HSE PLAN

Definition & Abbreviations

Work Sites
The places where the worker is or from where or to where he is going in light of his work, in which he is directly or indirectly subject to employer control or; Any and all physical locations where activities related to the work under the organization's control are carried out (OHSAS 18001).

Site yards
The locations where building construction and civil engineering works are carried out, as well as locations where activities of direct support to those works take place. Incident: Event(s) related to the work which, regardless of its (their) seriousness, Cause or could cause health damage (OHSAS 18001).

Accident
Incident that leads to injuries, health damages or a fatality (OHSAS 18001).

Work Accident
A work accident is an accident that takes place at the work site and during work time, which directly or indirectly produces body injury, functional impairment or illness, which lead to reducing work or earning capacity or causes death).

Near Miss
An incident that has resulted in no actual harm to people, the environment, facilities or equipment, or reputation.

Health Damage
Identifiable and adverse physical or mental condition resulting from or as consequence of executing the work and/or a situation related to the work (OHSAS 18001).

Fatality
A death resulting from a Work Injury, or Occupational Illness, regardless of the time intervening between injury/illness and death.

Hazard

Source, situation or act with a potential of causing damage in terms of injuries or health, or a combination of both (OHSAS 18001).

Hazard
Hazard Identification. Process for recognizing an existing danger and defining its characteristics (OHSAS 18001).

Risk
Combination of the probability of the occurrence of a dangerous event or exposure(s) and the seriousness of the injuries or health damages, which may be caused by the event or exposure(s).

Acceptable Risk
Risk that was reduced to a level that may be tolerated by the organization taking into account its legal obligations and its H&S policy (OHSAS 18001).

Environmental Aspect
An element of an organization's activities, products, services or processes that can interact with the environment.

Significant Environmental Aspect
An aspect that has or can have a significant environmental impact.

Environmental Impact
Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects

HSE
Health, Safety, Environment

HSE-Critical Task
Tasks that are undertaken to provide or maintain controls for major hazards.

LTI
Lost Time Injury. Sum of Fatalities, Permanent Total Disabilities, Permanent Partial Disabilities, and Lost Workday Cases.

LTIF
Lost Time Injury Frequency. The number of Lost Time Injuries per million man-hours worked during the period.

STOP
Safety Training Observation Program

TRC
Total Recordable Cases. The sum of Fatalities, Permanent Total Disabilities, Permanent Partial Disabilities, Lost Workday Cases, Restricted Work Cases and Medical Treatment Cases.

TRCF
Total Reportable Case Frequency. The number of Total Reportable Cases per million Exposure Hours worked during the period.

LSR
Life Saving Rules

CONTENTS

1. Introduction & Objectives

Queen Topaz International Construction's vision clearly encompasses its focus to improve the Quality and Safety standards as well as Work Environment. The same approach is reflected in its every process from Marketing to the Project hand over.

QT is an ISO 9001:2008 certified company which ensures all the Standard Operating Procedures, Department level Procedures, Work Instructions, Method Statements & formats are available for all the key processes.

HSE infrastructure consists of its management and execution team (reporting to the Top Management) along with the well-defined HSE Manual. It is training & inducting every employee on HSE Awareness before they start their job. This supports our sustainable HSE performance for Zero Loss Time Injury.

The general objective of the HSE Plan is to ensure that the company has in place all the necessary elements to achieve Goal zero and execute all operations under the contract at a risk level considered as low as reasonably practicable (ALARP). This is achieved by

- Improving safety awareness throughout organization and its contractors.
- Finding better and more effective ways to communicate with the workforce on health and safety matters.
- Reducing the risk of accidents occurring and eliminate injuries through committed line management.
- Preserving and protect Oman's natural and working environment.
- Building an HSE infrastructure within the company which will educate, support and monitor all aspects of occupational Health, Safety and Environmental consciousness within the company.

- Promoting the message that the Health and Safety of employees are just as important to its management as any revenue generating activity.
- Developing a culture in which employees and contractors share a common commitment to safe working practices at work and at home.
- Providing resources and training to achieve an HSE performance that our shareholders, customers and employees can be proud of.
- Promoting individual accountability and general acceptance of line management responsibilities throughout the company.
- Enlightening staff, employees and contractors in hazard identification, management and control and empowering them to stop work if they consider any job unsafe.

2. Leadership and Commitment

HSE plan is endorsed by the company Managing Director. The Managing Director endorsement invokes the company's requirement that all company personnel shall recognize and acknowledge their obligations and duties in respect of HSE matters endorsed in this HSE plan.

The Management of HSE matters shall be evolved through the operational management and supervisory structure. Managers and supervisors have responsibility and accountability for HSE matters, which equate to their operational roles.

The company employs dedicated professional HSE personnel whose principal role shall be to advise and make recommendations on all HSE matters. The employment of professional HSE personnel does not reduce or modify the responsibilities of line managers, supervisors or other employees towards HSE. Line management shall demonstrate their commitment to HSE by personal example and by a pro-active approach in promoting HSE principles and practices.

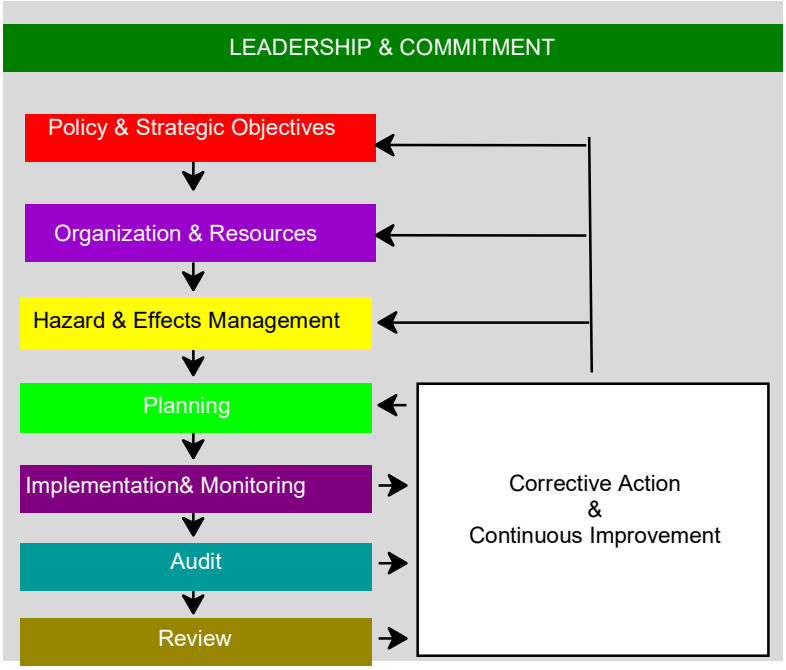
2.1 Visible Management Commitment

A program of visits by Senior Management will be carried out to assess, promote, and maintain levels of understanding, application and effectiveness of HSE management and practices with personnel at all levels.

Management will maintain and demonstrate its commitment to Health, Safety and Environment protection by regular visits to work sites, monitoring progress on HSE matters by inspections, audits, HSE meetings, promotions and incident investigation, etc.

Action Items Leadership & Commitment			
No.	**Action**	**Action By**	**Frequency**
2.1	Provide immediate and visible involvement in incident investigations and reviews	GM / HSE Department	Continuous
2.2	Review and if necessary instigate improvements to the HSE Management System	GM / HSE Department	Annually
2.3	Roll out the Play safe scheme throughout the company	GM / HSE Department	Monthly

The HSE plan will follow the same structure of 8 sections based on the company's Management System. The template enables the HSE plan to focus on corporate HSE objectives as well as specific departmental weaknesses; the 8 elements are as follows:



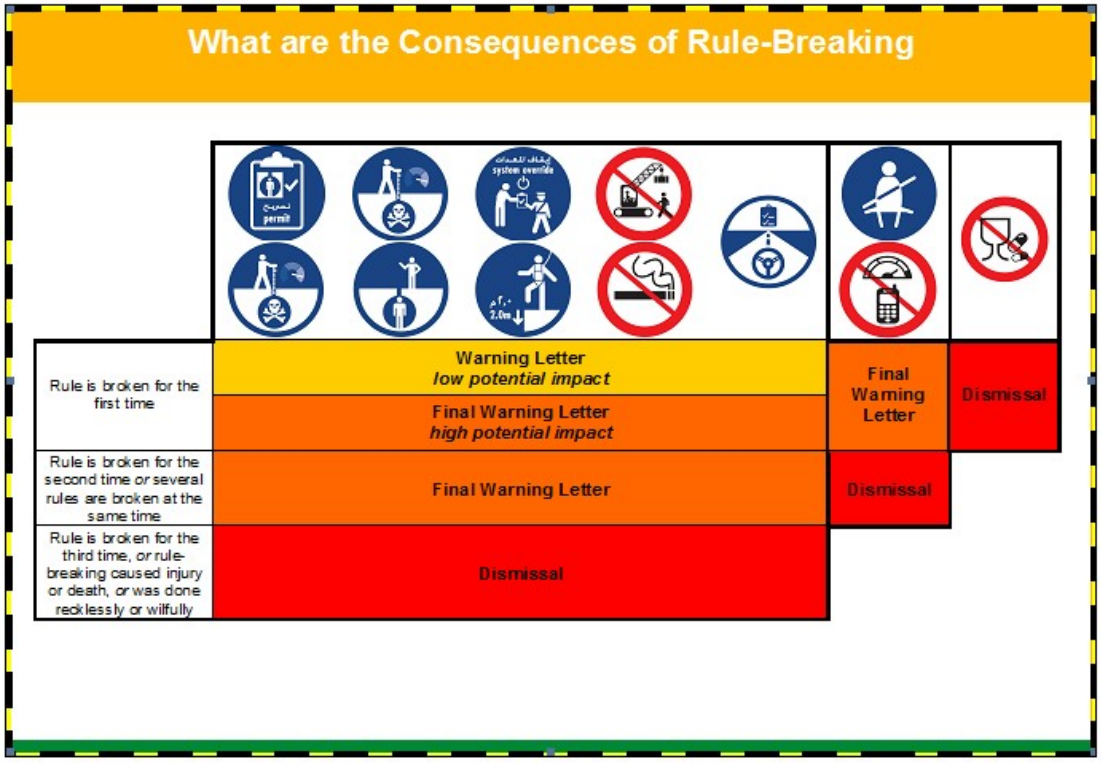
2.2 Our Focus

Our general focus will be to review our operations in order to ensure those contractual specifications, and standards described in the Company, and our contractors HSE management System (and associated reference manuals) are being adhered.

Therefore Adherence to Life Saving Rules besides Golden Rules is the HSE theme for the coming years. We are also looking at ways to proactively change our workforce's behavior and attitude approach to safety at work by addressing the following areas:

- Compliance with the LSR
- Compliance with basic rules and regulations.
- Competence of HSE Critical staff.
- Communication
- Commitment (Every employee has HSE Accountability)
- Controls (Risk Assessment on all activities)
- Continues improvement on road safety with IVMS
- Road Safety Awareness.
- Supervision.

LIFE SAVING RULES AND CONSEQUENCE MATRIX



3. Guidelines for Project Level HSE Plan

This procedure is being released with the purpose to lay down the guidelines for the preparation & implementation of Health, Safety & Environment (HSE) plan for the subject project. This will help project team to understand the hazards involved in the project & be prepared proactively to eliminate such hazards by planning the HSE requirements.

3.1 Project Level HSE Management Principles

QTC believes that the following are the pillars of the successful project:

- Customer Driven Quality
- HSE Compliance
- On Time Delivery
- Within budget

Hence, without HSE compliance, even though other pillars are achieved AKC projects are not successful. It also means that HSE noncompliance can damage other pillars including the image & brand of the company.

3.2 Project Specific HSE Plan will address the following parameters

- Policy Statement
- Project Scope
- Organization & delegations
- Risks & Standards
- Resources & Competence
- Coordination & Communication
- Monitoring Systems

3.3 Project Level HSE Deliverables

- Monthly HSE Return
- Inspection Report
- Training Report

3.4 Reference

a) Contract Requirements/Tender Specifications
b) Customer's / Consultant's guidelines, where ever applicable.
c) QTC HSE Manual
d) OHSAS 18001
e) Any Other Local Authority Safety Regulations/ Legislations.

4. Project Level HSE Policy Statement

AKC HSE Policy will remain applicable AS IT IS for this project.

4.1 Project Level HSE Objective

- On Time submission of HSE Plan to the client / consultant
- Approval in minimum revisions
- Minimizing the HSE related observations during the execution.
- Zero LTI (Lost Time Injury)
- Specific measures for special risks
- Information and training for workers

4.2 Performance Indicators

S#	HSE Objective	Target	1st Level Responsibility	2nd Level Responsibility
1	Number of Loss Time Incidents	Zero	Site In charge	Project Manager
2	Compliance to HSE procedures As per AKC HSE Manual.	100%	Site In charge	Project Manager
3	Submission of HSE Reports & other documents	On Time	HSE Officer	HSE Manager
4	HSE Training to Project Staff	As per Target Plan	HSE Manager	Project Manager
5	No of complaints from Auditors, clients, consultants, society & legal authorities.	Zero Complaints	Site In charge	HSE Manager

The reports of the above objectives will have maintained at the site & will be reviewed by the Top Management for monitoring the performance.

5. Project Scope

Ccompliance by all collective or individual entities present at the site-yard and at the site is compulsory. They are, namely:

- All direct and subsequent subcontractors.
- All Engineers and supervisors involved.
- All workers involved.

All individuals will be responsible for:

- Ensuring compliance with the regulations set forth in the present document.
- Complying and ensuring that all the collective or individual persons it hires comply with the present document.
- Guarantee, whenever necessary and/or justifiable, changes, adjustments and amendments to the present HSEP.

The HSE Plan will be submitted to the client / consultant prior to starting the site activities to seek their approval.

5.1 Scope of Work

Scope of Work are included but not limited to following items:

- Site Mobilization;
- Site surveying and all other activities related to it;
- Preparation of Method Statements for Client's approval

- Sites Preparation;
- Preparation of shop drawings
- Providing all necessary resources such as machineries, equipment and man power as well as necessary facilities to meet contractual obligations
- Supply of approved materials and equipment;
- Execution of all foundations, structures, civil and finishing works related to Ancillary Building along with external works with approved technical drawings, specifications and standards. With approved BOQ rates, Technical DWG and Contract specification.
- Cooperation for Inspection and surveillance;
- Submitting Project detailed time schedule (Construction program) for Client's approval
- Preparation of monthly reports as well as actual physical progress based on approved work breakdown structure (WBS).
- Utilizing all required resources and performing all necessary tests to prove quality of equipment's / materials and quality of different part of work in accordance with project technical specifications, related standards, Engineer recommendation etc.
- Keep clean the site and work area continually;
- Performing Quality Control activities, technical supervision and obtaining the inspection certificates and approvals from Client/Engineer
- Performing all activities with fully consideration of HSE rules and obligation
- Delivery of all work steps to Client/Engineer.
- Preparation of As built Drawings
- Site Demobilization.
- Removing all defects and providing guarantee services during guarantee period.

