HSE PROCEDURES MANUAL

Revision Summary

Approved Date	Issue Date	Revision No.	Section/Page Revised	Description of Revision	Approved By
30 Sept 16	-- --	0	N/A	Issued for implementation	AO

30 Sep. 16	0	Issued for implementation	(HSE)	Amin (HSE)	Ahmed (GM)	(Chairman & CEO)
Date	**Revision**	**Description of Revision**	**Prepared**	**Checked**		**Approved**

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1. SCOPE AND PURPOSE

Scope Of Work

The scope of work includes, the detail application/installation of heat insulation material and cladding, testing, pre-commissioning, commissioning assistance, and performance testing of all associated facilities, but not limited to the following:

Fields:

Import Business:

Approach is a certified agent of high reputed international companies in the field of Water Proofing and Construction Chemicals:-

Fixa: Turkish Company has pioneered the International: This covers all cementations & Epoxy products.

Alyaf: Specialized in manufacturing technical nonwovens with a state of the art nonwoven technology and utilizing the finest quality raw materials produced from the development of technical nonwovens in the Middle East.

Contracting Business:

The Company has the capacity to implement and execute the installation of the following:

Industrial flooring systems.
Show - Rooms & Workshops flooring systems.
Water proofing systems for Roofs, Wet areas, and underground structures.
Heat Insulation Systems.
Concrete Repair Technologies.
Water proofing and Repair of Water Reservoir and Sanitary systems.

2. HAZARD IDENTIFICATION PLAN

INTRODUCTION

Hazard Analysis

A review of the project has been made, and potential hazards have been identified. A “Hazard” is defined as the possible loss and/or injury to people and property.

The hazards are classified as a class “A”, “B” or “C” depending upon the potential severity of the accident.

Class “A” Hazards. A condition or practice likely to cause permanent disability, loss of life or body part, and/or extensive loss of structure, equipment or materials.

Class “B” Hazards. A condition or practice likely to cause serious injury or illness (resulting in temporary disability) or property damage that is disruptive, but less severe that Class “A”.

Class “C” Hazards. A condition or practice likely to cause minor (non-disability) injury or illness, or non-disruptive property damage. Risk assessment format and subsequent response are attached as Appendix-3 and Appendix-4, Risk Planning& Assessment, and job safety analysis, respectively.

SUMMARY OF HAZARDS TO BE ADDRESSED

The following items constitute a broad summary of the various types of hazards faced on this project. If the scope of work changes, or if individuals take it upon themselves to perform work outside the stated scope of work, additional hazards may arise. In the event, a hazard has not been covered in the attached punch list, which contains the specific hazards for the project; this summary list will be a guide to ensure all hazards are covered.

Special attention will be paid to the hazards created by other contractors and/or Subcontractors on the site. Personnel working on this project will be notified that hazards, created by others, could be present.

Heavy Equipment Operation Class “B” Hazard

Heavy equipment operated by uncertified operators, equipment lacking maintenance, or the lack of a backup spotter (banks man), are potential hazards.

Temporary & Permanent Electrical Installation. Class “A” Hazard

Distribution of electricity on a construction site is different from a permanent installation. Hazards will arise when unskilled or unqualified electricians carry out electrical work. The use of lockout and hold tags may be required on certain operations.

Cranes & Critical Lifts. Class “A” Hazards

Crane operation and critical lifts are major hazard areas. Where large or heavy pieces of equipment, inexperienced workmen, uncertified operators and unapproved cranes and rigging gear are combined, accidents can occur. Either through men’s actions/inaction’s, mechanical equipment failure, and/or adverse weather conditions. Approach Co. will follow special procedures as outlined in the Client Construction Safety Manual, and the crane safety handbook.

Note:

A lift plan is required whenever a lift is determined to be a critical lift. A special permit is required any time a man basket is utilized.

Slings & Lifting Gear. Class “A” Hazards

Exceeding the safe working limit of rigging equipment, using non-inspected or damaged slings, or using untrained personnel can cause accidents. Approach Company is dedicated to comply with the procedures as outlined in the Client construction safety manual, and crane safety handbook.

Welding, Cutting and Brazing. Class “A” Hazards

Welding, cutting and brazing are safe operations if carried out in a correct manner. Where equipment is defective, or there is no arranged plan, hazards can arise. **Approach Company** will ensure that all equipment is correctly maintained and thoroughly checked before use.

Hand/Power Tools. Class "B" Hazards

Power tools allow many jobs to be carried out more efficiently, and with greater speed and accuracy. Hazards will arise when unskilled and untrained workers are allowed to operate hand/power tools. Approach Company will ensure that only trained personnel operate these tools. Steps will be taken to ensure equipment is in a good state of repair.

Sanitation & Housekeeping. Class "C" Hazards

A major factor influencing the health of individuals, where public sewers are not available, is the proper disposal of human waste. Many diseases of various types can be transmitted from one person to another. For this reason, **Approach Company** will make every effort to prevent, or control this hazard.

Scaffolding/Ladders. Class "A" Hazards

Competent, trained workmen will erect scaffolding in accordance with the Client construction safety manual. Careful erection and inspection of scaffolding is essential to prevent accidents.

Excavations, Trenching & Shoring. Class "A" Hazards

No ground containing a deep excavation can be relied upon to support its own weight. Rescue equipment and procedure must be in place prior to the start of any work in a deep excavation. Shoring, benching or sloping must be utilized. Approach Company is obligated to have a competent person, who will inspect the excavation, as outlined in the Client construction manual.

Site Office / Lay down Yard. Class "B" Hazards

Lay down yards, including the flammable storage facilities and site offices will be constructed prior to start of the job construction.

Existing Above/Underground Utilities. Class "A" Hazards

Areas where work has to be executed can have different types of above/underground utilities, such as power cables, pipeline corridor, telephone cables, and gas lines. The hazard arises by damaging any of these services. **Approach Company**. will ensure that goal posts are erected before and after, overhead power lines and communication cables. Hand excavation only will be used to expose existing buried cables and pipelines.

