

SIGMA CONSTRUCTION COMPANY

Site Safety Policy



Index

CONSTRUCTION SAFETY MANUAL

Sl. No.	Sections
1.0	Corporate Construction Safety Program
1.1	Introduction
1.2	Objectives
1.3	General Terminology
1.4	Corporate Management Policy
1.5	Responsibility's
2.0	Safety Organization
3.0	Disciplinary Policy Procedures
3.1	Purpose
3.2	Scope
3.3	Responsibilities
4.0	Site Safety Procedure
4.1	New Employee Orientation / Induction Training.
4.2	Safety Inspection.
4.3	Safety Audit.
4.4	Tool Box Talks Meeting.
4.5	Pre-Job Meeting.
4.6	Safety Meeting.
4.7	Safety Committee Meeting
4.8	Co-Ordination.
4.9	Monitoring.
4.10	Hazard Communication.
4.11	Specific Hazard Training.
4.12	Accident and Incident Investigation Procedure.
4.13	Hazard Identification and Control.
4.14	Risk Assessment.
4.15	Work Permit System.
5.0	Welfare Facility
5.1	First Aid Box
5.2	Drinking Water Facility.
5.3	Temporary Facility (Worker Camp)
5.4	Toilet and Urinal Facility
6.0	Recordkeeping.
7.0	Safety Rules And Regulation
7.1	Use of PPE'S and safety Devices
7.2	General House Keeping and Stacking of Material
7.3	Road Safety In site Project
7.4	Access, Egress and Work station Safety
7.5	Safe Use of Construction Power Supply and Maintenance of Installation
7.6	Use and Maintenance of Plant and Machinery

7.7	Scaffold And Formwork Norms
7.8	Use of Safe Material and personal handling Devices
7.9	Fire Prevention ,Protection andpreparedness
7.10	Others
8.0	Safe Work Procedure
8.1	Excavation
8.2	Rebar Handling
8.3	Shuttering
8.4	Work At Height
8.5	Concreting
8.6	De Shuttering
8.7	Gas Cutting
8.8	Electric Arc Welding
8.9	Grinding Operation
8.10	Masonry Work
8.11	Electrification Work
9	Equipment, Machine Related General Safety Requirements
9.1	Safety Operation of Major Plant and Machinery (batching plant, concreting pump, transit mixer movement, excavator etc.)
9.2	Electrical Equipment
9.3	Hand Tools/Power Tools Management
9.4	Crane Operation
10	Drug and Alcohol Policy
11	Emergency Response /Evacuation /Action Plan
12	Monsoon Plan
13	Forms / Checklists
	Register

1 Corporate Construction Safety Program

Introduction

In the Construction Safety, Health and Environment Manual (Here after called EHS Manual), Sigma construction company (SCC) states the rules, regulations, guidelines, methods, checklists, permits, responsibilities and requirements regarding EHS.

The purpose of this plan is to outline the EHS policy adopted by SCC management. EHS procedures set forth in this manual are the minimum acceptable standard for the project execution. All level responsible persons are to implement and enforce the provision of EHS plan within their respective area of accountability with due consideration of safety, health & environment of all involved parties.

Objective

To achieve the prime objective of “Zero accident”.

To create safety awareness to every individual associated with the project.

To provide the necessary safety inputs.

To integrate safety and work practices.

To formulate and effectively maintain the accident prevention program of the project.

To identify critical activities, assess the risk associated there in & suggest precautionary measures to avoid accidents.

General Terminology:

Man hours Worked

The total number of employee – hours worked by all employees working in the premises, it includes managerial, supervisory, professional, technical, clerical and other workers (including contractor labors, security personnel & others)

Man hours worked shall be calculated from site record including overtime. When this is not applicable, the same shall be estimated by multiplying the total Man days worked for the period covered by the number of hours worked per day. The total number of Man days for a period is the product of the number of persons engaged multiplied by the Man days worked.

Man days Lost

The day on which the injury occurred and the day injured person returned to the work are not to be included as man days lost, but all intervening calendar days (including Sundays or days off of site / plant shutdown) are to be included. If after resumption of work, the person injured is again disabled for any period arising out of the injury which caused his earlier disablement, such subsequent disablement is also to be included in the man days lost. According to the schedule of charges, a loss of 6000 man days is taken for death of person.

Accident

An unintended / unplanned occurrence which will result in personal injury, property loss Reportable Lost Time Injury an Injury causing death or disablement of the injured person for 48 hours or more excluding the day of the shift on which the accident occurred.

Dangerous Occurrence

- An unplanned event, whether or not it is attended by personal injury or disablement, which result in –
- Bursting of plant used for containing or supplying steam under pressure greater than atmosphere pressure.
- Collapse or failure of crane, winch, chain pulley, hydra or other appliance or other appliance used in raising or lowering goods or any part thereof, or the overturning of crane, hydra
- Explosion or fire or bursting out, leakage or escape of any hot substance causing injury to any person or any room or place in which persons are employed
- Collapse or subsidence of any material, equipment, structure, scaffold

Accident: - "any unplanned event that results in personnel injury or damage to property, plant or equipment.

Near-miss: - "an unplanned event which does not cause injury or damage, but could have done so." Examples include: items falling near to personnel, incidents involving vehicles and electrical short-circuits

Hazard

Hazard is any existing or potential physical conditions in the workplace that itself or by interacting with other variables can result in death, injuries, property damage or any other losses.

Risk

Risk is likelihood that the hazard will result in an accident. Risk also considers how serious the resultant injury would be

Frequency Rate:

It is measure which indicates how frequently accidents are occurring. The question of injuries will not arise while calculating frequency rate. The terminology of frequency rate does not and should not mean in that sense. If in any accident more number of persons are injured, then the severity of the accident is more and not the frequency.

$$\text{Frequency Rate} = \frac{\text{Number of reportable Lost Time Injuries X 1000000}}{\text{Man hours Worked}}$$

Severity rate:

It is a measure of how severe the accidents are. It is the ratio of total man days lost due to the total man hours worked.

$$\text{Severity Rate} = \frac{\text{Number of Man Days Lost X 1000000}}{\text{Man hours Worked}}$$

To calculate the above, the man days lost shall be based on the following:

- Man days lost due to temporary total disability.
- Man days lost is to be calculated according to IS 3786-1983.
- Man days lost for a death is 6000 which is similar to 100% loss of earning capacity like absolute deafness, loss of hand and a foot etc.

Accident rates and its necessity:

- Number of physical or bodily injuries gives general idea about safety at workplace. There are two main reasons for this.
- The nature of injuries is of various types (i.e. First Aid, Minor, Major, etc.)
- Other is the number of employees working in the organization.

STANDARDS

SCC will implement this policy in compliance with Safety, Health and Environmental standards and codes of practice of its customers and in accordance with applicable national and International law and regulations. All the EHS policy will implement as per customer Requirement mentioned in our Contract

EHS Policy-

ENVIRONMENT, HEALTH & SAFETY POLICY

It is our commitment to provide a safe, accident free and healthy work environment for everyone. However, excellent safety and health conditions do not occur by chance. They are the result of diligent work and careful attention to all policies by everyone in SCC.

Management Commitment towards EHS:

- All activities are carried out in a manner that provides reasonably practical safe and healthy environment for employees and customers.
- Provide information, training and resources to accomplish EHS Commitments.
- Promote EHS awareness among all employees and encourage them for active participation and consultation on EHS management process.
- Design build and operate its facilities in environmentally responsible manner, conserving energy water other natural resources thus minimizing waste generation and preventing pollution thereby contributing to environmentally sustainable growth.

Our safety policies are based on past experience and current standards, and are also an integral part of SCC personnel policies. This means that compliance with the policies is a condition of employment and must be taken seriously. Failure to comply is sufficient grounds for disciplinary action and/or termination of employment.

SCC will implement this policy in compliance with Safety, Health and Environmental standards and codes of practice of its customers and in accordance with applicable national and international laws and regulations.

EHS policies will be implemented to meet customer requirements mentioned in our contracts. We shall also achieve Customer Satisfaction through planned objectives and targets and continual improvement in EHS performance.

EHS Responsibility

Corporate Management EHS Responsibilities. -

- Eliminate potential hazards by providing appropriate safeguards, personal protective equipment and safe worktasks.
- Provide necessary personal protective equipment and enforce its use and care.
- Provide effective training, which is required by the "standards", as a minimum for the employees.
- Become familiar and comply with applicable standards (BOCW Act 1996 and Chess Rule) and make copies of medical records as well as all safety and health programs available for employees to review.
- Review, consider for approval, and execute appropriate action on safety policies developed by safety committees or safety director.
- Ensure a high level of productivity and safety performance and hold project management staff accountable.
- Assign an individual(s) [competent person] the authority for the implementation of the safety program at each worksite.

Project Manager

The project manager is responsible for all activities in his job, including the prime responsibility for safety. With regards to EHS he will assure that:

- Safety rules, regulations and standards noted in this manual and the laws and regulations of various governmental bodies are complied with and enforced as far as practical
- Construction contractor conforms to the minimum safety standards of the company and appropriate regulatory agencies
- Review, comment, approve on construction contractors EHS manual
- Employees are given adequate training and instruction
- Safety inspections of job and equipment are performed, as required
- Accidents receive prompt investigation and reporting and that the necessary corrective action is taken
- Weekly safety meetings are instituted
- Work in close cooperation with the EHS engineer to eliminate and correct all practices and conditions that are deemed to be unsafe
- Chairs the monthly EHS committee
- Ensures that tools and equipment used by construction contractors are in safe and workable condition
- Conduct daily safety inspections of the construction area and work activities and initiate corrective action if any unsafe acts or conditions observed.

Construction Engineer -

Each construction engineer is required to perform the following:

- Familiarize him with the requirement of all safety standards and rules pertaining to his job.
- Be responsible for carrying out the procedures required by accident prevention standards and safe practice at the project
- Enforce safety regulations and rules.
- Be responsible for housekeeping in his work area and for the use and maintenance of all personal protective devices, equipment and safe guards
- Notify appropriate supervisors and/or the EHS engineer concerning work areas where he believed protective devices are required
- Attend and participate in all site engineer's meetings and contractors "safety tool box" meetings
- Report immediately all accidents in which personal injury or property damage occurs
- Assist in accident investigation and submit a report promptly on required forms
- Periodically analyze work methods in detail for the purpose of job simplification and for the establishment of the work safe method.

EHS Manager / Engineer / Officer -

The EHS Engineer acts in an advisory capacity to the project manager at the location and administers the safety and health program. For the day-to-day operations in the field, the EHS Engineer shall report to the project manager.

The EHS Engineer duties will include, but not limited to:

- Provide the required New Employee Orientation, including instructions, general site rules, emergency response plan details and a general safety induction prior to starting work on site.
- Establish safety, fire prevention and security measure required for the protection of the public, workers, materials and equipment
- Be responsible for carrying out the procedures required by accident prevention standards and safe practice at the project
- Maintain continuous inspection of the job site and report any unsafe act, unsafe behavior, unsafe environment or conditions on prescribed format to EHS Safety officer or Manager
- Inform all construction contractors of the project safety requirements and ascertain that the construction contractors comply with the safety requirements and develop a EHS manual
- Attend weekly progress and scheduled meetings
- Co-ordinate weekly safety meetings for site engineers
- Assist site supervisors in conducting weekly tool box meetings
- Investigate all accidents and recommend appropriate collective action/measures
- Notify the owner, head office construction department of all accidents involving fatality or serious injury
- Supervise all first aid activities
- Requisition and assist the purchase of all safety, first aid and fire prevention equipment which is necessary for the job

- Submit all safety reports to owner, head office construction department as required
- Integrate insurance carrier's activities and materials into the project safety program
- Review/ comment/amend on Site Safety Manual
- Maintain all required, including competent person designations, records, certifications, training and inspection reports and related data.

Employee Responsibilities' -

Never sacrifice safety for anything. Safety must be considered an integral part of quality control, cost reduction, and job efficiency.

THE WORLD'S BEST KNOWN SAFETY EQUIPMENT WILL NEVER REPLACE A CAREFUL WORKMAN.

- The direct responsibility of all employees is that no job can be considered competently finished unless the worker has followed every precaution and safety rule to protect him and fellow workers.
- Read and acknowledge the understanding of SCC'S Safety and Health, Drug Policies.
- Observe all safety rules and regulations (i.e. SCC's Safety and Health, Drug Policies and the EHS Construction Standard, and all other state and local requirements).
- Attend the weekly Tool Box Safety Meetings conducted by the foreman / Supervisor and a safety meeting conducted by the Project Manager.
- Use and maintain all personal safety devices provided.
- Maintain and properly use all tools under your control.
- Correct all unsafe conditions and practices and report them along with all near misses to your foreman / Supervisor or Project Manager for discussion in the weekly Safety Tool Box Meeting. There will be no retaliation or discipline against any employee reporting unsafe practices and/or unsafe conditions.
- Report any injury resulting in loss of consciousness, loss of time, or the inability to perform the duties of your regular job to your foreman or Engineering In-charge and, together, fill out the Supervisor's Incident/Injury Report form. Each accident that is defined as recordable must be reported on the Supervisor's Incident/Accident Report immediately.

