RA and Hazard Mitigation Plan- Construction and Operation Phase

Planning during Conceptual Stage

Proper planning at the conceptual stage of a corridor facility helps in enhancing the safety of the property and human beings. These eventually help to minimize loss of life and property, which are the direct consequences of accidents. In order to achieve the above, the following needs will be taken as given below:

- Risks associated with the power line, transportation etc.
- Safety measures
- Layout of the facility
- Emergency preparedness, and
- Compliance with the regulatory requirements.

During Construction:

Fall Protection

- Contractor is required to provide fall protection to employees who are working at heights equal to or greater than 1.8 m. Fall protection can be in the form of perimeter protection such as guardrails and toe rails, personal protective equipment (PPE), a safety monitoring system, or a fall protection plan. Activities that require personal fall protection systems include steel erection bolting, riveting, fitting-up and plumbing-up, work over water and some deep excavation work.
- On buildings or structures not adaptable to temporary floors, and where scaffolds are not used, safety nets will be installed and maintained whenever the potential fall distance exceeds two storey.
- The PPE standard should cover occupational foot, head, hearing, and eye protection.
- Foot Protection: If machines or operations present the potential for foot injury, the Contractor must provide foot protection, which is of safe design and construction for the work to be performed. Workers and visitors should not be allowed on a construction site without safety boots.
- Head Protection: If head hazards remain after all steps have been taken to control them (safety nets for work at heights, proper housekeeping), the Contractor must provide employees with appropriate head protection.
- Noise Protection: Workers should be wearing hearing protection devices (ear plugs, ear muffs, canal caps) that are in good condition whenever they are involved in noisy activities.
- Eye Protection: When machines or operations present potential eye injury from physical or chemical elements, the Contractor must select, provide, maintain and required affected employees to use appropriate eye protection. Eye protection (safety glasses and goggles, face shields and welding helmets) must be adequate and reasonably comfortable.
- To the greatest extent possible, working surfaces must be kept dry to prevent slips and falls and to reduce the chance of nuisance odors from pooled water.
- All equipment and materials should be stored in designated storage areas that are labeled as such.

Ladders and Stairs

- Contractor is required to inspect and maintain all ladders and temporary/portable steps to ensure that they are in good working condition.
- Portable ladders used for access to an upper landing surface must extend a minimum of 1.8 m above the landing surface, or where not practical, be provided with grab rails and be secured against movement while in use.
- All ladders must be used only on stable and level surfaces unless secured to prevent accidental movement. Ladders must not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental movement.
- Contractor should provide a ladder (or stairway) at all work points of access where there is a break in elevation of 0.5 m or more.
- When there is only one point of access between levels, it must be kept clear to permit free passage by workers. If free passage becomes restricted, a second point of access must be provided and used. At all times, at least one point of access must be kept clear.
- All required stairway and ladder fall protection systems must be provided and installed before employees begin work that requires them to use stairways or ladders.

Scaffolds

- Access to Scaffolds - access to and between scaffold platforms more than 0.6 m above or below the point of access will be made by portable/attachable ladders or ramps.
- Employees must never use makeshift devices, such as boxes and barrels, to increase the scaffold platform working level height.

Trenching and Excavation

- The area around the trench/excavation would be kept clear of surface encumbrances.
- Water should not be allowed to accumulate in the excavation.
- Adjacent structures would be shored in accordance with the design documents to prevent collapse.
- Guardrails or some other means of protecting people from falling into the trench/excavation would be present.
- The trench or excavation would be shored or sloped to prevent cave-ins.

Electrical Safety

- If work has to be done near an overhead power line, the line must be de-energized and grounded before work is started.
- A licensed electrician would have completed all temporary wiring and electrical installations required for construction activities.
- Fuses and circuit breakers would be used to protect motherboards, conductors and equipment
- Extension cords for equipment or as part of a temporary wiring system will not be damaged or compromised in any way and insulation must be of the highest grade.
- Anytime electrical equipment is deactivated for repair, or circuits are shut off, the equipment will be locked out and tagged at the point where it can be energized.

- Temporary lights may not be suspended by their cords.

  Contractor would provide the necessary safety equipment, supplies and monitoring equipment to their personnel.

Cranes

- A competent person has been designated to supervise activities that require the use of cranes.
- Cranes would not be operated near any power lines.
- All picks would be carefully planned to ensure that the crane adequately hoist the load.
- The hoisting signals would be posted on the exterior of the crane.

Occupational Noise Exposure

- The Contractor should implement engineering controls to reduce noise levels.
- The Contractor should provide hearing protection to employees that are exposed to noise levels above the permissible limit.