Concrete Forms & Shoring. Class "A" Hazards

This section covers several areas of work, all of which present hazards. The placement of concrete, vertical shoring, form work and shuttering, are but a few of the concerns. Accidents can be caused by employee's actions/inaction's, and/or unanticipated failure of mechanical devices, concrete forms, or shuttering. Procedures outlined in the Client Construction Safety Manual will be followed.

Abrasive blasting. Class "A" Hazards

Abrasive blasting can cause hazards to not only the operators, but also assistants, and other workers in the area. If hydrocarbons are present, if the abrasive blasting equipment is incorrectly grounded, if proper material is not used or if proper protective equipment is not worn, the possibility of hazards will increase. **Approach Company** will follow the guidelines in the Client Construction Safety Manual.

Personal Safety. (PPE) Class "A" Hazards

Incorrect types of personal protective equipment can lead to an accident. All PPE must comply with ANSI standards.

Piling Operations. Class "A" Hazards

Piling without experienced workmen, well maintained equipment, and the stress and vibration imposed on that equipment, could lead to hazardous conditions. **Approach Company**. will ensure that the Piling Subcontractors uses only qualified personnel, and well-maintained equipment.

Mechanical Equipment. Class "B" Hazards

Mechanical equipment improves the quantity, and efficiency of construction work, but equipment operators can cause hazardous situations. Approach Company will ensure specifically trained and qualified operators for the type of equipment they are operating. All equipment must be well maintained and regularly inspected.

Chemicals. Class "A" Hazards

Any chemical should be treated as hazardous. Handling, storage, identification and labels which are incorrectly tagged, and spillage's can cause extremely hazardous conditions. **Approach Company** will follow procedures as outlined in the Client Construction Safety Manual.

Fuel. Class "A" Hazards

Fuel handling, storage, and refueling operations require special attention. Fuels cannot be stored or transported in plastic containers. All containers, including large fuel tanks, must be grounded and bonded to the equipment into which the fuel is being transferred. Berms are required to retain any spillages at larger fuel storage tanks.

Ionizing Radiation. Class "A" Hazards

Ionizing industrial radiation, such as X-rays generated by equipment, or gamma rays emitted spontaneously by radioactive materials, are widely used for non-destructive testing. Radiation penetrates the human body and causes damage to living cells. Untrained/unqualified personnel and uncontrolled handling of the radiation sources can cause hazardous conditions.

3. TRAFFIC PLAN

3.1 TRAFFIC SAFETY – DRIVERS REQUIREMENTS

Approach Company. will employ only qualified personnel as drivers of motor vehicles, and ensure that all drivers are in possession of a valid driving License.

All posted speed limits and all local traffic signs shall be obeyed. In the event that construction activities involve us in roadwork's, or excavations where sidewalks, or footbridges are required, appropriate approved safety

measures will be carefully planned to protect our workers, and the general public from potential safety hazards, during the day or night.

Lights will be used if necessary or even A flagman, equipped with a safety vest and a red flag, shall be posted at least 5 meters (165 feet) from the work site at the entrance barricade, and another flagman at the exit barricade. It shall be the duty of the flagman to control the flow of traffic in a safe manner if indicated by the scope of work. Both flagmen shall be in sight of each other. If conditions do not permit this, then a third man shall be positioned where he can see, and be seen, by the other two men, in order to signal them to start, or stop traffic. Traffic control signals shall be in accordance with Client construction safety manual.

3.2 DRIVERS RESPONSIBILITY

It is the responsibility of the driver to ensure that his vehicle is safe to operate.

It is the responsibility of the driver to take his vehicle to the proper facility for servicing and repairs when they are required or scheduled.

The driver of the vehicle is fully responsible and accountable for the mechanical and physical condition of the vehicle. He must report any damage, beyond normal wear and tear, immediately.

The driver is responsible for transporting materials properly and ensuring that a load does not exceed the manufactures design load capacity. All loads must be properly secured and tied down. Materials should not extend over the sides of the truck. Loads extending beyond the front or rear shall be marked with a red flag. In addition, such vehicles must be equipped with visible brake and taillights at their rear end points.

Tires, which have breaks in the casing, or with exposed fabric, shall not be used.

Sand tires present a hazard if used on vehicles, which are, operated at excessive speed, especially when they are not properly inflated.

Drivers shall not transport unauthorized persons in company vehicles. The driver's supervisor shall authorize all passengers in the vehicle.

The driver and passengers of a company vehicle shall wear seat belts at all times while the vehicle is in motion.

Drivers have full authority to refuse to transport any passenger who refuses to use seat belts. Conversely, passengers may refuse to ride with a driver who refuses to wear his seat belt.

The driver must not exceed the posted speed limit. This is the maximum speed allowed in a certain area. Every driver is expected to reduce his vehicle's speed under hazardous weather or road conditions.

3.3 MOTOR VEHICLE REGULATIONS

Each driver shall become familiar with, and abide by the Sudan Government and the client traffic regulations.

Where there is no signpost indicating the maximum speed limit, no vehicle may be driven at a speed greater than the following:

- 100 KPH for light motor vehicles outside city limits.
- 70 KPH for vehicles with sand tires.

To drive safely, speed must be reduced below the allowable speed limit at night, or during fog, rain or sandstorm.

Drivers shall comply with Sudan traffic police and Client traffic signs.

All vehicles shall be parked correctly and/or in a designated parking area. Parked vehicles shall not obstruct other vehicles, roadways, access ways or fire hydrants.

3.4 VEHICLE CONDITION

The driver is responsible for inspecting a vehicle before operating it to determine if the following are present and in a satisfactory condition.

The vehicle number, company name, current inspection stickers and license plate (front and back) must be in place.

Two reflective warning triangles should be in each vehicle.

Windows and windshield must be clean and free of cracks or any other damage. The glass must be in good condition. The windows must open and close properly.

