

Project Name: **Development of S&D Network in Nayabad and adjoining areas in Borough XII (Part of Ward 109)**

Contract Package No. **KURIP/OCB/SD01/2023-24**







KOLKATA MUNICIPAL CORPORATION
Kolkata Urban Resilience Improvement Project



HEALTH AND SAFETY MANAGEMENT PLAN

Traders & Engineers Private Limited

16A, Lake View Road, Kolkata – 700029

| Prepared By: | Checked By: | Approved By: | Revision: |
|--|--|--|---|
|   (Safety In-charge) |   (Project In-charge) | (KMC/KURIP) | 01 |

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CONTENTS

1. HEALTH AND SAFETY MANAGEMENT PLAN
(Page – 1 to 77)

2. ANNEXURE **(Page – 1 to 18)**

Table of Contents: -

| Sr.No. | | Description | Page No. |
|--------|-----|---|----------|
| 1.0 | | Index: | 1-4 |
| | 1.1 | Project Layout Drawing: | 5 |
| | 1.2 | Organization Chart: | 6 |
| 2.0 | | Introduction | 7 |
| | 2.1 | Objective and Target | 7 |
| | 2.2 | Reference | 8 |
| | 2.3 | Scope of Work | 8 |
| 3.0 | 3.1 | Major Activities, Hazards/Risk and Control Measures | 9 |
| | 3.2 | Utility Work Safety Plan | 12 |
| | 3.3 | Monitoring Equipment Specification | 14 |
| | 3.4 | Material Storage and Handling | 13 |
| | 3.5 | Lifting Appliances and Equipment | 15 |
| | 3.6 | Emergency Procedures for Major Hazards | 18 |
| 4.0 | | Site Safety Rules | 21 |
| | 4.1 | HSE Induction Program | 23 |
| | 4.2 | Tool Box Meeting | 23 |
| 5.0 | | Roles and Responsibilities | 24 |
| 6.0 | | Project HSE Committee | 28 |
| | 6.1 | Enforcement of Resolution | 30 |
| 7.0 | | Job Safety Training | 30 |
| 8.0 | | Environmental Plan | 30 |
| | 8.1 | Environmental objectives and target | 31 |
| | 8.2 | Environmental management programme | 32 |
| | 8.3 | Environmental control measures (ECM) | 32 |

| | | | |
|-----|-------|---|----|
| | 8.4 | Control of air pollution | 33 |
| | 8.4.1 | Air pollution control during transportation of construction materials | 33 |
| | 8.4.2 | Air pollution control during storage of construction materials | 34 |
| | 8.4.3 | Air pollution control during construction activities | 35 |
| 8.5 | | Control of Water Pollution | 36 |
| | 8.5.1 | Measures for water pollution control during site planning | 36 |
| | 8.5.2 | Measures for minimization of waste water generation | 36 |
| 8.6 | | Control of Noise Pollution | 36 |
| 8.7 | | Waste Management | 37 |
| | 8.7.1 | Objective | 37 |
| | 8.7.2 | Waste Classification | 37 |
| | 8.7.3 | Waste Handling Procedures | 38 |
| | 8.7.4 | Waste Storage Arrangements | 38 |
| | 8.7.5 | Waste Disposal Arrangement | 39 |
| 9 | | Emergency Response | 39 |
| | 9.1 | Emergency Evacuation | 40 |
| 10 | | Alcohol, Drugs & NO-SMOKING | 41 |
| 11 | | Lighting /illumination | 41 |
| 12 | | Confined Space Safety | 42 |
| 13 | | Labour, Welfare Measures | 42 |
| | 13.1 | Provision Of Shelter During Rest | 43 |
| | 13.2 | Medical And First Aid | 43 |
| 14 | | Safety Discipline | 43 |
| 15 | | Emergency Procedures | 43 |
| 16 | | Important Telephone Numbers | 44 |
| 17 | | Fire Prevention and Protection | 45 |
| 18 | | Reporting of Accidents, Incidents and dangerous Occurrences | 46 |

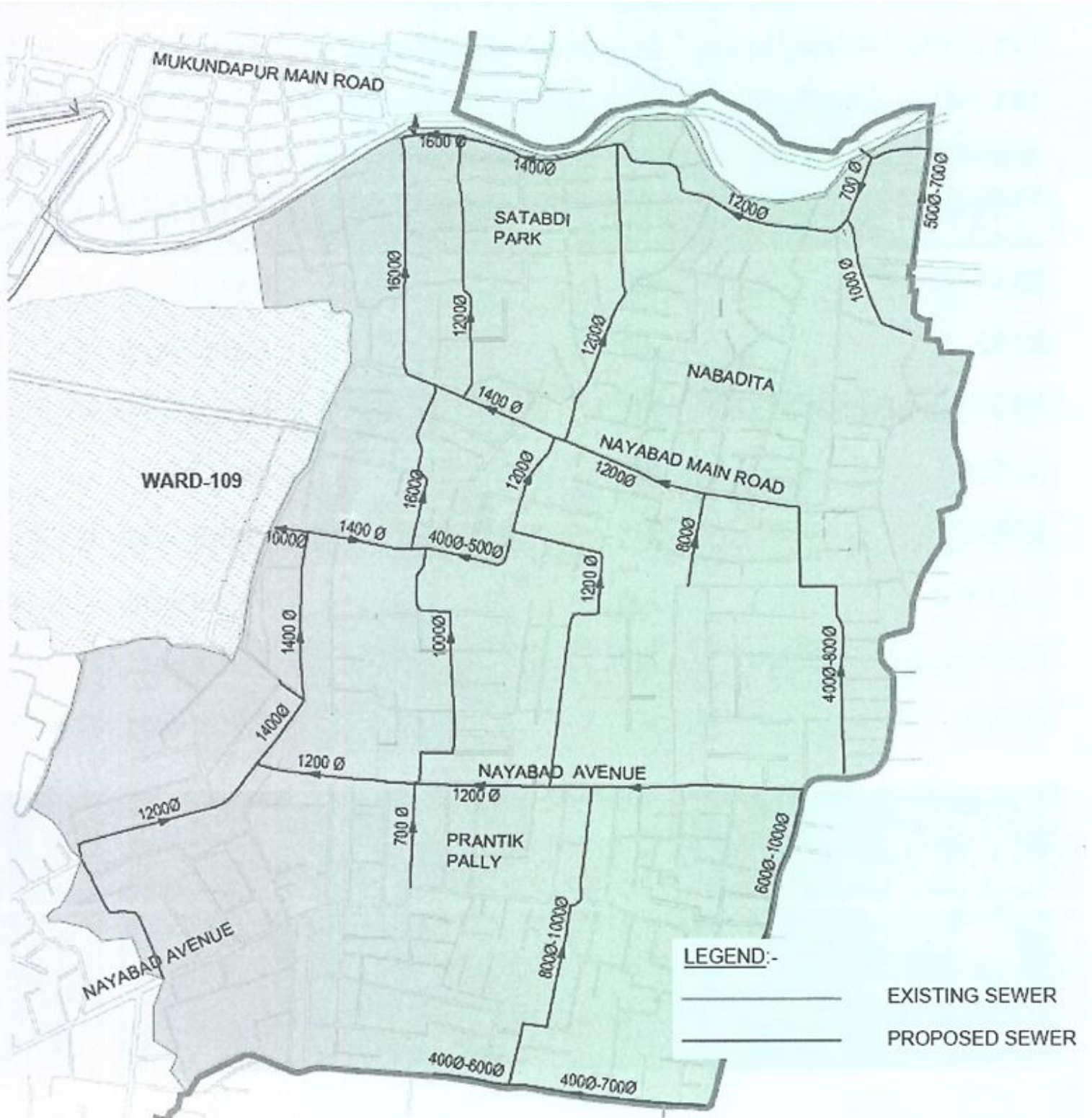
| | | | |
|----|------|--|-----------|
| | 18.1 | Contractors Responsibility | 46 |
| | 18.2 | Reportable Accidents | 47 |
| 19 | | Hazard Identification and Risk assessment | 50 |
| | 19.1 | General | 50 |
| | 19.2 | PPE Matrix by Activity | 51 |
| | 19.3 | Scope | 52 |
| | 19.4 | Hazard identification, risk assessment and determining controls | 52 |
| | 19.5 | Matrix for Risk Assessment | 53 |
| | 19.6 | Severity of hazard (Consequence) | 54 |
| | 19.7 | Health and Safety Communication Tools | 55 |
| | 19.8 | Health and Safety Promotion and Compliance at Sewerage & Drainage (S&D) Projects | 58 |
| 20 | | Job Safety Analysis (JSA) | 59 |
| | 20.1 | Scaffold Erection, Dismantling, Access System and Fall Protection | 59 |
| | 20.2 | Work at height | 60 |
| | 20.3 | Work under /near trench | 61 |
| | 20.4 | RCC pipes lying fixing system | 61 |
| 21 | | Night Work Safety for Sewer & Drainage (S&D) Works | 62 |
| 22 | | Construction, Labour Camp and Fabrication yard Safety | 64 |
| 23 | | Safe Operating procedures (for Prevention of Dengue and Malaria) | 66 |
| 24 | | Snakebite Prevention and Response | 68 |
| 25 | | Traffic and Cross Traffic Management | 71 |
| 26 | | Spoil Management Plan for On-Road Pipeline Works | 75 |
| 27 | | Conclusion | 77 |

Period of the Project:

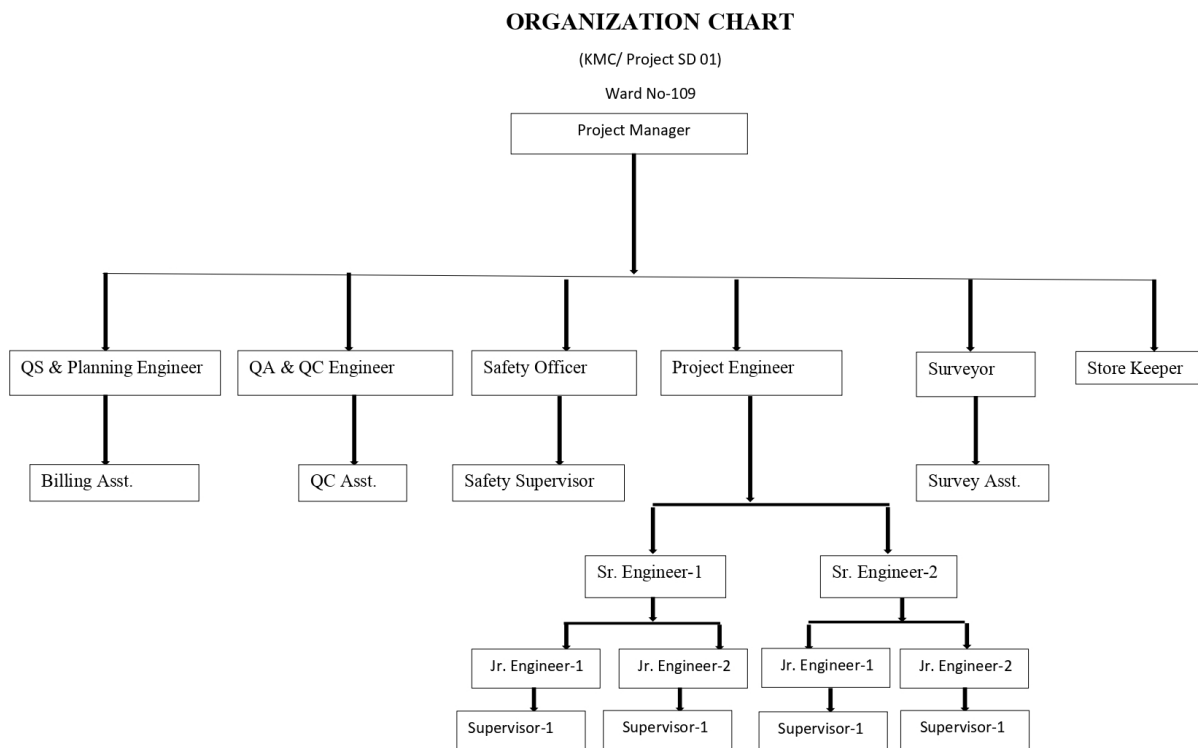
Project duration: 30 months from the date of commencement

Date of Commencement :- 15.10.2025.

1.1 PROJECT LAYOUT DRAWING



1.2 SITE ORGANISATION CHART



Name Qualification and Experience of Safety staffs

| SL NO. | Name of the Person | Designation |
|--------|---------------------|-------------|
| 01. | Mr. Bilu Chatterjee | HSE Officer |

2. INTRODUCTION

The Health, Safety & Environment Protection Plan (HSE Plan) has been prepared to provide a framework for Traders & Engineers Pvt.Ltd to plan and develop **"Safe System of Work"** in conformity with the Occupational, Health, Safety, Environment objectives of ADB Loan Project, KMC, Laying of trunk sewer and secondary sewer network with RCC Pipe Line with manholes and house sewer connections Project SD 01, Kolkata. Through this plan Traders & Engineers Private Limited shall undertake responsibility of Health, Safety and environmental protection of the Project activities during construction phase.

The Safety, Health & Environment protection plan is intended to be a living document and shall continue to evolve through the various stages of the Project in line with specific requirements of the site activities.

Traders & Engineers Private Limited shall submit to the Customer a copy of its HSE Management Plan for their reference & review.

Health, Safety & Environment (HSE) policy as laid down by the Senior Management of Traders & Engineers Private Limited shall be prominently displayed on site for the attention of all concerned.

2.1 Objectives and Targets are as follows:

1. To make SD 01 Laying of trunk sewer and secondary sewer network with RCC Pipe Line with manholes, house sewer connections and construction of outfall structures including installation of gates in Nayabad & adjoining areas an "Accident Free Site"(ZERO ACCIDENT)

2.1 Objectives & Targets:

1. 100% Lifting equipment, cranes and Tools and Tackles will be certified by a competent person before being put to use.
2. 100% Staff, workers and visitors (to site) shall wear adequate safety wear and personal protective equipment (PPE), while at site.
3. Issue of PPE to 100% workers prior to or immediately after induction.
4. All electrical distribution boards (DBs) shall have ELCB/RCCB on each outgoing line.
5. Toolbox talks shall be conducted at each work front by site engineer / supervisor twice a week with help of HSE staff
6. To identify the comprehensive HSE requirements and develop corresponding HSE deliverable s.

7. Safety review meetings, trainings, mock drills.
8. Specify the HSE related reviews and internal audits to be performed. This shall include The Site.
9. Protect the Health and Safety of all persons engaged at work site.
10. Comply at all times with the relevant statutory and Contractual Health,
11. Safety and Environment requirements & that of the Client ADB Loan Project, KMC, Laying of trunk sewer and secondary sewer network with RCC Pipe Line with manholes and house sewer connections, Kolkata.
12. Provide trained, experienced and competent personnel for supervision.
13. Effective control, Co-ordinate and monitor the activities of all personnel on the Project, including contractors, in respect of Health, Safety and Environment.
14. Establish effective communication on Health & Safety matters with all relevant parties involved in the Project works.
15. Ensure that all Construction Planning whether for permanent or temporary works takes into account the Health, Safety, and Environment of all persons that may be affected by the work.
16. Method statements to be distributed to all relevant personnel and risks to be identified and informed to relevant personnel.