Welding and Cutting

- The Contractor's employees would be trained in hot work procedures.
- There should be adequate ventilation to reduce the build up of metal fume.
- The hot work operators would use proper personal protective equipment (i.e., welding helmet, burning goggles, face shield, welding gloves, and apron).
- There would be a fire extinguisher present at all welding and burning activities.
- Extinguishers would also be placed at locations where slag and sparks may fall.
- Oxygen and flammable gas bottles are separated by at least 7 m when not in use.
- The Contractor would control the release of gases, vapors, fumes, dusts, and mists with engineering controls (e.g., adequate ventilation).
- General Guidelines
- Signs and symbols would be visible during any construction activity that presents a hazard. Upon completion of such activity, the postings must be removed immediately.
- The Contractor would post specific DANGER signs when an immediate hazard exists and specific CAUTION signs when the potential for a hazard exists. EXIT, NOTICE and specific safety signs may also be posted in the work area.
- Signage for traffic control, including directional signs, are applicable when the Contractor is disrupting traffic along a public way.
- Danger signs are posted at all immediate hazards (i.e. Danger: Open Hole).
- Caution signs are posted at all potential hazards (i.e. Caution: Construction Area, Caution: Buried Cable).
- The floor that is being used as the erection floor must be solidly planked or decked over its entire surface except for access openings.
- Every floor, working place and passageway would be kept free from protruding nails, splinters, holes or loose boards.

- Combustible scrap and debris (wood, clearing/grubbing material) would be removed from the site daily or should be securely stored in covered containers.
- The Contractor would have a spill prevention control and countermeasure plan that limits the risk of releases of oil or hazardous materials to the environment

During Operation:

Emergency Scenarios

Various scenarios that are anticipated to cause major emergencies are fire, oil spill, natural calamities like cyclone, earthquake etc. All these scenarios are as following

A. Fire

Fire is also a serious hazard and is normally regarded as having a disaster potential less than natural hazard that can be controlled at the incipient stage.

B. Earthquake

An earthquake poses a major threat to the property, life and environment. Some of the effects of an earthquake are ground shaking, ground lateral displacement, ground uplift, ground settlement, soil liquefaction and fires. Though the earthquake is not a regular phenomenon in this region, the possibility of its occurrence cannot be ruled out especially since occasional shocks are perceived sometimes. Project area is categorized in the seismic Zone III. However, the structural Design shall be as per Zone IV so as to safeguard the structures from the risk of unforeseen natural calamity.

C. Material / Transport Emergency

During transportation of the material, emergencies like Fire, Leakage or Spillage are possible. It may be outside the project premises, at nearby or far locations. Necessary emergency actions will be initiated from internal or external resources as per the nature of the emergency.

Categories of Emergencies

The emergency situations have been classified in three categories depending upon their magnitude and consequences.

Level 1 – section / Area wise

The emergency situation arising in any section of a particular area which is minor in nature & can be controlled within the affected section itself, with the help of in-house resources available at any given point of time. The emergency control actions are limited to level 1 only.
Such an emergency does not have the potential to cause serious injury or damage to property / environment and domino effect to other sections of the affected area or nearby areas. These incidents are analysed and proper actions remedial measures are taken so that it does not escalate into a major accident.

Level 2 - Affecting more than one area within the complex

The emergency situation arising in one or more areas which has the potential to cause serious injury or damage to property / environment within the affected area or to the nearby areas. This level of emergency situation will not affect surrounding community beyond our premises.
Such emergency situation always warrants to mobilise the necessary resources available in-house and/or out source to mitigate the emergency.

Level 3 – Affecting neighbouring area

The emergency situation as described in level 2, which by virtue of its consequences will spread and affect the nearby community outside the project.

Measures taken during Operation Phase:

- Shift-wise and trained Operation & Maintenance staff (formal training w.r.t. First aid fire fighting and other emergency services) will be provided.
- Periodic Mock drills along with refresher courses carried out to increase awareness
- First aid kit will be provided along with Emergency medicines

Training:

- Training pamphlet will be provides to every occupant
- Mock drills and training on safety aspects will be provided to all the staff

General Measures:

- The fire water tank will be always full loaded & there will be fire engine & diesel engine, in case of power backup
- Safe assembly points
- There will be availability of UPS (Uninterruptible Power Supply), emergency lighting and emergency announcement system, in case of emergency
- Fire/emergency exit boards will be displayed at suitable locations
- Fire alarm & wide stair case as per NBC will be provided
- Proper signage
- Emergency phone numbers will be displayed