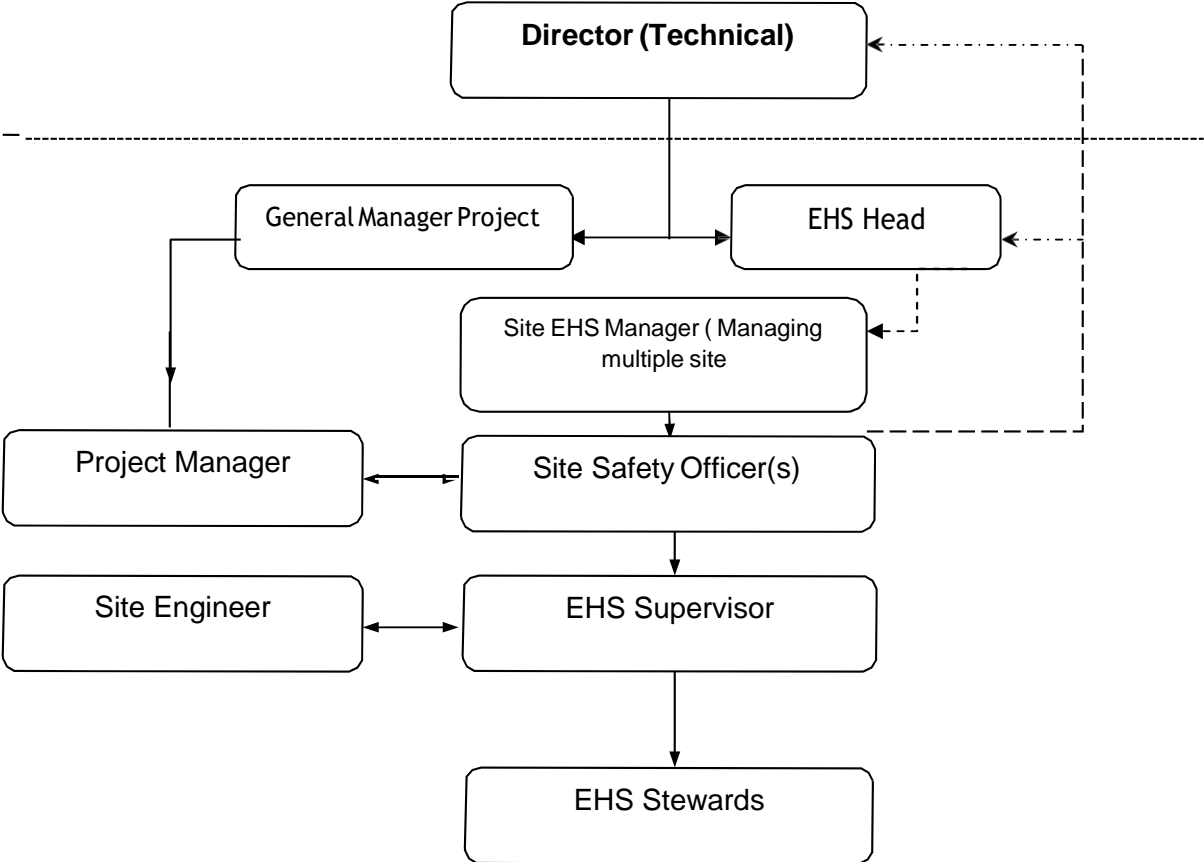
Responsibilities –Sub Contractor

Each construction contractor will be held responsible for the acts of his agents, supervising personnel and employees. Nothing contained herein relieves construction contractors of such responsibility or inability.

Construction contractor will use EHS manual as a guide and produce construction contractors EHS plan which is to be submitted to PMC for review/comments/approval.

Supervisory personnel from PMC and Owner are authorized to stop any work activity executed by construction contractor in case of emergency

2 Project Safety Organization



3 Disciplinary Procedure

Purpose

To provide guidelines for enforcement of safety rules, policies, procedures and directives from appropriate management personnel.

Scope

All employees.

Responsibilities

- Employees will be subject to disciplinary action for violations of safety rules. Such action may include any one or more of the following depending on the severity of the violation.
- Employees shall be afforded instructive counseling and/or training to assure a clear understanding of the infraction and the proper conduct under company guidelines. However, nothing in SCC's policy or this safety manual will preclude management from terminating an employee for a safety violation. This is not a progressive discipline
- system and any safety violation may lead to an employee's termination without prior instruction or warning. Management reserves the right to impose whatever disciplinary action it deems appropriate.
- Verbal warning with documentation in personnel file.
Y Written warning outlining nature of offense and necessary corrective action with documentation in personnel file.
Y Disciplinary suspension with documentation in personnel file.
Y Termination.
- Management, including supervisory personnel, shall be subject to disciplinary action for the following reasons:
Y Repeated safety rule violations by their job-site employees.
Y Failure to provide adequate training prior to job assignment.
Y Failure to report accidents and provide medical attention to employees injured at work.
Y Failure to control unsafe conditions or work practices reported by job-site employees or by job observation

4 Site Safety Procedure

New Employee Orientation / Induction -

The Induction training should be seen as a start meeting prior to start the work / Enter on the site. Preliminary to the general or Project oriented activities.

In the Orientation beside technical relevant information pay attention to the aspect of Health, Safety and Environment in general.

Orientation / Induction will be giving to all newcomers from Workers, Visitors as well as Staff.

Following things will be explained on our induction.

- Introduction of Our Company, Consultant & Costumer.
 - Introduction about Project Location.
 - HSE Policy.
 - Site Rules and Regulations.
 - Security & Awareness.
 - Safety in Practice & in an Emergency.
 - Health & Hygiene.
 - Manual & Mechanical Material Handling.
 - Height Work / Elevated Work.
 - Vehicle movement & Equipment Operation.
 - PPE's & Use of Equipment.
 - Hazard Identification & Precautions.
 - Environmental Care Systems & Implementation.
- Gate Pass will be upon successful completion of Induction Program.



For Checklist Refer Annexure: A

Site Inspection

SCC will maintain a procedure for Safety Inspection at routine intervals to assure that the instituted safety procedures are in place to prevent deviations from established standards that could lead to a safety hazard. Following things have to be verified for systematic job safety.

SI .No.	Description	Daily	Weekly	Monthly
1	PPE's			XXX
2	Electrical Operated Power tools	XXX		XXX
3	ELCB			XXX
4	Vehicle		XXX	
5	Construction Mechanical Equipment		XXX	XXX
6	Hand tools		XXX	
7	Scaffolds		XXX	
8	Fire Extinguisher			XXX

- Set standards are followed without deviation.
- Employees are competent to perform as per prescribed operation control procedures,
- Monitoring of safety of the various work areas/tasks

- (d) Adequacy of existing operation control procedures and practices to mitigate and eliminate risks
- (e) Joint inspection along with Client/Consultant will also be done.

SCC HSE&S have to initiate the hazards, Job Safety analysis and consultations with the Site Engineers (SE) to deploy appropriate remedial measures and improved operation control procedures. Periodic inspection reports and proposed remedial measures shall be recorded. Records of the change in processes; consultations with the SE and revision of operational controls shall all constitute objective evidence of the existence of established procedures.

For Checklist Refer Annexure: B

Safety Audit

SCC will undertake periodic (Monthly) safety audits to confirm through investigative methods. The effectiveness of the measures set out in the POLICY. In order to be effective such safety audit shall be comprehensively covering all aspects detailed in this specification to ensure effective loss-control/accident prevention program. Safety audits shall take into account the safety inspection records, remedial measures and effectiveness of the safety program. Effectiveness of safety program shall be based on the workers

Effective hazard Identification and Job Safety Analysis processes for design of operation control procedures and on the safety statistics. Audit reports and preventive actions and safety improvement programs shall be recorded.

The Client/Consultant shall retain their right to audit the Safety Management System either directly by their employees or his nominated representatives for its effectiveness.

For Checklist Refer Annexure: C

Tool Box Talks

A toolbox talk is a short safety talk, normally delivered at the workplace (not a training room) and on a specific subject matter. It should be short (5 – 10 minutes) and to the point with a specific safety message.

The objective is to raise awareness of a particular aspect of the work but to do it on a regular basis so that the good safety message is reinforced. Attendance should be recorded.

Pre-Job Meeting

The Pre Job meeting is held before start the activity in that Meeting check or discuss on safe work method state as related to the specific activity on site location wherever the activity will perform and same will be applicable if incase of any changes in procedure or condition. Pre-Job meeting will be conducted by the site supervisor with concern area EHS Personal.

Safety Meeting

safety meetings should be held in accordance with the various circumstances involved or when necessity dictate. No set pattern will suit all cases. Some examples are as follows:

- Safety meetings should occur immediately after the occurrence of an unsafe act.
- Safety meetings should occur when new procedures or equipment are introduced in the worksite and may represent a new hazard.
- Safety meetings should be held whenever a previously unrecognized hazard is identified.
- Generally, regular office safety meetings shall be conducted once a month. Department policy has established that the meeting will be held as per site planning.
- The attendance and subject discussed shall be documented on the SCC Safety Meeting form. Safety meeting attendance is not an option.

Safety Committee

- Develop and Establish the Safety Committee at Project level.
- Safety Committee will organize and assist by Project Safety Personal / Officer and will be chaired by site co-coordinator or Project Manager. Other safety Committee Member will be from various /different department with worker's representative which will be select by workers.
- Meeting will be held on monthly basis. And minutes of meeting will be recorded and circulate within committee and display on safety Board.

Co-Ordination

The Project Manager of SCC shall be totally responsible for this Site Safety Plan. SCC shall appoint HSE Personals to follow this.

Monitoring

The monitoring program is designed to ensure all project requirements are met including but not limited to: air emissions, water quality, Scaffolding, Excavations, Plant, Equipment's and also Equipment matters such as hazardous fumes, noises etc. The majority of non-compliances identified during the monitoring program will require long term solutions to be taken after the quick fix has been implemented i.e. turning off a generator until a sound barrier has been installed

Project Manager shall ensure periodical (weekly once at specified area) inspection by visiting the site along with Safety Officers & the Concerned Engineers.

Hazard Communication -

Handling and storage are the two most common causes of accidents with chemicals. There are several ways that the information is relayed to the employee, these being:

- Container labeling - labels give you information about immediate hazards associated with the chemical.

- Material Safety Data Sheets (MSDS) give you detailed Information about the chemical - physical and health hazards, First Aid, firefighting, protective equipment, etc. Know what you are handling, read the label, and if there is any doubt, consult the Material Safety Data Sheet.

Specific Hazard Training -

- Specialized training on following topics shall be given to the employees likely to get involved:
 - Hot work
 - Material handling
 - Pressure testing
 - Heavy equipment lifting & rigging
 - Work permit system
 - Lockout & tag out procedures
 - Entry into confined spaces
 - Fire prevention and control
 - Emergency Response Team (ERT) etc.
- These courses should provide the time needed to properly address the topic. Completion of specific hazard training is mandatory before working on such tasks. A list of all trained persons shall be maintained at site.

Accident and Incident Investigation Procedure

This policy outlines the procedures that are to be adopted when any employee, visitor or contractor experiences an accident, near-miss or dangerous occurrence on the company's premises.

It is the policy of the company to identify and investigate unplanned losses (accidents), their source and hence their underlying causes.

To enable this objective to be achieved it is imperative that all accidents, irrespective of the resulting injury or damage, be reported according to the laid down procedures.

In order to avoid misunderstanding, the company deems an accident and near-miss to be defined thus:-

Accident:- "any unplanned event that results in personnel injury or damage to property, plant or equipment.

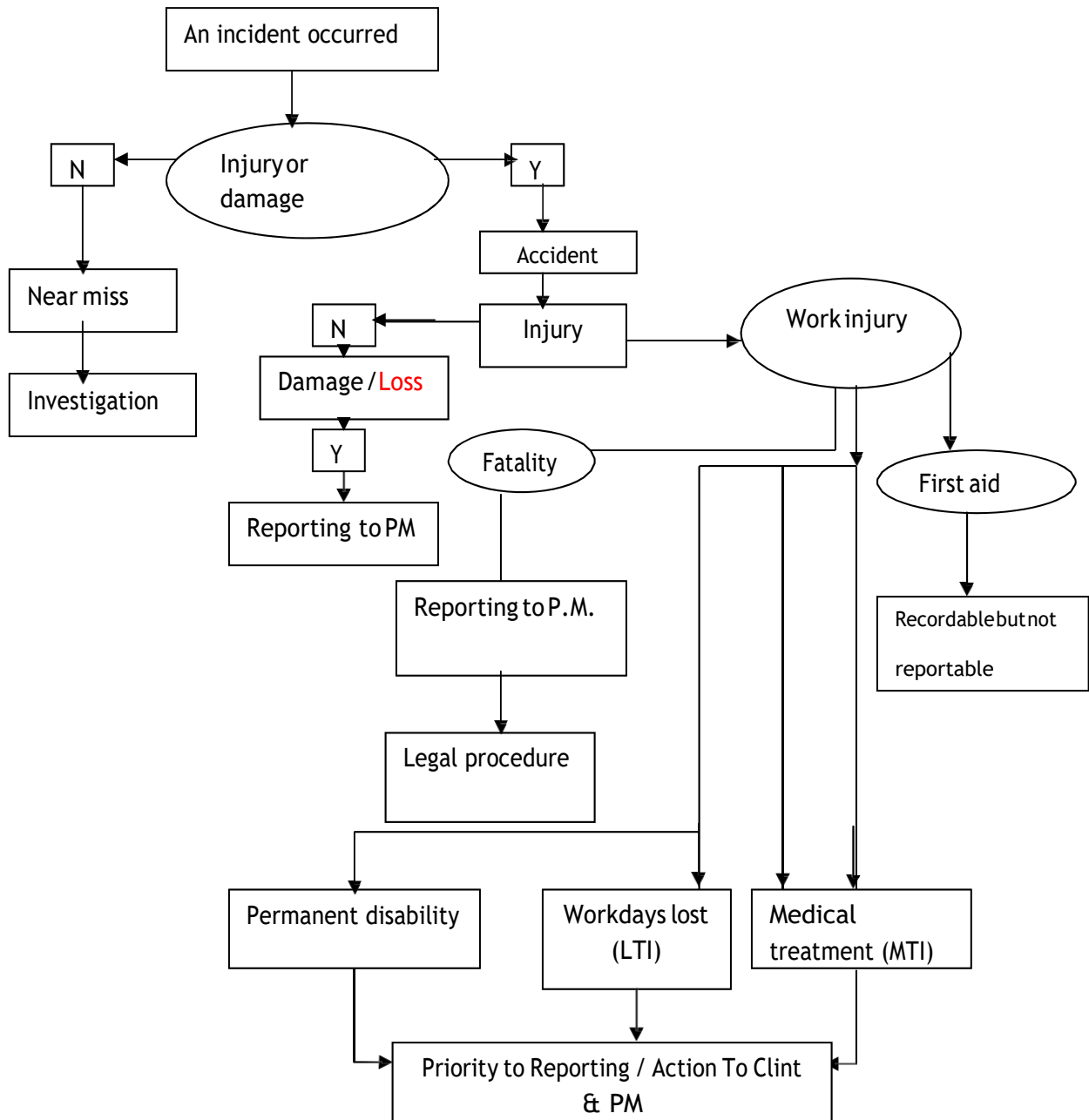
Near-miss:- "an unplanned event which does not cause injury or damage, but could have done so." Examples include: items falling near to personnel, incidents involving vehicles and electrical short-circuits.