2.2 REFERENCE


- ❖ Applicable Codes and standards for HSE
- ❖ Relevant Conditions of Contract

2.3 SCOPE OF WORK


- (i) Supply and laying of RCC /DWC pipe of size 400 to 1600 mm dia including house connections 8.4 km
- (ii) CCTV survey of assorted diameter of RCC pipes 8.4 km
- (iii) Construction of manholes 467 nos
- (iv) Construction of catch pit, gully pit and inspection pit 1452 nos
- (v) uPVC pipe house connection, 160mm and 200 mm 12.6 km
- (vi) Road restoration work etc. 59000 SQM

3.1 MAJOR ACTIVITIES, HAZARDS/RISK AND CONTROL MEASURES

Inspection and Diversion of Utilities, Excavation, Laying of RCC & UPVC Pipes, Manhole & Associated Civil works

| SL NO. | Work Activity | Hazards | Control Measures | Responsibility |
|---------------|---|--|---|-----------------------------|
| 01 | Inspection of Live / non-live Utilities  | Electrocut e, cuts and burn etc, Trips and fall injury Damage of property | Check the live electrical lines by the detector, conduct joint inspection with the client / local authority. Engage dedicated workforce for the job Check utilities before dig/trench Divert the cable / Old pipeline route as fit for construction works. Keep emergency contact numbers on job site. Engage dedicated workforce for the job. | Relevant front line Eng/Sup |

| | | | | |
|----|--|--|---|---|
| 02 | <p>Excavation (Open Trench)</p>  | <p>Fall in open pit</p> <p>Slipping of earth/embankments</p> <p>Damage of property</p> | <p>Engage dedicated workforce for the job</p> <p>Proper demarcation around the Open trench by rigid barricading/cordoning off the area.</p> <p>Use road barrier, Sign board.</p> <p>Do not keep heavy objects and Spoil/Muck near the edge of the trench</p> <p>Provide benching where depth is more than 3 mtr.</p> <p>Keep area de-watered at all time if required.</p> <p>Provide proper shoring.</p> <p>Impart safety instructions to all workers to guard against Sliding.</p> <p>Proper training shall be given to the workforce</p> <p>Use of PPEs like hand gloves, safety shoes with steel toe and safety helmets.</p> | <p>Relevant</p> <p>Front line Eng/sup Section – In-charge</p> |
| 03 | Placing & Jointing RCC Pipe. | Failure of equipmen | Material shall be handled by trained | Front line Eng/sup |

| | | | | |
|--|--|---|--|--------------------------|
| |  | <p>t Failure of lifting tools & tackles. Damage of property</p> | <p>riggers.</p> <p>Engage Proper rated lifting equipment.</p> <p>Use road barrier, Sign boards.</p> <p>Use tested slings & shackles for the job.</p> <p>Loads being lifted to be tied with the guy rope. Provide job related awareness training of workers. Use of Personal protective equipment</p> <p>No activities shall take place without presence of supervisor/Engg.</p> <p>Tag line /Guy rope shall be ensured.</p> <p>Not to stay/stand below the load</p> <p>Proper training shall be given to the workforce</p> <p>Use of PPEs like hand gloves, safety shoes with steel toe and safety helmets.</p> <p>Keep minimum 2 meters gap from the overhead cables while loading or unloading of pipe.</p> <p>Ensure there is no loading or unloading</p> | <p>Section-In-charge</p> |
|--|--|---|--|--------------------------|

| | | | | |
|--|--|--|---|--|
| | | | <p>during night time.</p> <p>Ensure availability of a signalman.</p> <p>Use rope as a tag line.</p> <p>Entry to be restricted for Unauthorized Personal</p> | |
|--|--|--|---|--|

3.2 UTILITY WORK SAFETY PLAN

Utility works involve risks such as electrocution, flooding, fire, explosion, and service disruption. Proper planning and control measures are mandatory.

- **Utility Work Safety (General)**

Utility works include activities related to:

- Electrical lines (LT/HT, temporary power)
- Water supply lines
- Sewer / drainage lines
- Gas pipelines
- Communication / data cables

Key Risks:

- Electrocution • Flooding / leakage • Explosion / fire • Service disruption • Injury due to unexpected energization

Specific Safety Arrangements

- Obtain latest utility drawings before work. • Conduct joint inspection with concerned authority. • Mark utilities clearly on ground. • Barricade work area and install warning signage. • Conduct toolbox talk before starting work. • Ensure trained supervisor is present

Personal Protective Equipment (PPE)

- Safety helmet • Safety shoes • Electrical insulated gloves (for electrical work) • Reflective jacket • Eye protection

Isolation Procedure (Power Line)

Before excavation work begins, we will use an underground utility tester to locate the underground utilities. We will then contact the electricity provider or relevant authority, and all work will be carried out under their supervision.

Water / Sewer / Gas Isolation

Same procedure we will follow and contact this particular department or persons and all work will be carried out under their supervision. Also we have to follow-up bellow procedure.

- Identify upstream and downstream valves.
- Close valves gradually.
- Drain residual pressure.
- Lock and tag valves.
- Confirm zero flow before work.

Permit to Work (PTW) System

Permit to Work is mandatory for all utility works. Permit shall include: • Description of work • Location • Type of utility • Isolation details • Validity period • Authorized persons • Emergency contact numbers

3.3 Monitoring Equipment Specification

These are done by your approved 3rd party laboratory.

3.4 Material Storage and Handling

3.4.1. Purpose

To ensure safe storage, handling, lifting and movement of construction materials during sewer and drainage works, preventing injuries, material damage and environmental hazards.

3.4.2. Scope

Applicable to storage yards, construction sites, trench locations and fabrication yards involved in: Pipes (RCC, DI, HDPE), Cement, sand, aggregates

- Manhole rings and covers
- Reinforcement steel
- Chemicals, fuels and lubricants

3.4.3. General Precautions

- Materials shall be stored only in designated and barricaded areas.
- Storage areas shall be level, well-drained and illuminated.
- Unauthorized access to material yards shall be restricted.
- Good housekeeping shall be maintained at all times.

- Material handling shall be planned to minimize manual lifting.
- PPE such as helmets, gloves, safety shoes and reflective jackets shall be mandatory.

3.4.4. Material Segregation

Materials shall be segregated based on type, size and hazard potential:

3.4.4.1 Non-Hazardous Construction Materials

- Pipes, aggregates, sand, bricks, steel
- Stored separately to avoid mixing and obstruction

3.4.4.2 Hazardous Materials

- Cement, chemicals, fuels, lubricants, adhesives
- Stored in covered, ventilated areas with proper labeling

3.4.4.3 Waste and Rejected Materials

- Damaged pipes, broken rings, scrap steel
- Stored separately and removed periodically

3.4.5. Stacking and Storage Limits

- Pipes shall be stacked on firm ground with wooden sleepers or wedges.
- Circular pipes shall be provided with chocks to prevent rolling.
- Maximum stacking height:
 - RCC / DI pipes: Not more than 1.5 m
 - HDPE / PVC pipes: As per manufacturer's recommendations
- Cement bags shall be stacked on pallets in covered sheds:
 - Maximum 10 bags per stack
- Steel bars shall be stacked by size and length with clear access paths.
- Manhole rings and covers shall be stacked securely with proper spacing.

3.4.6. Pick-and-Carry Controls (Manual Handling)

- Manual lifting shall be avoided for loads exceeding 20–25 kg per person.
- Team lifting shall be adopted for bulky materials.
- Proper lifting techniques shall be followed:

- Bend knees, keep back straight
- Avoid twisting while lifting
- Use of carrying aids such as trolleys, wheelbarrows and pipe rollers shall be encouraged.
- Workers shall be trained in manual handling safety.

3.4.7. Mechanical Lifting Safety

- Cranes, hydras, chain pulleys and forklifts shall be operated only by authorized and certified operators.
- Lifting equipment shall be inspected before use and periodically.
- Safe Working Load (SWL) shall be clearly marked and not exceeded.
- Slings, hooks and shackles shall be free from defects and color-coded.
- Tag lines shall be used to control swinging loads.
- No worker shall stand or pass under suspended loads.
- Lifting plans and permits shall be prepared for heavy lifts such as:
 - Manhole rings
 - Precast chambers
 - Large diameter pipes

3.4.8. Emergency Response

- In case of material collapse or lifting failure, work shall be stopped immediately.
- Injured personnel shall be provided first aid and medical assistance.
- Area shall be secured before resuming work.

3.5 Lifting Appliances and Equipment

Applicable to all lifting activities involving:

- Hydras, and chain pulley blocks
- Slings, shackles, hooks, eyebolts and spreader beams
- Lifting of RCC / DI pipes, manhole rings, covers and precast chambers

3.5.1. Types of Lifting Appliances

- Mobile cranes / hydras
- Chain pulley blocks (CPB)

3.5.2. Certification Requirements

- All lifting appliances shall have:
 - Valid load test certificates issued by a competent person / authorized agency
 - Clearly marked Safe Working Load (SWL)
- Lifting gears (slings, shackles, hooks) shall have:
 - Manufacturer's test certificate
 - Identification tag with SWL
- Certificates shall be:
 - Available at site
 - Verified before deployment
- Defective or uncertified equipment shall not be used.

3.5.3. Inspection Frequency

3.5.3.1 Daily Inspection

- Visual inspection by operator / rigger before use
- Check for:
 - Cracks, corrosion or deformation
 - Frayed wire ropes or slings
 - Malfunctioning controls and brakes

3.5.3.2 Periodic Inspection

- Weekly inspection by site supervisor
- Monthly inspection by Safety / EHS Officer
- Thorough examination and load testing:
 - Every 12 months or
 - As per statutory requirements and manufacturer's recommendations
- Inspection records shall be maintained and reviewed.

3.5.4. Competent Operators and Riggers

- Only trained, experienced and certified operators shall operate lifting appliances.
- Operators shall be medically fit and familiar with equipment controls.
- Rigging activities shall be carried out only by riggers.
- Signalmen / banksmen shall be appointed where visibility is restricted.
- Hand signals shall be standardized and understood by all involved.

3.5.5. Rigging Procedure

3.5.5.1 Pre-Lift Planning

- Assess weight, shape and center of gravity of load.
- Select appropriate lifting equipment and slings based on load.
- Prepare lifting plan and permit for heavy or critical lifts.
- Barricade the lifting area and restrict unauthorized entry.

3.5.5.2 Rigging and Lifting

- Ensure slings and shackles are correctly positioned and secured.
- Use tag lines to control swinging loads.
- Lift the load slowly to check balance before full lifting.
- Do not exceed SWL of any lifting component.
- No person shall stand or pass under suspended loads.

3.5.5.3 Post-Lift Activity

- Lower loads gently onto stable ground or supports.
- Remove slings only after load is fully secured.
- Store lifting gears properly after use.

3.5.6. Safety Precautions During Lifting

- Lifting shall not be carried out during high winds or poor visibility.
 - Lifting near excavations shall be carefully planned to prevent collapse.
 - Adequate ground bearing capacity shall be ensured for cranes/hydras.
- PPE including helmet, safety shoes, gloves and reflective jackets shall be worn.

3.6 Emergency Procedures for Major Hazards

Purpose

To establish clear emergency procedures to protect life, property and the environment during major hazard events occurring at sewer and drainage construction sites, labour camps and associated facilities.

Scope

These procedures apply to:

- Construction sites and excavations
- Manholes, confined spaces and pumping stations
- Labour camps and material yards
- Night work and remote work locations

General Emergency Preparedness

- An **Emergency Response Plan (ERP)** shall be available at all sites.
- Emergency contact numbers (fire, ambulance, police, hospital, project management) shall be displayed prominently.
- Trained emergency wardens and rescue personnel shall be identified.
- Emergency equipment (fire extinguishers, first aid, rescue kits) shall be readily accessible.
- Mock drills shall be conducted periodically.

Emergency Procedure – Fire

- Raise alarm immediately and inform Site Supervisor/Safety Officer.
- Stop work and shut down electrical power and fuel supply if safe to do so.
- Use appropriate fire extinguisher (CO₂ / ABC / Foam) only if trained.
- Evacuate personnel to designated assembly point.
- Do not use water on electrical or fuel fires.
- Do not attempt firefighting beyond personal capability.

Emergency Procedure – Seismic Event (Earthquake)

- Stop work immediately.
- Workers shall move away from excavations, scaffolds and heavy equipment.

- Take cover in open areas, away from structures and overhead hazards.
- Do not enter manholes or confined spaces.
- Inspect excavations, shoring, lifting equipment and structures before resuming work.
- Resume work only after clearance from Site Engineer and Safety Officer.

Emergency Procedure – Power Failure

- Stop all electrical work and machinery.
- Ensure DG sets or backup power are started safely if required.
- Confined space work shall be stopped immediately.
- Emergency lighting shall be used.
- Workers inside trenches or manholes shall be evacuated safely.
- Work shall resume only after stable power restoration and safety checks.

Emergency Procedure – Cyclone / High Wind Event

- Monitor weather alerts from local authorities.
- Secure loose materials, scaffolds and equipment.
- Stop lifting operations and work at height.
- Suspend all site activities.
- Evacuate to safe shelters or labour camp accommodations.
- Avoid standing near trees, poles and temporary structures.
- Inspect site conditions before restarting work.
- Clear debris and restore barricading and signage.

Emergency Procedure – Flooding / Water Ingress

- Stop work immediately.
- Evacuate workers from trenches, manholes and low-lying areas.
- Switch off electrical power. Deploy dewatering pumps if safe.
- Barricade flooded areas to prevent accidental entry.
- Resume work only after water recedes and ground stability is confirmed.

Emergency Procedure – Remote-Rescue Protocols

(Applicable where immediate external emergency support is delayed)

i. Preparedness

- Identify remote or difficult-access locations in advance.
- Ensure availability of:
 - Trained rescue personnel
 - Retrieval systems (tripod, winch, harness)
 - Multi-gas detectors and ventilation equipment

ii. Emergency Response

- Raise alarm and inform project management immediately.
- Initiate **non-entry rescue** wherever possible.
- Maintain continuous communication using mobile phones / radios.
- Provide first aid until professional medical help arrives.

iii. Coordination

- Pre-identify nearest hospitals and emergency services.
- Maintain transport readiness (vehicle/ambulance).
- Share GPS/location details with emergency responders if required.

iv. Communication and Evacuation

- Emergency signals and alarms shall be clearly defined.
- Designated evacuation routes and assembly points shall be known to all workers.
- Headcount shall be taken at assembly points.

Training and Emergency Drills

- Emergency response training shall be provided to workers and supervisors.
- Mock drills shall be conducted at least:
 - Once every six months
 - Before major or high-risk activities
- Drill observations shall be recorded and corrective actions implemented.

Reporting and Review

- All emergency incidents shall be reported immediately.
- Incident investigation and root-cause analysis shall be conducted.
- Emergency procedures shall be reviewed and updated based on lessons learned.

4. SITE SAFETY RULES

ALL OF OUR SAFETY RULES MUST BE OBEYED. FAILURE TO DO SO WILL RESULT IN STRICT DISCIPLINARY ACTION BEING TAKEN.

1. Keep your mind on your work at all times. No horseplay on the job. Injury or termination or both can be the result.
2. Personal safety equipment must be worn as prescribed for each job, such as: safety glasses for eye protection, hard hats at all times within the confines of the construction area where there is a potential for falling materials or tools, gloves when handling materials, and safety shoes are necessary for protection against foot injuries.
3. Precautions are necessary to prevent sunburn and to protect against burns from hot materials.
4. If any part of your body should come in contact with an acid or caustic substance, rush to the nearest water available and flush the affected part. Secure medical aid immediately.
5. Watch where you are walking. Don't run.
6. The use of illegal drugs or alcohol or being under the influence of the same on the project shall be cause for termination. Inform your supervisor if taking strong prescription drugs that warn against driving or using machinery.
7. Do not distract the attention of fellow workers. Do not engage in any act which would endanger another employee.
8. Sanitation facilities have been or will be provided for your use. Defacing or damaging these facilities is forbidden.

9. A good job is a clean job, and a clean job is the start of a safe job. So keep your working area free from rubbish and debris.
10. Do not use a compressor to blow dust or dirt from your clothes, hair, or hands.
11. Never work aloft if you are afraid to do so, if you are subject to dizzy spells, or if you are apt to be nervous or sick.
12. Never move an injured person unless it is necessary. Further injury may result. Keep the injured as comfortable as possible and utilize job site first-aid equipment until an ambulance arrives.
13. Know where firefighting equipment is located and be trained on how to use it.
14. Lift correctly – with legs, not the back. If the load is too heavy GET HELP. Stay fit. Control your weight. Do stretching exercises. Approximately twenty percent of all construction related injuries result from lifting materials.
15. Do not use power tools and equipment until you have been properly instructed in the safe work methods and become authorized to use them.
16. Be sure that all guards are in place. Do not remove, displace, damage, or destroy any safety device or safeguard furnished or provided for use on the job, nor interfere with the use thereof.
17. Do not enter an area which has been barricaded.
18. Barricade danger areas. Guard rails or perimeter cables may be required.
19. Trenches over five feet deep must be shored or sloped as required. Keep out of trenches or cuts that have not been properly shored or sloped. Excavated or other material shall not be stored nearer than two feet from the edge of the excavation. Excavations less than 5 ft may also require cave in protection in some instances.
20. Portable ladders in use shall be equipped with safety feet unless ladder is tied, blocked or otherwise secured. Step ladders shall not be used as a straight ladder.

