction.
7) To ensure that access to services, fields, water supply by private property owners is not disrupted.
8) Any reasonable conditions demanded by the landowner shall be respected and complied with in as far as it is practicable.

Cultural Values, Beliefs and Property Rights

With respect to community relations the following points to be ensured.

1. The Site shall conduct their operations in a manner that will not upset the socio-religious order of communities in the project area. Local traditional beliefs shall be respected.
2. In the interest of harmony and good public relations, the Site is strongly encouraged to develop rapport with local chiefs and traditional leaders through regular consultations and communications.

19) REHABILITATION

i. <u>General</u>

The following operating procedure for the rehabilitation of work areas to be maintained.

a. On slopes where the risk of erosion is likely, low ridges or beams parallel to the contours, or other approved erosion control features shall be made across the working width.
b. Heavily compacted soils shall be lightly ripped to encourage re-vegetation in areas not prone to erosion.

c. Where coarse substrate exists (e.g. rocky waste, gravel etc.), a layer of subsoil from the stockpiles shall be placed to a minimum depth of 75 mm and lightly compacted. Topsoil shall then be placed preferentially on sites of greatest disturbance to a depth of 75 mm on top of the sub-soil layer. The natural seed store contained in the topsoil should be sufficient for natural re-vegetation over one to two years.

d. On loose or erosion-prone slopes, grass planting or seeding is required, preferably using local indigenous creeping grasses.

e. The planting of grass, trees and shrubs shall be carried out during periods most likely to produce beneficial results.

f. Rehabilitation measures shall be at the latest carried out immediately after completion of construction of the permanent Works.

g. The site shall ensure that land is level to runoff water drain without eroding soil or stagnating in pools.

h. Fertiliser application shall be limited to areas where it is necessary to establish a rapid vegetative cover for erosion control purposes in areas of high risk.

i. The site shall ensure noxious weeds and invasive species within the re-vegetated areas.

ii. <u>The re-vegetation of the sites</u>

Temporary re-vegetation (or mechanical protection against erosion) will be required for any bare zone that will not be consolidated or re-mobilized for more than six months.

The following methods will be implemented:

- Systematic recovery of topsoil on sites before earthworks,
- Separate storage of topsoil,
- Use of topsoil to prepare the ground before sowing.
- Seeding adapted to the objectives of re-vegetation:
- The re-vegetation is undertaken throughout the duration of construction works and is not limited to the rehabilitation of project areas at completion of works.

iii. Shaping of Areas

1. To ensure that cut and fill slopes shall be shaped in a manner such that the final ground appears as a natural extension of the adjacent undisturbed ground profiles.
2. To ensure that shaped surfaces shall be left slightly rough to facilitate binding with topsoil or the natural establishment of vegetation.

iv. Grassing

1. Sodding: Areas to be grassed by sodding shall be given a layer of topsoil at least 75 mm thick unless, due to the presence of suitable subsoil.
2. Grass Types**:** Grass types planted shall be those normally endemic to the area, and shall not be of the exotic type.
3. Maintenance of Grass: All planted grass shall receive a good dressing of suitable fertiliser.

20) CONTROL REQUIREMENTS AT CONSTRUCTION SITES

The site shall ensure

- Necessary steps to be taken to suppress dust, during handling of debris or during demolition.
- Effective steps shall be taken during the delivery and handling of all raw sand and aggregate and other similar materials, when dust is likely to be created and to dampen all stored materials during dry and windy weather.
- Machine and equipment shall be operated, monitored as per the operation control parameters.
- Lasting material / concrete to be used / removed after completion of work.
- Topsoil to be removed from location and to be used in back filling at project.
- Proper precaution to be taken during casting, so that air pollution can be avoided.
- To store the paint tins, oils drums, lubricant and any chemical at the project site store must ensure that whether proper platform or wooden surface is available or not if not than need to be provided to avoid soil /land contamination.
- To ensure the control on dust during breaking of rock/ concrete.
- To ensure blasting to be done early morning at site.
- During blasting operations, appropriate precautions should be taken to minimize dust.
- Wire mesh, gunnysacks and sandbags should be used over blast area on each shot to prevent flying rock and reduce dust.

- Fitting of blast doors at the portals may be used to control dust and debris from tunnel works.

21) CONTAMINATED SITE MONITORING AND CONTROL (LAND CONTAMINATION)

- Ensure least contamination of site by controlling leakage of oils from engines and storage points.
- To ensure that supervisory staff is aware of what substance are contaminating the site and how much contamination is occurring and all this things site will be monitoring on regular basis.
- Careful positioning of construction equipment to avoid soil / land contamination.

22) CONTROL REQUIREMENTS AT DUMPING SITES

- Excavated materials shall be placed in the dumping/ disposal areas designated in the drawings or in project
- Excavated materials shall be placed in a manner that will minimize dust production.
- The heights from which materials are dropped will be the minimum practical height to limit fugitive dust generation.
- Sufficient equipment, water and personnel will be always available on dumping sites to minimize dust formation and movements to prevent nuisance.

Appendix -13
Environmental Clearance Certificate

শেখ হাসিনার বাংলাদেশ
পরিচ্ছন্ন পরিবেশ

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

Memo No: 22.02.0000.018.72.055.20 .115 Date: 11/08/2021

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

Ref: Your Application dated 14/07/2021.

With reference to your above application, the Department of Environment hereby renews the Environmental Clearance Certificate in favor of Dhaka and Western Zone Transmission Grid Expansion Project of Power Grid Company of Bangladesh Ltd. The terms and conditions stated in the Environmental Clearance Certificate of the above project issued on 28/07/2020 vide memo no. 22.02.0000.018.72.055.20.160 shall remain valid for the renewed period.

2. This renewal is valid until 27 July, 2022. An application for further renewal along with a) the renewal fees (as per the ECR, 1997) b) VAT on renewal fees (in separate Treasury Chalan) and c) all associated documents shall be submitted to the Head Office of DoE with a copy to Concerned Regional/Divisional Offices at least 30 days ahead of expiry date.

11.08.2021
(Masud Iqbal Md. Shameem)
Director (Environmental Clearance)
Phone: 8181673

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

Copy Forwarded to :

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

DPD-1
EYN-1
23/8/2021

Pic: Environmental Clearance Certificate

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