Purpose of Accident Investigation:

- To identify hazards existing at workplace.

- To find out the direct causes which are responsible for the accident.
- Search for the contributory causes such as inadequate or lack of supervision, improper housekeeping and absence of safety rules, maintenance or inspection.
- To specify the actions and procedures to avoid its repetitions.
- To collect information this can be useful for the purpose of accident cost estimation or any other statutory purpose.

Accident Investigation Flow Chart for form Refer Annexure



Hazards Identification and Control

Hazards Identify through daily walk round and Safety Observation Procedure (SOR)

Purpose

To identify various hazards / risks associated with every and Critical activity & integrate adequate safety

Measures and appropriate action steps so as to bring them down to an acceptable level.

Responsibility

All Project team with Project Manager / in charge in coordinate with site safety Manager / Officer.

Procedure

- Hazards Identify through daily walk round and Safety Observation Procedure (SOR)
- Identify the specific jobs/ activity for access hazard / risk / analysis, based on past experience or accident potential as well as site situation or condition.
- Highlight jobs having an un-acceptable risk & analyze the sequence and action – stepwise.
- Breakdown the task into major elements
- Establish a sequence of steps to be taken
- Assesses the hazards associated with the steps and identifies appropriate safety measures
- Integrate suitable safety measures
- Circulates the HIRA (Hazard Identification and Risk Analysis) / JSA (Job Safety Analysis) to site In-charge and execution team for implementation.

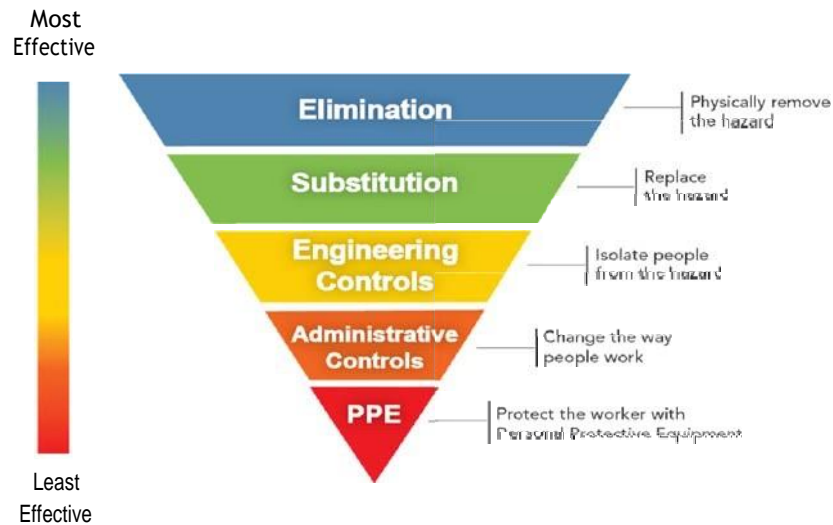
4.13.1 Hierarchy of Hazard Control:

ELIMINATE- Redesign the task to eliminate the Hazard?

SUBSTITUTE - Replace materials, equipment or processes with less hazardous ones?

ENGINEERING / ISOLATION - Is it possible to provide mechanical aids, barriers, guarding etc to isolate the hazard?

ADMINISTRATION/TRAINING – Use training and procedures to inform people how to avoid the hazard?



PPE – Use Personal protective equipment to avoid impact with hazard.

Risk Assessment

Purpose

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 as low as reasonably practical

Matrix

<u>OCCUPATIONAL HEALTH & SAFETY RISK MATRIX</u>				
DETERMINE HEALTH & SAFETY CONSEQUENCE				
	S1 = NEGLIGIBLE . NO INJURIES OR MINOR FIRST AID REQUIRE	S2 = MARGINAL MODERATE INJURY, MINOR MEDICAL TREATMENT REQUIERED	S3 = CRITICAL SEVER INJURY. EXTENSIVE MEDICAL TREATMENT REQUIERED	S4 = CATASTROPHIC SINGAL OR MULTIPAL FATALITY
P4 = FREQUENT	SIGNIFICANT	SIGNIFICANT	CRITICAL	CRITICAL
P3 = OCCASIONAL	INSIGNIFICANT	SIGNIFICANT	CRITICAL	CRITICAL
P2 = REMOTE	INSIGNIFICANT	SIGNIFICANT	SIGNIFICANT	CRITICAL
P1 = VERY RARE	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	CRITICAL
RISK	RISK RESPONSE CRITERIA			
INSIGNIFICANT	ACCEPT THE RISK WITH NO PARTICULAR MANAGEMENT CONTROL REQUIRE			
SIGNIFICANT	MITIGATE THE RISK BY IMPOSING EXISTING OR ADDITIONAL MANAGEMENT CONTROL & ACTION AT THE FUNCTIONAL LEVEL TO REDUCE THE RISK			
CRITICAL	RISK IS NOT ACCEPTABLE WITHOUT SPECIFIC & IMMEDIATE MANAGEMENT RESPONSE			

Severity of hazard (Impact)

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.

Impact Descriptions (The highest category will always be used)		
Value	Result of Hazard to Personnel	Result of Hazard to Assets / Progress
S5	Single or multiple Fatality	Catastrophic Damages, Critical Delay
S4	Serious Injury requiring hospitalisation	Major Damages, Serious Delay
S3	Lost Time Accident	Serious Damage, Moderate Delay
S2	Injury requiring Medical Treatment but not Lost Time	Moderate Damage, Minor Delay
S1	First Aid treatment only	Minor Damage, No Delay

4.14.4 Likelihood of occurrence (Probability)

Likelihood of occurrence of an accident or incident or ill health is classified as per the table given below.

Probability Descriptions (The highest category will always be used)		
Value	Status	Description
P5	Inevitable	Happens regularly on this site
P4	Most Likely	Known to have occurred on this site in the Past
P3	Likely	Known to occur on other sites
P2	Unlikely	Known to occur in the industry
P1	Most Unlikely	Never known before

4.15 WORK PERMIT SYSTEM

Some tasks can be hazardous unless special precautions are taken. When the recognized safe system of work requires an extra degree of control, this is obtained by the use of a permit to work.

A permit to work is a document, which certifies that certain operations, which may, otherwise, be of hazardous nature, have been rendered safe by implementing necessary precautions by the issuing authority. It details work to be done, precautions to be taken and checks to be carried out and has to be completed before work can commence.

Objective:

- To make the person who is ultimately responsible for the work, considering all possible hazards to remove them or invalidate them before allowing work to proceed.
- To inform the personnel carrying out the work of particular procedures and precautions they must use in order to carry out the work safely.

Application:

This procedure shall be used when construction, maintenance or repair work is done on or in the vicinity where the following procedures or conditions apply:

- Working at heights
- Excavation of deep trenches where electrical, piping lines etc. might cross
- Burning, welding, soldering or other hot work on or near systems containing any flammable gases.
- Electrical, mechanical or process equipment has to be isolated or locked-out when work is being done on it or a related item of plant or equipment.

Responsibility

The issue and control of a permit to work are the responsibility of the concerned authorities or his nominated delegate. This responsibility continues through the entire operation and includes monitoring of the actions called for on the permit and subsequent signing off when the work has been complete. Where work carries over into the second day or working period, it is the responsibility of the user department to raise a new permit /extend the validity before commencing the work.

Special Precaution

- If in doubt whether a permit is required the same should be checked up with safety engineer.
- Before allowing work to proceed, the person responsible shall check that the requirements of the permit have been met.
- During the work the person responsible shall check that the required safety measures are being carried out.
- When work is being carried out in a confined space, the person responsible must ensure that all necessary backup facilities and safety / emergency equipment are available and in working condition.
- No person may remove or disturb any equipment or signs associated with a permit to work situation.
- All keys and critical items such as fuses shall be kept under proper control until the person responsible authorizes their use or replacement.
 - After the work is completed the permit to work should be returned to the issuing authority that will give further necessary instructions.

To identify hazards & implement them before taking over any critical work, specific work permit systems will be followed at site to ensure safe execution of work. This will ensure the

safest way the work to be carried out at site. The same system will be implemented to a particular zone of work without affecting the other activities at construction site. The information format will be initiated by the permitted and clearance will be given by a responsible person / head of dept. Connected to the particular area. However the work permit as per the requirement of client will be also followed.

The following work permits systems Formats / Information Sheets shall be in used as per the requirement of the Quality management system procedures.

- Excavation Clearance Permit
- Industrial Radiography – Information Form
- Permit to work on Plant, Machinery & other power Driven equipment
- Permit to open manhole cover / grills
- Hot work Permit

5 Health and Welfare Facility

First Aid

Prevention is better than cure but when prevention is not possible and an injury does take place, cure is the only prevention of further injury and this cure is primarily to be provided by the First Aid.

First Aid can be defined as an immediate treatment given to the victim of an accident or sudden illness, before medical help is obtained. It is a combination of simple but quite expedient, active measures to save the victim’s life and prevent possible complications. It needs to be immediate in severe accidents complicated by bleeding, shock and loss of consciousness.

- Prior to commencement of work, arrangements shall be made for medical facilities and identify or nominated the person as a First Aider.
- Provide a First Aid Box at site office and nominate designated place for First Aid Box. Size of first Aid Box and content of material is depends upon the strength of workman working at site.
- Identify near by hospital for further treatment.
- The list of addresses, telephone number for physicians, hospitals, ambulances shall be posted at prominent locations.

Content of First Aid Box

Sr.No	Material Description	Quantity
1	Medium Size roller Bandages 2 Inch wide (Hand & Foot dressing)	2
2	Cotton Wool (20 gms packing)	2
3	Antiseptic solution Dettol or Savlon (50ml)	1



4	Paracetamol Tablets	2 Strips
5	Scissor	1
6	Adhesive Plaster (1.25 cms x 5 Mtrs) small	1
7	Polythene wash cup for washing eyes	1
8	Safety Pins 1strip of 10	1
9	Tinc. Iodine (100ml	1
10	Ointment for Wounds/Soframisin	1 Tube
11	Band Aid (trip of 5)	5
12	Iodex (25gm)	1 Bottle
13	Book let (English & Hindi)	1Each
14	Eye Drops	1 Bottle
15	Vicks (22 gms)	1 Bottle



Emergency Contact No.

Identify nearest Hospital, Police station, fire Brigade near to the site. List of Contact no. to be display at site office.

Sr.No	Description	Land Line No.	Mobil No.
1	Police Station	100	
2	Fire Brigade	101	
3	Hospital		
4	Ambulance	108	
5	First Aider		

6	Safety Officer		
7	Project Manager		
8	Administration Officer		

Drinking Water

- Portable drinking water should be made available at various work locations for worker.
- In monsoon season the chlorination of water should be carried out to prevent the spread of water born deceases with consultation of licensed physician.
- Regular cleaning to be carried out for the water tank.
- Check for stagnant water in surrounding area of tank and washing area.

Temporary Facilities (Worker Camp)

- Proper arrangement of Residence / hutments shall be provided with adequate lighting facility
- Adequate drainage facility shall be provided for Worker camp area.
- Open areas, grounds shall be maintained free from debris, Stagnated water, combustible material and garbage and material.
- Area shall be keep clean, well ventilated and lighted.
- All welfare and sanitary facilities shall be provided
- Camps must comply with local fire protection requirement
- Display of emergency numbers in the camp area
- To control & monitor camp area security & camp supervision shall be provided.
- Regular Pest control treatment for Snake and Scorpion as well as Fogging for Mosquitoes.