21. Keep ladder bases free of debris, hoses, wires, materials, etc.
22. Open fires are prohibited.
23. Know what emergency procedures have been established for your job site.
24. Never enter a manhole, well, shaft, tunnel or other confined space which could possibly have a non repairable atmosphere because of lack of oxygen, or presence of toxic or flammable gas, or has a possibility of engulfment by solids or liquids. Make certain a qualified person tests the confined area with an appropriate detector before entry, that the necessary safety equipment is worn. Standby person may be required to be stationed at the entrance.

4.1. HSE INDUCTION PROGRAM

All the personnel engaged for construction of this Drainage & Sewerage Project **Traders & Engineers Private Limited** shall undergo a Safety Induction training on basic safety requirements of the project and significant features of the construction work relating to the safety when he/ she arrives at the site.

The Safety Engineer or his subordinate shall conduct such training. A record of the same shall be maintained.

4.2. TOOL BOX MEETING

The site Safety Engineer and site Engineer will jointly conduct a Tool Box Meeting prior to starting any new job to discuss the hazards anticipated during execution and measures to minimize/ control the hazards.

The site Supervisor/ Foremen in consultation with Safety Engineer shall conduct Pep Talk on daily basis before starting the days work. Record of attendance will be kept by the Safety Department. Respective Department Head and Subcontractors representative shall ensure the attendance of their personnel.

The Tool Box Meeting shall be held to discuss the hazards anticipated during execution and its control measures prior to starting any new Job. The Safety Engineer or his deputy shall monitor that the meetings are held as required depending on the work status of the Subcontractor.

Mainly, the working plan and procedures for the day or the week are explained and confirmed including the following:-

- Detailed Work Procedure and/ or Risk Assessment.
- Potential hazards anticipated
- Safety instruction for equipment and tools to be used.
- Use of proper Personal Protective Equipment
- Visual checks of the health of each worker.
- Other instructions by the safety group, etc.
- Safety precautions
- Emergency response plans

5. ROLES & RESPONSIBILITIES

Project In charge

- He shall be responsible for safe execution of the project and reporting to the Project Head/In charge. He shall also ensure.
- All HSE issues are given priority and attended properly.
- Ensure HSE Tool box meetings, Job safety analysis is done prior to commencement of every day's work.
- Ensure all accidents are reported, investigated, corrective action taken to control the re occurrences.
- Responsible for the total compliance of HSE management plan in this site.
- Ensure HSE Audits are conducted once in three months along with the HSE In charge covering the entire contract.

Emergency Situation – Responsible for activating the emergency plan and assuming overall command immediately arrange for on-spot meeting. Take on-spot decision on the procedure to be adopted Arrange required facilities. Communicate to client, and other concerned officials at site. Assign following duties the respective dept.

- Account & Administration. - Ensure first aid facilities. Ensure arrangements for medical evacuation Coordinate with external agencies

- Plant & Machinery – Make arrangement for P&M, Operators and drivers required for rescue operations. Arrange Illumination as required
- Time Office – Collect details of manpower. Ensure the availability of first aid facilities and emergency vehicle. Carry out head count at assembly point.

HSE Officer

- Reports to the Project In charge directly in an advisory role. Shall inform all the hazards to the Project In charge and Clients HSE Representative. He will report all HSE related information, Accidents, incidents, HSE Statistics etc to HO/RO.
- Taking leading role to contribute towards an efficient HSE Management. Mainly creating awareness to all the employees for safe and healthy working condition and environmental protection required at the project.
- Shall highlight all HSE related issues to the site management and in the HSE committee and follow up at site.
- Co-ordinate and conduct HSE Audit at site and Labour camps along with the management team.
- Assist site HSE engineer/Supervisors to conduct TBM, Inspection, Investigations and in reporting.
- Carry out HSE inspection in all Work Area, equipment, personal protective equipment and advice to Project In Charge for the corrective actions and follow-ups.
- Organize campaigns, Training programs, competitions & other special emphasis program to promote HSE at the workplace.
- Highlight the requirement of HSE through PEP talks. Help to prepare RA for critical job.
- Conduct Investigation of all Accidents / Dangerous occurrences & recommend appropriate Safety Measures.
- Convene HSE Meeting & minute the proceedings for circulation & follow up actions.
- Advice & Co-ordinate for implementations of work permit system.

- Plan procurement of PPE's, Safety devices & inspect before use as per laid down Norms.
- Report to Area HSE In charge on all matters pertaining to status of Safety & promotional program at site level.
- Sending HSE reports to Area HSE In charge.
- Facilitate administration of First Aid
- Shall submit all accident /incident /near miss report to CLIENT HSE team without any undue delay and the same shall be circulated among all staff & discuss in TBT meeting along with lesson learn to prevent recurrence.

Emergency Situation Inform Clients. Act as a coordinator for the ERC. Organize rescue team with rescue apparatus like, gas detectors, stretchers etc.

Site HSE Supervisor

- Inform all the hazards to the Section Engineers. He will report all HSE related information, Accidents, Fire incidents, to the HSE Eng/Manager.
- Assist HSE Eng/Officer to mainly creating awareness to all the employees for safe and healthy working condition and environmental protection required at the project.
- Coordinate with HSE Officer to conduct HSE Audit at site and Labour camps along with the management team.
- Assist site HSE Officer to conduct TBM, Inspection, Investigations and in reporting.
- Assist HSE Officer to organize campaigns, Training programs, competitions & other special emphasis program to promote HSE at the work place.
- Assist HSE Officer to conduct Investigation of all Accidents / Dangerous occurrences & recommend appropriate Safety Measures.
- Follow up work permit systems at site.
- Report to HSE Officer on all matters pertaining to status of Safety & promotional

program at site level.

- Shall inform all accident /incident /near miss report to HSE Coordinator without any undue delay.

SITE ENGINEER /SUPERVISOR/ FOREMAN

- Understanding the safety codes, and standards, permit requirements, and follow and implement the same.
- Planning all the tasks in advance considering potential risk, mitigation measures before starting each task.
- Eliminating all unsafe conditions in their work area and ensure safe work environment at all the times.
- Ensure all employees adhere to HSE requirements, and his employees are having adequate type of PPE's.
- Responsible for maintaining good Housekeeping in their work area all the time.
- Co-operate with the Project In charge and HSE Co-ordinator in implementing HSE plan.
- Actively participate in HSE audit, inspections, Investigations, TBM and Trainings.
- Preparation of Job Safety Analysis in association with the HSE Co-ordinator for critical, hazardous / risky job to be carried out at his work places and suitable measures taken to be incorporated in his method statement.
- To follow all work permits system as per our Safety plan and guidance by HSE Co-ordinator before starting critical works.
- Report all First Aid cases, accidents / incidents/dangerous occurrences at site to Site HSE co-coordinator immediately and communicate the investigation findings to all workmen.

Emergency Situation - Convey the message to First-Aider, Project In charge, Site HSE co-ordinator. Take their site area workmen to assembly point and help for head count.

Help the rescue and evacuation operation.

6. Project HSE Committee.

Safety Committee Meetings

Traders & Engineers Private Limited shall set up a HSE Committee at site level. The HSE Committee shall address safety issues and ensure a safe working environment for all personnel. The committee shall include:

- Project In charge shall be the HSE Committee Chairman.
- HSE coordinator shall be the Secretary.
- Project In charge, Administration In-charge and P&M In-charge shall be members of the committee.
- Site Engineers (on rotation basis), representatives of Owner and Sub-Contractors shall be invited to attend the committee meetings as required.
- A circular shall be issued to formation

Members of the committee shall be competent, be committed to safety and possess positive attitude towards safety promotion. They shall be given the necessary support to perform their duties.

The functions and responsibilities of the committee shall conform to the statutory requirements. The minutes of the meetings shall be properly recorded and maintained. All decisions and follow-up actions shall be documented.

The agenda for the meeting will be structured around the following Guidelines as a minimum:

- Review of Minutes of the last meeting.
- Accidents, incidents and near misses.
- Lessons learned/actions required from accidents/incidents.
- Feedback on Plant incidents.
- Publicity/promotion/initiatives.

- Monthly look-ahead of construction activities.
- Anticipated concerns.
- Interface between Contractors.
- Site observations during walk downs.
- Feedback from site personnel.
- Proceedings of the meeting are minute.

Roles & responsibilities

The roles and responsibilities of the key members of the committee is explained below:

Chairman

- a) Provides leadership and guidance.
- b) Formulates HSE objectives.
- c) Allocates sufficient manpower and budget to achieve HSE objectives.
- d) Review committee's performance.**

Secretary

- a) Schedules and organizes HSE Committee Meeting.
- b) Keeps Minutes of Meeting.
- c) Schedules and organizes HSE inspection of work area by Committee members.
- d) Distributes HSE information to Committee members.**

Committee Members

- a) Communicate HSE information/decision to all organizational levels
- b) Demonstrate leadership towards HSE vision and sustainable improvements.
- c) Work to drive front line accountability and ownership for HSE.

- d) Support and work with Area HSE Committees to resolve area HSE issues.
- e) Drive and support the achievement of HSE Committee goals and objectives.

6.1 ENFORCEMENT OF RESOLUTION

The Chairman shall inform members of any outstanding issues in the meeting. Members concerned shall ensure the items identified, as needing improvement shall be carried out within a stipulated period. Failing which shall rendered disciplinary measure determined by the Chairman.

7. JOB SAFETY TRAINING

A. After inspecting a job site, the safety person or other designated person will identify and evaluate all potential hazards for:

1. Injury Severity potential.
2. Probability of an accident.

B. This person will also appraise the skill and knowledge level of exposed workers.

C. Appropriate Training will be given.

1. Hazards will be pointed out.
2. Necessary precautions will be explained.

3. The higher the hazard the more detailed will be the training.

D. Records will be maintained for all training sessions with descriptions of topics covered and names of workers trained.

8. ENVIRONMENTAL PLAN

INTRODUCTION

This Project Environmental Management Plan (PEMP) will establish relevant environmental standards or objectives for each element of the project to be executed. It outlines management strategies and actions to meet the project's environmental objectives and also details how the adverse environmental impacts generated from the

various stages of the construction and related activities would be minimized or controlled.

This EMP also explains the possible mitigation measures requires to be taken for minimizing and controlling the potential environmental significant impacts that arises during the execution of the project through appropriately laid down action plans. During developing this EMP, as per General condition of the contract. Environment Management Plan construction activity will be followed in reference to the environment Management Plan as part of IE as per EMP Air and Noise monitoring will be done.

8.1 ENVIRONMENTAL OBJECTIVES AND TARGET

The Environmental objective and targets are set in line with Traders & Engineers Private Limited Health, Safety and Environmental policy / client's or project environmental policy (if any). The following details shall be followed in the establishment of environmental objectives and targets:

Significant Environmental Aspects

- Legal and other requirements
- Technological options with consideration for financial, operational and business aspects
- To Conserve Resources and Reduce Waste Generation.
- Views of interested parties (Internal and External)
- Commitment to prevention of pollution

To meet the defined objective, targets shall be set in a way such that they are:-

- "SMART" (Specific, Measurable, Achievable, Realistic and Time bound).
- The time frame and responsibility for meeting the objectives and targets are defined.

In case of new environmental requirements due to new legislation or amendments in the existing legislation, environmental objectives and targets shall be set and identified appropriately to ensure compliance. If a particular objective/target has been achieved, then investigation shall be done to identify the opportunities / possibilities for new Objectives / Targets.

Project Coordinator and Project In charge shall periodically monitor the progress made towards achieving environmental objectives and targets, co-ordinate and optimize the

utilization of resources, and understand their difficulties in implementation (if any).

In general, objectives shall be set to achieve sustained improvements in environmental performance, rather than to address short term issues, such as small-scale failures in equipment or components, which would be dealt at the time of occurrence by the site management.

8.2. ENVIRONMENTAL MANAGEMENT PROGRAMME

Environmental Management Programme (EMP) describes, how the environmental issues and considerations are being managed for the construction and related activities. Where applicable, EMP also describes the mechanisms used to ensure the implementation and effectiveness of proposed mitigation measures covering.

- Legal requirements;
- Objectives and Targets derived from significant environmental aspects of the project;
- Environmental control measures;

EMP implementation and operation covers

- The structure, roles and responsibilities of employees assigned to implement EMP.
- Develop clear and measurable performance indicators, i.e., indicators are established such that the Traders & Engineers Private Limited performance in achieving its environmental objectives can be measured;
- Monitoring environmental training and awareness programme;
- Organize and control EMP documentation, i.e., audit is carried by means of written evidence;
- Internal operational environmental performance evaluation system.

In simple EMP is a derived action plan developed from the set of objectives and targets or significant environmental aspects explaining the following basics, i.e., who is responsible to achieve, when the plan will be completed, how the project related mitigation measures would be achieved, including time scales and resources required for implementing the same.

8.3. ENVIRONMENTAL CONTROL MEASURES (ECM)

Environmental Control Measures (ECM) means Operational Control Procedures. This documented procedure shall be established and maintained to cover situations where their absence could lead to deviations from the environmental policy and developed objectives and targets.

ECM maintains the baseline of environmental performance within the organization as opposed to objectives and targets that improves the environmental performance. It is easy to understand that without operational control there could be a chance that organization improves through objectives and targets in some areas and deteriorates in other areas. Environmental control measures are required to prevent this deterioration in environmental performance and maintain a baseline from where continual improvement in environmental performance can be planned through objectives and targets.

Environmental Control Measures are developed for all of the aspects that have turned out to be significant. All significant environmental aspects over which Traders & Engineers Private Limited has control are listed. Later the number and description of the ECM is determined. Many significant environment aspects may be addressed through one common ECM. For instance, if several departments deal hazardous waste handling, there could be one common ECM procedure on solid waste management.

Once the description of the ECM is written, care needs to be taken to cover issues related to operation/maintenance, checking and action if deviation occurs in the text of the ECM. The text shall necessarily include operating criteria for the activity, which can be determined from a variety of sources such as regulatory requirements or equipment standards or previous year's performance or contractual requirements. The Environmental Control Measures to be taken are highlighted below:

8.4. Control of Air Pollution

8.4.1 Air Pollution Control During Transportation of Construction Materials

A. Dust Suppression Measures

- Vehicles transporting dust-generating materials such as sand, soil, aggregates and excavated earth shall be fully covered with tarpaulin or cover lids.
- Materials shall not be loaded above the level of side and tail boards of vehicles.
- Haul roads within the construction site and approach roads shall be watered regularly, especially during dry and windy conditions.
- Spillage of materials on roads shall be cleared immediately to prevent re-suspension of dust.

B. Emission Control Measures

- All vehicles deployed for material transportation shall have valid PUC (Pollution Under Control) certificates.
- Regular maintenance of vehicles shall be ensured to minimize exhaust emissions.
- Overloading of vehicles shall be strictly prohibited.

C. Spill / Incident Response

- In case of accidental spillage of construction materials during transportation, immediate cleanup shall be carried out.
- Water spraying shall be undertaken after cleanup to suppress residual dust.
- Spilled materials shall be reused or disposed of at designated locations.

D. Environmental Monitoring

- Visual inspection of dust levels along haul routes shall be conducted daily by the Site Supervisor.
- Records of vehicle PUC certificates shall be maintained and reviewed periodically.

8.4.2 Air Pollution Control During Storage of Construction Materials

A. Dust Suppression Measures

- Excavated materials shall be placed only in designated dumping or disposal areas.
- Materials shall be stacked in a controlled manner to minimize dust generation.
- During summer season, excavated materials shall be stabilized daily by water sprinkling at regular intervals.
- The height from which materials are dropped shall be limited to 1.5 meters to reduce fugitive dust emissions.
- Water spray shall be applied on stockpiles of sand, aggregates and similar materials during dry and windy conditions.
- Cement shall always be stored in covered sheds or silos and shall not be kept in open areas.

B. Emission Control Measures

- Storage areas shall be located away from sensitive receptors such as labour camps, schools and residential areas.
- Use of wind barriers or temporary screens shall be encouraged where large quantities of materials are stored.

C. Spill / Incident Response

- Any scattered materials around storage areas shall be collected immediately.
- Damaged cement bags or leaking containers shall be isolated and handled promptly to avoid dust release.

D. Environmental Monitoring

- Daily inspection of storage yards shall be conducted to ensure proper covering and watering.
- Records of water sprinkling frequency shall be maintained during dry seasons.