All lights (high and low beam headlights, taillights, dash lights, stop lights, turn signals, and the rear license plate light) must be in working order. When fog lights and clearance lights have been installed, they must be in good working order.

All brakes (foot and hand brakes) must be in good working order. Check the foot and hand brake mechanism for correct operation.

The automatic transmission must be in good operating condition, and should shift into the parking position correctly.

Springs and shock absorbers must be in good condition with no alignment or control problems.

Check the wheels for rim damage. Make sure the wheels are not blocked or out of alignment, and wheel lug nuts are in place, and secure on the rim.

If the vehicle is fitted with a trailer, the coupling must be intact and working correctly. The trailer should have a safety coupling chain, rear brake lights, turn signals, taillights and rear license plate lights.

Make sure that the inside and outside rear view mirrors are clear, adjusted, secured and undamaged.

Check that the windshield wiper blades are in good condition, and operate properly. Inspect the rear window wiper, if fitted.

The windshield washer should work properly, and there should be water in the washer container.

The speedometer should be in good working order.

Test the exhaust system by starting the engine of the vehicle, listening for sounds, and spotting any leaks associated with it. Check to see if the tail pipe extends at least three inches from the body of the vehicle. The tail pipe emissions should be released from a point where they do not directly come into contact with the driver of the vehicle or its occupants, thereby causing any adverse health affects to any of them.

A properly inflated spare tire with a jack and tire wrench must be provided. The tire wrench should be the correct size to fit the wheel nuts of the vehicle.

Check the following fluids for leaks and proper levels, especially in hot weather.

- Radiator coolant.
- Oil.
- Brake fluid.
- Transmission Oil.
- Distilled water for the battery.

Note: The driver should check the radiator coolant level, only when the engine is cool. Fluid should be added to the level mark on the overflow expansion tank only.

The vehicles horn must be operational.

Note all damage on the vehicle, process the proper reports and have the damage repaired.

Each driver must conduct a vehicle inspection whenever taking charge of a vehicle and periodically thereafter (at least once a month) to ensure that all systems are operating properly and there is no damage.

Loose materials are to be kept out of the driving compartment. Do not place materials (hard hats etc.) on rear window shelf.

4. SAFETY POLICY AND ASSIGNMENT OF RESPONSIBILITIES

Corporate HSE policy statement is attached here to this document as Appendix-1

4.1 SAFETY PHILOSOPHY

“Zero Injury” is a term used to identify a unique attitude, which existed on projects achieving “Safety Excellence”. This attitude or philosophy appears as a zealous commitment by top management to the concept that zero injury is the only acceptable goal. Any other goal implies that injuries are expected and are acceptable.

Approach Company recognizes that eliminating all worker injury on projects for significant periods is possible. The first essential criterion required is the acceptance of the Zero Injury Concept by those in charge, and effectively communicating this fact through the organization to workers. Further, it is essential that owners and contractors devote resources for the development and implementation of the safety techniques that provide the highest impact on achieving zero injury projects.

4.1.1 Accident Prevention Objectives

To promote and implement a comprehensive safety program for all employees, and ensure that everyone is safety conscious at all times.
To eliminate, or to provide suitable protection against all recognizable occupational hazards.
To implement procedures and practices that minimizes the risk of accidents.
To instruct all employees of present hazards, how to recognize them, how to avoid the hazard, and what to do if one meets a hazard.
To disseminate the necessary educational information that will decrease hazards and improve each individual’s health and safety.
Stress good safety practices by example, by daily personal contact, by observation and evaluation, and by regular communication between the employee, supervision, and management.

4.1.2 Approach Company Philosophy

All injuries can be prevented.
Management, which includes all levels through the first line supervisor and foreman, is responsible for preventing occupational injuries and illnesses.
Safety must be planned into every job. Attention to the problems and hazards of the work and the work place is a continuing obligation.
All work exposures, which may result in injuries, can be controlled; no matter what the exposure is, an effective safeguard can be provided.
It is necessary to provide training and supervision to ensure that all employees work safely. Awareness for safety does not usually come naturally. With effective training programs, safety reinforcement, and supervision to teach, motivate, and sustain safety knowledge; Accidents and injuries can be eliminated.
Safety audits must monitor and evaluate performance in the work place to assess safety and health effectiveness.
All deficiencies must be recognized and corrected promptly.
In the event of an accident or near miss incident, a thorough investigation and evaluation of the incident sequence can prevent a similar occurrence in the future. Developed information, disseminated to all levels of management and employees, will aid in the prevention of future accidents. Near miss incidents are warnings and should be examined and treated accordingly.
It is good business to prevent accidents, injuries and illnesses. Safety, job competence and work efficiency go together for successful job completion.

People are the most essential element of the safety program. Concerned, involved, and trained employees are the company's greatest resources.

The strength of these principles lies in their application. It is the Project Manager/Construction Manager/Site Superintendent, and the first line supervisor who are ultimately responsible for the safety of all workers and for preventing accidents and injuries. The lead must come by example rather than rhetoric. Knowledge is not enough; attitude and execution make the difference.

4.1.3 System for Controlling Losses

Controlling losses is a function of management. There are four (4) concerns of management:

Production Control.

Quality Control.

Cost Control.

Loss Control.

Rarely can one be changed without some effect upon the other three. For this reason, it is not in the best interest of Company or its employees, to consider safety as something apart from production, quality, and cost. Since production, quality, and costs are managed on a day-to-day basis, loss control should have the same treatment.

There are five recognized steps in the successful management of losses. These steps are:

Identification of loss control problems.
Setting standards for that work.
Measurement of results based upon a standard.
Evaluation of results.
Correction of program deficiencies

Identification of loss control problems and setting standards for such work are essential elements of successful loss control programs. We have identified several areas in loss control for which standards have been developed. These work areas may be changed, increased, or decreased from time to time, as needs dictate.