Toilet and Urinal Facility

- Sufficient number of temporary toilets and urinals shall be made available for available work force at site.
- Effective planning should be done for maintaining the sanitation

Safety Promotion

Safety Notice Board

All sites conduct promotional activities to enhance the safety awareness & maintain interest of the staff and workers working at site. The safety promotion activities shall include following:

Display of safety news, accident alerts and information including worksite pictures on good and bad work practices, General rules and regulations shall be put on the site notice board for viewing by all who work at site

Microsoft Office

Celebration of national Safety Day (4th March): Celebrate National Safety Day for all work sites to promote and cultivate greater awareness of site safety practice for workers. Organized various competitions i.e. Safety Slogan & Poster Competitions) for all workers and staff.afe Working Procedure.

6 Record Keeping

The designated representative will:

- Have a copy of the contract on file and be thoroughly familiar with its contents, and with the safety and health aspects of the work.
- Keep records of all training done with company workers regarding hazards to be caused by the contracting company.
- Keep copies on file of all forms or statements related to the contract that are required by the company to be filled out before or during contract work.
- Keep a recordable injury and illness log for the project, as well as copies of accident reports on all accidents that occur in the course of the project.
- Keeps a daily log regarding pre work start-up inspection findings.
- Keep records of all documentation of any sort given to you by the contractor, including records of training done, MSDSs, accident reports, etc.
- Keep records of all documentation of any sort you give to the contractor, including List of hazards to train their employees on, MSDSs, etc.
- Document all discussions, letters, memos, or other communications made to the contractor regarding safety issues, including place, time, and names of people involved.

7 Safety Rule And Regulation

7.1 USE OF PPE & SAFETY DEVICES:

The purpose of personal protective equipment is to reduce employee exposure to hazards when engineering and administrative controls are not feasible or effective to reduce these risks to acceptable levels.

- Use of Personal Protective equipment (PPE) is a legal requirement as per BOCW Act 1996, is a mandatory on site while or During entering the site.
- Mandatory PPE Requirement: Safety Helmet, Safety Shoes and Reflective Vest Must Worn at Site.
- Before issuing PPE ensure they are in good working condition, clean and not defective & checked regularly, If found damage replace immediately.
- Training in use of PPE: All workmen shall adequately inform, instruct and trained on use of Personal Protective Equipment

The requirement of sufficient number of safety appliances should be planned well in advance and made available before the work commences. Checking shall be done periodically for safety appliances to identify, defects if any, and arranges replacement. All safety appliances should be properly maintained and serviced.

The important PPE to be used at site for safe guarding different parts of the body:

7.1.1 HEAD PROTECTION

Every individual entering the site must wear safety helmet, with the chinstrap fixed to the chin. Helmet has to be changed at the manufactures recommended frequency or after a significant impact or If it becomes deeply scratched or cracked.

FOOT AND LEG PROTECTION:

Safety footwear, with steel toe & sole reinforcement is essential on site to prevent crush injuries to toes and to stop sharp objects puncturing the soles of feet.

HEARING PROTECTION:

Noise is defined as an unwanted sound. Regular exposure to excessive noise causes damage to the inner ear and permanent loss of hearing. A single exposure to a very loud noise can have the same effect. Many types of ear defenders are available from disposable earplugs to earmuffs and safety helmets incorporating ear defenders and suitable protection for every situation.

EYE PROTECTION:

There are many types of eye protectors and it is important to wear the correct type to give the required protection. Person doing grinding works, operating pavement breakers etc, should wear safety goggles and those involved in welding and cutting works should wear cutting goggles.

HAND AND ARM PROTECTION:

Gloves give protection against cuts, toxic or irritant chemicals and dermatitis, e.g. that caused by cement. Check for correct gloves to protect against particular hazard. Rubber gloves should be used for electrical works.

FALL PROTECTION:

Full Body Harness shall be made of strong closely woven 44 mm wide 3mm thick nylon or other synthetic material webbing and supplied complete with 1.5 or 1.0 mtr long nylon, polyester or synthetic fiber lifeline made from 10 mm dia. (minimum) and tested as per relevant code. All metal components shall be solid or forged, smoothly finished and protected against corrosion by chromium coating or any other protective coating. Fall arrested device can be effectively used while climbing or coming down on a Scaffolding .

RESPIRATORY PROTECTION

There is a wide choice of respiratory protection for dust and gases. Facemasks, which are of the wrong type, unfit for the person worn out or blocked by dirt, can result in various injuries. Those workmen engaged in mixing or stocking cement bags or any materials that are injurious to lungs shall be provided with protective mask.

SPECIAL PROTECTION

Careful selection, maintenance, certification and regular training are needed for specialist equipment including Compressed air escapes breathing apparatus, artificial respirators & fall arrester and safety harnesses.

All workmen issued with suitable protective clothing or equipment should be trained:

- How to wear and use it.
- The hazards against which it affords protection.
- The limitation of the protection.
- How to maintain and store it.
- How to keep it clean.
- To obtain replacements in case of loss, damage or deterioration.
- To report any problems in its use to the concerned authority.

Besides the equipment intended for specific hazards, there is of course general protective clothing for work in wet weather, and high visibility clothing for roadwork's etc.

GENERAL HOUSEKEEPING, STACKING OF MATERIALS

Good housekeeping is an important element of accident prevention. It should be planned at the beginning of the job and carefully supervised until the final hand over. Orderly arrangement of operating tools, equipment, storage facilities and supplies at construction site to be ensured. Housekeeping is a practical method of increasing production, reducing accident and improving employee morale and public relations. Housekeeping should be the concern of all supervisors and engineers in their area of work and not left for the cleanup crew. Housekeeping should be a part of daily routine & clean up a continuous process.

TYPICAL ACCIDENTS DUE TO POOR HOUSEKEEPING:

The relationship between accidents and poor housekeeping is very close. Too often accidents are reported because of:

- Men tripping over loose objects on floors, stairs and platforms
- Men getting hit by articles falling from overhead
- Men slipping on greasy, wet, or dirty floors.

GUIDE LINES FOR HOUSEKEEPING: -

Storage Areas - All materials should be maintained in a neat stockpile with well-laid aisle and walkways for ease of access. There shall not be any projections in the walkways.

Work Areas - Loose materials, scrap, tools, etc., shall not be allowed to be left lying in the working areas especially in the vicinity of ladders, ramps, stairs, etc. spills of oil & grease should be removed immediately.

Protruding Nails - Protruding nails from wooden pieces should be retrieved by engaging separate personal/team. Nail collection boxes should be used for the purpose.

Scrap Yard - Wooden scrap yard should be well away from any gas cutting or welding operations and No Smoking shall be strictly ensured.

Lighting - The whole working area should have adequate illumination.

Openings in floor - All openings in areas where workmen are liable to work or pass through shall be closed or barricaded with a warning sign "OPENING BELOW".

Approach roads -The approach road should be freely accessible all the time so as not to have blocking during emergency.

ROAD SAFETY INSIDE PROJECT

- Roads as required shall be developed (as required) for transport of men, material and equipment. The repair of the same from time to time should be ensured for safe movement of the vehicles used for construction work. The speed limit for all the construction vehicles inside the project area shall be not more than 20 KM / hour. At places the signboards / caution signs indicating the speed limit, diversions, steep slope, bend / turns will be provided so as to caution the operator about the hazards present.
- No construction vehicle except for work purpose & personal vehicles shall be parked in the road in the manner obstructing the traffic.
- Vehicles parking brake shall be engaged during parking.
- Vehicles should not be parked on slop without parking brake along with provision of stop blocks at all tires.
- Nobody should be allowed taking Shelter underneath any vehicle.

ACCESS, EGRESS & WORKSTATION SAFETY

- Adequate and safe means of access to the work place will be provided by suitable means before engaging workmen inside the work area.
- All accesses provided shall be suitable, stronger & firm enough as per the standard norm.
- The stacking of materials on the access points shall be avoided so as to facilitate free movement for the workmen.
- Ladders should be used for depth greater than 4.88 mtr and additional access shall be provided for two-way traffic when strength is more than 25 persons in a particular area.
- The housekeeping & illumination on the accesses will also be ensured. The work area will be made clear of unwanted materials.
- Suitable platforms shall be provided before allowing any workmen to work at height. The elevated platforms shall be provided by our standard formwork system with adequate supports so as to ensure the stability of the working platforms.
- The openings & cut outs shall be strictly barricaded in the work area or working platforms to avoid fall of person & materials from Height.

SAFE USE OF CONSTRUCTION POWER SUPPLY AND MAINTENANCE OF INSTALLATIONS

- All cabling and installation shall comply with the appropriate statutory requirements and other relevant rules of local bodies and electricity boards.

- The lay out plan & sketch of construction power sub-stations & cable lying shall be prepared. The cables for construction supply shall be routed through under ground with cable indicators so as to locate & maintain the same will be convenient.
- The sub-stations & distribution Boards shall be inspected regularly by the concerned person on a regular interval. The meager value of all cables is to be checked in a regular interval to avoid electrical hazards.
- All the power supply to construction site for portable tools shall be routed through Circuit Breakers or Earth Leakage Circuit Breakers (ELCB)
- ELCB shall be tested once in a month for its intended working.
- All underground cables shall have a mark & diagram shall be maintained at main office.
- Before commencing any excavation work permit shall be obtained from safety dept.
- Only double insulated electrical cables shall be used at site.
- All submersible pumps must have treble insulated cables.
- Electrical cable joints shall be done by a connector or by a plug / adaptor. No manual joint is allowed.
- The main & distribution cables shall be laid underground or over ground, not on the ground.
- Electrical installations must be provided with Fire extinguisher & First aid for Shock treatment.
- All the installations DB's, SDB's at site are to be earthed as per specification.
- All metal body portable electrical machines must be earthed.
- Electricians must keep with them always an Insulation tape, tester, rubber gloves etc.

Some of the major electrical precautions to be taken at site are as listed below: -

- Only metal clad and interlocked type 15A/20A/30A combined switch-plug-socket units should be used.
- All portable tools shall be checked periodically and certified safe by the Plant and Machinery Department.
- Hand gloves are an absolute must while operating hand held electric tools.
- Single core flexible cables shall not be used.
- For jointing of armored cable, straight - through jointing kits should be used and no other jointing procedure should be followed. Wires should be properly insulated.
- If a roof cannot be provided over the head by a tarpaulin or by other means, it is better to suspend operation of hand tools till the drizzle stops.
- All boards, Main DB, Sub DB, etc. shall be covered by roof and walls. The smaller units like FDB's, Switch - Plug - Socket boards shall be protected by enclosures.

- The combined resistance of the earth pit should be less than 2 ohms. Periodical checking of the earth resistance should be carried on.
- Except trolley mounted and wheel mounted equipment, or hand held equipment with trailing cables the rest of the equipment's shall not be moved without switching of the control point. Even with trolley and wheel mounted equipment, it is safer to do so unless the distance through which the equipment is moved is marginal.
- Three cores, doubly insulated cables shall be used with earth lead correctly connected to the earth terminal at the controlling point.
- The Distribution Boards (Main Sub & Fixed) shall be fixed with standard switch fuse units incorporating HRC fuse.
- Power should be tapped from the sources under our control. A cut - off point and a proper fuse be used separately in control and unless these conditions are satisfied, power supply shall not be drawn from DB's under our control.
- ELCBS & RCCBS of proper sensitively and proper rating must be used to avoid electrical accidents.

USE, MAINTENANCE & INSPECTION OF PLANT & MACHINERY

- Proper tools & tackles should be planned according to the job requirement.
- The concerned department should prepare checking schedule of these tools and tackles.
- Monthly once all the lifting machines such as cranes, winches, hoists etc, should be checked visually for defects.
- The Cranes & machines must have safety devices like Boom limit switch, Automatic moment indicator, Overload limit switch, Over hoisting limit switch, Hoisting/swivel/boom brake, Horn, Reverse horn, Lights etc in working condition.
- Competent authority (Third party) for testing of all plant & machinery should be engaged for testing.
- All lifting machines, tools & tackles shall be checked and examined monthly once and the P&M department shall maintain the register.
- All lifting machines like Tower crane, Mobile / Crawler crane shall be inspected by the registered inspector once in every year.
- Competent person shall inspect tower crane for every assembly & erection.

SCAFFOLD & FORMWORK NORMS

All scaffolding shall be erected in conformance with the relevant IS code viz. IS 4014. A competent person must inspect each scaffold.

All scaffolding shall be equipped with toe boards, mid rails, top rails; and access ladders.

Personnel who are conversant with and competent to perform this work shall erect scaffolding.

Scaffolding shall be removed according to construction requirements and when work has been completed.

Chapter XIX of "The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998" deals with the subject of "SCAFFOLD".

Rule No. 188 of Chapter XIX is titled "Scaffold construction". As per Rule 188, "The employer shall ensure at a construction site of a building or other construction work that

- (a) every scaffold and every component thereof is of adequate construction, made of sound material and free from defects and is safe for the purposes for which it is intended for use;
- (b) In case bamboo is used for scaffolding, such bamboo is of suitable quality, good condition, free from protruding knots and stripped off to avoid any injury to building workers during handling such bamboo;
- (c) All metal scaffolds used in building or other construction work conform to the relevant national standards."