8.4.3 Air Pollution Control During Construction Activities

A. Dust Suppression Measures

- Water spray shall be used during unloading, handling and transfer of raw sand, aggregates and similar materials.
- Temporary roads within the site shall be kept moist by regular water sprinkling.
- Concrete batching plants and ancillary areas shall be cleaned frequently, and water spraying shall be carried out to minimize dust generation.
- Shot blasting and spray-painting activities shall preferably be carried out in enclosed or controlled areas.

B. Emission Control Measures

- All motorized vehicles operating on temporary site roads shall observe a maximum speed limit of 15 km/h.
- DG sets shall be provided with proper exhaust systems and acoustic enclosures.
- DG set emissions shall comply with CPCB/SPCB norms and shall be tested periodically.
- Idling of vehicles and construction equipment shall be minimized.

C. Spill / Incident Response

- In case of excessive dust generation due to equipment failure or operational lapses, construction activities shall be temporarily halted, and corrective measures implemented.
- Malfunctioning equipment causing abnormal emissions shall be removed from service immediately.

D. Environmental Monitoring

- Ambient air quality monitoring shall be carried out for Particulate Matter (PM₁₀ / PM_{2.5}), Oxides of Sulphur (SO₂) and Oxides of Nitrogen (NO_x) at regular intervals.
- Monitoring results shall be compared with applicable standards, and necessary corrective actions shall be taken if exceedances are observed.
- Monitoring records and test reports shall be maintained and made available for inspection.

8.5. Control of Water Pollution

8.5.1. Measures for water pollution control during site planning

- Drainage system shall be constructed to drain off all surface water from the work site into suitable drain outlet.
- Temporary drainage works shall be maintained, removed and reinstated as necessary, and precautions shall be taken for avoidance of damage by flooding and silt.

8.5.2. Measures for minimization of waste water generation

- Waste water generated due to washing of concrete mixers shall be collected in a sedimentation tank of sufficient capacity, as appropriate. The clear water shall be reused for curing purpose.
- When reuse is not practicable, it shall be disposed off at the nearest landfill site after obtaining permission from an agency owning the landfill site and under the conditions imposed by the agency concerned.

8.6. Control of Noise Pollution

- Stationary equipment shall be located so as to minimize impact of noise on the neighboring community.
- Equipment and plant shall not be kept idling, when not in use.
- Construction equipment shall be maintained / serviced regularly to control noise and vibration.
- High noise areas and equipment shall be notified as such and earmuffs / ear plugs shall be used by the personnel in such areas / near such equipment.

- All the plants and equipment, specifically Mechanical saw, hammers, mechanical breakers, pneumatic breakers involved in the work shall be maintained properly and periodically to avoid unnecessary noise generation.
- Noise Meters shall be maintained at the site to monitor the same. Wherever possible, Traders & Engineers Private Limited shall use low noise generating equipment. Adequate measures such as barricading the site and/or intermittent use of high noise generating equipment should be practiced.
- Necessary permissions shall be taken from the appropriate authority prior to installation of the high noise generating equipment, as far as practicable.
- Noise monitoring reports shall be maintained at the site jointly with the representative of the PMDSC Staff.

8.7 Waste Management Plan

8.7.1. Objective

To ensure safe, systematic, and environmentally sound management of all wastes generated during pipeline construction activities, minimizing health risks to workers, preventing environmental pollution, and ensuring compliance with statutory regulations.

8.7.2. Waste Classification

All wastes generated at construction sites shall be classified into the following categories:

8.7.2.1 Biodegradable Waste

- Food waste from labour camps
- Vegetable waste
- Paper napkins and organic packaging
- Garden/vegetation waste from ROW clearing

8.7.2.2 Non-Biodegradable Waste

- Plastic wrappers and containers
- HDPE bags, empty cement bags
- Scrap metal (pipes, welding rods, steel cuttings)

- Glass, rubber, wooden pallets
- Empty cartons and packaging materials

8.7.2.3 Hazardous Waste

- Used lubricating oil and grease
- Oil-contaminated rags, cotton waste
- Spent welding electrodes
- Paint containers and chemical drums
- Used batteries
- Oily sludge from equipment maintenance

8.7.3 Waste Handling Procedures

8.7.3.1 Collection

- Waste shall be collected daily from work fronts, camps, and yards.
- Manual handling shall be avoided; PPE such as gloves, masks, and safety shoes shall be mandatory.

8.7.3.2 Transportation

- Covered vehicles shall be used for waste transportation.
- Hazardous waste shall be transported in leak-proof, labeled containers.

8.7.4 Waste Storage Arrangements

5.1 Temporary Storage

- A designated waste storage area shall be developed at each construction site.
- The area shall have:
 - Impervious flooring
 - Weather protection
 - Spill containment arrangements
 - Proper signage and access control

5.2 Hazardous Waste Storage

- Stored separately with:

- Secondary containment
- Fire extinguishers
- Material Safety Data Sheets.
- Storage duration shall not exceed limits prescribed under Hazardous Waste Rules.

8.7.5. Waste Disposal Arrangement

8.7.5.1 Biodegradable Waste

- Disposal through:
 - Local municipal waste collection
 - Composting at labour camps (where feasible)

8.7.5.2 Non-Biodegradable Waste

- Recyclable materials shall be:
- Reused wherever possible
- Non-recyclable waste shall be disposed at authorized landfill sites.

8.7.5.3 Hazardous Waste

Oil-contaminated waste and sludge shall be disposed at authorized Treatment, Storage, and Disposal Facility facilities provided by local municipal corporation.

9. EMERGENCY RESPONSE

Drills and exercises

Regular emergency drills and exercises shall be carried out to test preparedness of emergency arrangements. Emergency evacuation drill register shall be maintained containing information for type of drill, location of drill, participants and observations.

- Shifting of injured personnel from work location to First Aid Center/hospital
- Fire drills
- Other emergency situations i.e. gas leakage, oil-spill etc.

Training shall be organized time to time internally and by the aid of external agencies. For external agency a request shall be made to HRD department for organizing the training.

9.1 EMERGENCY EVACUATION

- In case of an emergency area supervisor shall notify all employees by using over telephone
- The responsible person shall decide whether an evacuation is necessary and shall direct the activation of alarm signal accordingly
- Area in-charge shall direct all employees to assemble in the nearest and designated assembly point in an orderly manner without making noise
- All plant and equipment shall be switched OFF. Lighting shall be remaining in ON but capable of being switched off shall also be switched OFF.
- Where a work group does not have a dedicated assembly point then area In-charge shall decide the place where to assemble during time of emergency
- Roll call of the employees shall be taken and status to be reported to the area In-charge.
- Steps shall be taken to ensure that every person on site knows those procedures and that emergency drills are tested periodically.
- Written emergency procedures giving details of nearest hospital, fire station, Police station, shall be displayed in prominent locations.
- Instructions to report to the nearest assembly point
- Information about the assembly point
- Any indication of the locations of fire escape routes
- Positions of fire extinguishers, Instructions about using fire extinguishers
- In case of serious injury special arrangements shall be made available based upon site conditions for any severe injury Project In charge shall be authorized to take necessary arrangements for lifting/transporting the injured to the correct location.

10. ALCOHOL, DRUGS & NO-SMOKING

- It shall ensure at all times that no employee is working under the influence of alcohol/drugs.
- The rules in effect at the work site shall be to discourage smoking. Smoking shall not be allowed at the site except the designated areas. Failure to adhere to this requirement may result in immediate removal of the offending personnel. A designated area for smoking shall be demarcated.

11. LIGHTING /ILLUMINATION

Illumination is essential for safety, security and production as it related to every workplace, approach, dangerous opening and lifting appliance.

- Walking and working areas shall be adequately illuminated during periods of occupancy
- No dark spots shall be present in work place.
- General work area involving sites clearance and rough work performed.
- Illumination level shall be sufficient for detail of work performed.
- **Recommended lighting levels shall be as follows:-**
 1. General work area – 50 lux.
 2. Craft work such as reinforcing concreting – 100 lux.
 3. Fine craft work such as all work with power tools, electrical, welding – 300 lux.
 4. Emergency lighting for escape – 50 lux.
 5. No faulty light fixtures/bulbs shall be fitted.
 6. Hand lamps where required shall be provided with protective cover and preferably double insulated.
 7. All temporary work structures, surplus materials and wastes shall be properly disposed off after completion of the work.

12. CONFINED SPACE SAFETY

Ventilation, Heat, Dust and Fume Control

- Risk areas will be clearly identified. Physical condition of air should be consistent with comfort and health requirements.
- Ventilation shall be adequate where toxic or irritating substances are present such as welding fumes, vehicle exhaust fumes, carbon dioxide, carbon monoxide, ammonia,
- Dust, fumes, smoke or gases removed by hoods, air channels, exhaust fans etc.
- Entry to workplace containing harmful smoke, gas, fumes, or dust only permitted if effective respiratory apparatus worn so as to prevent the inhalation of such smoke, gas, fumes or dust
- Ventilating air should be free from dust or other impurity
- Provide safe and healthy environmental conditions to all areas used by workmen.
- Be adequate and capable of diluting and rendering inflammable, noxious gases and dusts harmless.

13. LABOUR, WELFARE MEASURES

Drinking Water: Drinking water shall be provided to everybody. Regular analysis of water shall be done to ensure its portability.

Washing Facilities: In every work place adequate and suitable facilities for washing shall be provided and maintained. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition.

Latrines & Urinals: These facilities shall be provided for the use of all concerned and shall be maintained in a clean & hygienic manner.

- All empty containers, drums, packing etc. which may retain water shall be removed from the site on regular basis
- Adequate number of water storage tanks shall be provided at site

- Adequate fumigation/spraying of insecticides shall be carried out at the site, camps and at workers colonies as a preventive measure against malaria.

13.1. PROVISION OF SHELTER DURING REST

At specified locations there shall be provided suitable labour rest sheds for the use of all workmen.

13.2. MEDICAL AND FIRST AID

The first aid shall always be on the execution work site. The first aid at the site shall have an all required Medicines and also well-equipped first aid room. Certified First-aid persons shall be made available at the site at all times. The Site In-charge shall make arrangements for replenishing all required medicines and maintain the First Aid Box in good condition always. The first aid kit shall be checked periodically & a register to be kept for recording all usage.

14. SAFETY DISCIPLINE

a. Four-Step System

First violation: Oral warning; notation for personnel file.

Second violation: Written warning; copy for file or Personnel Office.

Third violation: Written warning; one day suspension without pay.

Fourth violation: Written warning and one-week suspension, or termination if warranted.

b. A record will be maintained of all discipline.

15. EMERGENCY PROCEDURES

In case of an emergency on site the following procedures should be instituted at each site:

1. Method of communication should be determined at the site, telephone, etc.
2. Emergency telephone numbers should be posted:
 - a. Police

- b. Fire
- c. Medical Response Team.
- 3. Post near communication station the address of your site.
- 4. Post names of first aid responders on site.
- 5. Designate the person to direct emergency crews to site of emergency.
- 6. Instruction to each employee if known harmful plants, reptiles, animals, or insects, are present regarding all of the following:

The potential hazards.

How to avoid injury.

Applicable first aid procedures to be used in the event of injury.

16. Important Telephone Numbers

| IMPORTANT TELE PHONE NUMBER | | |
|------------------------------------|--|--------------------------|
| 1. | Local Police Station(East Jadav Paur) | 033 2426 7345 |
| 2. | Traffic police Station(Jadav Pur) | 033 2436 8050 |
| 3. | Baishnabghata - Patuli Fire Station | 033 2436 0685 |
| 4. | Government Hospital(Baghajatin Hospital) | 033 24297077 |
| 5. | Greenpark Nurshing Home | 9874267342 8100455508 |
| 6. | Ambulance Service | 088 2228 8222 |
| 7. | Trauma Centre | 080675 06860 (RN tegore) |
| 8. | National Fire Service | 101 |
| 9. | Gariahat Fire Station | 33 2474 2841 |

17. FIRE PREVENTION AND PROTECTION

| TYPE OF HAZARD | PREVENTIVE MEASURES |
|---|--|
| Small fires | <ul style="list-style-type: none">➤ In case a fire breaks out, press fire alarm system and shout "Fire, Fire"➤ Keep buckets full of sand and water near hazardous locations.➤ Confine smoking to 'Smoking' Zones only.➤ Train people for using specific type of fire fighting equipment under different classes of fire.➤ Keep fire doors, passages unobstructed➤ Maintain good housekeeping➤ Do not use elevators for evacuation during fire➤ Lightening arrestors should be maintained for elevated structures. |
| Improper storage of highly inflammable substances | <ul style="list-style-type: none">➤ Display voltage and current ratings prominently with 'Danger' signs.➤ Ensure approved cable size, voltage grade and type.➤ Switch off the electrical utilities when not in use.➤ Do not allow unauthorised connections. |

| | |
|---|--|
| | <ul style="list-style-type: none"> ➤ Ensure proper grid wise distribution of power. |
| Improper laying of overhead / underground transmission lines/cables | <ul style="list-style-type: none"> ➤ Do not lay un-armoured cable directly on ground, wall, roof of trees. ➤ Maintain at least 3 meter distance from HT cables. ➤ All temporary cables should be laid at least 750mm below ground on 100mm fine sand overlying by brick soling. ➤ Provide cable route markers indicating the type or depth of cables at intervals not exceeding 30m and at the diversions/termination. |

18. REPORTING OF ACCIDENTS, INCIDENTS AND DANGEROUS OCCURRENCES

18.1. Contractors Responsibility

All accidents and dangerous occurrences will be recorded, regardless of personnel injury occurs.

The Employer i.e. ADB Loan Project, KMC Sustainability, Hygiene and Resilience Project SD 1, KOLKATA and its representative will be notified by the quickest possible means, for example by telephone of the following classifications of accidents and incidents and by subsequent written notification within twenty four hours on the Contractors Accident and Incident Reporting Form;

- a) Fatal Accident
- b) Major Injury Accident
- c) Dangerous Occurrence
- d) Any Incident Involving a Member of the Public

All fatal accidents, major injury accidents, incidents, dangerous occurrences will be investigated by involving a member of investigation team, Copies of these investigations shall be forwarded to the KMC-KURIP & PMDSC representative within seven days of the incident.

All fatal accidents, and other occurrences will be report immediately, all fatal accidents, and other occurrences will be reported, to the police, at the police station in whose jurisdiction

the accident occurred.

18.2. Reportable Accidents

All reportable accident, Near Miss, Dangerous Occurrences and Fire Incidents will be recorded and report will be kept in HSE office, a copy of report will be sent to Client/Consultant KMC-KURIP & PMDSC) office in appropriate format.

Name of the project site:

Contract No:

Scope of Work:

Name(s) of the Investigator/Investigation Team:

| INCIDENT/ACCIDENT INFORMATION | | | | |
|-------------------------------|-------------|-------|------|--|
| Date of accident | Day of week | Shift | Time | |
| | | | | |

INJURED PERSON

| | | |
|-------|--|----------|
| Name: | | Address: |
| Age: | | |

| | |
|--|--|
| Treatment | |
| First Aid box | Name and Address of the Treating Physician, Hospital or Facility where treatment given: |
| Emergency Room | |
| Dr's Office | |
| Hospitalization | |
| PROPERTY DAMAGED | |
| Property, Equipment or Material Damaged: | |
| Object or Substance Causing Damage: | |

| | |
|--|--|
| Describe what happened (attach photographs or diagrams): | |
| | |
| | |
| | |

ROOT CAUSE ANALYSIS (CHECK ALL THAT APPLY)

| Unsafe Acts | Unsafe Conditions |
|-------------------------------|-----------------------------------|
| Improper work technique | Poor workstation design or layout |
| Safety rules violation | Congested work area |
| Improper PPE or PPE not used | Hazardous substances |
| Operating without authority | Fire or explosion hazard |
| Failure to warn or secure | Inadequate ventilation |
| | |
| | |
| Operating at improper speeds | Improper material storage |
| Bypassing safety devices | Improper tool or equipment |
| Guards not used | Insufficient knowledge of job |
| Improper loading or placement | Slippery condition |

| | | |
|-------------------------------|-------------------|---------------------------------|
| Improper lifting | Poor housekeeping | Inadequate hiring practice |
| Servicing machinery in motion | Excessive noise | Inadequate workplace inspection |

| | | |
|----------------------|------------------------------------|-------------------------------|
| Horseplay | Inadequate guarding of hazards | Inadequate equipment |
| Drug or alcohol use | Defective tools/equipment | Unsafe design or construction |
| Unnecessary haste | Insufficient lighting | Unrealistic scheduling |
| Unsafe act of others | Inadequate fall protection devices | Poor process design |
| Any other (specify) | Any other (specify) | Any other (specify) |

INCIDENT/ACCIDENT ANALYSIS

Using the root cause analysis listed as above, explain the cause(s) of the incident in as much relevant details as possible (specify the element of management control or engineering control as per HSE Manual).