Group safety meetings.
Dissemination of information.
Proper job instruction.
Accident Investigation.
Safety rules and enforcement.
Personal protective equipment.
Facility and work inspections.
Housekeeping audits.
Establishment of management safety steering committees.
Incentive, recognition and rewards for good safety performance.
General safety orientation training.
These work activities have been chosen because intensive studies have shown that these activities are the most significant in preventing losses in our industry.

4.1.4 Safety/Loss Control Standards

Seven standards have been developed which cover those work activities judged most important in our operations. These are:

SAFETY RULES: Rules are time savers and accident preventers. They codify certain behavioral procedures to be followed by all concerned, thus saving management time. Their development, reinforcement, and updating are a continuous activity, and usually results from past experiences.

PROPER JOB INSTRUCTION: The purpose of this work activity is to assist an employee in doing a job quickly, conscientiously, efficiently, safely, and correctly, the very first time it is done. We take time to do it right so we won't have to waste time doing it over. A prime tool of the first line supervisor, that will reduce many of his headaches, is instructing and asking questions.

DISSEMINATION OF INFORMATION: In order for safe work practices to become work habits, information should be given on new, different, unusual, or critical jobs, or when any variations occur. This information must be a personalized reminder that promotes production, quality, efficiency, and safety requirements.

GROUP SAFETY MEETINGS: The purpose of this standard is to provide the means of disseminating certain vital loss control information to the work force. Frequent reminders and opportunities to "tell why" are necessary to train, motivate, convince, and educate employees to perform their work in the most productive and safe manner.

FACILITY INSPECTIONS: Because of ongoing operations, equipment may become defective through normal wear and tear. This creates unsafe conditions and possible "downtime". Inspections can reduce the chance of accidents and downtime because of sudden failures; therefore, we will be correcting undesirable situations before losses occur.

ACCIDENT INVESTIGATION: The purpose of this work activity is prevention. We can learn from losses, establish controls and conduct follow-ups to keep similar accidents from happening. We should also be able to share findings from other projects and locations, to help all work areas; thus, making the most of lessons learned.

PERSONAL PROTECTIVE EQUIPMENT: The purpose of this activity is to protect the employee from known hazards through the use of approved safety equipment, and to comply with OSHA standards. Indoctrination, training, and follow up inspections are essential.

4.1.5 Zero Incident Philosophy

Mission
We will achieve “Zero Incidents” by attaining the following goals:

“0” Recordable Incidents.

“0” Lost Work Incidents.

“0” Motor Vehicle Accidents.

“0” Fires.

We will:
Comply with all client work rules.
Plan safety into the work.
Develop “Safe Behaviors” in all supervision, resulting in a culture of safety awareness and prevention.
Ensure total management support.
Use the following techniques:
Safety Orientation.
Safety Training.
Safety Audits.
Incident Investigation.
Recognition of each individual’s responsibility for incident prevention.
Recognition and awards.

4.2 COMPANY HSE RESPONSIBILITIES

4.2.1 Chairman and Managing Director

The Chairman has overall Company responsibility for ensuring that an effective method of HSE management exists. This commitment is clearly set out in the Company’s Health, Safety and Environmental Policy, which the Chairman has a duty to maintain. He also has legislative duties to ensure that all practicable steps are taken to fulfill the Company's statutory obligations with respect to its field of activities.

He may formally entrust specific responsibilities for the promotion and management of safety to functional managers or departments, however his duty will ensure that: -

- The Company's HSE Management System is periodically appraised and if necessary revised.
- Communicate positive HSE messages to all levels of staff within the company.
- Ensure that all divisions are aware of the importance of the HSE Management System and that they understand their responsibilities within it when fulfilling their duties.
- The Company’s HSE Management System is appraised once a year and if necessary revised

4.2.2 Operations Manager

The Operations Manager is responsible for ensuring that adequate resources are available within each operating division for the implementation of the HSE Management System.
He will ensure that relevant standards and procedures are provided for each division, and the managers of those divisions are formally monitored and assessed for their performance of HSE Management System implementation and will ensure that:

- Sufficient funds, staff and materials are available to meet health, safety and environmental standards.
- Employees receive sufficient information, instruction, training and supervision for their ongoing health and safety.
- Commitment to HSE related matters are demonstrated by personal example. This requires active involvement. For example, including HSE as a primary agenda item in management meetings, periodic safety tours and attendance of safety meetings on sites, participation in serious accident investigations, promotion of HSE as part of daily work activities and business decisions.

4.2.3 Human Resources Manager

The Human Resources, Organization shall be responsible for the development, maintenance and control of the organizational aspects including: -

- Organization charts.
- Job descriptions.
- Training needs.
- Organization procedure development and distribution.

He will establish and maintain systems to provide: -

- Methods for selection of personnel.
- Methods for assessing the capabilities and competence of personnel.
- Health co-ordination.

4.2.4 General Management

Senior management is responsible for actively demonstrating their commitment to the Company Health, Safety and Environment Management System and for promoting safety as part of their daily work activities. Specifically they shall:

- Ensure that the HSE Management System is applied uniformly by other managers under their supervision.
- Ensure that subordinates are aware of the importance of the HSE Management System and that they understand their responsibilities within it when fulfilling their duties.
- Ensure that adequate resources are made available so that effective implementation and operation of the HSE Management System can be carried out within the areas of their responsibility.
- Make HSE issues an agenda item at all management meetings together with the provision of minutes.
- Ensure HSE matters are considered in all business decisions.
- Participate in accident / incident investigations where defined.

4.2.5 HSE Manager

The HSE Manager shall formally advise Line Management with regard to health and safety at work and protection of the environment, including the requirements of the latest local legislation of authorities governing these matters.

In addition to an advisory / consultancy role, he has the following responsibilities to: -

- Report directly to the Chairman and Managing Director
- Liaise on behalf of the Company with appointed Client Safety and Environmental Representative, as well as local government authorities or agencies.
- Plan and organize the HSE Management System audits and reviews and act as the focal point for all external audits by clients or local authorities.