5.2 Activities

- On the award of the new contract / project, Head of the department will identify the experienced project team, depending on the nature of the job.
- Adequate enquiries to be made with the client at the tender stage/kick off meeting stage to identify any site specific hazards, work permits including any statutory & legal issues applicable to the site area.
- The Project Manager shall go through the customer's Tender Specifications & other guidelines related to the HSE aspects of the job and there influence to execution methodology of the project.
- Project programme can be referred to understand if any key milestones that might influence the safe execution of the project
- HSE related customer's requirement will be shared with the HSE Manager/ HSE Officers.
- HSE Manager should ensure that there is a clear specification available that identifies each of the work packages required.
- Project Manager will be responsible to prepare the HSE Plans with the Project Manager's inputs as per project requirement.
- Project Manager will submit the HSE plan to Project Manager for his review.

- If required, then necessary communication will take place between Project Team & HSE Team to finalize the HSE Plan before it is submitted to the customer / consultant to seek their approval.
- Customer / consultant may Reject / Comment or approve the HSE Plan after their review.
- HSE Manager may interact with the customer / consultant to obtain approval of the HSE plan if the client has any doubts.

5.3 Responsibility and Authority Matrix

Document	Prepared By	Reviewed By	Approved By
HSE Plan	Project Manager	HSE Manager	Client
Risk Assessments	HSE Officer	Project Manager	HSE Manager
Job Safety Environment Analysis	HSE Officer	Project Manager	HSE Manager
Customer's HSE requirements	Project Manager	HSE Manager	General Manager
Resource Requirements	Project Manager	HSE Manager	General Manager

HSE Plan, once approved by the customer / consultant, the copy will be distributed to the following members:

- Client / Consultant (the no of copies as required by them)
- Site Office Copy (with Project Manager)
- Site Copy (with site HSE Officer.)
- Corporate Office copy (with General Manager)

- The site team will be explained & trained on HSE Plan & how to implement it at the site. Site HSE Officer & Site Incharge / Site Engineers will be responsible for this.
- Project Manager will confirm to the HSE Manager on the effective implementation of the HSE Plan at the site.
- HSE Manager/ General Manager will verify & examine the effectiveness during his Site visit / audit.

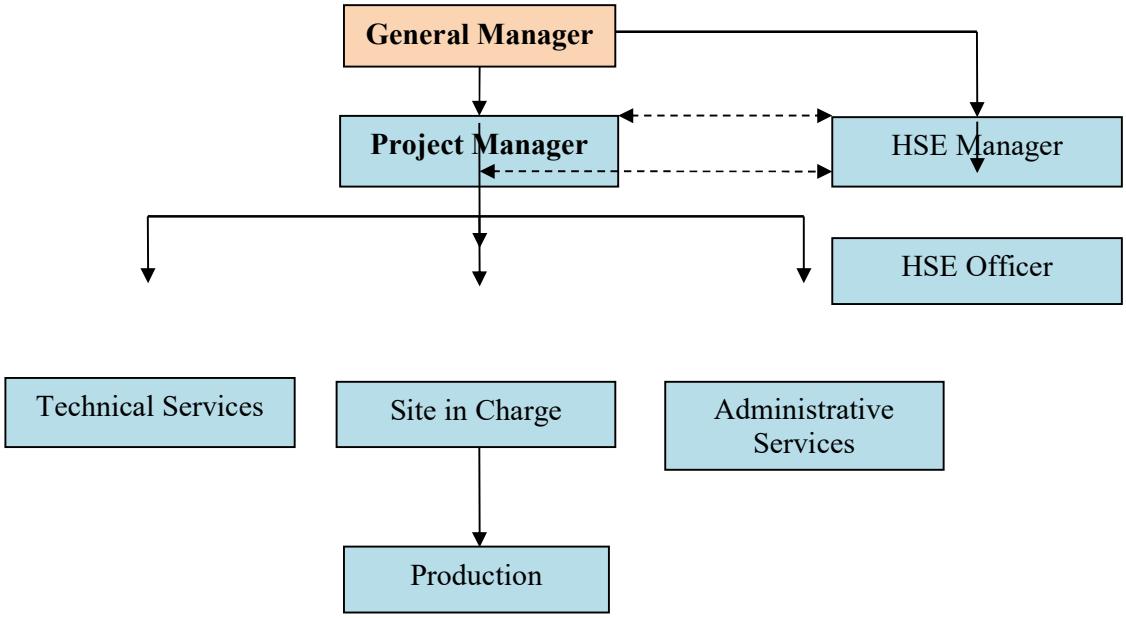
5.4 Identification of Critical Activities

From the study of the project scope & subsequent discussion with the project team, following are the hazardous or critical activities, associated with the project:

1) **Working inside Excavated Area**
2) **Operational Safety**
3) **Equipment Safety**
4) **Electrical Safety**
5) **Fire Safety**

6. Organization Chart

The organization and operational structure, which we may summaries as decentralization, delegation of authority, and responsibility, is applicable to all areas, namely within the HSE domain.



6.1 Duties and Competences

The duties and responsibilities of the members of the site's organization in terms of operative procedures are described in the following table, without prejudice of increasing or decreasing the number of intervening parties, with the corresponding expansion or accumulation of duties.

People in Charge	Functions within the scope of Safety Management Systems
Project Manager	• Global coordination of the contract job • To assure the mobilization of the required means of production • Establishment of the contract job organization chart • To define the organizational chart of the contract job. • Global planning of the contract job. • Selection of means
HSE Manager	• To keep safety plan updated • To carry out the identification of foreseen risks in the SHST area • To coordinate with the other work site structures the elaboration of specific procedures of the safety area. • Promote information to the workers regarding risks exposure which might affect their safety and health. • To elaborate the inquiries resulting from work accidents and diffuse them in accordance with the established methodologies. • To assure the workers' health monitoring (medicine at work) • To set and test an emergency system (first aid, fire prevention and fight, evacuation). • To plan and promote the realization of internal safety audits. • To act on the Site Manager's behalf.
Site In charge	• Resources control and management • In defining the site locations and work procedures, to identify the predictable H&S risks, eliminating them or limiting their effects. • To implement the Quality, Safety and Environmental Management and Assurance Process • To take over the responsibilities defined in the contract
Safety Officer	• Carrying out training actions on safety rules and principles. • To articulate, in a systematic way, his action with those of the frame working staff. • Implementation of the corresponding operational procedures deriving from the Quality, Safety and Environment System. • To assure the updating of the associated measuring equipment calibration status.

People in Charge	Functions within the scope of Safety Management Systems
Production	• Short and medium term planning. • Allocation of production means to the different activities. • To carry out the materials and processes control defined in the Quality, Safety and Environment System. • the resources, to bear in mind both the When organizing workers and third parties susceptible of facing risks, as well as the execution of the works • To coordinate the activities of subcontractors and independent workers who intervene in the site yard. • To control the correct application of work methods. • To inspect work areas and take corrective and preventive measures in order to minimize involved risks. • To assure the correct operation and maintenance of work equipment.
Technical Services	• Project reception, diffusion and filing. • Project examination for the detection and inventory errors, contradictions and/or omissions. • Technical preparation for the Production. • Implementation of the corresponding operational procedures deriving from the Quality, Safety and Environment System.
Administrative Services	• Secretariat, reception, stewardship and general archives. • Standardized control of the subcontractors and workers at the work site. Information diffusion to all workers, on the rules and regulations in force in the site yard. • Control and distribution of the adequate individual protection equipment to all the workers. • Implementation of the corresponding operational procedures deriving from the • Quality, Safety and Environment System.
Land Survey	• Implementation of the corresponding operational procedures deriving from the Quality, Safety and Environment System. • To assure the updating of the calibration status of the associated measuring equipment.
Store	• Materials and supplies reception and storage. • Administrative processing of the associated documentation. • To assure the adequate labeling of products. • Implementation of the corresponding operational procedures deriving from the Quality, Safety and Environment System.

People in Charge	Functions within the scope of Safety Management Systems
Operator	• To comply with the rules and regulations defined at the work site. • To participate in the training and awareness actions that might be promoted in the safety area. • To correctly use the equipment, he operates, not subjecting them to any efforts besides the previously defined ones. • To carry out the periodical inspections scheduled for the equipment and register them in the allocated files. • To alert for any deficiency he might detect in the equipment operation. • To maintain in good preservation conditions the documents and registrations associated to the equipment he operates.
Worker	• To comply with the rules and regulations defined at the work site. • To participate in the training and awareness actions promoted in the safety area. • To correctly use the EPI´s allocated to him and preserve them in good conditions. • Not to alter nor remove collective protection equipment applied and alert his hierarchic chief for any omission or deficiency he might detect.

7. Risk Assessment & Management

7.1 Concept

Risk assessment is carried out based on the traditional concept within this domain:

Risk = f (Probability; Seriousness)

Obviously, the risk assessment is nothing more than the result of a mathematical operation which will be linked to a scale of values that will define its degree or magnitude. The product of that relation shall always represent the subjective component which is the basis for the weight of the criteria of probability and seriousness, as we will later observe.

7.2 Methodology

The objective of Risk Assessment is to quantify the risk involved & try to eliminate or minimise. List down all the activities involved in the project. Identify the hazards involved in each activity. Assess the hazard referring to the following matrix:

Stages	Temporary or Movable Yards
Identification of hazards and assessment of risks in the initial phase	Carried out by the site within the scope of development of the H&S plan
Identification of control measures	Carried out by the site within the scope of the development of the H&P resorting, if so deemed, to the risk assessment matrix
Implementation of the control measures	Carried out by the site within the scope of the implementation of the H&P
Check control measures	The implementation of the control measures should be checked at least once a month.
Reassessment of the risks	Carried out by the site in order to guarantee its updating

Risk Level = Hazard Severity X Probability

Severity	CONSEQUENCE				PROBABILITY				
					A	B	C	D	E
	People	Assets	Environment	Reputation	Never heard of in our industry	Has occurred in our industry	Has occurred in AKC	Happens several times a year in AKC	Happens several times a year in the facility
1	**No Injury**	**No Damage**	**No Effect**	**No Impact**	**LOW**				
2	**Slight Injury**	**Slight Damage**	**Slight Effect**	**Slight Impact**					
3	**Minor Injury**	**Minor Damage**	**Minor Effect**	**Minor Impact**		**MEDIUM**			
4	**Major Injury**	**Local Damage**	**Localized Effect**	**Considerable Impact**			**HIGH**		
5	**Single Fatality**	**Major Damage**	**Major Effect**	**National Impact**				**SERIOUS**	

Sr. No.	Activity / Sub Activities	Hazard Involved	Before Actions		Actions to eliminate or Minimize Hazard	Risk Level After actions	
			Risk Level			Risk Level	
1	**Excavation**						
a	Survey & detection of undergroun d services	Heat stress, Road accidents,	4C	High	Use PPEs as helmet & shoes & reflective jackets. Local Road safety guidelines to be followed, cold water with ORS powder to be used, Rest room in case of longer duration work, Aware of Emergency Services.	1B	Low
b	Excavator Operation	Falling of weight, hitting object or human, slipping down, pollution, damaging underground utilities,	5D	Serious	Trained operators having valid license, Preventive maintenance, check before work, nearby humans to face excavator while doing work,	1B	Low

Sr. No.	Activity / Sub Activities	Hazard Involved	Before Actions		Actions to eliminate or Minimize Hazard	Risk Level After actions	
			Risk Level			Risk Level	
		etc			barricading & signage, workers away from the excavator, etc		
c	Removing Excavated material	Earth slide, collapsing excavated area, trapping, underground utilities, slipping, falling loads, etc	2C	Medium	Barricading & signage, excavated debris to be kept away, cable detection before excavation, Excavator operators training & skill, illumination in hazardous area if night operation, work permit, access for the movement & turning, etc	1B	Low
d	Compactors Operation	Hitting the object or human being, pollution, etc	2C	Medium	Training & skill of the operator, access for the movement & turning, preventive maintenance, check before work, etc	1B	Low
e	Cleaning	Breathing, pollution, skin problems, eyes burning, falling & tumbling, etc	1B	Low	Use PPEs as nose masks & hand gloves & goggles, scrap to be disposed in SIP approved area, clear passages & access & exit will be maintained.	1B	Low
f	Workers movement	Slipping, tumbling, falling down, accident due to plants & machineries, underground services hazards (gas line, ele cables, etc), buried under if soil collapse, etc	4C	High	HSE Induction, tool box talk, supervision, Clear entry & exit for the workers, PPEs, barricading & signage, warning tapes, rest hours, hygiene at the site, enough drinking & cleaning water, Emergency services, etc	1B	Low
g	Plants &	Traffic accidents,	2C	Mediu	Preventive maintenance,	1B	Low

Sr. No.	Activity / Sub Activities	Hazard Involved	Before Actions		Actions to eliminate or Minimize Hazard	Risk Level After actions	
			Risk Level			Risk Level	
	Machineries movements	slipping, turn around, fire due to leakages, striking against object or human being, Operator's fatigue etc		m	Operators skill & experience & training, check before work, warning signage, barricading, Fire Extinguishers, Cooling in operator's cabin, etc.		
2	**Reinforce Steel Work / Rebar**						
a	Rebar cutting & bending	Not Applicable			Not applicable	NA	Not at site
b	Steel transport to site	Road accidents	2C	Medium	Follow Traffic rules by SIP, trained & experienced & license holder driver, vehicle maintenance, loading within capacity of vehicle, Emergency nos available with the driver, etc	1B	Low
c	Steel loading / unloading	Scratches, cuts, fractures, slipping or falling of the steel, falling from trailer height, etc	2C	Medium	Use PPEs as helmet, shoes, hand gloves, lifting kits to be inspected, steel yard to be made ready, 1st aid box ready, safety belt to be used if standing on trailer height, etc	1A	Low
d	Steel Handling	Scratches, cuts, piercing, fractures, slipping or falling of the steel, etc	2C	Medium	Use PPEs as helmet, shoes, gloves, good housekeeping, good storage arrangement, etc	1B	Low
e	Steel binding	Cuts, scratches, stress, piercing, etc	1B	Low	Use PPEs as helmet, shoes, gloves, good housekeeping, good storage arrangement, etc	1B	Low
3	**Concrete Work**						
a	Concrete Mixing	Not Applicable			Not Applicable	NA	Not at site

Sr. No.	Activity / Sub Activities	Hazard Involved	Before Actions		Actions to eliminate or Minimize Hazard	Risk Level After actions	
			Risk Level			Risk Level	
b	Ready mix transport to site	Road accidents	2C	Medium	Follow Traffic rules by SIP, trained & experienced & license holder driver, vehicle maintenance, loading within capacity of vehicle, Emergency nos available with the driver, etc	1B	Low
c	Concrete Pumping	Falling of concrete pumping pipe, slipping, falling, skin irritation, chemical burns, irritate eyes-nose-throat-upper resp system, etc	2C	Medium	Use PPEs as rubber boot, helmet, hand gloves, supervision, away from pump rod & always facing it, pump operator to stand near area & carefully operate the same, training & awareness of all, etc	1B	Low
d	Concrete Levelling	Slipping, falling, skin irritation, chemical burns, irritate eyes-nose-throat-upper resp system, etc	1B	Low	Use PPEs as rubber boot, helmet, hand gloves, supervision, etc	1B	Low
e	Concrete Sampling	Skin irritation, chemical burns, irritate eyes-nose-throat-upper resp system, etc	2C	Medium	Use PPEs as helmet, gum boot & gloves, etc.	1B	Low
f	Concrete Testing	Not Applicable			Not Applicable	NA	Not at site
g	Concrete Curing	skin disease due to concrete exposure, eye strains, slipping, falling, strong smell, etc	1B	Low	Keep workers away from the curing area, barricading, warning signage, etc.	1B	Low
h	Shuttering	Cuts due to sharp edges, falling of woods, noise, falling from height, back pain, etc	2C	Medium	Usage of PPEs as shoes, helmets, gloves, Safety Belts, scaffolding with inspection status, tool box talk, etc.	1B	Low