IMMEDIATE CAUSE:

INTERMEDIATE CAUSE:

BASIC CAUSE:

Engineering control:

Management control:

| | |
|--|---|
| How the injury or damaged was? Very Serious Serious Minor | What is the chance of the accident recurring? Frequent Occasional Rare |
|--|---|

PREVENTIVE ACTION

| Describe action (s) that will be taken to prevent recurrence. | Deadline | By whom |
|---|----------|---------|
| | | |

| | |
|--|------|
| Remarks (Specify action taken with respect of the defaulter(s): | |
| INVESTIGATION TEAM | |
| Signature | Name |

| | |
|--------------|---------------------------------|
| Prepared By: | Approved By (Project In charge) |
|--------------|---------------------------------|

19. HAZARD IDENTIFICATION AND RISK ASSESSMENT

19.1. General

Hazard identification and risk assessment (HIRA) is done to assess the risk of the activities to be executed, rate the risk levels as per the risk assessment matrix, and identify the control measures so as to bring the risk level to ALARP (As Low As Reasonable Practicable). ALARP means a risk is low enough that attempting to make it lower, or the cost of assessing the improvement gained in an attempted risk reduction, would actually be costlier than any cost likely to come from the risk itself. This does Not automatically mean the risk is acceptable; a judgement will need to be made and justified.

The Risk mitigation strategies follow;

- a) Elimination
- b) Substitution
- c) Engineering Controls
- d) Administrative Controls.

e) PPE (Personnel Protective Equipment) Table:

| SL. No. | Type of PPE | Activity to be used in |
|---------|---------------|--|
| 1 | Safety Helmet | All construction Activities or during visit to the |

| | | |
|---|--------------------------------------|---|
| | | hard hat zone. |
| 2 | Safety Shoes /Gumboots | All construction Activities |
| 3 | Safety Belt /Full body Harness | Working above 1.8 meter. Height. |
| 4 | Nose Mask | In dusty atmosphere like cleaning job, dismantling jobs, crushing and screening operations, batching plant operation, particularly at cement handling etc. |
| 5 | Ear plug | In noise area level area (above 85 decibel limits) like pavement breaking operation, in running DG area, stone crushing / screening area. |
| 6 | Goggles | Carrying out activities like welding, cutting, grinding, chipping, drilling, dismantling, painting, sand blasting, operating pneumatic appliances & excavation etc. |
| 7 | Hand Gloves(Cotton, Leather &Rubber) | In almost all activities like fabrication job, material handling, tools handling, grinding, welding scrap removal, cutting & bar bending etc. |
| 8 | Reflective Jacket | Working at main road. |

19.2 PPE Matrix by Activity

| Project Activities | Type of personal protective equipment | | | | | | | | | | | |
|--|---------------------------------------|--------------------------------|---|--------------|-------------|----------------|-------------------|--------------------|-----------------|-----------------|------------------------|-------------------------|
| | Safety helmet | Foot protection (Safety Shoes) | Foot protection (Rubber High visibility Jacket) | Safety Glass | Face shield | Welding Helmet | Full body harness | Hearing protection | Hand protection | Body protection | Respiratory protection | Protection against dust |
| Project Executives / Engineer / Supervisor | √ | √ | √ | | | | ◆ | | | | | ◆ |
| Contractor Forman / Supervisor | √ | √ | √ | | | | ◆ | | | | | ◆ |
| Unskilled workmen | √ | | √ | √ | | | ◆ | | ◆ | | | ◆ |
| Scaffolding | √ | √ | √ | | | | ◆ | | | | | ◆ |
| Grinding / Polishing | √ | √ | √ | ◆ | ◆ | | ◆ | ◆ | ◆ | ◆ | | ◆ |
| Rigging | √ | √ | √ | | | | ◆ | | ◆ | | | ◆ |
| Arc Welding / Gas Cutting | √ | √ | √ | | ◆ | ◆ | ◆ | | ◆ | | | ◆ |
| Handling corrosive chemical | √ | √ | √ | | | | | | ◆ | ◆ | | ◆ |
| Painting | √ | √ | √ | ◆ | | | ◆ | | ◆ | ◆ | ◆ | ◆ |
| Insulation Work | √ | √ | √ | | | | ◆ | | ◆ | ◆ | ◆ | ◆ |
| Roof Work | √ | √ | √ | | | | ◆ | | ◆ | | | ◆ |
| Work at height above 2 mtr. height form ground | √ | √ | √ | ◆ | ◆ | ◆ | ◆ | | ◆ | ◆ | | ◆ |
| Visitor | √ | √ | √ | | | | ◆ | | | | | ◆ |

√- Mandatory PPEs

◆ - Optional PPEs (depending upon the work activities)

19.3. Scope

All critical activities to be taken during Construction of Sewerage & Drainage Project KMC-KURIP,SD01(TEPL)

19.4. Hazard identification, risk assessment and determining controls

The procedure defines the process steps that are to be initiated at project level commencing with;

- a) Creation of a project specific hazard log;

- b) Identification of the hazards;
- c) Identify the consequences of each hazard;
- d) Identify risk of injury and possible losses;

19.5. MATRIX FOR RISK ASSESSMENT

| | | | | | | Probability / Likelihood | | Consequence / Severity | |
|------------------------------|---|----------|----------|----------|----------|--------------------------|---|------------------------|--------------------------------|
| Pro bab ility | 5 | | | | | | 5 | Highly Probable | Fatality, Permanent Disability |
| | 4 | | | | | | 4 | Highly Probable | Serious Injury(LD>30 Days) |
| | 3 | | | | | | 3 | Probable | Major Injury(30>LD>2days) |
| | 2 | | | | | | 2 | Rare | Minor Injury(2>LD>1day) |
| | 1 | | | | | | 1 | Very Rare | No Loss Time Injury |
| | | 1 | 2 | 3 | 4 | 5 | | | |

| | |
|--|------------------------------------|
| | Extreme risk; cannot accept |
| | High risk must act |
| | Moderate risk must ensure controls |
| | Low Risk |

Severity is the degree or extent of injury or harm caused by the hazards, or as a result of an accident. Severity of hazard is classified as per the table given below.

Five types of PROBABILITY OF RISKS TO BE CONSIDER

| ..Sl. No. | Types of Probability | Points |
|-----------|----------------------|--------|
| 1. | Very rare | 1 |
| 2. | Rare | 2 |
| 3. | Probable | 3 |

| | | |
|----|-----------------|---|
| 4. | Highly Probable | 4 |
| 5. | Extremely high | 5 |

19.6. Severity of hazard (Consequence)

Severity is the degree or extent of injury or harm caused by the hazards, or as a result of an accident. Severity of hazard is classified as per the table given below;

Group Risk Assessment

1. The team members of individual department will carry out the risk assessment as mentioned below.
2. Estimate the SEVERITY OF RISK. By considering: -
 - a) Parts of the body likely to be affected.
 - b) Nature of harm
 - c) Slightly harmful (minor cuts, eye irritation from dust, bruises)

TYPES OF SEVERITY OF RISK

| Sl. No. | Types of Severity / Consequences | Points |
|---------|---|--------|
| 1. | No Loss Time Injury | 1 |
| 2. | Minor injury (4 > LD >1 day) | 2 |
| 3. | Major injury (30 > LD > 4 day) | 3 |
| 4. | Serious injury (LD > 30 Days) | 4 |
| 5. | Fatality, Amputations; Permanent Disability | 5 |

Attached Sample Copy of HIRA

| Activity | Hazards (What Can Go Wrong?) | Risk Identified (What Would Happen if it Did?) | Assessment of RISK | | Applicable Control Measures | | | | Total Controls Determined (What Can We do to Prevent This?) | Existing Control Measures/Work Instruction / Sop's (What Preventive measures available at site?) | Assessment of RISK | | Further Controlling Measures Required (What additional preventive measures to be taken?) | Cross Reference to relevant Objective & Program (if applicable) | Assessment of RISK | | | Action By | |
|--|---|---|--------------------------|-----------------------------|---------------------------------|-------------|------------|---------------|--|---|--------------------|------|---|--|----------------------------------|-----------------------------|---------------------------|---------------|---|
| | | | Severity (S) (Scale 1-5) | Probability (P) (Scale 1-5) | RISK LEVEL (Combination of S&P) | Elimination | Substitute | Engg. Control | | | Admin. Control | PPEs | | | Severity (S) (Scale 1-5) | Probability (P) (Scale 1-5) | Existing Risk Level (ERL) | | Severity (S) (Scale 1-5) | Probability (P) (Scale 1-5) | Anticipated Residual Risk Level (ARR) |
| Doing Job w ith the help of Earth Moving Equipment | Equipment struck with moving vehicles | Major injury / Dangerous occurrence | 4 | 4 | High Risk | | | | 3. Proper training | controlling | 3 | 2 | Moderate Risk | 1. Periodic training should be conducted | 012/RARE EARTH/SAFETY/VOL -1/020 | 3 | 1 | Low Risk | Execution Engineer |
| | Traffic / workmen struck by equipment | Major Injury | 4 | 4 | High Risk | | | | 3. Proper training 4. Periodic checking of brakes, lights & horn 5. At the end of the equipment must be parked in a safe place | 3. Proper training 4. Periodic checking of brakes, lights & horn | 3 | 2 | Moderate Risk | 1. Periodic training should be conducted | 012/RARE EARTH/SAFETY/VOL -1/020 | 3 | 1 | Low Risk | Execution Engineer |
| | Fire | Major Injury due to smoke inhalation / burns | 4 | 4 | High Risk | | | | 2. Effective extinguisher to be kept inside the equipment 3. Equipment to be checked periodically | 2. Effective extinguisher to be kept inside the equipment 3. Equipment to be checked periodically | 4 | 1 | Moderate Risk | 1. Periodic training should be conducted | 012/RARE EARTH/SAFETY/VOL -1/020 | 4 | 1 | Moderate Risk | Execution Engineer & Safety Dept. |
| | Caught in moving parts of the equipment | Major injury due to rotating parts | 4 | 4 | High Risk | | | | checked periodically & covered 2. Trained mechanic should be carry | covered 2. Trained | 3 | 1 | Low Risk | | 012/RARE EARTH/SAFETY/VOL -1/020 | 3 | 1 | Low Risk | Plant Engineer / Supervisor/ Execution Engineer |
| | Falling into excavation | Fatality | 5 | 5 | Extremely High | | | | 1. Controlled & planned movement of equipment 2. Caution board at excavation area | 1. Controlled & planned movement of equipment 2. Caution board at excavation area | 5 | 1 | High Risk | 1. Periodic training should be conducted | 012/RARE EARTH/SAFETY/VOL -1/020 | 5 | 1 | High Risk | Execution Engineer |
| | Overturning | Fatality | 5 | 5 | Extremely High | | | | 1. Speed limit to be maintained & displayed 2. Operator's experience 3. Proper training | maintained & displayed 2. Operator's experience | 5 | 1 | High Risk | 1. Periodic training should be conducted | 012/RARE EARTH/SAFETY/VOL -1/020 | 5 | 1 | High Risk | Execution Engineer |

19.7 Health and Safety Communication Tools

19.7.1 Mobile Phones for Health & Safety Officers

To ensure effective, timely and reliable communication for health and safety management during sewer and drainage network construction activities, particularly for emergency response, coordination and reporting. Dedicated mobile phones shall be provided to:

- Site Health & Safety Officers

- Supervisors involved in high-risk activities (excavation, confined space, lifting)
- Phones shall be available during all working hours, including night shifts.
- Reliable network connectivity suitable for urban and semi-urban areas.
- Adequate battery life to last a full shift.
- Hands-free facility (earpiece / headset) for safe use.
- Emergency speed-dial or contact list function.
- Torch / flashlight function (preferred for night work).

Usage and Controls

- Phones shall be kept **fully charged** before shift start.
- Use of phones while operating machinery or driving is strictly prohibited.
- Phones shall be used primarily for:
 - Emergency communication
 - Incident reporting
 - Coordination of rescue and safety response
- Emergency contact numbers (ambulance, hospital, fire, police, project management) shall be saved and displayed.

Emergency Communication

- Health & Safety Officers shall immediately use mobile phones to:
 - Raise alarms during accidents or emergencies
 - Coordinate rescue teams and medical transport
 - Inform project management and authorities
- Backup communication (second phone / supervisor phone) shall be identified in case of network failure.

Record Keeping and Reporting

- Phones may be used for:
 - Photographing unsafe conditions
 - Recording safety observations and incidents
- All incident communications shall be documented in safety records.

Training and Awareness

- Health & Safety Officers shall be trained on:
 - Emergency communication protocols
 - Proper and safe use of communication devices
- Workers shall be informed of emergency contact procedures.

Monitoring and Review

- Functionality of phones shall be checked daily by the Safety Officer.
- Communication effectiveness shall be reviewed after drills and incidents.
- Defective devices shall be replaced immediately.

19.7.2 Incident Escalation Chain

Purpose

The incident escalation chain defines the reporting and communication hierarchy to ensure timely response, investigation, and corrective action for all incidents at project sites.

Types of Incidents

- Near Miss
- First Aid Case
- Medical Treatment Case
- Lost Time Injury (LTI)
- Major Accident / Fatality
- Environmental Incident
- Fire / Explosion
- Public Injury or Damage

Escalation Chain

Level 1: Worker / Witness

- Immediately stop work (if unsafe).
- Inform Site Supervisor / Foreman immediately.
- Provide first aid or emergency assistance if trained.

Level 2: Site Supervisor / Foreman

- Secure the area and prevent further injury.
- Inform Site Engineer and Safety Officer.
- Arrange first aid / ambulance if required.
- Record initial incident details.

Level 3: Safety Officer / HSE In-charge

- Assess incident severity.
- Ensure medical attention and emergency response.
- Inform Project Manager.
- Preserve evidence and initiate investigation.
- Report to client/consultant as per requirement.

Level 4: Project Manager

- Review incident details.

- Inform Head Office / Corporate HSE.
- Coordinate with client, consultant, and authorities.
- Ensure corrective and preventive actions.

Level 5: Corporate HSE / Management

- Review serious incidents (LTI, fatality, major environmental incidents).
- Notify statutory authorities where applicable.
- Approve corrective action plan.
- Monitor implementation and closure.

Statutory & Client Notification

- Labour Department / Police (for fatal or serious accidents).
- Client / Engineer-in-Charge / PMC.
- Insurance Company (if applicable).
- Pollution Control Board (for environmental incidents).

Communication Timeline

- Near Miss / Minor Injury: Within 24 hours.
- LTI / Major Incident: Immediate (within 1 hour).
- Fatal Accident: Immediate verbal intimation followed by written report within 24 hours.

Documentation

- Incident Report Form.
- Medical records.
- Photographs and witness statements.
- Investigation report and corrective action log.

19.8 Health and Safety Promotion and Compliance at Sewerage & Drainage (S&D) Projects

Sewerage and Drainage (S&D) projects involve high-risk construction activities such as deep excavation, confined space entry, handling of sewage, operation of heavy machinery, and work in public areas. Effective promotion of health and safety and strict compliance with statutory and project-specific requirements are essential to prevent accidents, occupational illnesses, environmental contamination, and public hazards.

Health and Safety Promotion

Health and safety promotion aims to develop a strong safety culture through awareness, training, communication, and worker participation.

Training and Capacity Building

- Safety induction training for all workers before site deployment.
- Regular tool box talks on excavation safety, confined space hazards, PPE use, and emergency response.
- Specialized training on first aid, fire fighting, gas detection, and lifting operations.
- Training records maintained and reviewed periodically.

Safety Communication

- Display of safety signages, barricades, and warning boards.
- Posters showing emergency contacts and safe work practices.
- Daily safety briefings by supervisors.