"The employer shall ensure at a construction site of a building or other construction work that,

Standards of a scaffold are

- Plum, where practicable.
- Fixed sufficiently close together to secure the stability of such scaffold having regard to all the possible working situations and conditions for the intended use of such scaffold.
- Spaced, as close as practicable, to ensure safety and stability of such scaffold.
- Adequate measures are taken to prevent displacement of a standard of a scaffold either by providing sole plate or a base plate, as necessary.
- Ledgers of metal scaffold are placed at vertical intervals with due regard to safety and stability of such scaffold.
- Bamboo ledgers are kept as nearly as possible and are placed and fastened to the standards of a scaffold with due regard to the stability of such scaffold."

Working Platform.

As per Rule No. 192, of Chapter XIX "The employer shall ensure at a construction site of a building or other construction work that -

- Working platform is provided around the face or edge of a building adjoining at every upper most permanent floor of such building under construction and at any level where construction work of such building is carried out;
- A platform is designed to suit the number of building workers to be employed on each bay of a scaffold work on such platform and the materials or articles and tools to be carried with them in such bay;

- The safe working load and the number of building workers to be employed in each bay of a scaffold are displayed for the information of all the building workers employed at such construction site."

Scaffolding Tags

The scaffolds erected for work platform, access to workstation etc., shall be tagged by a competent person for its readiness to use.

Ex.

- Green Tag for use by all.
- Red Tag shows not to use the scaffold, because it is incomplete & unsafe to use.

Formwork

Placing of shuttering (forms)

- Shuttering shall be examined, erected and dismantled under the supervision of qualified and experienced persons and as far as practicable, by workers familiar with the work.

Removal of shuttering

- No shuttering should be removed until the authorization has been given by a competent person who has made sure that the concrete has sufficiently set to support by itself and any superimposed loads.

USE OF SAFE MATERIALS & PERSONNEL HANDLING DEVICES

Hand Tools

- The weight size and type of tool should be selected to suit the job being carried out.
- The handles of tools should be intact and properly tightened with wedge. Split broken handles should be replaced. Sharp tools should be used instead of dull ones. To avoid slippage due to grease and oil, it should be immediately wiped off. Insulated and non-conducting tools should be tested for their electrical resistance. Mushroomed chisel is a serious source of hazard. Pipes and rods should not be used as handles.
- Wrenches should not be puEHSd but be pulled. Wrenches should be placed on nuts with the jaw opening facing the direction in which the wrench is to be rotated. Tongs and other holding devices should hold chisels struck by others. Chisels should be held with steady but relaxed grips. While using screw diver the object should not be held in hand or thigh. The blades of hacksaw should always point forward and the entire length of the blade should be used in the forward cutting stroke. The stroke should be steady and firm to avoid jumping of blade.
- Hand tools should not be allowed to lie on benches, scaffoldings, etc., where they can be tipped down. They should be properly stored. Sharp ones should not be kept in pocket and held in hand while climbing up or down through the ladder. Tools should never be thrown up or down.

MATERIAL HANDLING

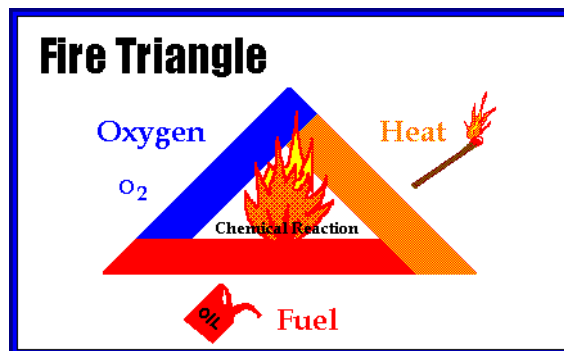
Inspection of components of material handling equipment will be carried out as per our checklist & inspection reports. Method of slinging and calculating load carrying capacity of slings & wire ropes at various angles will be taken in to consideration before lifting loads. The tools & tackles used for the same will be checked visually on day-to-day basis.

- While shifting materials manually, care should be taken that the rope should not rub against the edge of any structural members or concrete floors. Using suitable size of rope & pulley should shift materials.
- If materials to be lifted to nth floor then pulley should be tied above the floor so that the materials could be handled easily.
- A designated person should ensure tying of the lifting material so that the material does not slip and fall by any chance.
- Experienced gangs should do the works.
- The persons receiving the material on the platform top should hook their belt to a structure or preventive measures from falling of the same.
- The area below should be barricaded so that no one enters when the material is lifted.
- While shifting materials through platform openings the same precautions as stated above should be taken care.
- While lifting materials by crane suitable size of sling & D-shackle should be used.
- While shifting concrete by concrete bucket or shifting debris/ block or any other materials by a basket the opening / closing gate should be locked properly to avoid falling of materials while lifting.

FIRE PREVENTION, PROTECTION & PREPAREDNESS

FIRE

- It is an Oxidation of a Chemical Substance (Fuel). Fire is combustion of fuel, oxygen and heat.
- **Fire Triangle**



- Every employee shall be trained in the procedures and practices necessary to prevent the formation of fires. He must also know what to do if a fire does occur.
- When an outbreak of fire is discovered, immediate corrective action is essential in order to provide the best possible chance of putting it out quickly, thus reducing danger to life and damage caused to the minimum.
- When equipment that could give rise to a fire hazard is used, a suitable fire extinguisher / fire water / sand bucket should be placed within easy reach.

Types of fire and fire extinguishers:

Types of fire	Combustible material	Type of Fire Extinguisher
Class A	Solid Combustible Materials Ex. Paper, Cloth, Wood, Building, Coal, Coke, Human Body etc.	Water, DCP, Sand Water Co2, Soda Acid
Class B	Liquid combustible Materials Ex. Petrol, Diesel, kerosene, Paint, Solvent etc	Foam Mechanical & Foam Chemical
Class C	Gaseous Combustible Materials Ex. LPG, Acetylene, Hydrogen etc	DCP, CO2
Class D	Combustible metals when in fine powder form Ex. Aluminum, Sodium, Potassium, Magnesium etc.	Special Powder Fire Extinguisher

Preventive Measures

- Reduction of fire load
- Provision of fire extinguisher and its upkeepment.
- Display of "No Smoking" board/ caution board.
- Good house keeping
- All temporary wiring should be well supported & protected.
- No electrical circuits should be overloaded.
- Stacking of cylinder should not be done near to any live electrical wire.
- Education and training in fire prevention to all
- Fire Extinguishers shall be fixed at vantage points. Preferably DCP extinguisher shall be used.

- Inflammable items shall be stored in the area allocated.
- No Smoking & caution boards should be displayed at locations where there is fire vulnerability.

Fire protection

- Electrical wiring and equipment for light, or power purposes shall be installed in compliance with the requirements of Electrical Rules applicable
- Internal combustion engine powered equipment shall be so located that the exhausts are well away from combustible materials. When the exhausts are piped to outside the building under construction, a clearance of at least 15 cm shall be maintained between such piping and combustible material.
- Smoking shall be prohibited at or in the vicinity of operations, which constitute a fire hazard, and a notice shall be conspicuously posted: No Smoking.
- Portable battery powered lighting equipment used in connection with the storage; handling or use of flammable gases or liquids shall be of an intrinsically safe design.
- The nozzles of air, inert gas and steam lines or hoses, when used in the cleaning or ventilation of tanks and vessels that contain hazardous concentration of flammable gases or vapors, shall be bonded to the tank or vessel Shell. Bonding devices shall not be attached or detached in hazardous concentration of flammable gases or vapors.
- Temporary buildings, when located within another building or structure ,shall be of either non-combustible construction or of combustible construction having a fire resistance of not less than 1hour,
- Temporary buildings, located other than inside another building and not used for the storage, handling or use of flammable or combustible liquids, flammable gases, explosives or blasting agents or similar hazardous occupancies shall be located at a distance of not less than 3 meters from another building or structure. Groups of temporary buildings, not exceeding 200 sq. m. in aggregate shall, for the purpose of this section, be considered a single temporary building.
- The temporary buildings divided into rooms shall have doors to help to contain the spread of fire.
- Combustible materials shall be stacked with due regard to the stability of stacks and in no case higher than 5 meters. Driveways between and around combustible material storage area shall be at least 4 meters wide and maintained free from accumulation of rubbish, equipment, or other articles or materials. The entire storage site shall be kept free from accumulation of unnecessary combustible materials. Weeds and grass shall be kept down and regular procedure provided for the periodic clean up of the entire area.
- Portable fire extinguishing equipment, suitable for the fire hazard involved, shall be provided at convenient, conspicuously accessible locations in the Yard area. The portable fire extinguishers shall be placed so that maximum travel distance to the nearest unit shall not exceed 30meters.

- Storage shall not obstruct or adversely affect means of exit. All materials shall be stored, handled and piled with due regard to their fire characteristics.
- A barrier having a fire resistance of at least 1 hour shall segregate in-compatible materials, which may create a fire hazard.
- Material shall be stored to minimize the spread of fire internally and to permit convenient access for fire fighting. Aisle space shall be maintained at all times. Aisle space shall be maintained to safely accommodate the widest vehicle that may be used within the building for firefighting purpose.
- Clearance shall be maintained around lights and hot surfaces to prevent ignition of combustible materials.
- Material shall not be stored within 1 meter of a fire door opening.

OTHERS

Stores

- A layout demarcating areas for stacking, storing and disposing the materials should be made.
- The materials are stacked with passage to reach them. The aisle is marked. Materials should not protrude beyond the marked area posing tripping hazard.
- Name boards shall be displayed to mention the place for every item.
- The racks installed must be supported well to prevent from falling.
- To reach the rack top person should not climb on the rack Shelf appropriate ladder should be used.
- Vertical stacking of materials should not exceed the prescribed norms posing falling hazard because of imbalance.
- Adequate lighting should be provided.
- Flammable materials like Dissolved acetylene, paints etc should be stored under well-ventilated Shed. Electrical connection in these locations should be proper and maintained well such that they do not cause short circuit. Smoking, matchbox or any other fire causing materials are prohibited in these areas.
- Sufficient fire extinguishers are kept at designated places and the path to reach them shall not be blocked anytime.
- Toxic materials are labeled and kept at secluded place where only authorize persons shall handle. The MSDS of the chemicals should be available for all chemicals.
- Nail pullers shall be used whenever possible to remove nails from boxes and crates. Metal strapping should be cut with proper safety tool.
- Barrels and drums shall preferably be placed on end. If placed on their side, these shall be provided with racks or blocked so these cannot roll.
- Oils, greases and paints shall not be openly stored at any time.

- The scrap pile and junk material shall be kept as orderly as conditions will permit. Extreme care shall be used in handling scrap material to prevent personal injury.

Storage of Cylinders and Diesel/Petrol

The purpose of this procedure is to prevent injury to personnel and damage to property caused by the mishandling of compressed gas cylinders. This procedure applies to all employees, contractors, and visitors who handle compressed gas cylinders.

Responsibility:

All contractors will ensure that their affected employees are trained in the proper use and inspection of gas cylinders.

General Requirements

- Secure all cylinders upright and store in assigned places.
- Never drop cylinders or permit them to strike each other.
- Replace the valve caps on cylinders when regulators are removed. Do not transport cylinders without valve caps in place.
- Do not use cylinders for rollers, supports, or any purpose other than to contain gas.
- Keep sparks and flame away from cylinders. Never place or store cylinders near furnaces, boilers, or other high-temp sources.
- Identify all compressed gas cylinders by a legibly marked label. Do not accept for use any cylinder that is not identified by a legible label and notify shipping personnel to retrieve the cylinder.
- Open cylinder valves slowly. Stand to one side of the glass-covered gauge faces when opening cylinder valves. Close cylinder valves when stopping work, moving cylinders, or when cylinders are empty.
- Mark empty cylinders "EMPTY" or "MT". Ensure all valves are closed and caps installed.
- Never tamper with safety devices on valves or cylinders.
- Cylinders must be equipped with the proper regulators. Inspect all connections and seating surfaces when applying regulators.

Special Rules For Oxygen Cylinders

- Keep oxygen cylinders clean. Prevent oil or grease from contacting valves, regulators, gauges, fittings, hose lines, pipelines, blowpipes, and any connections.
- Open the cylinder valve fully when cylinder is in use.
- Never use oxygen as a pressure medium to blow out obstructed pipelines.
- Hoses must be equipped with backflow controls and flame arrestors.
- Oxygen cylinders in storage must be separated from fuel-gas cylinders by a minimum distance of 20 feet or by a 5-foot barrier having a fire rating of at least 30 minutes.

Special Rules for Acetylene Cylinders

- Do not ever use Acetylene at a pressure exceeding 15 pounds per square inch.

- Do not open an acetylene cylinder valve more than one full turn; then, in case of fire, the valve can be closed immediately.
- Move acetylene cylinders to open air away from possible sources of ignition if leak occurs that cannot be stopped.
- Never test for acetylene leaks with an open flame. Use leak detector or soapy water.

Diesel / Petrol storage area

- No Smoking sign boards should be displayed.
- Diesel / Petrol storage area should be demarcated
- Only approved quantity of diesel / petrol should be stored.
- Diesel drums should be stored on a hard surface preferably on a concrete floor. The floor is sloped towards a corner where a sump is made for collection of the spilled oil.
- Adequate numbers of foam type extinguishers are installed.
- Housekeeping should be maintained .The area inside and around the Shed should be clear from litters

Transportation of Materials

- Only identified crew does the loading and unloading of the materials.
- The gang leader and the crew should be aware of the weight of the materials they are to handle.
- Proper and reliable tackles like slings, D-shackles, etc. shall be used for material handling.
- Lashing to be done after the materials loaded on the trailer.
- Red flag is tied on structures extending beyond the trailer body. At night reflectors to be fixed.
- Structures extending beyond the cabin height are prohibited from transporting.
- The driver should be aware of the path to the terminal he is to transport the material and ensure no blockades are there.
- The gang leader should know the specific spot for unloading the materials
- Two tag lines shall be tied to the end of the structures while handling by crane.
- All structural steel shall be placed on wooden sleepers.
- Stable and sufficient wooden sleepers to be ensured by the Forman /gang leader.