Sr. No.	Activity / Sub Activities	Hazard Involved	Before Actions		Actions to eliminate or Minimize Hazard	Risk Level After actions	
			Risk Level			Risk Level	
i	Mason work	Skin diseases, eye strains, falling from height, back pain, etc	2C	Medium	Usage of PPEs as shoes, helmets, gloves, Safety Belts, scaffolding with inspection status, tool box talk, etc.	1B	Low
4	**Carpentry Work**						
a	Cutting	Finger cutting, electrocution, dust in nose, particles in eyes, heavy noise, back pain, etc	2C	Medium	Preventive maintenance of cutting machine, good condition & fitting of cutting blade, ele safety for connection, Use of helmet, shoes, gloves, goggles, ear plugs & nose mask, housekeeping around the area, etc	1B	Low
b	Wood handling	Cuts, scratches, falling of objects, striking against, ect	2C	Medium	Use of helmet, shoes, gloves, housekeeping around the area, clear passages, good storage etc	1B	Low
c	Joining	Hitting by hammer, cuts, scratches, falling from height, heavy noise, etc	2C	Medium	Use of helmets, shoes, gloves, ear plugs, inspected tools, scaffolds & safety belts, etc.	1B	Low
d	Nail work / hammering	Hitting by hammer, cuts, scratches, falling from height, heavy noise, hitting & piercing nails, etc	2C	Medium	Use of helmets, shoes, gloves, ear plugs, inspected tools, scaffolds & safety belts, etc.	1B	Low
5	**Fabrication**						
a	gas cutting	Fire, skin burning, eye strains, inhaling fumes, back pain, cut & scratches due to sharp edges, etc	4C	High	Fire extinguisher, PPEs as helmet, shoes, nose mask, dark glasses, housekeeping around area, Emergency nos.	1C	Low
b	gas welding	Fire, skin burning, eye strains, inhaling fumes, back pain, cut & scratches due to sharp edges, etc	4C	High	Fire extinguisher, PPEs as helmet, shoes, nose mask, dark glasses, housekeeping around area, Emergency nos.	1C	Low

Sr. No.	Activity / Sub Activities	Hazard Involved	Before Actions		Actions to eliminate or Minimize Hazard	Risk Level After actions	
			Risk Level			Risk Level	
c	Grinding	Particles in eyes, body pain due to vibrations, inhaling particles, electrocution, cuts due to slipping of grip, etc	2C	Medium	Use of goggles, nose mask, electrical safety, trained and experienced operators, etc	1B	Low
d	Heavy material handling	Falling of the material, fractures, bleeding, cuts, body pain, striking against human or object, etc.	2C	Medium	Inspection of lifting devices, clear passages, housekeeping, ergonomics, PPEs as safety shoes & helmets, etc.	1B	Low
6	**Electrical Work**						
a	High Voltage	Not Applicable			Not Applicable	NA	NA
b	Low Voltage	Electrocution, fire, etc	4C	High	Electrical safety, good insulated tools, insulated cables, testers, lock & tag procedure, plugs, PPEs as ele gloves, ele safety shoes with, experienced & trained electricians, etc	1B	Low
c	Electrical Tool operation	Electrocution, fire, heat, vibration, heavy noise, etc	3B	Medium	PPEs as ear plugs, goggles, inspected tools, insulated cables & connections, correct power supply, trained & experienced operators, etc	1B	Low
7	**Working at Height**						
a	Scaffolding erection & dismantling	Cuts due to sharp edges, falling from height, collapse, falling of scaffolding parts above body, scratches, fractures, stress, skin burn etc.	3B	Medium	Wear helmet, safety shoe and hand gloves. Do the scaffolding after levelling the ground properly, all the standards and ledgers must be properly fixed, if scaffolding goes at the	1B	Low

Sr. No.	Activity / Sub Activities	Hazard Involved	Before Actions		Actions to eliminate or Minimize Hazard	Risk Level After actions	
			Risk Level			Risk Level	
					more height then braces must be provided along with other supports etc. good quality of scaffolding material, Inspection,		
b	Working on scaffolding	Falling of objects, Slipping down or falling, stress, skin burn, danger to public etc.	4C	High	Safety belts must be worn by the workers working above 2 meters height, net may be provided all-round scaffolding, if necessary for the public safety.	1B	Low
c	Landscaping	Ingredients of sweet soil can cause respiratory problem, unhygienic etc	2A	Low	Wear face masks in order to avoid unnecessary dust inhalation containing chemicals, wash hands with soap after finishing the work, use gum boot etc.	1B	Low
8	**Working on Dual carriageway**						
a	Workers safety	Accident , Noise & Air pollution, Heat, Stress, Cold, irritation, faint etc	3D	High	Take extra care while crossing the roads, work inside the barricades, wear reflective jackets, keep ORS at site, in need wear nose mask or ear pads.	1B	Low
b	Public safety	Accident due to negligence, stress, traffic jam etc	5D	Serious	Put proper barricades, fix proper road signs at suitable places, Workers must wear reflective jackets, deploy suitable number of flagmen during peak hours of traffic, use rotating bulb etc.	1A	Low
9	**Chemical treatment**						
a	Anti termite treatment	Known to be carcinogenic, excessive inhalation	4C	High	Avoid unwanted exposure to the body or hand, wear hand gloves	1A	Low

Sr. No.	Activity / Sub Activities	Hazard Involved	Before Actions		Actions to eliminate or Minimize Hazard	Risk Level After actions	
			Risk Level			Risk Level	
		may lead to failure of internal organs, can cause respiratory disorders			and nose mask, cover the area with polythene sheet just after anti termite treatment etc.		
b	Water proofing	Pasting of bitumen membrane by heating with torch produces some gases which may cause suffocation and respiratory problem, stress, burn etc	4C	High	Wear gum boot, hand gloves, and nose mask, handle the torch carefully.	1A	Low
10	**Finishing works**						
a	Plastering	Cement mortar can enter inside the eye and cause irritation, Hands may cut due to adverse effect of cement, suffocation etc.	2C	Medium	While applying the mortar on wall wear safety glass, wear safety shoe and mild duty hand gloves, take rest for 5 minutes in open space at continuous interval, wear nose mask etc.	1B	Low
b	Landscaping	Ingredients of sweet soil can cause respiratory problem, unhygienic etc	2A	Low	Wear face masks in order to avoid unnecessary dust inhalation containing chemicals, wash hands with soap after finishing the work, use gum boot etc.	1B	Low
11	**Occupational Health**						
a	Camp lodging & boarding	Deceases due to water & food Quality, unhygienic, heat wave, suffocation, bad smell, Emergencies, fire, etc	2C	Medium	Good quality of food & water, housekeeping, cleanliness, AC rooms, sanitary arrangement, regular scrap disposal, dustbins, 1st aid box, emergency numbers, fire extinguishers, camp audit & inspections, etc	1B	Low
12	**Environment**						

Sr. No.	Activity / Sub Activities	Hazard Involved	Before Actions		Actions to eliminate or Minimize Hazard	Risk Level After actions	
			Risk Level			Risk Level	
a	Scrap Disposal	Pollution (air & water), diseases, bad smell, unhygienic, etc	2B	Medium	Housekeeping, dust bins, regular disposal at the approved place, no burning allowed, etc	1B	Low
b	Exhaust gases of vehicles	Throat infections, air pollution, lungs deceases, etc	2B	Medium	Preventive maintenance & checks of vehicles.	1B	Low

We also ensured that the above risk assessment covers all persons having access to the project site including our personnel, contractors and their sub contractors as well as client representatives and other visitors etc.

In addition to the above actions, following procedures will also be reinforced to minimise the risk impact.

- **Compliance to the procedures as per the HSE Manual**
- **Tool box talk, Training & awareness**
- **Supervision.**
- **Work Permit wherever possible**
- **HSE Signage**
- **Restricting Unsafe Act (major reason for construction accidents)**

At the time of starting the work, HSE officer will ensure that the identified measures are in place & the residue risk is acceptable. If the risk can't be eliminated fully then it will be minimize to the possible extent and or will be carried out under supervision of the knowledgeable staff.

8. Procedures

8.1 Excavation

An excavation means any man made cut, cavity, trench or depression in an earth surface formed by earth removal.

Trench:
A trench means a narrow excavation made below the surface of the ground. Generally the depth is greater than the width, but the width of the trench is not greater than 5 feet.

Hazards / Risks

- Soil Collapse
- Hazardous Atmosphere
- Adjacent Structures
- Falling Loads / Objects
- Falling / slipping of Personnel
- Poor Access / Egress
- Vehicle Traffic
- Illumination
- Water Accumulation
- Poor Ventilation
- Striking buried service lines / underground utilities.
- Danger due to operation of heavy equipment / machinery.
- Utilities

Responsibility

• Drafting & Revision of procedure	Project Manager
• Implementation of Procedure	Site in charge
• Monitoring	QA/QC Engineer
• Applicable Permits	MC1 Contractors/ Engineer
• Work Specifications	MOTC (Client)

Procedure

1) Manpower involved in the activity will be covered by the following trainings :
   a. HSE Induction
   b. First Aid Training
   c. Emergency Preparedness
   d. Signaling for banks men

2) Following PPEs will be applicable for all the employees:
   a. Safety Helmet
   b. Safety Shoes
   c. Reflective Jackets (Orange for workers & Green for Staff)

3) Following Safety Items & Signage will be kept ready :

a. Signage - Men at work
b. Signage- Deep Excavation
c. Signage – Ingress / Egress (as applicable)
d. Lights as applicable
e. Red & Green Flags
f. Hard Barricades
g. Barricading Nets
h. Warning Tapes
i. Safety Cones (for temporary barricading)

4) On the day of work (before starting the work), following check points will be confirmed :
a. Proper Barricading to block or divert
b. Proper Sign board
c. Flag men at the right position
d. All employees with PPE & reflective jackets
e. Lights in case of night work

Preventive Actions

Before Starting Excavation:

- Cable / gas detectors or any other method, by which the underground utility services can be identified, must be run over the entire stretch of excavation area to ensure the safety of the underground services and avoid hazards as well.
- Ensure Excavation Permit are obtained for each job, from concerned MC1 Contractor/Authorities.
- Excavation work should be properly supervised and carried out with tools specified in the dig/excavation permits.
- Never use pointed tools to probe for underground gas / electrical line.
- Utilities should be isolated before start of activity.
- While using electrical / mechanical / pneumatic equipment care must be taken to avoid damage to utilities.
- Marksman must be provided to supervise the excavation in the areas where underground services exist. Always face the excavating machine when supervising the work.

Outside the Excavation / Trench*:*

- Provide barricading
- Provide Proper Access and Exit to open area excavation.
- Provide proper means of strong access to cross a trench.
- Provide Safety Signage.
- Provide Supervision.
- Personnel shall not walk close to the edge of excavations where earth may slip and area shall be kept clean and tidy to prevent workmen from falling or slipping.
- If the access area to excavation is obstructed by materials, rocks, poles, structures etc. take measures to isolate them or remove them to avoid traffic restriction and hazards.

Setback for Excavated Material:

- Excavated earth shall not be stored close to edges of excavation, as this will promote earth slides.
- Should be stored at least 4 m away from excavated edge for open excavation.
- A strip of one meter (or practically possible) on both sides of the trench shall be leveled and kept clear to avoid falling objects into the trench.
- Any stuff within 2m shall be removed before entering the pit

Scaling & Trimming:

- Side of excavation should be scaled or trimmed to prevent fall of loose soil / rocks.
- Any unstable excavation must be securely battered or properly supported.

Crossing:

- A walkway at least 50cm wide provided if the walkway is made by providing wooden ladders and handrails and walkway platform.
- The platform landing should be at least 560mm wide.
- Handrails should have a minimum height from 840-960mm.
- The treads and risers should be proper.

Access / Egress

- For excavations greater than 1.5m deep sufficient access / egress should be provided by means of ladders or ramps.
- Ladders shall be placed at the distance of 30 m of the excavations length.
- Ladders shall be placed at 75 deg. and shall be securely tied / fixed.
- If ramps are provided having depth greater than 1.5m. It should have proper handrails.
- The access / egress way should be illuminated at all items.

Providing Warning Signs:

- Lights should be placed around excavation.
- Excavation should be barricaded and sign posted.
- Rope/warning tapes should barricade all pits and trenches of more than a Meter deep and 0.5 Meter wide.
- Warning lights and hazard lights shall be provided at regular intervals for any excavation adjacent to the roads or there is a chance of movement by human beings/vehicles and that is kept open over-night.

Other Precautions:

- No one is allowed to take rest inside excavation area / pit / trench.
- Prevent unwanted movement of people in the vicinity of excavation/trenches.
- Excavation should be stopped on finding any unknown services or object. This shall be reported to the concerned Site In-charge and the client. Excavation shall be preceded further, only after obtaining their concurrence.
- In case, fossils found then stop the work & immediately report to the local authorities.
- The men working in trenches shall stand and work at a safe distance to avoid being struck by fellow workmen's tools. The safe distance to be determined by the Site In-charge based on the work practices. For manual excavation by pickaxe / spade, the safe distance shall be minimum 3 Meters.

Standby/look out man with emergency contact numbers should.

8.2 Working at Height

8.2.1 Assembled Scaffolds

- Material for scaffolding should be sufficient for the job. The materials shall be inspected prior to installation, to ensure that all parts are in good condition.
- Erection of scaffolding shall be carried-out under competent and experienced supervision and executed by trained personnel.
- Use only approved materials for scaffolds.
- Erect scaffolding on firm and even ground. Use adjustable base plates to compensate uneven surfaces.
- Safety belts or lifelines shall be worn if conditions make the use of other equipment impracticable while working on scaffolds.
- Where people are working with electric tools standing on metallic scaffolds, the scaffolds shall be earthed. Avail the help of an Electrician for this purpose.
- Climbing up or down the scaffolding shall be prohibited. Only ladders and stairs should be used.
- No material shall be thrown, tipped or dropped from platforms. These should be lowered using a suitable tackle or through a properly erected chute.
- Removal of components or interference of any kind from scaffolding shall be made only by authorized persons.
- Correct type of couplers shall be used for all connections.
- Standards should be straight and set out in accordance with drawings or sketches provided.
- Alternative pairs of standards shall be provided with ledger braking to the full height of scaffolding. Exceptions may be made only of bottom and top lifts where access is required.
- Scaffolding shall be adequately tied to the structure.
- Working platforms shall be adequately boarded without keeping any gap between boards. Platforms should be provided with guardrails depending upon the application.