Worker Participation

- Reporting of unsafe acts and conditions encouraged.
- Safety meetings and near-miss discussions conducted.
- Worker participation in mock drills and inspections.

Health and Safety Compliance

Statutory Compliance

- BOCW Act, 1996
- Factories Act, 1948 (where applicable)
- IS Codes and NBC guidelines
- Labour Department and Pollution Control Board requirements

Project-Specific Compliance

- Site-specific Health & Safety Plan implemented.
- Hazard Identification and Risk Assessment (HIRA).
- Permit-to-Work system for confined space, excavation, and hot work.
- Mandatory PPE enforcement.

Monitoring and Enforcement

- Daily site inspections.
- Weekly and monthly safety audits.
- Corrective actions for non-compliance.
- Immediate stoppage of unsafe work.

Emergency Preparedness

- Emergency Response Plan in place.
- Confined space rescue procedures.
- First aid facilities and trained personnel.
- Periodic mock drills.

20. JOB SAFETY ANALYSIS (JSA).

20.1 Scaffold Erection, Dismantling, Access System and Fall Protection

To establish safe procedures for erection, use and dismantling of scaffolds, provision of safe access systems, and prevention of falls from height during construction activities.

Scope

1. Sewerage network construction 2. Manhole construction 3. Fabrication and maintenance activities at height

General Safety

Only trained and competent personnel shall erect, modify or dismantle scaffolds.

A Work at Height Permit shall be obtained prior to starting work.

Use of full body safety harness with double lanyard is mandatory for work above 1.8 m.

Scaffolds shall be erected on firm, level and stable ground

Working during high winds, heavy rain or poor visibility shall be avoided.

Erection Procedure

Install base plates and sole boards on firm ground.

Vertical standards shall be erected plumb and secured properly.

Ledgers and transoms shall be fixed at recommended spacing.

Working platforms shall be fully decked using approved planks.
Guardrails (top rail & mid-rail) and toe boards shall be installed on all open sides.
Scaffolds shall be tied to the structure at regular intervals.
Access ladders shall be securely fixed and extend at least 1 m above platform level.

Scaffolds shall be inspected:

- * After erection
- * Before first use
- * After modification or adverse weather
- * Inspection tags (Green/Red) shall be displayed.

Scaffold Dismantling

- * Dismantling shall be carried out under supervision of a competent person.
- * Work shall proceed *top to bottom*, in reverse order of erection.
- * Workers shall use full body harness and remain tied off at all times.
- * Components shall not be thrown from height; they shall be lowered safely.
- * Area below dismantling zone shall be barricaded with warning signage.
- * Materials shall be stacked properly after dismantling.

Access Systems

Ladders

- * Only industrial-grade ladders shall be used.
- * Ladders shall be placed at *4:1 ratio* (for portable ladders).
- * Ladders shall be secured at top and bottom.
- * Workers shall maintain *three points of contact* while climbing.

Stairways / Walkways

- * Temporary stairways shall have handrails on both sides.
- * Walkways shall be free from obstructions and adequately lit.
- * Slippery surfaces shall be treated with anti-skid measures.

Fall Protection Measures

- * Full body safety harness with shock-absorbing lanyard shall be used.
- * Anchor points shall be capable of withstanding minimum *15 kN load*.
- * Lifelines (horizontal/vertical) shall be provided where required.
- * Safety nets shall be installed where harness use is not feasible.
- * Open edges, floor openings and manholes shall be properly covered or guarded.

Training and Awareness

- * Workers involved in scaffolding and work at height shall receive:
 - * Scaffold safety training
 - * Fall protection training
- * Toolbox talks shall be conducted before commencement of work.

20.2. WORK AT HEIGHT

Where work at height is required the team leader will ensure that all such work is properly controlled and that safe access and working platforms are provided in accordance with statutory requirements. The team leader will ensure that all scaffolding is erected, altered or dismantled only by competent, trained, experienced personnel

under the immediate supervision of a competent supervisor. All scaffolds will be of sound construction and be properly maintained and inspected. Where the provision of scaffolding for work at height is impracticable other safe working methods or systems will be used. This may be in the form of mobile elevating work platforms, personnel carriers suspended from cranes or the provision of fall arrest equipment such as safety harness and lanyards. Where such alternative methods are used a system of work will be devised to ensure that all aspects satisfy the relevant statutory provisions and provide the personnel involved with a safe place and system of work.

20.3. WORKING UNDER/NEAR TRENCH (Open Pit)

All activities shall be carried out in strict awareness of the in- place safety procedures, with each new task requiring a job Safety analysis and with regular briefing in the form of tool box talks. Periodically there will be safety demonstrations and drills to ensure that all involved in the steel piling activities are kept vigilant. Basic safety precautions shall include:

1. Use life vests while working over water
2. Unwanted personnel not to stay/engage at works.
3. Not to stay/stand below the suspended load.
4. To keep the flammable items away from the hot work area.
5. To display the "No smoking" board on work area.
6. Emergency Vehicle must be tragic location

20.4. RCC Pipe lying, Fixing & Testing.

Pipe lying activities include hoisting, laying out, placing, connecting, welding burning, bolting, plumbing and rigging installing metal decking, curtain walls, window walls, siding systems, miscellaneous metals, ornamental iron and similar materials, and moving point-to-point while performing these activities.

- a) Stability of earth will be checked.
- b) Care shall be taken that ground is leveled.
- c) 1" thick metallic plate or wooden sleeper will be placed on the ground to increase the stability of the crane to be positioned and distribute the load equally.

- d) The approach area should be decided and kept neat and clean.
- e) Correct hitch will be selected respective to the structure to be lifted.
- f) Exact determination of sling capacity, sling angle and factor of safety shall be kept.
- g) Radius of swing will be identified.
- h) Turnbuckles used for plumbing up steel shall be secured to keep from unwinding.
- i) Covers and/or guardrails shall be provided to protect personnel from the hazards of open pits, tanks, vats, ditches, etc.
- j) Open-sided floors or platforms 4 feet or more above adjacent floor or ground level shall be guarded by a standard railing on all open sides except where there is entrance to a ramp, stairway, or fixed ladder.

21. Night Work Safety for Sewer & Drainage (S&D) Works

To ensure the safety of workers, road users and nearby residents during night-time execution of sewer and drainage works by minimizing risks related to poor visibility, traffic movement, fatigue and emergencies.

Activity:

- * Excavation and trenching
- * Pipe laying and jointing
- * Manhole construction and rehabilitation
- * Road crossing works
- * Dewatering and backfilling operations

Responsibilities

- * Project Manager: Approval of night work and resource deployment.
- * Site Engineer / Supervisor: Execution and site control.
- * Safety Officer / EHS Officer: Safety arrangements, monitoring and compliance.
- * Traffic Marshal: Traffic control and pedestrian safety.
- * Workers: Follow SOP and use PPE.

Pre-Work Planning and Authorization

- * Night work shall be carried out only with written approval/Night work Permit from the competent authority.
- * A Night Work Permit and Excavation Permit shall be obtained prior to commencement.
- * Risk assessment and toolbox talk shall be conducted before starting each shift.
- * Adequate manpower shall be planned to avoid over-fatigue.

Illumination and Visibility

- * Sufficient artificial lighting shall be provided to illuminate:
 - * Excavation areas
 - * Access points and walkways
 - * Material storage areas
- * Emergency backup lighting (DG set / battery lights) shall be available.
- * Reflective tapes and signage shall be installed around work zones.

Traffic and Public Safety

- * Work area shall be properly barricaded using rigid barricades.
- * Reflective cones, blinkers and hazard lights shall be placed at adequate intervals.
- * Warning signboards (e.g., "Men at Work", "Road Closed") shall be installed in advance.
- * Trained *traffic marshals with reflective jackets and batons* shall be deployed.
- * Safe pedestrian pathways shall be provided with proper lighting.

Excavation and Trench Safety

- * Trenches shall be provided with proper shoring, strutting or sloping as required.
- * Open trenches shall not be left unattended; they shall be covered or barricaded.
- * Access ladders shall be provided at regular intervals and properly illuminated.
- * Spoil material shall be stacked away from trench edges.

PPE and Worker Safety

- * Mandatory PPE for night work:
 - * Helmet with reflective tape
 - * High-visibility reflective jackets
 - * Safety shoes
 - * Gloves
- * Adequate rest breaks shall be provided to prevent fatigue.

* Workers under the influence of alcohol or drugs shall not be allowed on site.

Emergency Preparedness

* First-aid kits and trained first-aiders shall be available on site.

* Emergency contact numbers (hospital, police, fire) shall be displayed.

* Rescue arrangements shall be in place for trench collapse or worker injury.

* Emergency evacuation routes and assembly points shall be identified.

Supervision and Monitoring

* A competent supervisor and safety officer shall be present throughout night work.

* Continuous monitoring shall be carried out for unsafe conditions.

* Any unsafe act or condition shall be corrected immediately.

* Incidents, near misses and complaints shall be recorded and investigated.

22. Construction, Labour Camp and Fabrication yard Safety

Contractor shall be fully responsible for:

- Arrangement, operation and maintenance of labour camps
- Provision of sanitation, potable water, electricity and fire safety
- Compliance with applicable labour, safety and health regulations

22.1. HOUSE KEEPING:

Hazards: Poor housekeeping prevails, trip and fall, slip and fall, fire, wastage of material, damage to material, blocking of access / egress and obstruction to smooth movement.

Solution:

- a) Place for everything and everything in its place
- b) Ensure that material (properly placed and securely stacked) does not obstruct passages, platform and stairs etc.
- c) Do not place materials near edge of excavations, pits or openings
- d) Do not throw materials, tools and objects (unless lowering is impracticable in which

- case barricade the area and take precautions against falling objects).
- e) Segregate non-compatible materials.
 - f) Dispose of debris through chutes and from sites on daily basis to keep the site clear of obstruction and occupying working space.
 - g) Scrap Yard to be designated as per generation of type of scrap and all material should be stored in it as per its type.
 - h) All nails at the site to be picked up on daily basis so that it does not pinch inside the foot.
 - i) All protruding rods tips should be covered by suitable material (such as wooden block or to be removed)
 - j) All wooden plank with nails should be de-nailed while carrying and storing on daily basis
 - k) Separate Disposal bins to be provided at the site for specific waste such as, Hazardous waste, non hazardous waste & biomedical waste etc.
 - l) Store flammable liquids in fire resistant covered containers.
 - m) Comply with relevant codes and statutory regulation in case of radioactive material equipment.

22.2 Sanitation and Hygiene

- Adequate temporary toilets shall be provided near work locations.
- Toilets shall be regularly cleaned and disinfected.
- Handwashing facilities with soap and water shall be provided.
- Toilets and wash areas shall be provided and maintained.
- Wastewater shall be disposed of safely without stagnation.

22.3 Potable Water Supply

- Safe and adequate potable drinking water shall be provided at Construction sites and Fabrication yards.
- Water storage tanks shall be cleaned periodically.
- Workers shall be instructed not to consume water from unauthorized sources.

22.4 Electrical Safety

- Temporary electrical connections shall comply with applicable IS standards.
- Electrical panels shall be fitted with **MCB / RCCB / ELCB**.
- All equipment shall be properly earthed.
- Cables shall be insulated, protected from damage and kept away from wet areas.
- Welding machines and power tools shall be properly earthed.
- Electrical cables shall be routed safely to avoid trip hazards.
- Lock-out and isolation procedures shall be followed during maintenance.

22.5. Fire Prevention and Protection

- Fire extinguishers of suitable type (ABC / CO₂ / Foam) shall be provided at Electrical panels Fuel storage areas Fabrication yards Labour camps Fire extinguishers shall be inspected periodically.
- Emergency exit routes shall be clearly marked.
- Flammable materials shall be stored away from ignition sources.

23. Safe operating Procedures (SOP)

- Excavation
- Manual Handling

- Use of Plant, Equipment and Machineries
- Fire Prevention
- Housekeeping
- Issue and use of PPE
- Lifting Appliances and lifting Gears
- Site Electricity
- Arc Welding and Flame Cutting
- Work at Height at Night shift
- Hot Mix Plant
- RCC Pipe Factory
- Prevention of Dengue and Malaria (SOP-attached as below): -

Standard Operating Procedure (SOP) for Prevention of Dengue and Malaria

Objective:

To eliminate or minimize the risk of dengue and malaria by controlling mosquito breeding and promoting awareness and hygiene practices.

1. Identification and Elimination of Breeding Grounds:

- Inspect all areas weekly for stagnant water (gutters, open tanks, drums, plant pots, etc.).
- Drain or remove standing water in containers, construction materials, or any place where water collects.
- Fill or level depressions in soil and cover open drains.
- Keep overhead and underground water tanks tightly covered.
- Clean and scrub all water containers every week.

2. Use of Kingfog and Anti-Mosquito Measures:

- Spray Kingfog chemical in stagnant water bodies, drains, pits, etc., weekly.
- Use fogging machines in high-risk areas during early morning or evening hours.
- Use mosquito repellents and nets in sleeping or rest areas.
- Ensure regular fumigation at the workplace and labour accommodation.

3. Personal Protective Measures:

- Encourage workers/staff to wear full-sleeve clothing, especially during early morning and dusk.

- Distribute mosquito repellents to workers.
- Avoid perfumes and scented body products, which attract mosquitoes.

4. Housekeeping and Waste Management:

- Ensure daily disposal of solid waste to prevent water accumulation in trash.
- Cover all dustbins and remove garbage regularly.
- Keep surroundings clean and dry.

5. Awareness and Training:

- Conduct periodic awareness sessions on prevention of dengue and malaria.
- Display posters and signage’s in common areas with “Do’s and Don’ts”.
- Train housekeeping staff and workers on identifying mosquito breeding spots.

6. Health Monitoring:

- Maintain records of fever or flu-like symptoms reported by workers.
- Immediately refer any suspected dengue/malaria cases to a doctor.
- Isolate infected individuals to avoid spreading.

7. Responsibilities:

| Person Responsible | Responsibility |
|-------------------------|---|
| Site Safety Officer | Weekly inspection, training & documentation |
| Housekeeping Supervisor | Daily cleaning & waste disposal |
| Admin/HR | Procurement of repellents, coordination with health authorities |
| All Workers/Residents | Follow hygiene practices & report symptoms |

8. Records and Documentation:

- Maintain checklist for weekly inspections.
- Keep records of fogging activities.
- Log of health complaints and doctor visits.

24. Snakebite Prevention and Response

To prevent snakebite incidents and ensure prompt, effective response including first aid, medical treatment and reporting during sewer and drainage construction activities.

24.1. Snakebite Prevention and Control Measures

24.1.1. Site Control Measures

- Work areas shall be kept clean and free from debris, bushes and stagnant water.
- Tall grass, vegetation and garbage around work sites and camps shall be cleared regularly.
- Excavated soil shall not be left unattended for long durations.
- Proper drainage shall be ensured to avoid waterlogging, which attracts snakes.
- Rodent control measures shall be implemented at camps and storage areas.

24.1.2 Access and Habitat Control

- Trenches, pits and manholes shall be covered or barricaded when work is not in progress.
- Temporary lighting shall be provided during night work to improve visibility.
- Storage areas shall be kept elevated and well-organized.

24.1.3 Personal Protective Measures

- Workers shall wear:
 - Safety shoes or gumboots
 - Long trousers
- Sleeping on bare ground shall be prohibited in labour camps.
- Workers shall be discouraged from inserting hands into holes, pipes or dark spaces without inspection.
- Awareness training on snakebite risks shall be provided, especially before monsoon season.

24.2. First Aid for Snakebite

24.2.1 Immediate Actions

- Keep the victim calm and reassured; avoid panic.
- Immobilize the affected limb using a splint and keep it at heart level.
- Remove tight items such as rings, bangles or footwear.
- Shift the victim immediately to the nearest hospital.

24.2.2 Actions Strictly Prohibited

- Do NOT cut, suck or apply pressure to the bite wound.
- Do NOT apply tourniquets.
- Do NOT apply ice, chemicals or herbal remedies.
- Do NOT allow the victim to run or walk unnecessarily.

24.2.3 On-Site Preparedness

- First-aid kits shall be available at all sites and camps.
- Supervisors shall be trained in snakebite first aid.
- Emergency transport shall be available at all times.