Material Safety Data Sheet

In the interest of protecting the Safety, Health & Environment affecting the workers and the general public, a material safety data Sheet for all the potentially hazardous materials

should be retained by the HSE Engineer and made available at site locations. It should cover details about the hazardous substance Handling, Transportation and Storage and mitigating measures in the event of spill, fire or other untoward occurrence. HSE Engineer disseminates the hazard and precaution and remedial measures to all the employees in the project.

8. Safe Work Procedure

8.1 EXCAVATION

While planning any excavation work, it is important to give due consideration to the following safety hazards:

- Collapse of the sides,
- Material falling on the people working in the excavation,
- People and vehicles falling into the excavation,
- People being stuck by plant and machinery,
- Access to the excavation,
- Fumes, Toxic gas
- Underground utilities
- Accidents to members of the public.

It shall be ensured that necessary equipment needed such as trench Sheets, props, baulks, etc. are available on site before workstarts.

Precautionary measures to be adopted for Excavation and trenching are as below:

- Before starting excavation it is to be checked whether there is any underground utilities present like electrical power cables, water pipe line or any other service line in consultation with the client and consultant.
- If the excavated pit is more than 5ft. depth, then appropriate preventive measure to be taken to avoid earth collapse like slope or bench providing to the walls of the pit or EHSet piling etc. as per norms and design. The slope of excavation should not be steeper than the angle of repose of the particular soil. When the slope is less than the angle of repose, which cannot be achieved because of limited place or if it is uneconomical to provide such a slope then shoring should support the earth.
- Excavation area should be barricaded 1meter away from the edge of excavation pit.
- No materials should be stacked at edge of the excavation pit.
- There should not be any vehicle movement close to the edge of the excavation pit.
- Proper access should be made for workers, either by providing ladders or cutting steps on the wall of the pit or by any appropriate means. More access/ladders shall be provided at every 15m distance if there are hazards due to underground facilities and in case of normal conditions access/ladder should provided at every 30m distance, when the excavated pit is large.
- Ramp with an angle not more than 15⁰ shall be made if the excavated earth is to be moved by vehicles.
- Proper lighting is required for work at night. Reflectors & caution boards are to be fixed to caution outsiders.
- Electrical cable routing should be laid such that it do not cause tripping hazard.

- Care should be taken that the persons working near by the excavation area may not be hit by moving part of the machine.
- The Dump Truck that shifts the excavated material shall move only after lowering the hull to original position; after completion of dumping the material.

8.2 SHUTTERING

General safety practices to be adopted for shuttering works are as below:

- Shuttering shall be done as per the drawing given and under supervision.
- Before it is cleared for concrete pouring the carpentry foreman shall inspect for the reliability of the shutters.
- While pouring the concrete, persons shall be assigned to keep a watch on the shutters & its supports during major pours; for reliability.
- Employees should be briefed the proper handling of the shuttering materials.
- Shuttering oil should be applied gently over the shuttering plates. Overdose may make the floor form more slippery. Instruction should be given for NO SMOKING and care for no fire/ hot work occurs nearby.
- Vessel containing shuttering oil should be covered and kept in a safe place to avoid any ignition source come and contact with the shuttering oil.
- Dismantling of shutters is done as per the instruction and supervision of the foreman.
- Tools & nails are to be kept in a toolbox.
- No materials shall be left scattered on the ground. The foreman shall ensure good housekeeping.

8.3 WORK AT HEIGHTS

General safety practices to be adopted for work at height as below:

- Employees deployed for height works shall be selected persons who are experienced and screened by the site management.
- Proper access and working platform should be provided to reach the work spot.
- Workmen shall wear safety belt for works above 1.8m height. The employee shall hook his safety belt once he reaches the work spot.

- All temporary structures erected for the purpose of allowing the workmen to work at heights of more than 2.0 meters above the floor level, must be done in accordance with specified construction rules that may be provided from concerned engineer.
- Workers shall carry tools in a bag.
- On horizontal movements the lanyard is hooked to the static line.
- No materials shall be dropped from height. They should be lowered by a headline. An employee should be posted at ground level to clear and caution person from coming under the lowering material.
- Workers who have acrophobia are proscribed from going to height works.

8.4 CONCRETING

General safety practices to be adopted for concreting works are as below:

- Safety helmet, gloves, and gumboots shall be used during work.
- Eating or drinking or keeping foodstuff near the machine shall not be allowed.
- Only authorized operator shall work on mixer machine. Nobody shall be allowed to work near mixer machine with loose clothing. Moving parts of the machine shall be guarded.
- The access from the point where concrete is supplied to the area to be concreted shall be properly made and free from obstructions.
- Before starting the concrete works the formwork engineer or foreman shall check the reliability of the formwork done and give approval for concreting.
- While carrying out floor/ slab-concreting planks shall be placed on the rebar's tied for safe movement of the employees.
- Movement of the employees and concreting process shall be predetermined and informed to the concreting gang.

8.6 DE-SHUTTERING

General safety practices to be adopted for de-shuttering works are as below:

- The area should be closed.
- Signaller shall be deputed to stop the unauthorized entry.
- All workmen shall wear PPEs. Lifeline shall be provided wherever required.
- The material is lowered by rope. Throwing of material is strictly prohibited.
- Tools and tackles with test certificate are used.
- For bigger load, the tag line should be used for guiding the load.

8.7 RIGGING

General safety practices to be adopted for rigging operations are as below;

- Know the safe working load of the equipment and the tackle being used. Never exceed this limit.
- Examine all hardware, equipment, tackle and slings before using it and destroy defective components.
- Caution must be exercised when working near overhead power lines. Minimum safe distance should be maintained.
- Hoist lines shall be in plumb at all times.
- Rapid swinging of suspended loads also subjects the equipment to additional stresses, which can cause collapse. Load must always be kept directly below the boom point or upper load block
- The rated loads of most hoisting equipment do not generally account for the weight of hook blocks, hooks, slings, equalizer beams, material handling equipment and other elements of lifting tackle. Their combined weight must be subtracted from the load capacity of the equipment to determine the maximum allowable load to be lifted.
- Never use damaged slings or hoistropes.
- Sharp bends, pinching and crushing must be avoided.
- Never allow wire rope to lie on ground for any length of time or on damp or wet surfaces, rusty steel or near corrosive substances.
- Avoid dragging rope slings from beneath loads.
- Keep all ropes away from flame cutting and electric welding operations.
- Never wrap a wire rope completely around a hook. The sharp radius will damage the sling.
- Ensure that the sling angle is always greater than 45° . If horizontal distance between the attachment points on the load is less than the weight of the shortest sling leg, then the angle is adequate one. In this case angle is greater than 60° .
- When using choker hitches, do not force the eye down towards the load once tension is applied. Rope damage is inevitable.
- All loads must be rigged properly to prevent the dislodgement of any part.
- The load must be kept under control at all times.
- Loads must be safely landed and properly blocked before being unhooked and unsung.
- Lifting beams should be plainly marked with their weight and designed working loads and should only be used for the purpose for this they were designed.
- Hoist rope must never be wrapped around the load.
- Keep hands away from pinch points as the slack is being taken up.
- Wear gloves when handling wire rope.
- Avoid impact loading. Lift the sling gradually until the slack is eliminated.
- Never ride on a load that is being lifted.

8.8 GAS CUTTING

General safety practices to be adopted for gas cutting works are as below:

- Wear protective clothing, gauntlets and eye protection;
- Shut off the blowpipe when not in use. Do not leave a lighted blowpipe on a bench or the floor as the force of the flame may cause it to move;

- Clamp the work piece, do not hold it by hand;
- Keep hoses away from the working area to prevent contact with flames, heat, sparks or hot spatter;

The following safety precautions will help to prevent fire

- Move the work piece to a safe location for carrying out the hot work process;
- Remove any combustible materials (such as flammable liquids, wood, paper, textiles, packaging or plastics) from within about 10 meters of the work;
- Ventilate spaces where vapors could accumulate, such as vehicle pits or trenches;
- Protect any combustible materials that cannot be moved, from close contact with flame, heat, sparks or hot slag. Use suitable guards or covers such as metal Sheeting, mineral fiber boards or fire retardant blankets;
- Use guards or covers to prevent hot particles passing through openings in floors and walls (doorways, windows, etc);
- Maintain a continuous fire watch during the period of the work, and for at least an hour afterwards;
- Keep fire extinguishers nearby.

The following safety precautions will help to prevent leaks:

- Keep hoses clear of sharp edges and abrasive surfaces or where vehicles can run over them;
- Do not allow hot metal or spatter to fall on hoses;
- Handle cylinders carefully. Keep them in an upright position and fasten them to prevent them from falling or being knocked over. For example, chain them in a wheeled trolley or against a wall;
- Always turn the gas supply off at the cylinder when the job is finished;
- Maintain all equipment and keep in good condition;
- Regularly check all connections and equipment for faults and leaks.
- Always provide adequate ventilation during welding and cutting operations;
- Store gas cylinders outside whenever possible or in a well-ventilated place;
- Avoid taking gas cylinders into poorly ventilated rooms or confined spaces.
- Never allow oil or grease to come into contact with oxygen valves or cylinder fittings;
- Never use oxygen with equipment not designed for it. In particular, check that the regulator is safe for oxygen and for the cylinder pressure.

The following safety precautions will help to prevent flashbacks

- Use the correct lighting up procedure. Purge the hoses before lighting the blowpipe to remove any potentially explosive gas mixtures. Use a spark igniter and ignite the gas quickly after turning it on;
- Ensure the blowpipe is fitted with Flashback Arrestors on Both End (Near Regulator and Torch) to prevent a backflow of gas into the hoses;
- Use the correct gas pressures and nozzle size for the job.
- Maintain the equipment in good condition.

If a flashback does occur

- Immediately close the cylinder valves, both fuel gas and oxygen, if it is safe to do so. The flame should go out when the fuel gas is shut off. If the fire cannot be put out at once, evacuate the area and call the emergency fire services.
- The blowpipe, hoses, regulators, flashback arresters and other components may have been damaged. Check carefully and replace if necessary before reuse. If in doubt, consult the supplier.

8.9 ELECTRIC ARC WELDING

General safety practices to be adopted for Welding works are as below:

- The frame or case of the welder shall be properly grounded.
- A safety-type disconnecting switch or controller shall be located near the machine.
- The welder or welders shall be protected by a properly sized fuse and circuit breaker on an independent circuit.
- Welding shall be done in an area with adequate ventilation.
- Connection of the welding cable with the output pole of the welding machine shall be suitably done with proper fittings. Welding joints shall be made using ferrule and the joint shall be insulated.
- Electrode holder shall be of good quality with proper insulation .The welder should never be allowed to weld when he is wet. Usage of proper personal protective equipments shall also be ensured.
- Apron and Helmet with welding screen shall be used by the welder Adequate ventilation shall be ensured at the area.
- Combustible and inflammable materials shall be removed from the place where welding is to be done. Oil or Paint Drums (empty or with contents) shall never be kept in the vicinity of the welding area.
- Welding cables shall not be laid along with other electrical cables as; they may damage insulation of other cables.
- If hot work-permit is applicable, obtain it before starting welding.

8.10 GRINDING OPERATIONS

General safety practices to be adopted for grinding operations are as below

- Grinding wheels are fragile and sensitive to impacts and shocks. Be aware of this when you handle them.
- The grinding wheels must be handled with care during transportation.
- Store in dry, frost free conditions in special racks or containers.
- Store in moderate and constant temperature.
- Use the wheels held in stock longest first.
- Never exceed the maximum operating speed of the wheel in RPM or /min.
- Make sure that the instructions on the wheel and on the machine are compatible.
- Carefully inspect the abrasive wheels: if they are damaged in any way do not use them.
- Before starting the cutting-off or grinding operation, the wheel guard must be in position and fixed securely.

General Instructions for use:

- Grind and cut only materials for which the grinding wheel is suitable.
- Cutting off: Keep the wheel straight in the cut.
- Grinding: Keep the wheel at an angle of 20-30 degrees with the piece.
- Switch off the machine and allows the wheel to stop completely before placing it on a bench or on the floor

The following safety Personal Protective Equipments are used at grinding operations

- Face Shield
- Ear muffs or plugs
- Gloves
- Dust mask
- Leather apron or safety clothes
- Head cover
- Safety shoes

8.11 MASONRYWORKS

BLOCK WORKS

- The blocks transported to site shall be kept in stacked condition and on leveled, compacted ground level.
- The stack pile of blocks should not be more than 1.5 mtr.
- The blocks should be removed from top to bottom by layer by layer. Never remove blocks opposite to this process it will result in collapse & fall of stack pile.
- Use leather hand gloves to protect hand against abrasion.
- Adequate scaffolding for block work to be erected by Scaffolders.
- The scaffolding shall be tied with ledger pipe support at an interval of every 6 mtrs.
- At least two wooden planks or scaffold platforms to be used as a work platform.
- Barricade the area at ground level, before commencing the block work at height from inside building at floor.
- Ensure no falling of cut pieces of block from height.
- Wear full body harness anchored to the horizontal lifeline while doing work at height from building floor & on Scaffolding on or above 1.8 mtr.
- Clear the broken block pieces and masonry waste on daily basis.
- Only authorized person shall be allowed to use Explosive power hammer.
- Approach to the work platform shall be provided by portable ladder / approach platform from building / Stair tower etc.