8.2.2 Tower Scaffolds

- All the safety measures stipulated for the assembled scaffolds shall be followed.
- For tower scaffolds the base: height ratio should not be more than 1:3.
- Tower scaffolds shall be used only on solid or level surfaces.
- Extra precautions shall be taken while moving them from one location to another.
- No persons shall ride on scaffolds, while it is being moved from one location to another.
- The wheels shall be checked on a daily basis including the operation of its brake.
- Ladder shall be used always for accessing into a tower scaffold.
- The tower scaffolds shall be tied with the main structure as a precaution in the event of failure of the wheel brakes.
- Ground standing ladders (placed on the platform of the scaffolds) are prohibited on mobile scaffolds.

8.2.3 Ladders

- Choose the right ladder for the right job. (Consider the type, size, condition of floor etc.)
- Check the condition of the ladder before climbing. Don't use the ladder with broken or cracked rails and rungs or with slippery rungs from oil or grease. Also check the condition of the foot of ladder thoroughly.
- Ladders shall always be positioned on a firm, level base.
- If the floor is smooth, proper shoes shall be fitted to the foot of the ladder, to provide adequate grip.
- Never run up or down stairs. Climb up/down the ladder carefully, facing it using both hands.
- If work is to be carried out with both hands for a long duration, it would be safer to use an elevated platform.
- Safety securing (harness) shall be used, if work is to be carried out by using both hands.
- Ladder shall never be placed, where it may obstruct entry/exit or be pushed by windows or doors, opening outwards.
- Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height.
- Ladders shall not be leaned against any fragile/weak surface on top.
- Ladder of insufficient length shall not be used. It shall project at least 1Meter above the landing space, unless such space has got a handhold.
- Secure the ladder properly at the top. If it is not possible, secure it at the bottom or make a person to foot it correctly and hold it.
- Angle of ladder shall be 75 degree inclined, while at use. Ladders shall be placed, so that there is a 4:1, vertical to horizontal pitch.
- Use a tool belt or hand-line to carry materials.
- Wear clean soled safety shoes, which are in good condition while climbing the ladders.
- If the ladder has been tipped over, inspect it thoroughly before using it again.
- Check that there is no damage due to corrosion on steel ladders.
- The area above and below the ladder shall be clear of sharp objects.
- For fabricated wooden / metallic ladders, always keep 15 to 20 inches width and ladder cleats shall be uniformly spaced 12 inches apart.
- Always mark the top 2 cleats of the ladders with red color, since it is not allowed to step on them.

8.3 Storage of Material

8.3.1 Gas Cylinder

Storage of Gas Cylinders

- The cylinder storage areas shall be prominently posted with the names of the gases stored.
- Cylinders shall be stored always in upright position, in a cool, dry and ventilated area.
- Never store the cylinders near highly inflammable material such as oil, gasoline or wastes, etc. Maintain at least 20 meter distance for storing cylinders from these inflammable substances.
- Oxygen cylinders shall never be stored in an unventilated enclosed place along with cylinders holding other flammable gases such as LPG and acetylene gas.
- Separate storage space shall be provided with appropriate identification by means of tags for cylinders of different gases such as Oxygen, LPG, CO2 and Acetylene gas.
- Color-coding of the gas cylinders shall be understood by all concerned and the cylinders should be stored accordingly.
- Do not place the cylinders near elevators of gangways or in locations where heavy-moving objects may strike or fall on them.
- Full and empty cylinders shall be stored separately to avoid mix up.
- Protective caps shall be placed for both full and empty cylinders while they are stored.
- No smoking shall be strictly observed within the vicinity of the gas cylinder storage area. Provide necessary safety sign boards in this regard.

8.3.2 Flammable Liquids

Diesel Storage

- Diesel containers should be stored in the open air at ground level positioned away from any source of direct heat in a shed.
- There should be no 'hot work' performed on or near any diesel containing vessel unless it is emptied and purged of any remaining vapour.
- Diesel storage Tanks/ Barrel shall be located at least
  - ✓ 3 meter from combustible vegetation
  - ✓ 15 meter from the boundary of the property
  - ✓ 15 meter from protected work (dwelling, workshop, an accumulation of combustible material)
  - ✓ 5 meters from overhead wires
  - ✓ 8 meters from any ignition source
- Diesel storage tanks positioned so as to avoid accidental collision by vehicle
- Spill kits should be available to ensure that spills are cleaned up quickly to lessen the risk of people slipping

- Container refilling and dispensing task need to take account of manual handling risk

Storage of Bitumen Paint/Primer

- Bitumen containers should be positioned away from any source of direct heat.
- Store in a cool and dry place in the open air at ground level in a shed.
- Keep container closed at all time
- Ensure ventilation is sufficient to prevent a buildup of vapour
- There should be no 'hot work' performed on or near any bitumen container
- Container even those that have been emptied can contain flammable or explosive vapours
- This material is combustible eliminate all ignition sources
- Bitumen storage tanks positioned so as to avoid accidental collision by vehicle
- Spill kits should be available to ensure that spills are cleaned up quickly to lessen the risk of people slipping
- Container refilling and dispensing task need to take account of manual handling risk

Precautions:

- Do not sleep or eat in the areas designated as hazardous area or hazardous material preservation area.
- All personnel shall have information of hazardous materials/liquids available nearby.
- Inhaling the vapor of chemicals shall be avoided.
- Do not eat, drink or smoke while handling chemicals.
- Always read the label on a container before any act with the ingredients.
- All workers shall be alerted for sprays and splashes while opening a container or pipe.
- Always keep adequate alkaline substances to combat with swallowing or spillage of acids.
- Provide safety shower and eye bath at appropriate places.
- Keep sign boards for safety shower and eyewash.
- Extinguishing media Extinguish with Dry powder, Foam and Co2

8.4 Materials Handling

8.4.1 Wheel Barrow

The following shall be checked while using wheelbarrow:

- Load properly balanced
- Load properly tied up where necessary
- Sufficient room clearance maintained for moving the load

- Rules of the road observed
- Kept in good condition
- Bearings lubricated properly
- Repairs effected as and when required
- Wear hand gloves and safety shoes.

8.4.2 Lifting By Hand

The following care shall be taken while lifting by hand:

- Load shall be sized up and assistance sought if necessary.
- Appropriate protective hand-gloves shall be used for lifting objects.
- Strength of legs and not the back shall be used while lifting
- Take care if any moving machinery is in the vicinity.
- Care shall be taken against slipping hazards
- Proper method of lifting shall be adopted
- If two or more persons are involved in lifting, better co-ordination is required to avoid any hazard.
- Always wear safety shoe while lifting or carrying any load.

8.4.3 Chain Hoist

The following shall be checked while using a chain hoist:

- The operator is adequately trained
- Defects checked up and proper repairs carried out.
- Chain not worn out.
- Hoist in good condition and well lubricated.
- No person below the load or in the vicinity where the chain may swing.
- Periodical check and load test conducted and certified.
- Chain hooks, fasteners, etc. are in good condition.
- Load limits assessed, displayed and observed.

8.4.4 Pulleys and Ropes

The following shall be checked while using pulleys and ropes:

- Ropes in good condition
- Pulleys and load properly fastened
- Pulleys kept lubricated
- Pulleys, hooks, pins and split-pins are in good condition
- Wire ropes looped and clamped with bulldog clips, minimum two at 200/250 mm intervals.
- Manila/Nylon ropes properly anchored while lifting light loads, knots, hitches and slings made-out properly.
- Ropes periodically checked up for defects, load-tested, and renewed as and when necessary.
- Wire ropes properly lubricated.

8.4.5 General

- Use the right equipment for the right job.
- Wear the correct personal protective equipment.
- Stay clear of cranes, overhead work and suspended loads.
- Use correct signals when working with lifting equipment.
- Sling loads correctly.
- Look above and around - watch for hazards wherever you are.

8.4.6 Housekeeping

- Improper housekeeping is an important cause for most of the accidents
- Always a place for everything and everything in its place
- Proper identification and segregation of all materials shall be done
- Keep all gangways, aisles, doors, passages and stairways clear of materials.
- Sufficient waste bins shall be kept at applicable locations
- Provide proper lighting and ventilation at all working areas
- Maintain the floors as slippery, dry and oil free
- Remove all stumbling or protruding hazards
- Remove all loose material under foot or on gratings
- Protruding nails shall be either removed or bent over
- Close or barricade all unguarded floor openings, manholes, pits or excavations
- Warning sign boards, protective barriers or preventive rope fencing shall be put as applicable
- Avoid temporary or permanent runs of pipes or wires across floors, doorways or windows
- Keep away all sharp materials around the ladder, while it is used
- Use metal container for oily/greasy rags and wastes
- Allocate proper dump-yard and dispose off the debris and wastes regularly

8.5 Equipment Safety

8.5.1 Lifting Equipment

- The lifting equipment shall be inspected and certified that it is mechanically sound by third party on yearly basis to assess its load capacity at different radii.
- An inspection certificate from the third party together with a chart showing permissible loads with boom lengths and angles obtained shall be preserved for verification.
- On Hiabs the load capacity for different boom lengths shall be marked on both sides.
- Daily check shall be carried-out for the equipment, mainly the tyre pressure, oil level and brakes.
- Safe load chart showing angles, boom length and corresponding safe load shall be available with each equipment.

- Lifting equipment shall be used only if a valid inspection certificate is available.
- The defects shall be rectified promptly, when reported or noticed during inspection.

Operation

- The lifting gear used shall be appropriate to the load. They shall be supported correctly by deployment of outrigger stabiliser jacks and other aids before commencement of lifting.
- The wheels of truck mounted cranes (Hiabs) shall be supported by "blocks", before the crane is operated.
- The crane shall be positioned always on a firm surface. This shall be ascertained before actual load lifting, so as to prevent toppling over of the crane, by settling of the ground under the load. On soft surface, thick wooden blocks shall be placed under the outrigger stabilizer jacks of cranes/Hiabs.
- Weight of lifting gear shall be added to the assessed weight of material, when load is assessed before lifting.
- Particular care shall be taken if overhead electric cables exist in the near vicinity of crane operation.
- When the crane is moved from one location to another, the route and new site shall be thoroughly examined to ensure that there is no a back-filled trench, large obstruction or overhead electrical cables, which will hamper the movement of the crane.
- Tail radius at ground level and the gap between the tail on the move and any other obstruction all round the equipment shall be assessed and movement of the equipment restricted accordingly.
- Cranes, Hiabs and Side-booms shall be positioned to lift vertically and not used to pull loads sideways.
- Deliberate "Swinging" of loads to increase radius of load deposit/pick up shall not be resorted to and keep clear of a swinging load.
- Eyes shall never be taken off from the vision of swinging load, while awaiting for materials
- Everyone shall keep clear of the tail swing of cranes in order to avoid being struck or crushed.
- Crane shall be operated only on clear hand signals made by the banks-man.
- If at any time, the crane operator and banks-man are unable to see each other, the operation shall be stopped, till extra assistance is provided for guiding the operator.
- Personnel working with the crane or in the vicinity shall not stand near or under the load, while it is being lifted or positioned.
- Other workers and operators working within the radius of the crane shall be ever watchful of its movements and observe safety rules.
- Ropes shall be attached to corners of loads, which due to the weight and shape tend to rotate or swing, in order to control safe and correct positioning.
- When large sized, comparatively light items are being lifted by crane, one shall be careful of wind conditions. Strong wind could cause such loads to be spun around beyond control.

Personnel

- The operator shall be trained on the equipment and shall possess license.
- Operators and banks-man of lifting equipment shall be examined medically every year to ensure fitness, with more emphasis on eyesight, hearing and reflexes.

- They shall be good and trained on judging distances, heights and clearances.
- They shall be agile and strong enough to handle lifting gear.
- They shall be trained in general principles of slinging.
- Conversant with safe working loads at different radii of the crane with which they are working.
- Capable of ensuring safe movement of the crane and its load to maintain safety to personnel and property.

Builder's Hoist

- Erection shall be carried-out only by trained personnel.
- Toe board and handrails shall be provided.
- Firm stays shall be provided for the hoist to protect it from causing causality due to extreme windy conditions.
- Proprietary scaffolding system shall be used and it shall be fixed to a permanent structure.
- Lift tower shall preferably be erected in suitable location to provide easy access for loading and unloading of material.
- It shall be used only for lifting materials, not for transporting people or working on them as a platform.
- Operator and those who work near the hoist must wear safety helmets.
- No one is allowed to stand under the hoist when it is in suspended position.
- Maximum load capacity shall be indicated on the hoist.
- Visible indicators shall be provided for stopping the hoist at the right place.
- The operator shall properly co-ordinate and communicates with co-workers / banks-men to avoid any mishaps.
- Horseplay shall not be entertained at any cost.
- Hoist shall not be allowed to stay suspended with the load for longer duration.
- Load placed on the Hoist shall be stable and chances of material falling down shall be nullified.
- Wheelbarrows and buckets shall be properly tied to the handrails to avoid danger of falling.
- Loading platform shall be firm and clear of any other materials at all destinations.
- The operator shall strictly follow daily checks as per the manufacturer's instructions.
- The brakes shall be checked daily to confirm its safe functioning before the commencement of work.

8.5.2 Excavators

- Trenches shall be declared safe by a competent and experienced person before an Excavator is deployed.
- If more than one person is working with the Excavator apart from the driver, responsibility for signaling shall be fixed on one person.
- The mechanic shall inspect excavators, during the servicing before certifying it as fit to operate. Load carrying capacity shall also be assessed during servicing.
- Drivers of Trucks or Dumpers being loaded by Excavator shall be standing clear off their machines and the Excavator, when loading takes place.

- Face shall always be towards the excavator; never turned away.
- Personnel and material shall be clear of the operating boom and swing.
- No one shall stand under the load when Excavator is used as Crane.

8.5.3 Small Dumpers

- Only trained and authorized personnel shall operate the Dumper.
- Daily checks shall be made for tyre pressure, oil/water level and braking efficiency.
- Harsh acceleration or braking shall be avoided.
- Driving wheels shall not be allowed to spin.
- Excessive speed shall be avoided, since it may lead to accidents.
- Steering shall be done with caution.
- Skip safety catch shall be engaged when Dumper is left unattended or before moving off.
- Load shall be stacked forward so as to provide good vision.
- Load shall be evenly distributed, within the capacity of the machine and well secured.
- While loading of the skip takes place, the operator shall engage hand brake, disengage gears and stand well off the machine
- No passengers shall be carried.
- Caution shall be exercised in driving the vehicle with due consideration to movements of other machinery and personnel at site.
- Hand starting shall be resorted to only after proper instruction and training to avoid injury from engine backfire.
- At the end of normal working hours, the machine shall be completely and effectively demobilized.
- When engine is running, the operator shall not leave the machine.
- Parking shall be done on level ground with gear in neutral, hand brake applied and wheels "chocked", if necessary.
- Wheel shall be "chocked" to prevent falling in while tipping into trenches/ excavations.