- Measure the performance of Safety & Environment issues on a regular basis using effective Safety & Environment performance criteria and indicators. This is achieved by a combination of site and management system audits.
- Monitor the applicability of Safety & Environment legislation as it applies to the Company.
- Advise Senior, Departmental and Project Managers on Safety & Environmental legislation, codes of practice and give guidance to the Line Management.
- Prepare the base documentation for the HSE Management System. This includes standards, procedures, safety plan guidelines, safety handbooks and template procedures (for project development).
- Prepare, monitor and periodically review HSE training programs. Ensure that all company employees receive induction and specific HSE training.
- Implement the Project Health Plan.
- Co-ordinate all medical emergency.
- Apply the disease prevention program.
- Provide to hygiene and sanitary inspection.
- Establish a working relationship with hospital, laboratory, etc.
- Provide for all medical facilities.
- Prepare, monitor and review the first aid training programs.

4.3 PROJECT HSE RESPONSIBILITIES

4.3.1 Project Engineer

The Project Engineer shall ensure that all activities under his control are carried out in accordance with the Company Policy.

They may formally entrust specific responsibilities to selected persons, however he shall be directly responsible to ensure: -

- Promote the HSE Management System by personal example.
- The establishment of programs for HSE Management System implementation.
- Adequate HSE training of personnel to assure competency at work.
- The adoption of safe working procedures including safe place of work.
- All necessary risk assessments are undertaken within the areas of their responsibility and actions arising from risk assessments are implemented.
- Liaison with HSE Management for specialist advice.
- Liaison with the Client and Local Authorities on HSE issues.
- Selected Contractors are able to meet Company HSE standards.
- Selected Contractors are monitored to ensure that standards are maintained.
- Deficiencies in equipment, standards, operating procedures or training are corrected.
- All accidents, incidents and near misses are reported and investigated according to Company procedures and local authority requirements.
- Participate in all accident, incident and high potential near miss investigations
- Chair site safety meetings on a monthly basis). Meetings should include discussions of for example, safety suggestions made by the workforce.

4.3.2 Safety Coordinator

Safety Coordinator reports to the Company Safety Manager with functional reporting to the Project Manager and assist other departments on Safety & Environment requirements. The Safety Co-coordinator shall: -

- Promote Company HSE Management System by personal example.
- Perform safety-engineering activities as required.
- Contribute to HAZOP studies and risk assessments.
- Conduct S&E audits where delegated.
- Liaise with relevant personnel as required:-
  Line Managers, Supervisors, Safety Committee, assigned Emergency Response personnel, etc.
- Inspect and monitor the place of work ensuring that all procedures, safe working practices, authorization systems or permit to work systems are being carried out properly.
- Conduct inspections to ensure correct placement and serviceability of safety equipment, life saving equipment and fire fighting equipment.
- Ensure that actions are taken in case of defective equipment.
- Ensure that records or checklists are completed and filed for all inspections, audits or exercises.
- Assist the Site Manager in organizing and carrying out emergency safety exercises and training.
- Assist with reporting and investigation of accidents, incidents and near-misses and ensure that all accidents, incidents and near-misses are reported
- Ensure that safety notices and safety information is posted in prominent positions.
- Liaise with Client Site Safety & Environment Representative.
- Consult with Sub-contractors and obtain information concerning potential hazards, which may be produced by their actions.
- Conduct the site safety induction for all new or transferred employees (including contractors).
- Implement and promote an ongoing HSE training program for all project employees.
- Keep HSE training records and documentation.

4.3.3 Safety Officers

The Project Safety Officers are responsible for the supervision of the safety activities on the project, and responsible for implementing and supervising a continual safety program. They shall make recommendations for corrective action to prevent potential accidents with full authority to make on the spot corrections of any violations considered immediately dangerous to employees, or which will cause damage to client or companies equipment. Their general duties shall be as follows:

- Promote the HSE Program by example.
- Report directly to the Safety Engineer with all matters concerning the HSE Program.
- Organize sites daily/weekly safety meeting with job supervisors and crews.
- Keep a record of every weekly safety meeting on site, complete with subject discussed and a signed list of attendees.
- Prevent injury to personnel, damage to plant, equipment and fire.
- Carry out Safety Induction courses for all new employees that arrive on the job site for the first time, and advise them of specific regulations and safety precautions in force.
- Inspect and monitor the place of work ensuring that all procedures, safe working practices, authorization systems or permit to work systems are being carried out properly.
- Conduct inspections to ensure correct placement and serviceability of safety and fire fighting equipment.
- Ensure that corrective action is taken in the event of defective equipment. Report, record, reject, replace, and isolate.
- Ensure that records or checklists are completed and filed for all inspections, audits or drills.

- Assist with reporting and investigation of accidents and incidents and ensure that all accidents and incidents are reported.
- Keep a permanent record of all injuries, fires, MVC's, near misses, fires, safety inspections, property damage and crane/heavy equipment accidents, which have occurred on site.
- Determine the cause of any accident or dangerous occurrence and recommend means of preventing recurrence.
- Co-ordinate safety activities between the company and any other individual contractors who may be working on the same site.
- Liaise with client site safety representative.
- Consult with sub-contractors and obtain information concerning potential hazards, which may be produced by their actions.
- Monitor and enforce safety requirements on all sub-contractors.
- Monitor and maintain control measures in the use and storage of hazardous materials. Ensure that lifting equipment and gear is in good condition and certified, scheduling with the client appointed department for the periodical inspection.