PLASTERING

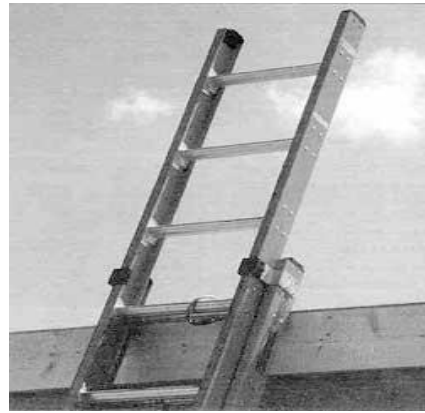
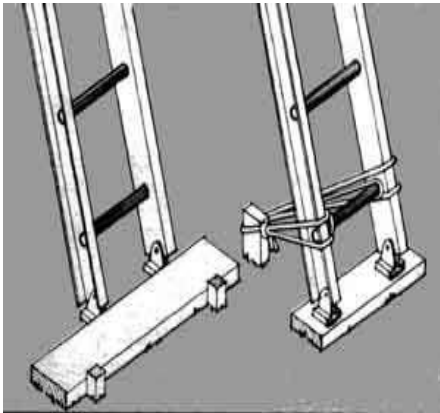
- Proper Work platform shall be provided for plastering work to be erected by Trained Scaffolders.
- The scaffolding shall be tied with ledger pipe support at an interval of every 6 mtrs.

- No material shall be thrown from work height (Working platform).
- All concerned must wear full body harness on or above 1.8 mtrs.
- During plastering activity no bracing should be removed from scaffolding.
- Approach to the work platform shall be provided by portable ladder / approach platform from building / Stair tower etc.
- Horizontal tag line shall be provided to anchor the full body harness lanyard during plastering
- Plastering waste to be cleared from ground level on daily basis.
- Cotton and PVC Hand gloves shall be provided to workmen.
- The work platform must be fully decked. Don't allow any openings & dis-continuity in it.

SAFE ACCESS TO WORK:

General safety access to be adopted for roof Sheeting works as below

- Ladders or any suitable safe access should be provided to reach the roof.
- It shall be secured at top and bottom and projecting 3 feet above the Sheeting.
- At every 50 meters an access is required.



9 Equipment, Machine Related General Safety Requirements

Safety measures to be adopted for major plant & machineries

- The equipments are deployed after obtaining the 'Equipment fitness certificate' from the P&M engineer and the HSE engineer.

DIESEL GENERATOR SET

General safety precaution to be adopted for diesel generator as below

- D.G.set is installed as per the electrical regulations of the country.
- Fuel to be stored away from the D.G Set and the area to be cordoned.
- Foam types of fire extinguishers are installed.
- All rotating parts of the equipment shall be adequately guarded.
- Fueling should be avoided while D.G is in operation.
- All cables shall be double insulated / armored.
- Routing of cables shall be proper.
- Proper earthing shall be provided. Earth resistance shall preferably below 1 ohm.
- Only authorized personnel shall be allowed to operate the generator.
- Smoking shall be strictly prohibited in the area around the generator and fuel storage area.
- The designated operator shall use earmuff in addition to other common PPEs.

HYDRAULIC EXCAVATORS

General safety rules to be adopted for Hydraulic excavators are as below

- Operator holding valid license as per the law of the country.
- He shall always have his valid license and the certificate of the equipment he operates.
- No person shall enter the swing of action of Earth-moving equipment when in operation.
- No Earth-moving equipment shall be started up until all workers are away from the operating radius. The helper shall ensure it.
- The cab of Earth-moving equipment shall be kept at least 1m from a face being excavated.

- Earth-moving equipment shall not travel on bridges, viaducts, embankments, etc., unless it has been found safe for it to do so.
- Adequate precautions shall be taken to prevent Earth-moving equipment being operated in dangerous proximity to live electrical conductors.
- On Earth-moving equipment motors, brakes, steering gear, chassis, blades, blade-holders, tracks, wire ropes, Sheaves, hydraulic mechanisms, transmissions, bolts and other parts on which safety depends shall be inspected daily.
- Earth-moving equipment shall not be left on a slope with the engine running.
- No adjustments, maintenance work or repairs shall be made on equipment in motion.
- Deck plates and steps shall be kept free from oil, grease, mud or other slippery substances.

TIPPERS AND TRAILORS

General safety rules to be adopted for tippers and trailers as below

- Operator shall have valid license to operate the equipment.
- He shall always have his valid license and the certificate of the equipment he operates.
- A driver shall follow the indications given by traffic signs (e.g. - Speed limit, Sharp turn etc.)
- Reverse Horn shall be provided and frequently checked for its proper functioning.
- Trailer shall also be equipped with first aid kit and a fire extinguisher.
- While moving in the public roads the driver shall comply with all local traffic regulations.
- In case of loading or transporting of long materials, such as built up columns or MS rods the projection beyond the sides and end of the bed shall be kept minimum. Suitable precautionary measures such as flags etc shall be provided.
- Materials loaded should be lashed before starting the trailer.

CONCRETE MIXERS

General safety rules to be adopted for concrete mixers are as below

- All gears, chains and rollers of Concrete Mixer should be adequately guarded to prevent damage/danger.
- Concrete Mixer hopper shall be protected by side railing to prevent workers from passing under them and operators shall make sure before lowering the skip that all workers are in the clear.
- Hopper hoisting wire rope has to be checked for its condition periodically.
- Hopper hoist and anchoring brake should be checked/ adjusted.
- Skin hoist clutch to be checked and adjusted while slipping occurs.
- Nothing should be kept inside the Motor enclosure.

- Be sure that Motor fan guard is secured firmly.
- Be sure that wiring is properly connected and insulated.

CONCRETE VIBRATORS

General safety rules to be adopted for concrete vibrators are as below

- Vibrating unit shall be completely enclosed and belt transmitting the power to the unit adequately guarded.
- Electrically operated compactor Vibrators shall be totally enclosed and be protected against overloads by suitable Overload relays and shall be effectively earthed.
- Be sure that sufficient length of cable is provided to the Vibrator.
- Ensure electric starters are fixed firmly on the stand.
- While needle is inserted in the vibrator, be sure needle load is firmly locked.
- Be sure to lubricate needle inner core.

DEWATERING PUMP

General safety rules to be adopted for dewatering pump as below

- Ensure proper foundation is provided for placing water pumps to prevent possible toppling and to avoid vibration.
- The coupling used should be of correct size with proper keyway and keys and the alignment should be perfect.
- Ensure the power supply is switched off before attending any type of repairs on the water pump.
- Ensure all the bolts are tightened properly and keys are placed well before starting the pump.
- Before starting the pump, ensure that there is no unwanted tools left near the pump.
- No cloth or cotton waste or paper shall be allowed to come in contact with the shaft when the pump is in running condition.
- Proper cover should be provided for the motor to prevent it from rain or any unexpected water spillage.
- No loose connection is to be allowed in the water line, especially near the pump. The water may spill on the motor and pump causing damage.
- Proper earthing is a must for electrically operated pumps.

ELECTRICAL EQUIPMENT

General safety rules to be adopted for electrical equipment as below

- Motor, gearing, transmission, wiring and other dangerous parts of hoisting appliances shall be provided with efficient safeguards; hoisting appliance should be provided with such means as will reduce to the minimum, the risk of accidental

descent of the load.

- Adequate precautions shall be taken to reduce to the minimum, the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations, which are already energized, insulating mats, wearing apparel such as gloves and boots as may be necessary shall be provided.
- The workers shall not wear any rings, watches and carry keys or other materials, which are good conductors of electricity.

HAND TOOLS

General safety rules to be adopted for hand tools are as below

- Hand tools shall be repaired by competent persons
- Heads of hammers and other shock tools shall be dressed or ground to a suitable radius on the edge as soon as they begin to mushroom or crack.
- When not in use and while being carried or transported, sharp tools shall be kept in sheath, shields, chests or other suitable containers.
- Only insulated or non-conducting tools shall be used on or near live electrical installations.
- Only non-sparking tools shall be used near or in the presence of flammable or explosive dusts or vapours.

CRANE OPERATORS

General safety rules to be adopted for crane operators as below

- Operator of valid license shall be permitted to operate the crane.
- Operator shall always have his valid license and the certificate of the equipment he operates.
- Certified crane shall only be deployed for the job.
- Assembling, maintenance and disassembling on the equipment shall be done as per the manufacturer's manual.
- Overloading shall never be allowed at site.
- The operator shall ensure the area is good enough for the crane before marching or parking it.
- Crane shall be stationed on a firm level ground.
- Proper boom angle and radius shall be followed to lift the load. Refer the load chart given in the crane manual or fixed inside the crane cabin.
- Cranes shall not be parked near the edges of pit or excavations.
- The swinging area of the crane shall be cordoned. The Crane helper shall ensure no trespasser enters in this vicinity.
- The operator shall have a clear view of the operation through out the hoisting period.
- A trained signaller shall give the signal for crane operation.
- A competent rigging gang shall do material handling.
- Clear passages shall be left for easy handling and transportation structures.
- All persons shall stand clear when a crane is sorting or shifting materials.
- Monthly safety inspection shall be carried out and recorded

Drug and Alcohol Policy

Purpose

The purpose of this policy is to:

- Show our responsibility and commitment to ensure a safe and healthy workplace for all staff.
- Ensure that the staff at SJCPD can work in an environment free of alcohol and drug use or abuse.
- Outline the company's expectations and requirements for creating and maintaining an alcohol and drug free work environment, and for dealing with substance abuse in the workplace.
- Provide an opportunity to staff members with a substance use problem to get well rather than provide grounds to terminate the employment.

Scope

This policy applies, at the workplace, to all staff members of SCC and also includes visitors and subcontractors inside and outside of normal scheduled working hours.

- All individuals working at SCC are expected to report fit for duty for scheduled work and be able to perform assigned duties safely and acceptably without any limitations due to the use or after-effects of alcohol, illicit drugs, non-prescription drugs, or prescribed medications or any other substance.
- Off the job and on the job involvements with alcohol or drugs can have adverse effects upon the workplace, the integrity of our work product, the safety of other staff, the well-being of our staff families, and the ability to accomplish the goal of an alcohol and drug free work environment. The Company therefore wants to emphasize that it has zero tolerance for staff who arrive at work under the influence of alcohol or drugs, and/or whose ability to work is impaired in any way by the consumption of alcohol or drugs, or who consume alcohol or drugs on Company property.
- The Company strictly prohibits the use, making, sale, purchase, transfer, distribution, consumption, or possession of drugs or alcohol on company property. To this end, the Company reserves the right to conduct searches for drugs or alcohol, including, but not limited to, searches of lockers, filing cabinets, desks, packages, etc. which are on Company property or in a Company facility. Any drugs or alcohol found as a result of such a search will be confiscated and the occupant or user of the object searched will be subject to disciplinary action, including termination of employment.

Roles & responsibilities

It is the responsibility of all staff to identify concerns about an individual's immediate ability to perform their job, and take appropriate steps. Where necessary, they will advise a supervisor who

will remove any staff member who is suspected of breaching this policy from Company premises, pending investigation and a decision on appropriate consequences including potential disciplinary action.

Here is some guidance on how to administer this policy; however, not every situation can be predicted.

1. If a staff member, visitor or contractor arrives at the workplace, (on company property) and you have reasonable cause to suspect that they are under the influence of alcohol or drugs, the supervisor shall immediately remove him/her from the work environment. If you have any doubt about whether they are, or are not impaired, you should err on the side of caution and remove him/her from the work environment.
2. Unexpected circumstances can arise when an off-duty staff member is requested to work. It is the staff member's responsibility to refuse the request and ask that the request be directed to another person if the member feels unfit due to the influence of alcohol or other drugs.
3. Staff who are prescribed medication are expected to ask their doctor if the medication will have any potential negative effect on job performance. They are required to report to their team leader if there is any potential risk, limitation or restriction for whatever reason that may require modification of duties or temporary reassignment, and provide appropriate medical verification on any restrictions in performance of their duties.
4. If a staff member or contractor believes an employee in a more senior position is in violation of this policy, they are encouraged to get a second opinion where possible. They are also expected to notify any other senior manager.
5. In support of those who may have developed or are developing the disease of chemical dependence, all employees and contractors are required to document and report any violations of this policy. Any staff member, co-worker, contractor or supervisor not complying with this is enabling the dependence. Enabling behavior leads to ongoing health and safety concerns for an addicted individual and those around him or her.

Disciplinary Procedure

The disciplinary procedure will follow a three step progression:

1. Warning with 1 week suspension
2. Warning with 2 week suspension
3. Termination

11 Emergency Response/Evacuation /Action Plan

Purpose and Scope:

A disaster is occurrence of an incident that is undesirable and unexpected. At workplace when such an incident take place it will be of such magnitude that it will create a situation in which normal pattern of life within it, will be get suddenly disturbed. It will have advance effect on persons, environment and property within complex or outside the premises also. Accidents can be due to lack of awareness, training, proper equipment or negligence leading to damaging effects.

Therefore it is essential to be prepared the Emergency Plan. Mock drills for regular interval to minimize incident effect and to save human life.