8.5.4 Small Concrete Mixers

- Mixer and associated equipment shall be maintained in a clean and serviceable condition at all times.
- Drum and supply skip shall not be hammered in order to clear material.
- Wheels shall be “chocked” securely to prevent movement.
- Personnel selected to operate Mixer machine, shall be given adequate instructions and training by a competent person, before authorization to drive / operate.
- Machine shall be inspected to ensure all the proper guards are securely fixed.
- Mixer shall be set up on firm level ground or on specially provided support system.
- If loading is carried out mechanically, barriers shall be provided to keep others from danger.

- If the plant is motorized, it shall be ensured that exhaust fumes do not affect others working in the vicinity, particularly inside trenches, excavations or other enclosed spaces.
- Skip rope, drum and pulley gear, where used, shall be properly maintained and regularly inspected.
- Safety chains shall be fitted to the skip to prevent it from falling, if the rope fails.

8.5.5 Pneumatic Equipment

- Personnel selected to use pneumatic equipment/tools, shall be properly instructed on the operation and precautions to be taken to overcome potential hazards.
- Properly trained mechanics shall inspect all pneumatic equipment and tools monthly and record of the inspection/servicing/maintenance shall be maintained.
- Tools shall be disconnected from the airline when not in use. For check, inspection, cleaning or maintenance, only the air supply should be turned off.
- Hoses and pipes shall regularly be checked for leaks.
- Bending or restricting of hoses to reduce power shall not be done, as extra pressure on couplings would make the hose whip and twist at high speed.
- Horseplay shall be avoided with compressed air, since it can be fatal.
- Air jet shall never be directed towards self or others as compressed air, in the blood stream, eyes, ears or nostrils could be fatal.
- A restricter to the airflow or a lance shall be used to blow out shutters.
- Correct action to be taken in case of an airline break is to turn off the air supply, crimping the airline at a safe distance from the break. Every one working on pneumatic equipment shall be repeatedly educated on this.
- It shall always be remembered that mishandling of hoses or tools of compressed air could cause accidents.
- Breaks at regular intervals shall be allowed to the operators handling vibratory hand tools on air line, as prolonged vibrations are prone to cause diseases like vibration induced "White Finger" and muscular problems.
- Air operated equipment shall be properly silenced. No excessive noise shall be tolerated. Noise as well as vibration is reduced by properly cleaning and maintaining the equipment, periodically.

8.5.6 Air Compressors

- Regular maintenance and cleaning of compressor shall be carried out as per maintenance instructions.
- Trained mechanic shall inspect the compressor during servicing in order to ensure that all safety valves and devices are working properly.
- Only trained personal shall be authorized to operate and maintain compressors.
- Check that the air receiver is marked with safe working pressure not exceeding maximum pressure rating. Pressure reducing valve is fitted to prevent working pressure exceeding the safe working pressure.
- Ensure that the air receiver is fitted with a safety valve, pressure gauge, drain cock and manhole which are all in working condition.

- Ensure that the compressor is sited on level ground in a well-ventilated location with no risk of exhaust fumes sinking into trenches, excavations or enclosed spaces nearby.
- Flammable liquids shall never be used to clean any part of the compressor.
- If compressor is overheated, it shall be stopped and the condition shall be reported at once to the supervisor.
- 'V' belt drive guards and guards for other moveable parts of the compressor must be firmly fixed to the compressor when it is being operated.
- Pressure gauge shall be kept clean at all-times. If working pressure exceeds safe limits, compressor shall be shut down, and the fact shall be reported at once. The maximum working pressure shall be displayed on the equipment.
- Damage to gauges and pressure relief devices shall be avoided. If damage occurs, the compressor shall be immediately shut down and the damage shall be reported to the supervisor.

8.6 Tools

8.6.1 Electrically Operated Tools

- Wires and cables shall be laid out of the way of other operatives, to avoid damage of tripping hazard.
- Tools shall be used at the correct speed setting for the work to be done.
- Correct drill or blade shall be used and chucks shall be secured.
- Tools shall be disconnected from mains when not in use and before changing of blades, discs and drill bits.
- Regular maintenance of electrically operated tools shall be carried out by the operator after attaining proper training.
- Repairs shall be carried-out by authorized person only, as temporary repairs by amateurs can be very dangerous and even fatal.
- All personnel in the site shall know to deal with electrical shock and also the use of correct fire extinguisher for electrical fire.
- Operators shall be trained properly for the work to be carried-out, the hazards and the safety precautions to be observed.
- Tools shall be checked before use for signs of damage to the tools and signs of wear or damage to cables and wires. In case of any damage, the tool shall not be used but reported for repair.
- All tools shall be properly earthed and provided with correct type of fuses.
- In temporary wiring installations, only approved waterproof socket outlets, plugs and distribution boxes shall be used.
- All connections to socket outlets or wire-to-wire shall be made by proper electrical plugs, NOT by bare and cables.
- Cables and wires shall not be allowed to come into contact with water.
- Tools shall not be carried or dragged by its cable.

8.6.2 Hand Tools

Following precautions shall be taken while using the hand tools:

- Use right spanner depending upon dimension and shape of screw-head of nut.
- Use serviceable handle without cracks or other damage for every file, Screwdriver and Hammer.
- Chisels and Punches with mushroomed heads shall be ground on the wheel.
- Striking tool's head shall be securely wedged on their shaft.
- Cutting tool's edges shall be maintained sharp and straight.
- Hands shall be behind cutting edges while working.
- Screwdrivers shall not be used with the object held in hand.
- Eyes shall be protected using goggles, while using striking tools.
- Scrap the tools, which are worn out or beyond repair.
- Tools shall not be laid down giving a change to roll, fall or be knocked over.
- Tools shall not be left lying in walkways or at places they could be tripped over.
- Where appropriate, tools shall be hung from racks.
- Ensure all cutting edges, teeth etc. are adequately sheathed or well protected when not in use.
- Employees shall be trained in using the right tool for the right job, after analyzing the underlying safety hazards.
- Supervisor/Foreman shall monitor each employee for correct usage of tools
- Regular weekly inspection of tools and all possible repairs shall be promptly carried out.
- Goggles and screens shall be used wherever needed
- Only insulated tools shall be used for electrical maintenance work
- Spanners and wrenches shall fit well. Their jaws shall be sharp and not spread out, to get a good grip

  Screwdrivers shall be:
- In good condition
- Fitted with good, non-slippery handles
- Insulation shall be effective
- Never use as lever to open things

8.6.3 Grinding Wheel

- Grinding wheel shall be inspected before fixing on the machine.
- Check proper mounting of wheels.
- Do not use badly worn unguarded wheels.
- Always work on grinding wheels with adequate hoods, tool rest, and guards and eye protection.
- Do not stand in line with wheel when starting it.
- Stand clear till wheel has reached full speed.
- Overheating the surface of the wheel by excessive pressure or other causes shall be avoided.
- Avoid contact of hands or fingers with rotating wheels.
- Care shall be taken especially while putting in or removing work.
- Take precautions while grinding the edge of thin or narrow gauge metal.

8.7 Electrical Safety

Safety from electricity is broadly categorized by following aspects:

Primary Protection

- All electricity-bearing parts are properly insulated or covered or protected from accidental contact by human body.
- Safety devices are introduced in circuit to automatically disconnect electricity in the event of a danger.

Secondary Protection

- Purposeful use of safety implements like insulated tools / hand gloves/ insulated platform of work.
- Full knowledge of point of danger and extent of risk.
- Working on electrical equipment where the supply is fully disconnected and isolated.

First Aid for Electrical Shock:

- Do not touch the victim's skin with bare hands until the source of electricity has been turned off.
- Switch off power if possible. Otherwise pull the plug or pull the cable away from the victim.
- If this is not possible, stand on dry insulating material and pull the victim clear of the conductor, preferably using insulated material such as dry wood.

8.8 Fire Safety

Basic Factors of Fire

The three factors namely Heat, Oxygen and combustible substance, combined together, create and promote fire. Removal of any one of them will diminish incidence or propagation of fire.

Fire Detection

Burning smell or smoke indicates outbreak of fire. Therefore, always be on the alert to recognize the same.

Action on Outbreak of Fire

- All fires can be extinguished at initial stages.
- Locate the spot of fire eruption.
- Determine the material on fire and use appropriate extinguisher taken from nearest fire point.
- Direct the nozzle of the extinguisher on to the fire, start from the outer side and slowly move to the center when the outer layers are extinguished.
- If you cannot control the fire, and no one else is near you, switch off the electrical main and raise an alarm.
- Get more people from the nearest locality.
- Contact the Fire Department over telephone
- Inform the Dept. Head and HSE Manager.

Precautions against Fire

- Emergency exits must be provided in all enclosed areas.

- All the personnel shall be familiar with the emergency procedures.
- Escape routes, alarm points and firefighting equipment shall be kept clear of all obstructions at all times.
- Fire hazard posters should be displayed at all places where fire can occur.
- "No Smoking, No Open Flame" boards should be fixed at all required points.
- Monitor and ensure "No Smoking" at declared areas.
- Display nearest fire brigade phone number at important places.
- Only trained personnel should use the blow-torches.
- Inflammables, explosives and flammable vapors / liquids should be positioned at safe distance from flames and sparks.
- No sparking tools should be used at places where easily combustible and inflammable materials are kept or likely to be stored.
- Oils and paints should be stored in approved places. Drippings of the same should be collected and disposed of properly without delay.
- Rubbish and oily rags should be deposited into specified containers and disposed off daily.
- Accumulation of waste should be avoided by timely clearance.
- All electrical circuits should be switched off by the last person leaving the premises, except those are essential. Example: Danger alarms, refrigeration apparatus, security lights etc.
- Electrical connections should be of approved design, earthed and grounded where necessary.
- All petrol / diesel engines, while working inside oil / gas installation stations shall have flame arrestors.
- None of the equipment for firefighting like fire buckets, hoses, hydrants etc. shall any account be tampered with or utilized for any other purpose.
- Validity of the fire extinguishers shall be monitored closely and the servicing shall be carried-out, when they are due.
- All the personnel shall be familiar with the operation of fire extinguishers in the event of outbreak of Fire.

Type of fire		**Recommended extinguishers**		
Type	Definition	Water	ABC Chem. powder	CO2
A	Paper, wood, cloth, others	yes	yes	-
B	Inflammable liquids like Oil, Grease, gasoline, solvents, paints, others	-	yes	yes
C	Auto Combustible Gas like Hydrogen, Acetylene, propane, butane, methane, others	-	yes	yes
D	Metallic Fire like Mild Steel, Brass, Copper, Sodium, lithium, potassium, magnesium, others	-	*FM 200	-

E	Electrical – Live electrical components/ circuits.	-	yes	yes

*FM 200 may be used in all type of Fires

Use of fire extinguishers:

- Ascertain the validity of the extinguishers' load.
- Approach the fire, always towards the direction of the wind
- Attempt to extinguish the fire by pointing the extinguisher nozzle at the base of the flame
- When dealing with liquids spilled from pipes or tubes, spray from top to bottom
- Consider the possibility of the fire re-igniting.
- Any fire extinguisher once it is used must be sending to the tool shed for servicing/reloading immediately.

8.9 Health

Occupational Health Hazards

Occupational Health hazards usually occur due to the prevailing working environment. Exposure to any erratic or abnormal working conditions can lead to these hazards. A particular worker carrying out similar activity in an unhealthy environment for a longer duration of time is another cause for occupational health hazards. Rotating the workers to various activities within the work-site can help to avoid these types of hazards to certain extent. Effective usage of PPEs can overcome most of the occupational health hazards. Some of the occupational health hazards and the remedial measures are given below.

8.7.1 High Noise Level

Excessive noise can lead to loss of hearing, stress, fatigue, loss of efficiency, interference in communication, deafness and other acute effects like rupture of eardrum, hemorrhage, etc. The type of hearing protection shall depend on the application. Ear muffs and earplugs are the most frequently used PPEs. The ear defenders shall be used for all areas where the sound level is above 80 Decibels.

8.7.2 Skin Diseases

Skin diseases can occur due to contact with chemicals, materials, which can cause allergy or irritation, cutting oils, etc. It also depends on the environmental factors like temperature, humidity, friction, etc. The most appropriate method is to use the protective gears like overall, aprons, gum boots, hand gloves, bell clove etc. designed for the specific purposes.

8.7.3 Radiation

Radiation is the emission of waves of electromagnetic energy, which can penetrate the human body. The radiation can occur from industrial applications like welding, pigging of pipelines, medical x-rays, chemical analysis, security baggage scanning, etc. This radiation can damage the tissues and even cause cancer. Where there is a chance of radiation exposure, special care and appropriate PPEs shall be used.

8.7.4 Exposure to Acids

The spillage of acids on the skin can produce severe burns. Human eyes are particularly sensitive against acids. Inhalation of acid fumes causes choking, breathlessness and asphyxia. Ingestion causes burning of the mouth and tongue, vomiting and collapse. Drenching shower and eyewash facilities shall be made available where the acids are handled. Protective clothing like full-face mask, gown, gum boots, rubber gloves, etc. shall be used. Efficient exhaust ventilation shall be provided. This shall be applicable for activities like pickling of metals and electroplating.

8.7.5 Heat Stress

The normal body temperature of the human body is 37 Deg. C or 98.6 Deg. F to maintain the body temperature, the body looses heat by sweating when the outside conditions are hot.
The factors which affect the body temperature are as follows:

- The air temperature
- Humidity
- Wind
- Clothing
- Activity
- Fluid intake
- Body adaptability

The elderly people, young children, those who have health problems and those who work at outdoors like construction workers, are at the risk of heat related illnesses.

The major heat related emergencies, their signs and symptoms are as follows:

➢ **Heat Cramps**
- Heavy sweating
- Rapid onset
- Pain
- Muscle spasms

➢ **Heat Exhaustion**
- Dizziness/weakness
- Cool/moist/pale or ashen skin
- Nausea/vomiting

➢ **Heat Stroke**
- Sweating stops
- Rapid rise in body temperature
- Change in consciousness

- Convulsions
- Body system failure like respiratory /cardiac arrest

8.10 First-Aid

First aid is the immediate assistance or treatment given to someone injured or suddenly taken ill before the arrival of the doctor or being taken to a clinic or hospital. The main aims of the first aid are to preserve life, limit worsening of the condition and to promote recovery.

The following are some of the general possible first aid cases.

Wounds and Bleeding
Any abnormal break in the skin or body surface is known as a wound. The open wounds allow blood and other fluid to be lost from the body and germs to enter. For close wounds the bleeding is purely internal.

External Wounds

The following actions shall be carried-out for providing first aid to external bleeding.