4.3.4 Supervisors

Supervisors are directly responsible to the Construction Manager for the day-to-day maintenance of safe working practices in the work place. Direct responsibilities include:

- Promotion of safe working practices and safe place of work by personal example.
- Organize sites so that work is carried out to the required standard with minimum risk to personnel, equipment and material.
- Be familiar with the work permit procedures
- Ensure that selected personnel are competent to carry out their task.
- Pre-job description/discussion with foremen.
- Give precise instructions on responsibilities for correct work methods.
- Providing adequate supervision during work task.
- Ensure those formal procedures, standing instructions, safety standards and client requirements are complied with at all times.
- Ensure that individuals are aware of their responsibilities and are accountable for them.
- Co-ordinate with sub-contractors and other contractors on site to avoid any confusion about areas of responsibility.
- Ensure that suitable PPE is available, and that it is used.
- Release foremen and workers when necessary for fire and safety training.
- Co-operate with the safety engineers and officers, acting on their recommendations.
- Review details of every task to be performed with Managers and other Supervisors, as appropriate, to ensure all factors likely to affect safety has been fully considered and appropriate action taken.

4.3.5 Foremen

Shall ensure that new employees are properly instructed in precautions to be taken, and that they have attended the required safety induction courses, before they are allowed to start work, and in particular:

- Promotion of safe working practices and safe place of work by personal example.
- Organize site so that the work is carried out to the required standard with minimum risk to personnel, equipment and material.
- Follow Supervisors safety instructions and recommendations.
- Co-operate with safety officers, following their safety instructions and recommendations.
- Ensure that selected personnel are competent to carry out the task.

- Ensure that verbal instructions are fully understood and check back to see that they are carried out as intended.
- Ensure that all workers know how to obtain first aid and that proper care is taken of all injuries. Know how to summon assistance in case of emergency and nominate others to act in your absence.
- Incorporate safety instructions in routine orders and see that they are obeyed.
- Position equipment effectively and ensure that electricity supply is installed, used, and maintained correctly.
- Conduct weekly safety meetings with safety officers to work together to eliminate the taking of unnecessary risks.
- Check that equipment and tools, both power and hand tools are maintained in good condition.
- Plan for and provide good housekeeping.
- Report unsafe conditions and defects in equipment.

4.3.6 Workers

Each individual shall confirm that they understand their responsibilities, which include:

- Observe rules, regulations and instructions issued by the company for the purposes of individual as well as collective safety.
- Use the correct tools for the job, and use the protective clothing and equipment provided.
- Do not remove, modify or otherwise alter any safety equipment or devices without the proper authorization.
- Never attempt to undertake any function or equipment operation that you are not familiar with.
- Carry out activities in Accordance with the Company HSE standards and procedures.
- Co-operate fully with Supervisors in the promotion of safety.
- Become familiar with any information published by the company or brought to their notice regarding the safe use of equipment, plant and materials relevant to their work.
- Report any non-conformance or potential hazards to their Supervisor.
- Follow safety officer's safety instructions and recommendations.

Individuals must not:

- Participate in any act, which they believe may endanger themselves or colleagues.
- Jeopardize the safety and integrity of company equipment or facilities including the misuse of emergency equipment.
- Undertake any task or operation for which they have not received adequate training or for which they lack proper tools, equipment or personal protective equipment.
- Operate plant or equipment, which they know to be inadequately guarded or unsafe.

5. SAFETY INSPECTIONS

Safety inspections shall be conducted on a daily basis by the Site Safety Officer with a summary report to be included in the weekly progress meeting.

Site HSE Coordinator shall submit a weekly and monthly report providing the following information:

- A list of all safety inspections and related activities performed during the previous week.
- Descriptions of corrective actions taken to prevent a recurrence of all safety violations observed.

5.1 INTERNAL AUDITING

All activities, on land, shall be audited annually by senior safety staff and/or by the Safety Manager.

Auditing shall be performed by using standard checklists.

Audit-reports shall indicate the corrective actions needed in function of nonconformity highlighted during the inspection of the work-site. Typical Internal Audit report& Check list are attached as Appendix-5, and Appendix-6, whereas the subsequent action Plan is attached as Appendix-7

Auditing activities shall be carried out in accordance with **Approach Company** "Monitoring and Audit".

6. SAFETY REPORTS AND RECORDS

The Resident Manager, HSE Coordinator, or Government relation's representative will be responsible in reporting immediately all accidents to the client and in some cases to the Sudan Government as required. Immediate reports will be made to the Proponent in cases of all:

1. Fatal injuries
2. Injuries requiring medical attention which result in lost time
3. Damage to **Approach Company**'s plant or equipment
4. Damage in any amount to Client's equipment or property
5. Fires
6. Damage and near misses to cranes and heavy equipment.

Site HSE Coordinator is responsible for the safety files breakdown that shall be always available in the HSE office.

The Safety Files Breakdown shall respect the following folders and category numbers and Client Construction Safety Manual.

Contractor Safety Files and Breakdown.

1 BI and/or JO Number, Project Title, Location, Contractor

2 Loss Prevention Program (CLPP) Hazard Identification Plans (HIP) **Approach Company** HSE Plan and Manual

3 Safety Supervisor(s) Resume

4 **Approach Company** Safety Orientation

5 Emergency Response Plan

6 Safety Inspections

a) Weekly – Checklist
b) Approach Company Safety Competition Program
c) Safety Logbook
d) Other

7 Environmental Health / Medical

a) Client Sanitary Code
b) Approved waste Treatment Facilities

c) Medical Logbook
d) Medical Representative(s) Resume
e) Certified First Aider List
f) Inspection Reports / Citations / Action
g) Other

8 Work Permits
a) Receiver List / Types of permit
b) Alternate List / Types of permit
c) Forms
d) Work Permit Information

9 Scaffolds
a) Competent Person(s) List
b) Scaffold Drawings
c) Scaffold Information
d) Citation(s) / Action

10 Trenches and Excavations
a) Competent Person(s) List
b) Approved Shoring Drawings
c) Trenches and Excavation Information
d) Citation(s) / Action

11 Crane Operators / Riggers / Heavy Equipment Operators
a) Crane Operator List / Certification(s)
b) Lift Plans
c) Rigger List / Certification Level
d) Heavy Equipment Operator List / Certifications
e) Forms – Operator/ Rigger Certification Application etc.
f) Citation(s) / Action
g) Miscellaneous