23.4. Anti-Venom Access and Medical Management

- Details of nearest government / private hospitals with snake anti-venom facilities shall be displayed prominently at site and labour camps.
- Emergency contact numbers (ambulance, hospital, site management) shall be displayed.
- Pre-arranged transport (vehicle/ambulance) shall be kept ready for emergency evacuation.
- Anti-venom shall only be administered by qualified medical professionals at a hospital.
- No anti-venom shall be stored or administered at site.

24.4. Reporting and Investigation

- All snakebite incidents, suspected bites or near misses shall be reported immediately to:
 - Site Supervisor
 - Safety Officer / EHS Officer
- An incident report shall be prepared detailing:
 - Date, time and location
 - Activity being performed
 - First aid and medical response
- Corrective and preventive measures shall be implemented to avoid recurrence.
- Records shall be maintained as part of EHS documentation.

24.5. Training and Awareness

- Regular toolbox talks shall be conducted on:
 - Snake identification and behavior
 - Do's and Don'ts after snakebite
- Posters and visual aids shall be displayed at camps and sites.
- Special awareness sessions shall be conducted during monsoon season.

24.6. Monitoring and Review

- Safety Officer shall inspect sites periodically for snake-prone conditions.
- Preventive measures shall be reviewed and strengthened based on seasonal risk.
- Effectiveness of response measures shall be reviewed after any incident.

25. Traffic and Cross Traffic management (Vehicle, Pedestrian movement)

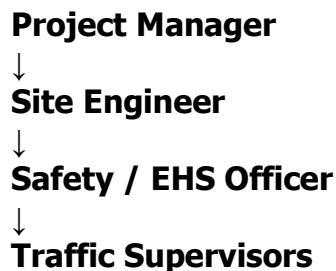
25.1. Purpose

The purpose of this Traffic Management Plan is to ensure safe movement of vehicles, machinery, workers, and the general public around the project site. It aims to prevent accidents, minimize disruptions, and comply with legal and contractual safety requirements.

25.2. Scope

This plan applies to all construction activities, site vehicles, material delivery trucks, and pedestrian movements during project execution.

25.3.1 Traffic Management Organogram



25.3.2 Roles and Responsibilities

Project Manager

- Overall responsibility for traffic management planning and compliance.
- Liaison with local authorities and police.

Site Engineer

- Preparation and implementation of Traffic Management Plan (TMP).
- Coordination of diversions, barricading and signage.

Safety / EHS Officer

- Monitoring traffic safety arrangements.
- Ensuring compliance with safety standards and SOPs.
- Incident investigation and reporting.

Traffic Supervisor

- Deployment and supervision of traffic marshals.
- Ensuring barricades, lighting and signage are in place.

25.4. Legal Requirements

- Motor Vehicle Act, 1988
- Building and Other Construction Workers Act, 1996
- Central Rules, 1998 (Rule 48, 88, 95)
- Local Traffic Police / Municipal Authority guidelines

25.5. Traffic Control Measures

25.5.1 Planning Stage

- Road diversion plan approved by competent authorities.
- Placement of traffic signs, cones, barriers, hazard lights, and information boards.
- Night working areas to be provided with adequate lighting.
- Safe pedestrian walkways and crossing points to be established.

25.5.2 Cross-Traffic Flow Control Measures

- Barricading of working areas with reflective sheets.
- Speed limit inside site restricted to **15 km/hr**.
- One-way traffic flow to minimize congestion.

- Safe storage zones identified for materials and machinery.

25.5.3 Vehicle & Equipment Management

- Daily inspection of vehicles (brakes, lights, horns, tyres, reverse horn).
- Monthly checks by Safety & Plant Department.
- Only licensed and experienced drivers/operators allowed.
- Reverse alarms mandatory for all vehicles.

25.5.4 Loading & Unloading

- Only authorized personnel permitted.
- Materials to be within vehicle weight limits.
- Use of red flags/lights for projecting loads.
- Vehicle engines must be switched off and brakes applied during stoppage.

25.5.5. Signage and Road Markings

- Standard traffic signage shall be installed as per local authority guidelines.
- Signboards shall include:
 - "Men at Work"
 - "Road Ahead Closed / Diversion"
 - Speed limit signs
- Signage shall be placed at adequate distances before work zones.
- Reflective signage and cones shall be used for visibility during night and low-light conditions.

25.5.6. Lighting Arrangements

- Adequate lighting shall be provided at:
 - Excavation areas
 - Barricades and diversion points
 - Pedestrian crossings
- Light towers and floodlights shall be positioned to avoid glare to motorists.
- Backup power shall be provided for night-time traffic control.

25.5.7. Guarding and Barricading

- Trenches and open excavations shall be guarded with:
 - Rigid barricades
 - Reflective tapes
 - Blinkers / hazard lights
- Barricades shall be checked daily and after adverse weather.
- Unauthorized access to work zones shall be prevented.

25.5.8. Temporary Diversions (Including Night-Time Diversions)

- Temporary traffic diversion plans shall be prepared and approved by local authorities.
- Diversion routes shall be:
 - Clearly marked
 - Properly lit
 - Free from obstructions
- Night-time diversions shall include:
 - Reflective cones and signage
 - Flashing warning lights
 - Deployment of trained traffic marshals
- Public information boards shall be displayed indicating diversion routes and duration.

25.6. Emergency Preparedness

- Emergency contact numbers displayed at site.
- Traffic diversions during accidents coordinated with local authorities.
- First-aid kits and trained personnel available at site.

25.7. Communication & Training

- Toolbox talks to drivers, operators, and workers on traffic safety.
- Induction training for all site personnel.
- Signboards in local language(s) for public awareness.

25.8. Monitoring & Review

- Regular inspections by Safety Officer.
- Non-compliance recorded and corrective actions taken.
- Review and update of TMP as work progresses.

25.9. Hazard Reporting Under Traffic Management

25.9.1 Identification of Traffic Hazards

- Damaged or displaced barricades
- Poor visibility or lighting failure
- Congestion or near-miss incidents
- Unauthorized public entry into work zones

25.9.2 Reporting Procedure

- Traffic hazards shall be reported immediately to:
 - Traffic Supervisor
 - Safety / EHS Officer
- Serious hazards shall be escalated to the Site Engineer and Project Manager without delay.

26. Spoil Management Plan for On-Road Pipeline Works

1. Objective

To ensure safe, environmentally responsible, and efficient management of excavated spoil generated during pipeline installation along road corridors.

2. Scope

This plan covers handling, storage, transportation, reuse, and disposal of spoil generated from trenching, manhole, and catch-pit works on public roads.

• Key Principles

- Minimize Generation – Optimize trench dimensions to reduce excess excavation.
- Reuse Wherever Possible – Backfilling with suitable excavated material.
- Safe Handling & Storage – Prevent obstruction, accidents, and environmental hazards.
- Environmentally Compliant Disposal – Spoil disposal only at authorized locations.

4. Spoil Handling Procedure

4.1 Excavation & Collection

- Excavated spoil shall be stockpiled on one side of the trench, away from traffic.
- Proper barricades and reflective tapes to be installed around spoil heaps.
- Water sprinkling to control dust emissions.

4.2 Temporary Storage

- Stockpiles not to exceed 1.5 m height.
- Covered with tarpaulin during rain or when kept >24 hours.
- Avoid blocking storm water drains, pedestrian paths, or property access.

4.3 Transportation

- Only covered trucks/tippers or Tractor to be used.
- Spoil material to be transported during non-peak hours to reduce traffic disruption.
- Vehicles shall not be overloaded, and wheels cleaned before leaving site to avoid mud on roads.

5. Reuse & Disposal

5.1 Reuse

- Suitable spoil (sand, gravel, selected soil) to be reused as backfill material after compaction.
- Topsoil (if available) to be separately stored and reused for landscaping or surface reinstatement.

5.2 Disposal

- Unsuitable spoil (sludge, debris, mixed waste) to be sent to municipal/authorized dumping ground.
- Hazardous material (e.g., tar-contaminated soil, asbestos pipes, oily waste) to be handled as per Hazardous Waste Rules, through licensed agencies.

6. Environmental & Safety Controls

- Dust suppression by water sprinkling.
- Cover spoil heaps with tarpaulin sheets.
- Ensure pedestrian safety with barricades and signage.
- Fire safety measures if spoil contains flammable material.
- Periodic inspection by site engineer/ESHS officer.

7. Monitoring & Record Keeping

- Daily record of spoil generated, reused, and disposed.
- Trip sheets for spoil transported to disposal sites.
- Photographic evidence of disposal at approved locations.

CONCLUSION

By systematic way of implementing the Health, Safety and Environmental Management System as discussed in this plan, it is certainly possible to prevent or control or minimize the adverse HSE impacts that shall arise during the pre-construction and construction stage of the project. With the mitigation measures of this plan implemented during the construction stage.

Practice Safety Every Day

Safety Has No Holiday.

ANNEXURE

CONTENT

| SUBJECT | PAGE NO. |
|---|----------|
| ❖ PERMIT TO WORK (PTW) SYSTEM | 2 |
| ➤ TYPES OF PERMIT TO WORK | 2 |
| ✓ EXCAVATION & TRENCHING PERMIT | 3 |
| ✓ CONFINED SPACE ENTRY PERMIT | 5 |
| ✓ WORK AT HEIGHT | 7 |
| ✓ ELECTRICAL WORK PERMIT | 9 |
| ✓ HOT WORK PERMIT | 11 |
| ✓ WORK ON PLANT, MACHINERY & OTHER POWER DRIVEN EQUIPMENT | 13 |
| ❖ CHECKLIST | 14 |
| ✓ VEHICLE & EARTH MOVING EQUIPMENT INSPECTION CHECK LIST | 14 |
| ✓ ELECTRICAL SAFETY CHECK SHEET | 15 |
| ✓ CHECKLIST FOR HYDRA | 16 |
| ✓ CHECKLIST FOR GAS WELDING AND GAS CUTTING | 17 |
| ✓ CONCLUSION | 18 |

WORK PERMITS

The Work Permit Systems are designed and intended to specify adequate safety measures in advance against identified hazards and stipulate implementation of the said safety measures by the permittee to ensure safe execution of work in the designated workplace within a specified period.

❖ Activities Related to our activities requiring WPS

The following select few activities may require WPS:

- a. Excavation/ Trenching
- b. Working in confined space
- c. Working at Height
- d. Electrical Work
- e. Hot work
- f. Working at P&M & other Power driven equipment
- g. Night work
- h. Hydro test permit

❖ Procedure

- a. Before starting any work covered under WPS (Work Permit System), the concerned supervisor (Permittee) fills work permit form and sends it to the authorizing staff.
- b. On receipt of the filled form, the issuing authority inspects the work spot, fills the form and authorizes the permittee to work.
- c. After completion of the job, the permit is brought back by the permittee to the issuing authority.
- d. The issuing authority inspects the work spot and once he is satisfied that the situation is safe, close the permit.
- e. A copy of the permit is sent to the HSE In-charge for his information when issuing the permit.
- f. In case the Client desires that their Work Permit Systems is to be implemented then the same is followed.

WORK PERMIT: EXCAVATION / TRENCHING

Name of the project site:

Contract:

Job information / details (SHOULD BE FILLED BY EXECUTING AUTHORITY):

| | | | | |
|--|-------------------|---|-----------------------------------|---|
| Location : | | | | |
| Whether the sketch has enclosed as per excavation / trenching job to be carried out? | | | | |
| Excavation : Length _____ m | | Width _____ m | | Depth _____ m |
| Activity : | | | | |
| Purpose of work : | | | Performing Agency : | |
| Permit From : Time _____ Date _____ | | | Permit To : Time _____ Date _____ | |
| Name : | Position : | Signature : | Date : | Time : |
| Equipment / Tools to be used during this activities | | | | |
| | | | | |
| Potential Hazards present in the work | | | | |
| <input type="checkbox"/> Electrical Shock <input type="checkbox"/> Flying Object <input type="checkbox"/> Rotating parts <input type="checkbox"/> Burns <input type="checkbox"/> Moving vehicle <input type="checkbox"/> Fire & Explosion | | <input type="checkbox"/> Failure of lifting appliances & tackles <input type="checkbox"/> Poor illumination <input type="checkbox"/> Dust & Mist <input type="checkbox"/> Fall of person from height <input type="checkbox"/> Falling objects | | <input type="checkbox"/> Fall below ground level <input type="checkbox"/> Overhead work activity <input type="checkbox"/> Radiation <input type="checkbox"/> Adverse weather condition <input type="checkbox"/> Noise <input type="checkbox"/> Vibration |
| <input type="checkbox"/> Unstable structure, building <input type="checkbox"/> Asphyxiation <input type="checkbox"/> Others if any (Specify) | | | | |

| EXCAVATION CLEARANCE (If applicable) | | | | | |
|---|------------------------------------|---|--|--------------------|-----------------|
| Sl. No | Item | Detail of Observation / Items present in the area to be excavated | Preparation & Precaution to be taken for safe excavation | Name & Designation | Sign. With Date |
| 1 | Permanent Electrical Installations | <input type="checkbox"/> Any Underground cables : <input type="checkbox"/> Any Over Head cables : | Electrical isolation : | | |
| 2 | Temporary Electrification | <input type="checkbox"/> Any Underground cables : <input type="checkbox"/> Any Over Head cables : | Electrical isolation : | | |
| 3 | Instruments | <input type="checkbox"/> Any Underground cables : <input type="checkbox"/> Any Over Head cables : | Electrical isolation : | | |
| 4 | Engineering Services | <input type="checkbox"/> Existing Underground facilities / utilities : | | | |
| 5 | Computer Services | <input type="checkbox"/> Existing Underground facilities / utilities : | | | |
| 6 | Fire & Safety | <input type="checkbox"/> Provision of cross over, barricades, road blocks, shoring/angle of repose etc. | | | |

PRECAUTIONS TAKEN AND EQUIPMENT PROVIDED TO PROTECT PERSONNEL FROM ACCIDENT OR INJURY

Precautions Taken

- A competent person assigned to inspect & control condition of excavation on site
- Underground utilities identified
- Power equipment grounded
- Electrical or mechanical overhead clearances checked
- Hard / Soft Barricades, area warning placed
- Means of egress (ladder or steps) placed
- Side walls shored or laid back
- Area adequately lighted
- Material or soil removed from excavation edge
- Excavator is fit for the job
- Method of dewatering is established and ensured the stoppage of water return
- Excavated pit edges free from heavy over-burden, stack of materials
- People are prevented from working inside pits if heavy vehicle movement in the vicinity due to which soil collapse may take place.
- Job Hazards is explained to all concern through tool box talk meeting.

THE PERSON GIVING PERMIT TO WORK (ISSUING AUTHORITY)

The precautions and safe conditions mentioned above have been verified and the work can be started.

| WEEK (Days) | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 | Day 6 | Day 7 |
|--|-------|-------|-------|-------|-------|-------|-------|
| Sectional-In-charge | | | | | | | |
| HSE In-charge | | | | | | | |
| Electrical/ Mechanical In-charge | | | | | | | |
| In other Authority (specify if applicable) | | | | | | | |

JOB Completion Date & Time :

Sign of Executor :

Sign of Engineer In-Charge :

N.B.: HSE department will keep one copy. And the work executor must keep one copy for checking. After the work completed, the executor must return the copy to HSE Dept. with job completion signature of Engineer In-charge. One Work Permit can last for 7 days.

WORK PERMIT: WORKING IN CONFINED SPACE

Name of the project site:

Contract:

Job information / details:

Permit Start Date/ Time.....Permit Expiration Date/ Time.....