This on site Emergency Plan is applicable to All SCC Construction Project.

Objective:

- Safeguard lives and property at site and in its neighborhood;
- Contain the incident and bring it under control;
- Minimize damage to lives, property and environment;
- Rescue and treat casualties;
- Evacuate people to safe areas

Any incident which occurs without any prior warning / intimation, which may result in loss or damage to life, property or both

DEFINITION:

- Chief Controller: Person who will be overall controller (In charge) of emergency situation.
- Dy Chief Controller: Person who will assist Chief Controller and coordinate with Emergency Team during emergency situation.
- Person who will communicate with all employees, police, Fire Brigade, Ambulance, medical help and with media during the emergency situation.
- Fire Fighting Team: Trained fire fighter team.
- First Aid Team: Trained First Aid team.
- Rescue Team: Person who will evacuate people toward assembly point.

- Assembly Point Team: Head Counting at Assembly point & report to site controller.
- Security In-charge: Traffic Control & Alarm Activate during Emergency.
- Electrical Assist: Shutdown the electric supply & report to assembly point in-charge.

Types of Emergencies anticipated:

- Personal Injury(s).
- Fire
- Fall of Scaffolding and Shuttering Material
- Soil collapse
- Earthquake
- Medical Emergency
- Spillage of Chemical/ Fuel
- Vehicle Accident
- Fall from height.

Method:

The first step in the process is to establish an Emergency Planning Team (EPT) and provide it with the authority, resources and purpose for its existence.

The EPT is a cooperative and consultative group who should represent the full of stakeholders in a facility and will typically comprise of senior management, tenant, staff and special such as building engineer / manager.

The EPT does not necessarily have an operational role in an emergency. During the planning process the EPT identifies the role and likely participants of the emergency control team (ECT). The ECT is the doing team who will implement the plan and procedure during an emergency.

The EPT requires management involvement as the work carried out by the EPT will override normal construction activities in the event of an emergency. Management should initially drive the process but may find it useful to assign roles to other members of the committee. Through this process the EPT is authorized to carry out its duties and this will be assisted by the creation of a policy statement from senior management.

Roles and Responsibility:

EPT is responsible for:

- Establish and implement Plans and Procedures.
- Determine the resources (Human & Equipment) required carrying out the Emergency plan.
- Ensuring all identified roles are filled well trained and capable persons.
- Ensuring exercise of the emergency plan is carried out and effectiveness reviewed and any changes in plan and procedure that are identified and made.

Chief Controller:

- Site in-charge /Project Manager will be in charge of the total Emergency situations.
- Assessment of the situation from reports

Dy. Chief Controller

- Will take complete charge of operation in the absence of the Chief Controller.
- Take feed back from site controller.
- Communicate to Chief controller.

Communicator

In the event of an emergency communicate with employees in the following way.

- Call of Emergency Vehicle.
- Call the medical help.
- Communicate with Chief Controller.

Fire Fighting Team

- In case of fire: site controller will inform to the Dy. Chief Controller about the fire incident.
- Dy. Chief Controller will analyze the severity and then if required will inform to the Chief controller.
- Chief controller will inform to security to activate the first emergency siren.
- On hearing the emergency siren the group leader establishes communication with the Chief-controller and start handling the emergency directly.
- Team takes the help of Security Team to cordon off the affected area.
- Group leader evaluate the incident situation and give feedback to the team and Dy. Chief controller.
- If fire is under control team leader control the fire by suing available fire equipments.

- If fire is not under control and spreading, then fire team leader ask to chief controller to activate the evacuation alarm.
- In case of evacuation: Position the team at the site area and guide people to evacuate and processed towards assembly point. .
- Make a complete survey of the site to make sure nobody is left behind. This will include all toilets, service areas and site office.
- The leader ensures that he and his team members wear the necessary Personal Protective Equipment while searching for missing personnel.
- Continuous communicate to the Chief Controller, and give feed back of EmergencyPoint.

Rescue Team

- In case of evacuation: Position the team at the site area and guide people to evacuate and processed towards assembly point. .
- Guide the visitors / contract labors outside the emergency zone.
- Make a complete survey of the site to make sure nobody is left behind. This will include all toilets, service areas and site office.

First Aid Team

- To attend person/s requiring first aid.
- To bring the first aid box to Assembly point.
- In case if casualty, shift affected people to the safe area or to the assembly point.
- Communicate with Assembly point incharge and give head count report.
- Report status of casualty/s (if any) to the Chief Controller.

Assembly Point In-charge

- To collect attendance list from control center staff and take head count.
- Report head count total to Site Controller.
- Assist Overall In-charge.

Electrical Shut Down In charge.

- Electrical Engineer will Shut down the electrical supply during the emergencies (If required)
- Proceed to the assigned Assembly Point.
- Report status of shut down to Assembly Point in charge.

Handling Emergency:

Sequence of reporting /receiving & attending Emergencies during working Hrs:

- In case of emergency area site engineer check the incident point and inform to the Chief Controller about incident.
- After assessment of the incident, Chief Controller takes decision for evacuation. In case of evacuation situation, following are the step:
- Through the Electrical Alarm System / dedicated telephone (Phone. No-----) Security to raise an alarm (Electrical Fire Alarm System).
- After hearing First Siren People are alert, Stop Work & reach at Safe Place.
- After hearing Second Sire all people must proceed to area assembly points.
- On hearing the emergency siren, Emergency Planning Team assembles at emergency control center i.e. First Aid Room or Site Specific ECC Room.
- The actions related to handling the emergency are taken under the guidance of the Site controller.
- After assessment of the emergency situation, chief controller has to take decision for outside help like medical, Police etc.
- Chief Controller has to take over emergency control and instruct first aider, rescue team, external help for doctor, ambulance, accordingly.
- A quick head count is carried out by Assembly Point Leader at assembly point to confirm that no person is trapped at the effected place of emergency.
- The actions/procedure for handling the emergency will differ depending upon its nature and the severity. First aid is given to the injured by the nominated persons(s) and if required, immediately evacuated to the hospital.
- After the EMERGENCY is over the Project manger will take overview of the situation and finally blow Siren for the **ALL CLEAR** signal.

Personal Injury:

The following actions will be taken for personnel injuries.

First aid Cases (Recordable but not reportable)

- If a minor injury happens, the site supervisor informed to the first aider/site safety supervisor.

- A qualified first aider attendant the injury immediate and temporary medical care provided to the injured workers at site.
- Record the injury status.

Reportable/Medical Cases

- If a Reportable/Medical Cases injury happens, the site supervisor informed to the Chief Controller(s) /first aider/site safety supervisor.
- The Chief Controller(s), designee, will be notified of the injury(s) & location of injuries.
- A qualified first aid attendant will administer first aid until medical assistance arrives;
- All key supervisors will be called and advised of the injury;
- For off-site assistance, the Chief Controller(s), or designee, will meet the emergency responders at a ECC room and direct them to the location of the emergency;
- If an employee become injured and require off-site medical transportation, they will be accompanied by a Project representative to give the information.

Fatality

- Site engineer/Site Supervisor/Safety Representative Communicate with the Chief Controller(s) about the fatality.
- The Chief Controller(s), designee, will be notified of the incidents(s) & location of incident.
- After assessment of the incident, Controller take decision for evacuation.

Emergency Control Centre:

The Emergency Control Centre is: EMERGENCY CONTROL CENTRE (ECC) – (First Aid Room) -

All information should first be given to this center and instruction will be issued from here.

Following documents are available in Emergency control center

- A copy of **ON-SITE EMERGENCY PLAN**

- List of Emergency & Important telephone numbers.
- List of key personnel with telephone numbers.
- List of Fire and Rescue (First Aider) team.
- Details of Fire extinguisher.
- And other ECC material as per attached list.

Identification of Correct Fire Equipment Plan:

REASON OF GENERATION OF FIRE	TYPE OF FIRE EXTINGUISHER					CLASS OF FIRE
	WATER/ CO2	HALON/ DCP/FO AM	ABC	AFFE TYPE	SAND	
Burning wood, paper, textiles		-		-	-	A
Burning cotton, oil, solvents, petroleum products, paints	-					B
Burning LPG, gaseous substances under pressure	-	-		-		C
Fire involving metals	-	-	-			D
Electrical short circuit.	CO2			-		E

Points to Remember:

1. Check all the types of fire extinguishers which are placed as per the area requirement.
2. Check all fire extinguishers are well maintained and due dates are highlighted on the cylinder.

DO'S and Don'ts

Do's:

- Follow all instructions as per Onsite Emergency plan.

- On spotting the emergency situation, inform Chief Controller and mention your Name and Location of Emergency.
- After listening to the emergency siren, follow the Supervisor's instructions.
- Arrange to collect fluorescent jacket & helmet and move towards the emergency location.
- No person shall work at emergency site without identification & proper PPEs.
- Guide the visitors / contract labors outside the emergency zone.
- Only qualified first-aiders shall provide first-aid before the injured is removed to the doctor.
- Co-operate with Security Supervisor to enable him to take a quick head count.

DONT'S

- Do not panic.
- Do not communicate with any external agency, unless instructed.
- Do not spread rumor
- Do not keep any telephone engaged for a long time.
- Do not approach the emergency site as a spectator

11 MONSOON SEASON

ACCESS:

- Access to be cleared from other obstacles.
- Ensure roads and pathways are cleaned and all pit holes are filled.
- Inform to all use handrails while using staircases.
- High level of cleanliness to be maintained for working & lay down areas

LIGHTNING:

- Ensure structures near Shelters are earthed for lightning protection.
- Don't allow to work at outside of building during lightning, all are should come to Shelters which is available near the work area.
- No loitering in open area during lightning.
- Avoid using the mobile except for emergency.

DURING RAINING:

- All height jobs in open area to be stopped during rain & gusty atmosphere.
- To be used appropriate PPE's like gum boot & rain coat.
- All personnel should use marking pathways only.
- Inform to all personnel don't run at site.
- Water logging inside the premises are to be cleaned on priority basis.
- Proper protection and ventilation to be provided (Shelters/ building)
- Ensure rain protection Shed for welding and gas cutting operations.
- Make non slippery surface such as lopes entrances or staircase
- If wet surfaces means ensure warning visual.

ELECTRICITY:

- If any cable Laying on water don't touch and inform to concerned electrician persons/supervisors.
- Ensure cable route maintain with insulation in all area.
- Ensure DBs are provided with flooring and proper Shed to avoid in going of water.
- Ingress of water into cables joints, immediately shutdown all electrical equipment's.
- Wiring joints must be properly insulated with good quality tape to avoid electrocution due to leakage.
- If water is accumulated in the dug pit then dewatered the pit by the certified pump, which is been run by the electrician taking all necessary precautions.
- Electrical equipment like cutting m/c, welding m/c, drilling m/c, and etc.....are taken care off from water to prevent from electrocution.

SCAFFOLD:

- Inspect all scaffolding materials, Shuttering materials, waste spoil particular on construction site and shoring daily by the competent person to avoid any incident on site.
- More frequent checks on scaffold bases, bracings, support (out rigger) and etc....

EXCAVATION:

- Don't allow to start any excavation work during rains.
- Proper hard barricading to be provided for excavation.
- Inspect all the Excavated pit/Trenches Prior to Start any Work as per standard Format.

GENERAL:

- Always ensure availability of first Aid kit.
- Scrap metal pieces are to be taken care off particularly in water logging. Sharp metal edges may cause injury to the persons passing through this area.
- Frequent maintenance of toilets and urinal.

FOOD WASTE MANAGEMENT:

- All personnel to be taken their food in allocated area. (Rest room/canteen)
- Ensure availability of two food waste bins nearer the rest room/canteen.
- Strictly inform to personnel to drop the waste food into the waste food bins.
- Arrange try inform of water tank for wash the plate to avoid water spillage on ground.
- Plates should be washed only allocated area.
- Food waste bins to be removed on regular basis to avoid hygienic problems.

VEHICLE:

- Check the tire conditions.
- Ensure proper functioning of the break system.
- Check breaks oil.
- Replace old or brittle wipers. Ensure both the wipers; Signal light and tail lamp are in working condition.

LABOUR CAMP:

- Ensure regular Sewage collection and disposal at labour camp and sites to prevent foul smell and health hazard.
- Camp area shall be fenced and security lighting be installed.
- All housing units must be of good quality and condition.
- Accommodation units must be cleaned on a regular basis and all waste disposed of into segregated waste skips with doors.
- Garbage and waste food collection yard should be set away from living area.
- Regular fogging & pest control is required to prevent from epidemic diseases.
- Clear all water drains in and around labour camp. Provide covering on open drains.
- The camp shall have adequate drainage to eliminate monsoon rains and units shall be elevated to eliminate water ingress.
- Secure all GI. Sheets to prevent from flying off in case off stormy & gusty wind.
- Prevent contamination of drinking water.

- All units must be electrically powered and all temporary electric connections must be routed through ELCB`s installed on distribution boards/boxes and checked regularly .Lighting is required in each unit.
- Ensure proper cable management and proper distribution of current load to prevent fire by over loading of wiring.
- Ensure all cables /wires are not laid on G.I. Sheet partitions/sharp edges/holes within G.I. Sheets to prevent damage to cable insulation. Route the cable on ceiling through conduits pipes for lighting, this would avoid misuse of electricity and protection against electrical shock and fire hazard. The common switching arrangement made separate and electrician will be overall control authority.