- Apply direct pressure to the wound
- Raise and support the injured part
- Apply pressure bandage
- If bleeding seeps through, provide another bandage firmly over the top

Following are the first aid actions against minor open wounds

- Wash the wound
- Apply sterile dressing
- Apply direct pressure
- Apply antibiotic ointment

Following are the first aid actions for major open wounds

- Do not wash the wound
- Apply clean dressings by placing sterile dressing or clean cloth over wound.
- Apply direct pressure by pressing firmly against wound with hand
- Elevate the injured part by raising the wound above the level of heart, if possible.
- Apply pressure bandage with roller bandage using overlapping turns and tie or tape the bandage in place.
- Take steps to minimize shock
- Seek medical attention

Following care shall be taken against any impaled objects during first aid

- Do not remove the object

- Use bulky dressings to stabilize
- Control bleeding

Internal Bleeding

The internal bleeding is the escape of blood from arteries, veins or capillaries into spaces in the body. Internal bleeding involving arteries and veins are more serious compared to capillary bleeding. Capillary bleeding is identified as minor bruising just beneath the skin.

The following first aid shall be given for internal bleeding / closed wounds.

- Help the casualty to rest in the most comfortable position
- Reassure casualty
- Apply direct pressure
- Elevate the injured part
- Monitor breathing, pulse and level of consciousness
- Provide care for other conditions
- Seek medical attention, if injury is severe

The symptoms and signs for internal bleeding are as follows:

- Pale, cold and clammy skin
- A rapid weak pulse
- Rapid breathing
- Soft tissue (either tender, swollen or firm)
- Pain, bruising
- Excessive thirst
- Confusion, restlessness, irritability
- Bleeding from the orifices

Burns

Burns are soft tissue injuries caused primarily by heat. Heat, chemicals, electricity and radiation can cause burns.

The severity of the burn depends on the temperature of the object, location of burn, extent of burn, length of exposure and the casualty's age and medical condition.

Thermal Burns

The following first aid actions shall be carried-out for the thermal burns.

- Stop the burning process
- Cool the burnt area
- Cover the burnt area
- Minimize shock

Electrical Burns

The following first aid actions shall be carried-out for the electrical burns.

- Check to ensure the scene is safe
- Check for life threatening conditions
- Care for shock
- Call medical assistance

Chemical Burns

The following first aid actions shall be carried-out for the chemical burns.

- Flush the burn continuously with water
- Remove contaminated clothing
- Avail medical assistance.

Injuries to Muscles, Joints and Bones

The following are the different types of injuries, which can occur to any muscle, or joint or bone.

- Sprain - The partial or complete tearing of ligaments and other tissues at a joint
- Strain – A stretching and tearing of muscle or tendon fibers
- Fracture - a break or disruption in bone
- Dislocation - Displacement or separation of a bone from its normal position

The common signs and symptoms for the above injuries are pain, swelling, deformity, bruising and inability to use affected part normally.

The following first aid shall be taken against any sprain or strain. It is also known as RISE procedure.

- R - Rest the injured part
- I - Ice or cold application
- S - Compress the injury
- E - Elevate the injured part

Following are the symptoms of fracture or dislocation.

- Pain
- Moderate to severe swelling and bruising
- Inability to move or use the affected body part
- Casualty feels bone grating, or felt or heard a snap or pop at the time of injury
- A shortening, bending, or twisting of the affected limb
- Bone fragment protruding from a wound
- Loss of circulation or feeling in an extremity

The following first aid shall be given against any fracture or dislocation.

- Prevent blood loss, movement, and infection at the spot of injury
- Rest the injured part
- Apply ice or cold pack to the injured part
- Immobilize the injured part
- Elevate the injured part
- Do not let the casualty have anything to eat or drink
- Do not press down directly on a protruding bone
- Do not try to replace a dislocated bone into its socket

The purpose of immobilizing an injury is to:

- Lessen pain
- Prevent further damage to soft tissue
- Reduce the possibility or loss of circulation to injured part
- Prevent closed fractures from becoming open fractures

Fainting

A faint is a brief loss of consciousness that is caused by a temporary reduction of blood flow. It may be a reaction due to pain or fright, or the result of emotional upset, exhaustion, or lack of food. It can occur while working or standing still for longer period of time in warm conditions. The signs of fainting are the falling of the casualty to the ground, a slow pulse, or a pale, cold skin and sweating. The first aid for a fainted casualty is as follows:

- Lay casualty down and raise his legs
- Make sure there is plenty of fresh air
- As he recovers, reassure and help him to sit up gradually
- Look and treat any injury that has been sustained through falling

Artificial Respiration

The artificial respiration shall be provided as a first aid in case the casualty undergoes a respiratory arrest, but still have pulse. This shall be provided for a person who has ceased breathing due to drowning, choking, electric shock, poisoning, drug overdose, head injury, chest injury or other causes and lying unconscious on the back. The rescue breathing is the process of breathing air into a non-breathing person to supply oxygen needed to survive. The following actions shall be carried-out while provided artificial respiration.

- Kneel by the casualty
- Tilt the head and lift the chin
- Look, listen and feel for breathing for about 5 seconds
- Check his mouth and remove any obvious obstruction
- Open the airway
- Close the casualty's nostrils
- Give mouth to mouth ventilation. Take a full breath, place your lips around the casualty's lips and make a good seal.
- Blow into the mouth for 2 seconds of full inflation until the chest rises
- Remove the lips and allow the chest to fall fully
- Repeat this every 5 seconds for about 1minute
- Recheck the pulse and look for signs of recovery after every minute

Cardiac Arrest

Cardiac arrest occurs when the heart stops beating, or beats too irregularly or too weakly to circulate blood effectively. Without a heartbeat, breathing will soon cease. The common causes for cardiac arrest are the cardiovascular disease, severe blood loss, electric shock, drug overdose and hypothermia. The signs and symptoms for the cardiac arrest are the absence of pulse and breathing.

Cardiopulmonary Resuscitation (CPR)

The term cardio refers to heart and pulmonary refers to the lungs. CPR is a combination of rescue breathing and chest compressions. The chest compressions are a method of making the blood circulates when the heart is not beating. The rescue breathing and chest compressions provided artificially take over the function of the lungs and heart.

The following steps are to be performed while performing the CPR

- Assess casualty for circulation by checking the pulse for about 10 seconds
- Position hands for chest compressions by placing the middle finger of the lower hand over the point where the lower most ribs meet the breastbone.
- Place your index finger above it on the breastbone.
- Place the heel of your other hand on the breastbone next to your index finger.
- Place the heel of your fist hand on top of the other hand, and interlock your fingers.
- Lean over the casualty with your arms straight.
- Press down vertically on the breastbone and depress it by approximately 5cms.
- Complete 15 compressions in approximately 10 seconds.
- Compress down and up smoothly.
- Give 2 breaths
- Continue alternating 15 chest compressions with 2 breaths for 3 or more cycles.
- Recheck the pulse by feel it for about 5 seconds.
- Once you start CPR, try not to interrupt the blood flow being created artificially.
- Stop the CPR if the scene becomes unsafe, other medical personnel arrived, the person becomes exhausted or the casualty's heart starts beating.

Vital Signs

A person's level of consciousness, pulse, breathing and skin characteristics are known as the vital signs. These vital signs can determine how his body is responding to injury or illness. The heartbeats create the pulse and the normal pulse for an adult is between 60 and 100 beats per minutes. A healthy person breaths regularly, quietly and effortlessly and the normal breathing rate for an adult is between 12 and 20 breaths per minute. The appearance of the skin like wet or dry, pale, bluish, or flushed and its temperature namely cold or hot, often indicate something about the casualty's condition

8.11 Environmental Protection

8.11.1 Environmental Management

Work shall be executed in the best possible way to protect the environment by minimizing pollution, maintaining cleanliness and efficient use of all available natural resources. The site engineers/supervisors, workshop-in-charge and camp-boss shall be responsible for the implementation of environmental management at the sites, workshop and camps respectively.

8.11.2 Environmental Protection

- To protect environment, tree planting should be promoted near offices, work places and site offices.
- Sites, offices, work place and camps shall be kept clean
- Display posters, which encourage environmental awareness at sites.
- All sites toilets shall be brushed and cleaned with water daily. Detergent/acid shall be used for cleaning once in two weeks.
- Wastes originating from rubber and plastic materials shall not be burned at sites, since they generate toxic fumes

8.11.3 Guidelines on Environmental Protection

- Keep our planet earth clean by not littering.
- Participate in the beatification schemes like planting trees.
- Encourage our families and friends to buy environmentally friendly products.
- Conserve natural resources by avoiding wastage.
- Use more number of recycled products in our daily lives.
- Avoid purchase of non-sustainable forest products such as aerosol type polishes, hair lacquers, perfumes and air fresheners in the spray form.
- Avoid causing physical damage to natural features like ecology, heritage, and surface geology.
- Reduce gas or exhaust release causing smoke or smell to the atmosphere.

8.11.4 Waste Management

- All wastes shall be collected on daily basis and disposed off as recorded below.
- Separate area shall be demarcated as dump-yards at all work-sites, workshops and camps for waste collection.
- Necessary waste bins in offices, workshop and sites areas shall be provided.
- Food wastes shall not be mixed with other wastes.
- No untreated sewage shall be allowed to flow out.

- Adequate arrangement for sewage disposal shall be made even for temporary site offices and camps.
- The short or long-term hazards to air, water or soil as a result of incorrect disposal of the waste shall be avoided.

The some of the methods, which shall be adopted for the effective waste management, are as follows:

- Reduction of wastes by proper planning and careful consumption of all material
- Segregation of different types of wastes at work-sites
  - Metallic Wastes.
  - Wooden wastes
  - Concrete debris
  - Paper wastes, empty cement bags and cartons
  - Food Wastes
- Reuse wastes for other appropriate applications, where ever possible.
- Recover useful commodities or parts from the wastes, where ever possible.

Following are some of the hazardous and non-hazardous wastes, commonly encountered, their method of disposal and the PPE to be worn while handling them.

Hazardous

Item	*Method of disposal*	*PPE to be worn*
Petroleum product wastes/spillage	Separate tank made in the workshop and bowered by tanker	No need of PPE
Mercury, acids & other chemical spillage	Acidic wastes shall be neutralized and fed to the tank, from there it shall be bowered by tanker	Rubber gloves
Paint drums with residue	Paint drums shall be cleaned thoroughly and can be used as waste bins	Leather gloves

Non-Hazardous

Item	*Method of disposal*	*PPE to be worn*
Scrap metals	To be sold to metal scrap vendors when a truckload volume, accumulates	Leather gloves
Wooden wastes	Municipality dump-yards	Leather gloves
Concrete debris.	Municipality dump-yards	Leather gloves
Paper wastes	Paper wastes shall be collected in separate bag and dumped to municipality yard	No need of PPE
Sewage water and sludge deposits.	Bowered by tanker from the septic tank. Or Soak pit shall be made at sites.	Rubber gloves & Face mask
Food Wastes.	To be collected in black polyethylene bags (Garbage bags) and disposed at designated waste areas.	Polyethylene gloves

8.12 Personal Protective Equipment

Definition
Personal protective equipment (PPE) is the devices designed to be worn by the personnel to protect themselves against any work-related hazards, which may threaten their health or safety.

Selection
The PPE shall be selected for each activity by understanding the hazard expected in that particular operation/area. All PPE selected should not lead to any additional or increased risk. These shall be correct fitting and shall comply with the requisite international standards.

General Guidance

- All workers shall wear appropriate PPE supplied to them at all times while working at their tasks. ***Any non-compliance shall be liable to disciplinary action.***
- All employees shall be responsible for proper care and use of the PPE supplied to them.
- A worker shall not use PPE that is broken, torn, or cracked and not in a condition to perform the function for which it was designed.
- Safety appliances shall not be mixed up with tools and other materials.
- Rubber materials such as apron, gloves and gum boots shall be kept away from oil or grease and shall not be exposed to extreme heat.

8.12.1 Types of Personal Protection

The types of personal protection and the appropriate PPE for the potential hazards are identified as follows:

Body Protection

- All workers shall wear overalls while working.
- Leather aprons specified for hot works shall be worn while performing welding and gas cutting activities.
- Rubber coated aprons specified for wet works shall be used by the individual holding the hose end while concreting.
- No loose work-wear shall be worn while working on rotary machines.

Head Protection

- All workers shall wear hardhats to protect their head from any falling objects or hit on/by other objects.
- Chin strap shall be attached to the hardhats to keep it properly fastened to the head always.
- All hardhats used shall have proper wearing band.
- The hardhats with crack or holes shall be not be used further.
- Three numbers of additional hardhats shall be provided at all the sites for visitors.

Eye and Face Protection

- Safety goggles shall be used for activities like grinding, chipping, drilling, sawing and other activities in which there is a risk of flying particles penetrating the eye.
- Ensure that the goggles are clear and replaced when they cannot provide requisite visibility.
- Welding shields shall be used for tack welding and welding for smaller duration.
- Full face welding helmets shall be used for continuous welding activity.
- Ensure that the co-worker those who are in the vicinity and observers also use the welding shield.
- Face and neck coverings that may restrict a worker's vision while working shall not be used.
- Bellclove can be used at outdoor construction sites to protect the face from extreme heat and windy conditions.

Fall Protection

- Fall protection equipment like safety belts or Safety harnesses shall be provided to the workers working in following conditions.
  - Working on overhead lines
  - Working at heights like scaffolding, ladders, storage tanks, rooftops, etc.
- All harness and safety belts shall be hooked to any rigid and firm object.

Hearing Protection

- Hearing protection shall be made available to all workers exposed to noise levels above 80 decibels.
- Ear defenders like earmuffs or earplugs shall be used by the operator for the following activities:
  - Excavator for rock breaking.
  - Air compressor with pneumatic chisels like jack-hammer
  - High noise drilling, chiseling and demolition works
  - Grinding, cutting and polishing of metal, stone, etc.
  - Vibration compacting during concreting.
- People in the vicinity of high noise area for longer hours like banks-men and supervisors shall wear earplugs.

Hand and Arm Protection

- Suitable types of hand gloves shall be used for specific activities/personnel listed below:
  - Spotted cotton gloves shall be worn by the following technicians/operators
    - Operating electrical power tools
    - Electrical installation works

- Air-conditioning installation works
- Carpentry works
- On any other circumstances where a good grip is essential.

➢ Heavy duty Leather gloves shall be worn for the following operations:
- Hammering for demolition
- Using crow bar for demolition and manual excavation
- Chiseling/drilling
- Bar bending operation
- Bar cutting operation
- For lifting blocks
- Cutting blocks, bricks, interlock tiles, etc.
- Loading and unloading of heavy goods requiring less grip

➢ Welding Leather gloves shall be worn for the following hot works:
- Arc welding
- Gas cutting
- Drilling on Radial drilling machine in fabrication workshop
- Grinding on grinding wheel in fabrication workshop
- Working on other heat generating equipments

➢ Rubber Gloves shall be worn while
- Handling chemicals in Electroplating activities
- Handling concrete construction chemicals

➢ Heavy duty Rubber gloves shall be worn by the Electricians while working on live lines
➢ All gloves shall be in good condition, without cuts or abrasions.

- Leggings shall be used while welding and gas cutting to protect the forearm.