Site location description

Task

Type of Confined Space Procedural Permit required

(Note Permit required confined spaces required both the supervisor or designee & EH &S signature)

List Confined Space Team

Attended (s)

Entrant (s)

Requirements completed prior to entry

| | N/A | Yes | | N/A | Yes |
|----------------------------------|--------------------------|--------------------------|---------------------------------|--------------------------|--------------------------|
| 12 V electrical lines present | <input type="checkbox"/> | <input type="checkbox"/> | Fire extinguisher | <input type="checkbox"/> | <input type="checkbox"/> |
| Lockout/ de-energized tag-out | <input type="checkbox"/> | <input type="checkbox"/> | Ionizing radiation | <input type="checkbox"/> | <input type="checkbox"/> |
| Completed | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| Line(s) blanked/ broken/ capped | <input type="checkbox"/> | <input type="checkbox"/> | Protective clothing | <input type="checkbox"/> | <input type="checkbox"/> |
| Ventilation* | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> |
| Standby in visual/ radio contact | | | | | |
| Hazardous materials* | <input type="checkbox"/> | <input type="checkbox"/> | Special communication required* | <input type="checkbox"/> | <input type="checkbox"/> |
| Lifelines | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> |
| Respiratory protection* | | | | | |
| (e.g., hoist, lifeline, harness) | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| Standby CPR trained | <input type="checkbox"/> | <input type="checkbox"/> | Hot Work Permit* | <input type="checkbox"/> | <input type="checkbox"/> |
| Air monitoring (periodic)* | <input type="checkbox"/> | <input type="checkbox"/> | Confined Space Training | <input type="checkbox"/> | <input type="checkbox"/> |
| Secure area (signs/ barriers) | <input type="checkbox"/> | <input type="checkbox"/> | Lighting (explosion proof) | <input type="checkbox"/> | <input type="checkbox"/> |

*Note: If marked yes, these items require specific details to be listed in the information section.

*Permit required confined space if marked yes, even if otherwise listed as procedural.

Monitoring results

| | Instrument/Model | Cal. Date | Serial# |
|--|------------------|-----------|---------|
| Percentage oxygen (19.5-23.5%=safe)_____% | ..... | ..... | ..... |
| Flammability (less than 10% = safe)..... % | ..... | ..... | ..... |
| ..... | ppm ..... | ..... | ..... |
| (Other toxics) | | | |
| ..... | ppm..... | ..... | ..... |

Additional Information

.....
.....

Approvals

Supervisor (or designation) _____

Date

(Note: Electrical supervisor's approvals for confined spaces with 12 V)

HSE Representative _____

Date

WORK PERMIT: WORKING AT HEIGHT

| | |
|-----------------------------------|-------------------------|
| Name of the project site: | Contract Number: |
| Permit No. | Date: |
| Specific Location of Work: | |

| |
|--|
| 1. DESCRIPTION OF WORK |
| <i>(Have type and scope of work planned to be carried out been mentioned?)</i> |
| |

| 2. PRECAUTIONS TAKEN AND EQUIPMENT PROVIDED TO PROTECT PERSONNEL FROM ACCIDENT OR INJURY | | | | |
|---|--|---------|----|-----|
| Sl. No | Measure | Remarks | | |
| 1 | Instruction to Personnel regarding hazards and working procedure | Yes | No | N/A |
| 2 | Notification To Other Contractors <i>(if applicable)</i> | | | |
| 3 | Whether height pass issued to all the workers working at height. | | | |
| 4 | Whether persons are provided with full body harness & life line <i>(if required)</i> . | | | |
| 5 | Is ladder / walk way and scaffold secured and supported properly. | | | |
| 6 | Is weather condition normal and toxic weather or flammable fumes are observed during the height work. | | | |
| 7 | Whether mandatory PPE like foot protection, safety helmet, full body harness, fall arresters are provided. | | | |
| 8 | Is working area below safely barricaded | | | |
| 9 | Whether all scraps are removed and area cleared for smooth operation after completion of work. | | | |
| 10 | Whether all tools are properly anchored and carried in bags / tool kit. | | | |
| 11 | Whether vertical and catch net provided below progress floor / area <i>(if required)</i> . | | | |
| 12 | Whether supervisor available at the place of work all time. | | | |
| 13 | Whether proper illumination provided at work area <i>(if required)</i> . | | | |
| 14 | Any other Precaution taken:-..... | | | |

WORK PERMIT: ELECTRICAL WORK

| | |
|-----------------------------------|-------------------------|
| Name of the project site: | Contract Number: |
| Permit No. | Date: |
| Specific Location of Work: | |

1. DESCRIPTION OF WORK

(Have type and scope of work planned to be carried out been mentioned?)

2. PRECAUTIONS TAKEN AND EQUIPMENT PROVIDED TO PROTECT PERSONNEL FROM ACCIDENT OR INJURY

| Sl. No | Measure | Remarks | | |
|--------|--|---------|----|-----|
| 1 | Instruction to Personnel regarding hazards and working procedure | Yes | No | N/A |
| 2 | Notification To Other Contractors <i>(if applicable)</i> | | | |
| 3 | Has permission for the intended work been confirmed? | | | |
| 4 | Is the equipment isolated from all source of supply. | | | |
| 5 | Are lockout device fixed at all point of isolation. | | | |
| 6 | Are caution sign fixed at all point of isolation. | | | |
| 7 | Has the equipment been proved dead by competent electrician. | | | |
| 8 | Are safety locked fixed to secure temporary earth. | | | |
| 9 | Where the work involves a cable has it been identified with certainty. | | | |
| 10 | Has lockout key handed over to the responsible person <i>(if applicable)</i> | | | |
| 11 | Whether working area has been barricaded / isolated. | | | |
| 12 | Whether tagout or warning tag is secured onto the energy isolated point. | | | |
| 13 | Whether proper illumination provided at work area <i>(if required)</i> . | | | |
| 14 | Are mandatory PPE like rubber gloves, shoes, helmet, goggles, etc. provided. | | | |
| 15 | Any other Precaution taken:-..... | | | |

HOT WORK PERMIT

(Hot work would mainly comprise - Welding, Gas-cutting, use of Open Flames or other sources of fire in a fire-prone place containing inflammable substances, explosives & / or other such highly combustible materials susceptible to spontaneous ignition & / or explosion.)

A) The person taking permit (permittee) to fill up:

1. Exact location where hot work is being planned. _____
2. Approximate duration of work. From : Date: _____ Time _____
To : Date _____ Time _____

| Points to be checked | | | | |
|----------------------|---|---------|----|------|
| Sl. No | Details | Remarks | | |
| | | Yes | No | N.A. |
| 1 | Instruction to Personnel regarding hazards and working procedure (like | | | |
| 2 | Escape routes to be provided and kept clear | | | |
| 3 | Combustible material to be removed / covered | | | |
| 4 | Has the area immediately below the work spot, been cleared / removed of oil, grease & waste cotton etc.? | | | |
| 5 | Has Gas concentration been tested in case there is gas valve / gas line nearby? | | | |
| 6 | Have fire extinguisher been kept handy at site? | | | |
| 7 | Has tin sheet / wet gunny bag / fire retardant cloth / sheet been placed to prevent sparks from causing fire? | | | |
| 8 | Has water hose connection been made for continuous water spray? | | | |
| 9 | Have all the drain inlets (if any) been closed? | | | |
| 10 | Whether welding machine checked for fitness and gas cutting set for flash back arrestor and NRV. | | | |
| 11 | Any other precautions taken (specify):_ | | | |

Tick As Applicable

- Special fire extinguisher at place Security Guard / Helper Explosion Potential Test reqd. Bucket of water Bucket Of Sand Fire watch Non Sparking Tools Fire Hose prepared Post Work Fire inspection Communication
 Provision Of low Voltage Light Escape route + kept Clear Fire resistant clothing
 Electrical Tools Grounded Flying Sparks protection Respirators
 Safety Harness With Life line Ventilation. Barriers, Warning signs Miscellaneous

Additional Safety Precaution / Remarks :-

I have checked the above points and found conditions suitable to undertake the work:- _____

Permit Applicant (Engineer / Supervisor) Name (in BLOCK letter) / Date / Signature

B. THE PERSON GIVING PERMIT TO WORK (ISSUING AUTHORITY)

The precautions and safe conditions mentioned above have been verified and the work can be started.

| WEEK (Days) | <i>Day 1</i> | <i>Day 2</i> | <i>Day 3</i> | <i>Day 4</i> | <i>Day 5</i> | <i>Day 6</i> | <i>Day 7</i> |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Sectional-In-charge | | | | | | | |
| HSE In-charge | | | | | | | |
| In other Authority (specify if applicable) | | | | | | | |

4. Notification of Work Completion:

WORK Completion Date & Time :

Sign of Executor :

Sign of Sectional In-Charge :

WORK PERMIT: WORK ON PLANT, MACHINERY & OTHER POWER DRIVEN EQUIPMENT

Name of the equipment :
Area/ Location :
Clearance required for : (Time)to.....on..... (Date)
Nature of the job to be done :

Requested by

Approved by

Name

Name

Designation

Designation

Date & Time

Date & Time

Equipment de-energised at(Time)..... (Date)

Fuses removed Yes / No

Circuit Breaker Lowered/ Removed Yes / No

Danger Tag provided Yes / No

Earthing Lead No. Provided

Authorized Signature

Name

Designation

Signature, Date & Time

We have completed job on the above equipment & we certify that

1. The equipment is clear of all the men doing the job
2. All tools and tackles have been removed
3. Whole of the area has been cleared
4. the equipment can be energized

Signature

Name

Designation

Signature, Date & Time

Equipment Energized at (Time)(Date)

Earthing Lead No. Provided Yes/No

Authorized Signature

Name

Designation

Signature, Date & Time

Check List

VEHICLE & EARTH MOVING EQUIPMENT INSPECTION CHECK LIST

NAME OF SITE / JOB NO. : _____

REF. NO OF THE VEHICLE / EQUIPMENT TO BE INSPECTED : _____

INSPECTED BY : _____ DATE : _____

| SL. NO. | POINTS | OBSERVATION | REMARKS |
|---------|----------------------------------|-------------|---------|
| 1 | Fitness of the Operator & helper | | |
| 2 | Guards / Doors / Cover | | |
| 3 | Condition of Hydraulic System | | |
| 4 | Engine Condition | | |
| 5 | Brake & Clutch | | |
| 6 | Wind Glass & Wiper Blades | | |
| 7 | Indicator / Side Mirror | | |
| 8 | Light / Horn / Reverse Horn | | |
| 9 | Tyre Pressure / Condition | | |
| 10 | Fastener Lock Pins / Key | | |
| 11 | Condition of Battery & Lamps | | |
| 12 | Seat Belt | | |
| 13 | Gauges & Warning Devices | | |
| 14 | Fire Extinguisher | | |
| 15 | First Aid Box | | |
| 16 | House Keeping in the cabin | | |
| 17 | Other (Specify) | | |

VALIDITY: From _____ To _____

| NAME : | DESIGNATION : | SIGNATURE | DATE |
|--------|---------------|-----------|------|
| | | | |

ELECTRICAL SAFETY CHECK SHEET

PERMIT NO-

LOCATION: _____

DATE & TIME: _____

| Sl. No | Checking Points | Ideal Condition | Item Status (OK / Not OK) | | | | | Remarks |
|------------------------|-----------------|--|---------------------------|---|---|---|---|---------|
| | | | 1 | 2 | 3 | 4 | 5 | |
| 1. | Connection | No overheating of cable joint | | | | | | |
| | | No discoloration of insulation by heating | | | | | | |
| | | Proper isolation / insulation of connection points against shock | | | | | | |
| 2. | Earthing | Equipments properly earthed | | | | | | |
| | | Earth connection through proper sockets | | | | | | |
| | | Earthing done by suitable wires & poles | | | | | | |
| 3. | Equipments | No damage of electrical parts | | | | | | |
| | | Equipments' body earthing done properly | | | | | | |
| | | No exposed electrical parts | | | | | | |
| | | Rotating parts should have suitable guards | | | | | | |
| | | No overloading | | | | | | |
| | | No overheating of any parts | | | | | | |
| | | Suitable protection against water/dust | | | | | | |
| | | No wire fuse, only HRC fuse used | | | | | | |
| | | Connected with ELCB | | | | | | |
| Proper rated ELCB used | | | | | | | | |
| ELCB working properly | | | | | | | | |
| 4. | Cables | Double insulated cable used | | | | | | |
| | | No damage of insulation | | | | | | |
| | | Joint portion properly taped by PVC tape | | | | | | |
| | | Cable ends should have suitable rating socket | | | | | | |
| | | No burning / discoloration | | | | | | |
| 5. | Power Sockets | No physical damage | | | | | | |
| | | No loose contacts | | | | | | |
| | | No discoloration by heating | | | | | | |
| 6. | General | Exhaust points directed outside | | | | | | |
| | | Fire extinguisher available | | | | | | |
| | | Danger sign board displayed | | | | | | |
| | | Rubber mats provided inside the DG room | | | | | | |
| | | Line diagram displayed | | | | | | |

| | |
|--|------------------|
| CHECKED BY (NAME & DESIGNATION) | SIGNATURE |
| | |

Checklist for Hydra

PERMIT NO-

LOCATION: _____

DATE & TIME: _____

| S. No | Description of check point | Yes | NO |
|-------|--|-----|----|
| 1. | Is SWL marked on Hydra & Anchoring Hooks on boom? | | |
| 2. | Is safety Latch in hook is provided and hook is without damage? | | |
| 3. | Hoist limit switch and plate provided? | | |
| 4. | Wire rope free from tolerable damage? (Wear, Broken wire more than 10% etc.) | | |
| 5. | Load – wire rope & other parts are well lubricated? | | |
| 6. | Any oil leakage from Hydraulic parts (Piston drums)? | | |
| 7. | Is there any visible damage in types (Crack, cut. Wear off etc.) | | |
| 8. | Are Head Lights & Rear Lights in good condition? | | |
| 9. | Is Front Horn in working condition? | | |
| 10. | Is Reverse Horn provided and in working condition? | | |
| 11. | Is Boom structure in good condition while full expansion? (Free from Damage , Crack or jam) | | |
| 12. | Are Brakes in good condition? | | |
| 13. | Are Travelling, Steering, Braking, Motions (in both directions) satisfactory? | | |
| 14. | Is load chart Displayed in operator cabin and operator aware or its use? Load at the appropriate radius. (Max & Min radii) | | |
| 15. | Are operating Instruction and warning signs displayed? | | |
| 16. | Is fire extinguisher provided in operator cabin and operator trained for using it? | | |
| 17. | Does the operator have valid driving license? (Heavy duty) | | |
| 18. | Is the Hydra operator trained and competent for the Hydra being used? | | |
| 19. | Is hydra having seat belt? | | |
| 20. | Is hydra having valid RTO Fitness? | | |
| 21. | Is stability of hydra satisfied? | | |
| 22. | Is hydra suitable for use at site? (Fitness) | | |
| 23. | Others (if any) ground condition? | | |

| CHECKED BY (NAME & DESIGNATION) | SIGNATURE |
|---------------------------------|-----------|
| | |

CHECKLIST FOR GAS WELDING AND GAS CUTTING

LOCATION: _____

DATE & TIME: _____

| Sl.No. | Description of check point | Yes | No | NA | Remarks |
|--------|--|-----|----|----|---------|
| 1 | Storing of gas cylinder like DA, Oxygen full and empty etc. | | | | |
| 2 | Proper handling of gas cylinder | | | | |
| 3 | Condition of regulator hose, torch etc | | | | |
| 4 | Welding generators/ transformers conditions and its proper earthing | | | | |
| 5 | Condition of welding cables and joints | | | | |
| 6 | Electrode Holder | | | | |
| 7 | Area free from combustible material | | | | |
| 8 | Cordoning of welding/ Gas cutting is in progress at height | | | | |
| 9 | Provision of fire extinguishers | | | | |
| 10 | Smoldering fires are religiously extinguished after day's work. | | | | |
| 11 | Stacking of cylinders not near live wires, battery charging rooms/ oil rooms | | | | |
| 12 | Are valid licenses available for storing all these cylinders? | | | | |
| 13 | Whether integrity test certificates are obtained from the suppliers of the cylinders? | | | | |
| 14 | Are the filled and empty cylinders stored separately? | | | | |
| 15 | Are trolleys being used for carriage of gas cylinders? | | | | |
| 16 | Are gauges working properly? | | | | |
| 17 | Is the hose in good working condition and proper clamps been used to secure it with cylinders? | | | | |
| 18 | Is the correct type of lighters being used by the cutters? | | | | |

| | |
|--|------------------|
| CHECKED BY (NAME & DESIGNATION) | SIGNATURE |
| | |

Conclusion

The HSE Plan for Sewer and Drainage (S&D) works has been prepared to ensure safe working practices, protection of workers' health, and minimal environmental impact during all construction activities. The plan identifies key hazards and prescribes control measures for excavation, pipe laying, manhole construction, dewatering, and testing works.

Implementation of this plan will help achieve zero major accidents, compliance with statutory requirements, and effective environmental management. Regular supervision, training, and inspections will be carried out to ensure adherence. The HSE Plan will be reviewed and updated as required to suit site conditions, ensuring safe and sustainable execution of S&D works.