RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

A hazard is a potential source of harm or an adverse health effect on a person or persons. "Hazard" and "Risk "are often used interchangeably. Workers of construction sites are, generally, exposed to an excessive risk of being injured at work elicited that construction industry is unique and complex compared with other industries and it contains a wide range of construction materials and products, building services, manufactures, contractors, sub-contractors, design, operation, and refurbishment services. These complexities make the construction industry as one of the most hazardous industries that causes high rate of accidents

RISK AND HAZARDS INVOLVED IN CONSTRUCTION ACTIVITY:

Construction sites are dangerous places where injury or death or illness can cause to workers. These can happen due to electrocution, falling from height, injuries from tools, equipment and machines; being hit by moving construction vehicles, injuries from manual handling operations, illness due to hazardous substance such as dust, chemicals, etc. Even a nail standing up from a discarded piece of wood can cause serious injury if trodden on in unsuitable shoes.

TYPES OF HEALTH AND SAFETY HAZARDS ON CONSTRUCTION SITE

- Height
- Slips, Trips & Falls
- Equipment, Machinery, Tools and Transport
- Electricity
- Fire
- Manual Handling
- Noise
- Chemical Substance

HAZARDS IDENTIFIED DURING CONSTRUCTION AND OPERATION AND CONTROL MEASURES

TYPE OF HAZARD	CONTROL MEASURES
Personal Protective Equipment • Unaware of using PPE • Unavailability of PPE	• Awareness in using PPE • Keep Availability of PPE • Training how to use the PPE
Manual Handling • Incorrect lifting of the materials • Physical strength of the lifting person • Lifting of too heavy loads • Improper handling of equipment • Twisting - bending - repetitive movement body vibration.	• Don't allow the person to lift more than 30 kg for materials shifting from one place to other. • Provide Trolley for materials shifting. • Person handing the material should be physically fit to do work. • Use hand gloves during material handling. • All mandatory PPE's shall be use at site.
Slips, Trips & Falls • Slippery surfaces • Uncovered holes or trenches • Poor access to work areas • Unloading materials	• Keep sign boards for slippery surfaces • Clear& safe access to work areas • Guardrails, handholds, harnesses, hole cover.
Fire • Flammable liquids/Gases like LPG, Diesel • Improper Storage of area Flammable liquids/Gases • Absence of Fire extinguishers and Fire hydrant system.	• Combustible/flammable materials should be properly stored and used • Fire extinguishers made available & Fire hydrant • Emergency Plan and Escape plan is mad available in case of Fire • Good housekeeping

Electricity • Electrocution • Temporary repairs • Circuits overloaded • No use of PPE • No Proper Earthing	• No temporary repairs • No exposed wires • Good insulation • No overloading • Use of PPE • Proper Earthing
Excavations • Trench collapse • Material falling in undetected underground services • Falls • Hazardous atmosphere struck by traffic and mobile plant.	• All excavation work deeper than 1.25 meters must be shored or battered. • Excavation deeper than 2 meters must be guarded by rails or barriers. • Vehicles working, too close to the side of the trench or rubble piled on the sides may cause collapse and therefore at most care should be taken. • Vehicles tipping into the excavation work must use stop blocks, so as to avoid the collapse of the trench. • Make sure that the excavation work is inspected daily.
Scaffolding • Use of timber & bamboo • Poor strength of structure • Lack of guardrails and toe boards • Insufficient ties or other means • Unaware of wearing safety belts	• Using of Steel scaffolds • Proper platform for erecting scaffolds • Use of PPE(Safety Belts, Helmets etc.)
Ladders • Carrying loads • Defective ladders • Not sufficient length	• Always have a firm grip on the ladder and keep a good balance. • Never allow more than one person on a

• Wrong positions • Incorrectly placed • Fear in climbing	ladder. • Use tool belts or hand line to carry objects when you are climbing the ladder. • Do not lean out from the ladder in any direction. • If you have a fear of heights – don't climb a ladder. • Do not allow others to work under a ladder in use. • Do not use a defective ladder.
Gas Cutting and Welding • Improper unloading process- damage of cylinder resulting fire & explosion, injury while handling. • Improper Storage & Untied cylinders. • Electrocution due to improper electric connection. • Welding fumes / Health hazard. • Fire hazard due to welding spark.	• Providing Flash back arrestor each side of gas cutting set. • Welding goggles shall be provided to welder's helper for eye protection. • Cylinders should keep upright direction & properly tied • Area shall be cleared of Flammables and combustibles before commencing welding.
Crane Operations • Unsecured loads • Incorrectly slung • In proper hand signals • Fall of material while lifting, carrying and unloading • Avoid of PPE	• The weight of the load intended to be lifted by the crane must be carefully estimated. • The crane must be fitted with an automatic safe load indicator. • The crane must always work on a hard, level base. • The load must be properly fixed and secured. • The signal man must be trained to give clear signals. • The ropes, hooks, chains, slings, etc. used in

	the lifting operations, must be inspected regularly for their worn out. • Wear appropriate personal protective equipment.
Visitors at site • Falls • Struck by dropped materials • Accidents at site • Insufficient hoarding or fencing • Pedestrian access past site	• Sufficient hoarding • Fencing and barricades • Safe pedestrian access • Site traffic management