12 Crane / Heavy Equipment / Lifting Equipment
a) Certified Crane(s) List
b) Inspection Record Logs
c) Forms – Daily inspection Checklist, etc.
d) Citation(s) / Action

e) Miscellaneous

13 Confined Space(s)

a) Trained Personnel List

b) Confined Space(s) Location Drawings

c) Confined Space Entry and Emergency Response Checklist

d) Other

14 Painting / abrasive blasting

a) Certified Painter(s) /abrasive blaster(s) List

b) Medical Documentation

c) Breathing Air Equipment / Air Compressor Documentation

d) Other

15 Welding / Cutting

a) Information

b) Other

16 Personal Protective Equipment (PPE)

a) Information

b) Other

17 Electrical

a) Information

b) Other

18 Safety Meetings (Tool-Box Talks)

a) Weekly

b) Daily

c) Information

d) Other

19 Accident / Illness Reporting

a) Accident / Illness Reporting Guidelines

b) Fatality Reports

c) Industrial Disabling Injury (IDI)

d) Restricted Duty Injury (RDI)

e) Property Damage

f) Fires

g) Equipment Damage
h) Motor Vehicle Accidents (MVAs)
i) Near Misses
j) Job-Related Illnesses
k) Other

20 Fire Prevention
a) Fire Training / Drills
b) Fire Extinguisher Inspection
c) Citation(s) / Action
d) Information
e) Other

21 Progress Meetings
a) Meeting Minutes
b) Other

22 Correspondence

23 Vehicle Safety
a) Inspection Checklist and Logs
b) Materials
c) Other

24 Competent Persons List

Approach Company will maintain a current record showing motor vehicle accidents and all accidents involving cranes and heavy equipment as specified in Client.

All accidents shall be reported verbally to project management team as soon as is practicable after they occur. A preliminary written report shall be submitted within 24 hours, followed by a detailed written report submitted within three days to the Client Representative.

Approach Company shall maintain, in the format displayed in the Client Construction Safety Manual, a current record showing.

- Work Injuries.
- Fires.
- Incidents of property damage.
- Incidents involving damage to Client equipment and property.
- Cranes and heavy equipment accident reporting procedures, when applicable.

The record shall be available for inspection at all times, and shall be submitted to Client on request.

7. WORK PERMIT

A work permit authorizes specific works to be conducted in a restricted area. This serves as a record that steps have been taken to ensure safe working conditions in the area.

Approach Company shall strictly follow Client work permit system for all activities within restricted operating areas, or where work permits are required. Application for work permit must be made before the commencement of the work activity. Any activity will not start until all conditions on work permit are completely met.

An authorized "Receiver" will request a work permit from a certified issuer before doing any work in a restricted area.

If the work contemplated involves any change, addition, or deletion in the facility, the work will be coordinated between Client Operations and Approach.

Precautions will be taken to ensure all employees are made aware of checklists, clearing area of people not required, and work stoppage if conditions become unsafe:

- Obtaining and Posting the permit in the work area.
- Closing out the permit.
- Different types of work permits required and the types of restricted areas.

8. WELDING AND CUTTING EQUIPMENT

All welding and cutting equipment shall be of the approved type and maintained in good condition.

Personnel working with welding equipment shall be trained, competent, and be provided with personal protection equipment and welders possess Client certificate.

Appropriate Personal Protective Equipment (PPE) such as welding face shields, goggles, helmets, leggings, screen personnel protective barriers and forced air ventilation will be provided where required

No welding or cutting operation will be conducted unless the area is cleared of any flammable or combustible materials.

Cutting operations will be done in a manner such that, the torch flame will not be directed to oxy-acetylene gas cylinders or to any material or object that could be damaged or burned.

Approach Company will obtain and follow "OPEN FLAME check list" in restricted areas for any welding, cutting or grinding

Foreman and Supervisors will complete a post hot work inspection after all welding or cutting operations, especially before leaving the area.

8.1 STORAGE OF CYLINDERS

Cylinders shall be stored in a safe, dry, well-ventilated place prepared and reserved for that purpose. Flammable substances should not be stored in the same area.

All storage areas will have no smoking signs posted. All cylinder storage rooms should be ventilated sufficiently so that explosive concentrations of gas cannot accumulate. All wiring should be located outside the room. All bulbs should be enclosed by a flameproof glass cover.

"No Smoking" signs will be provided in Arabic and English to all storage areas.

All gas cylinders must be chained or otherwise secured in an upright position.

Flammable substances shall not be stored within 50 feet of cylinder storage areas.

Cylinders shall not be stored at temperatures exceeding 54o C and shall be stored out of direct sunlight.
Oxygen cylinders should not be stored indoors, within 20ft of cylinders containing flammable gases or highly combustible materials.

If separating distance is less than 20 ft, a dividing fire rated wall (one-hour minimum rating) to the height of seven feet shall be provided.

Empty and full cylinders should be stored separately, with empty cylinders being plainly identified to avoid confusion (labeled EMPTY). Cylinders, which have held the same contents, should be grouped together.

Color-coding of cylinders: Oxygen Cylinder is GREEN. Acetylene Cylinder is YELLOW.

An acetylene cylinder valve wrench shall be available at all times for the cylinder in use.

8.2 HANDLING OF CYLINDERS

Cylinders in transport shall be secured in an up right position with the valve caps in place. Loading and unloading should take place carefully. Cylinders should not be dropped, thrown, dragged, used as rollers, or as a support. No damaged or defective cylinder shall be used.

All valves must be fully closed before a cylinder is moved. Unless a trolley or special carrier is used, regulators and hoses should be detached from the cylinders.

Lifting or hoisting compressed gas cylinders will be done only by means of properly constructed compressed gas hoisting cart. Use of Standard Bottle Carts for hoisting or slings attached directly to the bottles is strictly prohibited.