Leg Protection

- All workers and Site in-charge / Supervisor shall wear safety shoes.
- Gumboots shall be used for the following activities:
  - ➢ Handling chemicals, acids, alkalis, etc
  - ➢ Concreting
  - ➢ Working on wet floors

Nose Protection (Protection against inhaling)

- Dust /paper masks shall be worn by all workers while performing following operations:
  - ➢ Buffing in Electroplating area
  - ➢ Painting
  - ➢ construction sites having dusty conditions
  - ➢ Applying water proof coating/ anti termite chemicals/ pest control chemicals.
  - ➢ Wood cutting and planing machines

➢ Special filter facemasks with replaceable cartridges specially designed for air purification shall be used for following activities:
- ➢ Spray painting
- ➢ AC insulation works with fiber wool
- ➢ Pickling in Electroplating area
- ➢ Buffing in Electroplating area

- The cartridges of the filter masks shall be thoroughly cleaned after use and kept ready for subsequent usage.

8.12.2 Training of Usage of PPE

- Site in-charge / Supervisor shall be responsible for ensuring that all personnel at site are trained for proper use of PPE provided to them.
  - Specific instructions shall be given to concerned workers, for the effective usage of PPE.
  - Demonstration shall be carried out on how to wear any PPE, as applicable.
- Site in-charge / Supervisor shall identify the PPE requirements for all personnel involved in the contract before mobilization. This shall be recorded in the project HSE plan for easy monitoring.
- The Site in-charge / Supervisor shall authorize commencement of work only if all employees involved are equipped with basic safety requirements like overalls, safety shoes and hardhats.
- The effective usage of PPE shall form as a subject for toolbox talks.

8.12.3 PPE Inspection

- Site in-charge / Supervisor shall inspect all the PPEs at sites on a monthly basis.
- Site in-charge /Supervisor shall rectify / withdraw the respective PPEs, which are in unusable condition or improper for the task to be carried out or crossed its effective life and provide replacement for it.
- Member of the safety audit team, HSE Manager and senior staff shall check appropriate PPE during audits/site visits.

8.12.4 Caution Signs for PPE

The caution signs for the use of PPE are intended to remind the personnel about the risk or hazard involved in the activity, which they are going to perform. These signs shall be legible and placed at locations where the persons view them from anywhere around the working locality. The following are the commonly used caution signs and their color-coding.

Caution Sign	*Location*	*Color-coding*
Hard hat	Site entrance	Blue

Safety Shoe	Site entrance	Blue
Hand Gloves	Carpentry yard, Welding area Steel bending /cutting yard, Chemical handling area, etc.	Blue
Safety Goggles	Carpentry yard, Chipping / Hacking Steel bending / cutting yard, Near to demolition works using Hilti, etc.	Blue
Ear Defender	Near to rock breaker in operation, Near to Pneumatic tool in operation, Near to demolition works, etc.	Blue
Face Masks	Carpentry yard, Debris removal, Anti-termite treatment Buffing area, Pickling Area, Spray Painting booth, etc.	Blue
Low Voltage	DB at sites	Yellow
Caution Sign	***Location***	***Color-coding***
High Voltage-Danger	Electrical control room in camps	Red
No Smoking	All sites, site offices, camps	Red
No Open Flame	Fuel storage area, Wood storage area, Wooden waste yard, carpentry yard, etc.	Red
Flammable Solids	Wood storage area, wooden waste yard, carpentry yard etc.	Yellow
Unfit for Use	For scaffolding above 5 Meter height	Red
Fit for Use	For scaffolding above 5 Meter height	Green
First-aid Box	Site office	Green
Assembly Point	Near site entrance	Green

Definitions of the commonly used color-coding are as follows:

- Red – Prohibition sign / Danger
- Yellow – Warning sign
- Blue – Mandatory sign
- Green – Emergency door / First aid sign.

9. EMERGENCY PROCEDURE

The emergency system has its main objective to control the occurrence of emergency situations in order to limit losses (human and natural materials) to the minimum possible in the event of any emergency situation (slight accident, severe accident, fire or disaster).

Given the logistical difficulties, minimum requirements shall be created for the provision of first-aid services at the site and for transporting injured workers to a hospital or clinic.

Site will be equipped to face all types of Emergency in the following way:

1) Emergency map of the works, with indication of access and meeting points
2) Training & Awareness on Emergency Escape
3) Fire Drill exercise
4) Fire Extinguisher

5) First Aid Facility
6) Availability of vehicle
7) Tie up with Healthy Life Clinic (free medical services to the Employees)
8) Display of the Emergency Numbers:
    - First Aid Services
    - HSE Manager
    - Project Manager/ Site In Charge
    - Ambulance
    - Hospital
    - Fire Brigade
    - Police Station

Other Emergency Numbers as applicable to the location & will be displayed

Scenarios	Actions to be undertaken – Contents
Accident at work	In case of any accident, this should be reported to the foreman (metallic, concrete) or to the safety officer as listed in the emergency number list. Should be provide first aid to the victim if by someone with first aid course at the scene until the arrival of emergency services
Fire	In the case of an outbreak of fire at work or in the site caused by work being undertaken the responsibility of the contractor, shall be use dry chemical extinguishers on existing work to control that fire. In case of fire in large proportions as to be alerted the fire department to give assistance.
Accident by electrocution	In the event of any accident at work by electrocution no one should touch the victim, turn off the power supply and immediately give warning to the person in charge so to arrange the necessary means to provide assistance to victims of accidents.
Road accidents	In the event of traffic accidents should be called the authorities, local police and if there are victims, alert and call an ambulance. After the rescue of victims put at the disposal the means of the work to restored to normal conditions of traffic circulation

9.1 In case of Fire:

1. Any person discovering a fire should
   - Raise the alarm
   - Shout FIRE! FIRE!! And sound the alarm

2. Site occupants upon hearing Fire alarm
   - Follow Company evacuation procedure
   - Proceed to assembly point
3. Emergency Team Leader
   - Seek information about location, scale and type of fire
   - Take charge of situation

4. Emergency Telephone Nos.
   - Telephone 9999 (interior 5555)
   - Request fire service and ambulance
   - Record events, times and messages on log sheets

5. Roll Call Attendant
   - Take roll call as per updated occupants list
   - Identify if anyone is missing
   - Inform the team of missing persons trapped inside
   - Calm the occupants

6. Emergency Team
   - Taking personnel safety into account
   - Will search for missing persons / casualties
   - Bring them to assembly point and administer first-aid.

7. Team Leader
   - Liaise with Fire Warden and ambulance crew
   - Seek clearance for re-entry
   - Declare all clear
   - Keep roll call sheet and event log sheet of the incident on fire

9.2 In case of Electrical Accident

1. Disconnect the source of electrical power supply.
2. Ensure the area is safe and secure for yourself and others to enter.
3. Separate the casualty from the electric cable by means of a non- conductor such as wood or nylon rope.
4. Do not move casualty unless the situation is immediately life threatening.
5. Call the emergency response unit.
   - Emergency telephone no. 9999 (interior 5555)
   - Pass on the following information clearly and precisely:
     - Location

- Type of immediate assistance required.
- Number of casualties.
- Type of severe injuries.
- Personnel and equipment already at scene

6. If First aider is available give immediate First Aid to preserve life
   - Airway: Ensure airway is open and maintained (remove debris from mouth)
   - Breathing: Check for breathing (mouth to mouth ventilation if necessary).
   - Circulation: Check for pulse (Chest compression if necessary).
7. If second person is available, have them record in writing the injuries, vital signs and times of observation.
8. Protect and continually reassure the casualty(s).

9.3 In case of Accident – No first aider

Any person involved in an accident.

1. Stay calm
   - Assess the situation
   - What exactly has happened?
2. Contact the most senior Company person on site.
   - Send Vehicle in necessary
   - Give your name and telephone number, nature of emergency, location and type of assistance required.
3. Ensure the area is safe and secure for yourself and others to enter. DO NOT put yourself in danger.
   - Be aware of Fire, Traffic, Electricity, Gas and Falling Debris.
4. Do not move casualty unless the situation is immediately life threatening.
5. Call the emergency response unit.
   - Emergency telephone no. 9999 (interior 5555)
     - Pass on the following information clearly and precisely
     - Location
     - Type of immediate assistance required
     - Number of casualties
     - Type and severity of injuries
     - Personnel and equipment already at scene
6. Listen carefully to the instructions given to you by the controller.
7. If no contact can be made, send for help. If messenger cannot speak English, send the message in writing to avoid any miss- communication.
8. Protect and continually reassure the casualty(s)

9.4 In case of Accident – First aider Present

Any person involved in an accident.

1. Stay calm
   - Assess the situation
   - What exactly has happened?

2. Contact 9999 (85555 Interior) and the relevant company office.
   - Send Vehicle if necessary
   - Give your name and telephone number, nature of emergency, location and type of assistance required.
3. Ensure the area is safe and secure for yourself and others to enter.
   - Be aware of Fire, Traffic, Electricity, Gas and Falling Debris.
4. Do not move casualty unless the situation is immediately life threatening.
5. Give immediate First Aid to preserve life
   - Airway: Ensure airway is open and maintained (remove debris from mouth)
   - Breathing: Check for breathing (mouth to mouth ventilation if necessary).
   - Circulation: Check for pulse (Chest compression if necessary).
6. If second person is available, have them record in writing the injuries, vital signs and times of observation.
7. Check for injuries (cut cloths to have a good look unless it is a burn injury).
8. Call the emergency response unit.
   - Emergency telephone no. 9999 (Interior 5555)
     - Pass on the following information clearly and precisely
     - Location
     - Type of immediate assistance required
     - Number of casualties
     - Type and severity of injuries
     - Personnel and equipment already at scene
9. Protect and continually reassure the casualty(s).

9.5 In case of attack by snake, dogs, foxes & Scorpions.

Precautions:

- Look where you walk and put your hands.
- Wear good ankle covering footwear
- Avoid walking with bare feet or flip flops outside at night without a light.
-

a) Snake bite – You are Alone.

- Try to be calm
- Contact the most senior person in the area by any means of communication available.
- Give your name, telephone number; tell him you have been bitten by a snake and describe it if you can; Give location and say you need immediate medical assistance.
- Lie down on your side and wait for help. The less movement the better.

b) Snake bite – There is someone to help.

- Reassure and calm the victim to reduce fright, shock and fear of death.
- Contact the most senior person in the relevant area and give your name and telephone number, nature of emergency, location and type of assistance required.
- Restrain all movements of the victim to avoid the spread of venom in the blood stream. Place the patient in the restful position, preferably lying down on one side.
- Clean and examine the area where the bite is. Did a fang penetrate the skin? If so, or in doubt and if a doctor or hospital is not within 30 minutes
- Bandage the whole limb firmly as for a sprain, starting at the toes or fingers, or press a pad firmly on the bite, and
- Immobilize the limb, with a sling for an arm, and splits if necessary for a leg: place it in a restful position.
- Do not cut or suck the wound
- Do not apply tourniquet, or give aspirin or spirits.
- Do not administer anti venom; this is a doctor's decision only.
- Do not handle live or dead snake; however, if there is no risk, identify the snake and if possible collect it on the end of a stick.

c) Bite from Animal (fox or dog)

- Flush the wound thoroughly with soap and water or alcohol.
- Contact the most senior person in the relevant area and give your name and telephone number, nature of emergency, location and type of assistance required.
- Seek medical assistance and inform the doctor of the type of animal and that it may be rabid. Note: if the animal was foaming at the mouth or was aggressive and attacked without provocation, then it is likely that the animal has rabies.
- Rabies can kill humans if not treated soon after contacting the disease.

d) Scorpion sting

- It is unlikely that a scorpion sting will kill, but it may be more serious if you suffer an allergic response.
- In the event of a sting, report this straight to your supervisor and seek medical attention.

9.6 In case of Man missing/Man lost

If you are either,

- Lost
- Have had an accident
- Broken down
- Been delayed by an unplanned event
- Other

Try to communicate with your base starting with journey manager, and then your senior and lastly, anyone who can pass on your message.

1. Do not leave your vehicle.
    - Alone human being is very hard to locate- even from the air

- Your vehicle is large and much more easily spotted
- Your vehicle provides shade
- Your vehicle can hold water which you cannot carry
- Your vehicle may have radio communication
- Your vehicle has lights which can be used at night times
- Your vehicle has mirrors to reflect light.
- Using smoke the denser the better, as a second option.
- As fuel for fire use your spare tyre if no other option is available. But make sure that it is completely deflated otherwise it will burst from the heat.

2. Protect yourself from the sun.
3. Conserve your energy by carrying out task in the cool of the morning or evening.
4. Conserve water supplies from the moment that you find yourself lost or immobile, however, take care not to become dehydrated if water is available – ration your water sensibly.
5. Use your GSM, Satellite Telephone, and Radio every half hour or hour to conserve the batteries

10. HSE Roles & Responsibilities

HSE Manager

- Reports to General Manager.
- Review and Approve HSE plan in coordination with Project Manager and monitor its implementation.
- With the involvement of Management, set and revise HSE Plan as well as HSE Objectives.
- Distribute and hold custody of HSE Plan and other HSE Guidelines and ensures that all documents are current.
- Interact with client /consultant on HSE matters in consultation with the Project Manager.
- Prepare and plan budgets for HSE related activities
- Conduct HSE Induction program for the new employees.
- Holds regular HSE meetings with staff/workers, explaining the relevant measures and procedures in relation to the work, encouraging greater awareness.
- Ensures that field personnel including sub-contractors are competent to carry out their work safely and that they understand the relevant HSE procedures.
- Co-ordinate with Departmental Heads and Manager (HRD) for external training.
- Co-ordinate HSE audit at sites and ensures that Audits and inspection are carried out as per the HSE Plan.
- Depute/carryout accident investigations and suggest necessary learning points and propose appropriate preventive actions to avoid recurrence.
- Circulate relevant HSE records and findings, to all concerned to prevent recurrence of accidents/Near miss.
- Decide on reward/penalty for accidents.
- Ensures that all waste is disposed of according to environmental regulations.
- Responsible for ensuring that all emergency drills are carried out as per the HSE plan.

- Takes immediate action on unsafe plant and equipment, unsafe or unhealthy working conditions, which are potential HSE hazards.
- Ensure compliance of LSRs by all employees and initiate disciplinary action if required as per the matrix given.
- Compiles contract HSE statistics and prepares monthly reports.
- Record and distribute minutes from any meetings.

Project Manager

- Responsible for all HSE matters of the company and reports to The General Manager.
- Ensures that adequate HSE professionals are available to assist in implementing revising/reviewing HSE plan and procedures.
- To liaise with Client/Consultant/Engineer and HSE Manager.
- Participates in HSE co-ordination meetings called by Client to review contract.
- Enforce HSE requirements to the sub-contractors, at the time of their appointment.
- Budget HSE items & other HSE costs in Project planning.
- Authorize purchase of PPE/safety gears and other HSE items related to the Project.
- Ensures that HSE requirements are fully implemented and non-compliances are investigated.
- Ensures that HSE objectives of the contract are achieved by monthly review of performance and participation in audit program.
- Instruct site team for the Zero gap implementation of HSE.
- Empower HSE Officer for the HSE Implementation.
- Conducts random HSE inspections of work sites to review conditions and practices.
- Take strict actions against the HSE defaulters.