DISASTER MANAGEMENT PLAN

EMERGENCY DUE TO DISASTERS

Emergencies due to sudden and powerful natural events are capable of inflicting considerable damage to property and placing many lives at risk. These types of emergencies generally result from severe weather conditions or earthquakes.

1) EMERGENCY DURING EARTHQUAKE:

If indoors:

1. Take cover under a piece of heavy furniture or against an inside wall and hold on.
2. Stay inside: The most dangerous thing to do during the shaking of an earthquake is to try to leave the building because objects can fall on you.

If outdoors:

1. Move into the open, away from buildings, streetlights, and utility wires. Once in the open, stay there until the shaking stops.

After the earthquake:

1. After the quake be prepared for aftershocks.
2. Although smaller than the main shock, aftershocks cause additional damage and may bring weakened structures down. Aftershocks can occur in the first hours, days, weeks, or even months after the quake.

Help injured or trapped persons:

1. Give first aid where appropriate. Do not move seriously injured persons unless they are in immediate danger of further injury. Call for help.
2. Remember to help those who may require special assistance--infants, the elderly, and people with disabilities.

2) EMERGENCY DURING FLOODS:

Building management should assess the threat of flooding to their building. Usually this is easily accomplished due to a history of similar earlier events. Alternatively, they can contact the local

municipal planning office for flood information. Many insurance companies also have information on the potential for flooding in specified areas.

Building management may wish to consider the following:

- Providing pumps, generators, sandbags, etc., for temporary flood relief.
- Providing permanent breakwaters and dikes where the flood potential is high.
- Evaluate the potential impact on ground level and underground tanks.
- Hazardous materials stored at or below grade moved to a safe location.
- Protection of drinking water sources.
- Impact of floodwater on high value and process equipment.
- Electrical hazards that may be created due to the presence of water (to both permanent and temporary wiring).
- Affect of flooding on the structural integrity of the building.
- Retain a list of qualified personnel and contractors who can be contacted to assess and
- Repair flood damage.
- Arrange to have drinking water tested after a flood. This is particularly important in areas
- Where drinking water is obtained from wells.

3) EMERGENCY DURING FIRE:

Buildings are designed and constructed to confine and control a fire to allow building occupants time to evacuate. Buildings are also designed to allow fire department personnel time to access and gain control over the fire. Buildings are designed for the expected fire loads they will encounter during their lifespan.

For example, a building designed to maintain its structural stability for three hours, may fail in a much shorter period of time under these adverse conditions.

Equipment and procedures dealing with egress and exit facilities, fire alarm systems, voice communication systems, fire suppression systems and other life safety devices and features will play a major role in enhancing occupant safety in the event of a fire and/or explosion. Property owners and managers must ensure that these life safety features are maintained in operable condition and ready for use at all times. All the buildings must have the approved fire safety plan which includes the following:

- The emergency procedures to be used in case of fire including sounding the fire alarm, notifying the fire department, provisions for access for fire fighting, instructing occupants on procedures to be followed when the fire alarm sounds, evacuating endangered occupants and confining, controlling and extinguishing the fire.
- The appointment and organization of designated supervisory staff to carry out fire safety duties.
- The instruction of supervisory staff and other occupants so that they are aware of their responsibilities for fire safety.
- The holding of fire drills including the emergency procedures appropriate to the building
- The provision of alternative measures for the safety of occupants during any shutdown of fire protection equipment and systems or part thereof.
- Instructions, including schematic diagrams, describing the type, location and operation of building fire emergency systems.

4) EMERGENCY DURING LPG LEAKAGE:

- The affected area should be evacuated immediately
- Call an Emergency Response Team
- Allow only Authorized persons in the affected area and all other personnel and visitors are moved to the nearest assembly points.
- Rescue trapped personnel, also check if any personnel are unconscious in the area and immediately move them outside and provide first aid.
- Ambulance should be summoned to take injured personnel to the nearest hospital.
- Personnel in the nearby buildings to close all doors and windows to prevent entry of the leaked gas.
- Source of leakage to be traced and isolated from all the other areas. And if required use pedestal fans to bring down the gas concentration.