Site In-Charge

- Ensures that all site activities are carried out in accordance with HSE procedures and policy.
- Where a permit to work system is in operation ensures the required documentation e.g. Permit to work, clearance certificates are in place and complied with, before work is carried out.
- Takes immediate action on unsafe plant and equipment, unsafe or unhealthy working conditions, which are potential HSE hazards.
- Investigates and reports promptly all unsafe acts and incidents.
- Holds regular HSE meetings with staff, explaining the relevant measures and procedures in relation to the work, encouraging greater awareness, responding to suggestions, seeks advice and assistance when necessary or desired.
- Co-operate HSE Manger/officer for HSE Implementation.
- Involve & inform HSE Manager/officer in case of –
- Appointment of new workers
- New plants & machineries arriving at the site
- Receipt of hazardous materials at the site
- Share daily / weekly schedule with the HSE Manager/officer for his preventive checks.

- Seek clearances/work permit, as applicable from the HSE Manager/officer before starting hazardous activities.
- Co-ordinate with HSE Manager in providing mandatory HSE trainings and In-House Competency to their staff.
- Ensure all personnel are issued with appropriate PPE as per their job descriptions and ensure sufficient stocks available for all load securing/binding items.
- Conducts random inspections of work sites to review conditions and practices
- Initiate actions against HSE defaulters at the site.
- Instruct site team to strictly follow the HSE requirements.
- Overall responsibility to carry out work under HSE certified environment.
- Lead and conduct regular in-house/ Third Party HSE inspections and audits and ensure compliance where standards are not being met.

HSE Officer

-
- Get Trained and well aware about QT HSE Requirements.
- Assist HSE Manager to implements HSE at the site.
- Understand Project Specific Client/Engineer HSE requirements thru Project Manager and or HSE Manager.
- Guide and train site staff & workers on HSE deployment.
- Establish basic HSE requirements at the site.
- Guide on display of caution signs and posters for HSE awareness.
- Conduct Tool Box Talk daily before the start of the shift.
- Identify unsafe conditions/acts at work places.
- Conduct regular HSE inspections at sites and workshop.
- Authority in matters of maintaining working area in a high state of safety and cleanliness.
- Recommend to workshop for the maintenance and repairs of vehicles/ equipment / plant / tools.
- Stop unsafe working practice, reprimand the involved workers
- Analyze and understand safety requirements of hazardous activities
- Conduct accident investigations
- Examine safety devices
- Encourage HSE awareness / implementation
- Recommend for purchase of safety gears /PPE
- In case of any serious HSE breaches or poor response, report the findings to HSE Manager and Project Manager.
- Responsible for ensuring that all documents are controlled and up to date.
- Responsible for maintaining the HSE documentation and is kept up to date.
- Ensure proper disposal of hazardous and non-hazardous wastes by correctly segregating them into separate waste skips.
- Ensure proper and timely disposal of the waste water (washing bay) and sludge along with other hazardous waste which may accumulate from time to time.

Site Engineer (SE)

- Co-operate HSE Manger/officer for HSE Implementation.
- Ensure that all onsite activities are in accordance with HSE procedures and practices.
- Ensure that hazards identified during execution of work are controlled or eliminated as per guidelines set for risk management.
- Reports all incidents, dangerous occurrences and hazards and action taken, to enable investigations to be carried out where required.
- Ensures that only authorized personnel are on site.
- Ensure that field personnel under his control wear proper PPE.
- Ensure that all lifting equipment's/ handling equipment including chains, slings, shackles, belts, winches, vehicles are in proper conditions and fit for use at all times.
- Ensure proper house-keeping is maintained at all times in the workshops and the stores under their control.
- Participate in HSE Audits & Inspections as required and continually monitor safety procedures in the work place.
- Ensures tool box talks are conducted by workshop supervisors, foreman and records maintained of the same.
- Reinforce HSE among the site workers.

Site Supervisor/ Foreman

- Line responsibility for field operations. Reports to Site in charge/ Site Engineer.
- Co-operate HSE officer for HSE Implementation.
- Responsible for onsite activities are in accordance with HSE procedures and practices.
- Takes immediate action on unsafe plant and equipment, unsafe or unhealthy working conditions, which are potential HSE hazards and reports promptly all unsafe acts and incidents.
- Ensure that hazards identified during execution of work are controlled or eliminated as per guidelines set for risk management.
- Ensures that only authorized personnel are on site.
- Ensure that field personnel under his control wear proper PPE.
- Ensure that all lifting equipment's/ handling equipment including chains, slings, shackles, belts, winches, vehicles are in proper conditions and fit for use at all times.
- Responsible for proper house-keeping is maintained at all times in the workshops and the stores under their control.
- Reinforce HSE among the site workers.
- Proactively promotes HSE message EVERY MAN IS HIS OWN SAFETY OFFICER.

Employees/ Workers

- To take reasonable care to avoid injury to self, work colleagues and others affected by activity.
- To minimize any damage to the environment caused by his duties.

- To comply with the rules and regulations made by the company and by the client with regard to HSE.
- To comply with the LSRs at all times.
- To use the protective equipment supplied by the company.
- To co-operate in training sessions, HSE meetings, and tool-box talks.
- To accept that HSE training is a condition of employment.
- To keep all working areas neat and tidy.
- Not to remove any guards, protective appliances/equipment or interfere with the plant, machinery or vehicles in any way which may be dangerous to himself or to others.
- To report all incidents to their supervisors.
- To seek first aid treatment for all injuries sustained at work.
- To inspect all equipment prior to use and report faults to his immediate supervisor.
- To be fully conversant with the company emergency procedures which are posted on notice boards?
- Where a permit to work system is in operation it is his duty to co-operate with procedures. If in doubt he should consult his immediate supervisor.
- To acknowledge that each and every individual employee has a responsibility and accountability commensurate with his position to comply with HSE provisions and procedures.

11. INFORMATION AND COMMUNICATION MANAGEMENT SYSTEM

WORK SCHEDULE

After the work schedule is approved, the copy of work schedule at the site shall always be available at the site's office, in a visible place.

RECORDS OF SUBCONTRACTORS AND WORKERS

The site shall keep records of each subcontractor, subsequent subcontractor or independent worker that works in the site-yard for more than 24 hours.

THE INDIVIDUAL OCCUPATIONAL SAFETY FORM

The following procedures shall be established for the purpose of making it possible to better control normative aspects and H&S when a worker arrives at the site, namely:

- Gathering the workers identification data;
- Controlling the distribution of personal protection equipment, PPE;
- Providing information on the risks that each PPE is meant to protect against;
- Providing the safety rules to be adopted at the site-yard;
- Providing information on any behavioral requirements that the site intends to implement.

a) All workers commencing work at the site shall be sent to the Record-keeping Office, regardless of their employer.
   - Company workers.
   - Subcontractor or subsequent subcontractor workers.
   - Independent workers.

b) At the Record-keeping Office, a Personal Occupational Safety Form (POSF) shall be filled out for each worker, with their identification and the situation of their PPE.
   - Record of their identification data and copies of the respective papers.
   - Record of the PPE handed in at the time.
   - Record of the PPE they already have, provided by their respective employer (subcontractors).
   - Record of the PPE they already have from another site where that PPE was provided.

c) The workers are informed of the following aspects:
   - The risks that each PPE is meant to protect against.
   - Their obligations in terms of PPE use and maintenance.
   - The risks associated with their work post.
   - The safety standards to be observed.
   - Any rules and regulations that are implemented at the site

d) The Workers are informed relating to:
   - Safety notices issued.
   - Rules to be adopted at the site-yard and which are issued by the site.

e) The workers sign their POSF in the appropriate fields, thus agreeing to comply with the above mentioned points.

Should new PPE be provided to replace or add to previous equipment in the course of the works, the following data shall be added to the worker's POSF (the same one):

- The new PPE received

- The date
- The worker's signature

12. INFORMATION AND TRAINING MANAGEMENT

This set of actions is developed and detailed in the general training plan that is presented in the following article.

Characterization	Contents	Providing entity	Target group
Welcoming session	□ General safety rules □ Use of the PPEs and hazards They are aimed to protect from. □ Rules in force at the site-yard. □ Procedures to be adopted in emergency situations □ Risks associated with the work post □ Good environmental practices	□ Administrative services or □ H&S officer	Compulsory for all workers who commence work at the site for the first time
Management Systems	□ The Safety, Quality and Environment Management System and the reference rules.	□ Internal trainer enabled with VTC (Vocational Training Certificate), or □ External entity qualified for the purpose	Management and administrative staff
Occupational Safety	□ Occupational Safety general principles. □ Occupational safety in specific activities. □ Procedure in emergency situation.	□ H&S officer, or □ External entity qualified for the purpose. □ H&S officer, or □ External competent entity □ H&S officer	All workers The workers involved in these activities All workers
First aid	□ Training in first-aid actions	competent entity	Restricted number, by volunteering
Environment	□ Good environmental practices and individual behavior	□ H&S officer , or □ Environment technician	All workers
Information/	□ Safety rules.	□ Administrative	All workers

Characterization	Contents	Providing entity	Target group
Disclosure		services,	
	Regulations and other provisions in use in the site-yard. General information	by display or disclosure	

13. ACCIDENT AND INCIDENT INVESTIGATION

Whenever there is an **Incident**, an investigation should take place, recording all the pertinent information that enables carrying out a detailed analysis. This Incident shall be classified as a work accident, if the resulting damage requires filing an insurance claim form, or as a relevant near-accident that shows a particularly serious situation from an occupational health and safety prospective.

CARRYING OUT THE ENQUIRY (INVESTIGATION)

The investigation is carried out by the worksite. In more serious cases, it may get the support from the company's central services.
Whenever the specificity or seriousness of the accident or near-accident so justifies, other information elements resulting from the investigation should be attached to the Accident (AAF), or Near Accident Analysis Form (NAAF):

- witness statements;
- detailed reports;
- photos;
- graphical diagrams and drawings;
- other technical elements;
- copy of the correspondence related to the accident or near-accident;

If a work accident involves subcontractor personnel, the worksite shall demand a copy of the relevant correspondence sent by it and which may be of interest to the process (case).

When filling out the "Accident or Near-Accident Analysis Form", the comments of the framework's head member (work front foreman, team leader ...) which is most directly related to the work front where the incident took place shall be obtained.

The Site Manager must check and validate the AAF or NAAF and its annexes.

INFORMATION TO THE CENTRAL SERVICES

The report sent to the Company's central services should keep in mind the following principles:

- should be complete, objective, rigorous and true;
- cover all accidents which occurred at the worksite, including those involving subcontractors;
- be of a strictly in-house nature.

PROCEDURE FOR THE STATISTICAL ANALYSIS OF ACCIDENTS

Accidents require statistical treatment to effectively identify the conditions leading to their

occurrence, for their characterization and for unofficial purposes. Will be implemented preventive procedures regulating this matters

14. Monitoring & Communication Mechanism

Sr. No.	Mechanism	From	To	Frequency	Record
1	HSE planning	Project Team + HSE Manager	Customer	Once before starting	HSE plan
2	Risk Assessment	HSE Officer	Site Team	Ongoing	Checklist
3	Tool Box Talk	HSE Officer	Workers	Before shift	DPR
4	Checking of Plants, machineries & operators	HSE Officer	Drivers & operators	Whenever any new plant arrives	Workshop Record
5	HSE Inspections	HSE Officer	Site In charge	Weekly	Gaps
6	HSE Audits	HSE Manager	HSE Officer	Quarterly	Audit Report
7	Work Permits	Local Authority	Site In charge	As per rule	Work Permits
8	Accident Report & Investigations	HSE Officer	HSE Manager	In case of accident	Accident Report & Investigations
9	Trainings	HSE officer / HSE Manager	Site Team	Monthly	Training Record
10	HSE Meetings	HSE & Project Manager	Site Team	Quarterly	MOM
11	Customers HSE Meetings	Customer's HSE Manager	HSE Team	Quarterly	MOM

Integral Certification Ltd.

Certificate OF REGISTRATION

This is to Certify that the Management System of

QUEEN TOPAZ INTERNATIONAL TRADING & CONT. CO. LLC

P.O. BOX 3311, P.C. 130, MUSCAT, SULTANATE OF OMAN

has been found to conform to the Quality Management System standard:

ISO 9001:2015

This certificate is valid for the following scope of operations:

CIVIL CONSTRUCTION, ELECTROMECHANICAL & PLUMBING WORK, TURNKEY CAMP CONSTRUCTION, CONSTRUCTION OF PREFABRICATED BUILDINGS, INSTALLATION OF FIRE PROTECTION SYSTEM, STRUCTURAL FABRICATION AND ERECTION, TRADING AND CONTRACTING

Certificate No.: OM20954A

Date of initial registration	*Date of this Certificate*	*Surv. audit on or before/ Certificate expiry*	*Recertification Due*
21 October 2024	*21 October 2024*	*20 October 2025*	*20 October 2027*

This Certificate remains valid subject to satisfactory surveillance audits.

Accreditation

EGAC Accredited
MSCB
CAB # 011201

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

Director

ICL/FM-001/REV07

For verification and updated information concerning the present certificatevisit to www.iclcert.com
This certificate is property of Integral Certification Ltd. and shall be returned immediately when demanded.

Integral Certification Ltd.
International Office : 45, Middle Hillgate, Stockport, Greater Manchester SK1 3DG
Contact No. : +44 7404 823687
(Company Number 15218428 Registered in England and Wales)
Integral Certification Pvt. Ltd.
Corporate Office : 301, U-60 (3rd Floor), Laxmi Nagar, Delhi-110092, India.
Contact No. : +91 9319332223
E-mail: info@iclcert.com **Website :** www.iclcert.com

Integral Certification Ltd.

Certificate OF REGISTRATION

This is to Certify that the Management System of

QUEEN TOPAZ INTERNATIONAL TRADING & CONT. CO. LLC

P.O. BOX 3311, P.C. 130, MUSCAT, SULTANATE OF OMAN

has been found to conform to the Occupational Health & Safety Management System standard:

ISO 45001:2018

This certificate is valid for the following scope of operations:

CIVIL CONSTRUCTION, ELECTROMECHANICAL & PLUMBING WORK, TURNKEY CAMP CONSTRUCTION, CONSTRUCTION OF PREFABRICATED BUILDINGS, INSTALLATION OF FIRE PROTECTION SYSTEM, STRUCTURAL FABRICATION AND ERECTION, TRADING AND CONTRACTING

Certificate No.: OM20954C-1

Date of initial registration	*Date of this Certificate*	*Surv. audit on or before/ Certificate expiry*	*Recertification Due*
21 October 2024	*21 October 2024*	*20 October 2025*	*20 October 2027*

This Certificate remains valid subject to satisfactory surveillance audits.

Accreditation

EGAC Accredited MSCB CAB # 011201

IAF MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT

Director

ICL/FM-001/REV07

For verification and updated information concerning the present certificatevisit to www.iclcert.com

Integral Certification Ltd.
International Office : 45, Middle Hillgate, Stockport, Greater Manchester SK1 3DG
Contact No. : +44 7404 823687
(Company Number 15218428 Registered in England and Wales)
Integral Certification Pvt. Ltd.
Corporate Office : 301, U-60 (3rd Floor), Laxmi Nagar, Delhi-110092, India.
Contact No. : +91 9319332223
E-mail: info@iclcert.com **Website :** www.iclcert.com