8.3 INSPECTION OF EQUIPMENT

Special measures will be taken to ensure equipment is inspected regularly. All equipment should be examined immediately before use and regularly maintained. All welding operations shall be conducted in well-ventilated areas.

Only soapy water should be used to check for leaks. Presence of a leak is often indicated by a hissing sound, or by the nature of the torch flame. Cylinders and valves should be kept clean. Valve sockets shall be kept free of grit, dirt, oil, or dirty water.

Oxygen and acetylene cutting equipment must be provided with flashback flame arrestors at regulator and torch. Hoses should be kept for one type of gas only and color coded for identification. They should be examined before use for any signs of splitting, which might give rise to leakage. All connections shall be made by crimps. The hoses used for acetylene and for oxygen shall not be interchangeable.

Connections and check valves should be regularly examined to detect leakage. Equipment should be fitted with the correct pressure regulators, and a regular check should be made to ensure that the regulator is working

correctly. The torch nozzle should be kept tight. An acetylene cylinder valve wrench shall be available at all times for the cylinder in use.

A friction lighter shall be used as the means of ignition and should be readily available.

Wherever possible, the cylinders in use should be kept upright on a custom built stand, fitted with a bracket to accommodate the hoses and equipment. Unless a recess in the head protects the cylinder valve, the metal cap should be kept in place to protect the valve when the cylinder is not connected for use.

8.4 PERSONAL PROTECTION

Helmets, hand shields, and head shields are necessary to protect eyes and face against heat and the effect of the intense light emitted by an electric arc.

Goggles are required to protect the eyes of the welder from pieces of flying slag when chipping takes place. Goggles should be fitted with opaque sidepieces. These goggles should also be worn under the regular welding head shields.

Electric welding operations must be effectively screened to prevent nearby personnel from being effected by harmful light radiation. Screens should be made from fire resistant materials, or should be suitably treated with a fire resistant compound.

Gloves are necessary protection for the hands, against heat, sparks, molten metal, and radiation. Leather, suitably reinforced at points of maximum wear, is the material most generally worn. Gloves should be long enough to protect wrists and forearms. When gloves are not long enough, protective sleeves of similar materials should be worn.

Safety boots and leggings are essential to provide effective protection against heat, flying sparks, and falling metal.

No welding or burning shall be done in a hazardous area without obtaining written authorization from the responsible authority (Work Permit System).

It will be made sure that suitable fire extinguishing equipment is available in the work area.

No welding or burning shall be carried out on barrels, tanks, piping or other system, which have contained either combustible or unknown products without first obtaining approval from the responsible authority.

Whenever it is necessary to work after normal daylight hours Approach Company. shall supply lighting equipment, which will provide an intensity of illumination that will permit work to be done in a professional manner, without risk of personal injury or damage to the work.

9. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Approach Company will provide and enforce the use of items of personal protective equipment listed in Client Construction Manual and follow manufactures recommendations.

When a hazardous situation is recognized steps should immediately be taken to eliminate the hazard, by either engineering revision, or alteration to the method of work. Should it prove impracticable to eliminate the hazard, personal protective equipment shall be used. When it has been decided that personal protective equipment is required, steps shall be taken to select the proper type of equipment, and to ensure that supervisors properly instruct their employees about the use of that equipment, and ensure that it is used in accordance with instructions. Each worker, depending on his job, is provided with appropriate personal protective equipment.

Hard hats, safety shoes and safety glasses are worn in all work areas.

9.1 FALL PROTECTION EQUIPMENT

There are several types of Fall Protection devices used throughout the construction industry. The two (2) most commonly used ones are the full body safety harness and the safety belt. Harnesses are used for above ground work, where fall restraining and arresting protection is required. Safety belts are used to restrain the wearer at his place of work. Safety belts should be used as part of the fall arrest system.

Full body safety harnesses are required when working in areas with no guard rails at heights above 1.82 meters (6 feet) or for potential falls of six feet or greater.

Special attention should be given to achieve a snug fit of the safety harness as it is easy for a man to slip through sound but badly adjusted equipment and fall.

No fall restraining or arresting device is any stronger than the point of attachment. Therefore, all users should be carefully instructed in the importance of a firm anchorage.

Fall protection devices must be stored in clean and dry conditions away from sunlight, and must be thoroughly inspected both on issue and at the start of each shift.

Fall protection device shall be capable of supporting a minimum dead weight of 2500 kilograms (5500 pounds). Refer to OSHA 29 CFR 1910.66, Appendix C – 1991.

The maximum length of standard lanyards shall be limited to provide for a fall of no grater than 1.82 meters (6 feet) except in the case of mechanical fall arresting devices which have been reviewed and received concurrence by the Loss Prevention Department. The lanyard shall have a minimum breaking strength of 2500 kilograms (5500 pounds)

9.2 SAFETY HELMET

In the work area safety helmets with rigid headgear made of various materials, designed to protect the head from impact, flying particles, electric shock or any combination of the three, must always be worn. Headgear must meet ANSI Standard No. Z89.1

Safety helmets with metal tags, drilled holes or painting will not be permitted on the job. Only stick on decals, supplied Approach Company is permitted. Painted hard hats will not be permitted because of the effect the paint will have on the strength of the hat. Hard hats should be adjusted so your hat is suspended on your head by the webbing, preventing the shell of the hat from touching your head.

The complete helmet should be cleaned regularly with soap and water. Helmets should be scrapped following any penetration, high impact, or subjection to extreme heat.

A safety helmet should be worn by all persons at all times when on a construction job site or whenever there are overhead hazards. Metal hard hats do not afford proper impact or electrical protection and, therefore, are prohibited from all work areas.

9.3 SAFETY GOGGLES

The protection of the eyes from injury is of importance in an industrial environment.

All Supervisors are obliged to instruct their personnel about the right use and right type of eye protection.

The type of protection selected will depend on the hazard, but it should be borne in mind that all eye protection devices must be considered as optical instruments. Factors to be considered in selecting impact resistant eye protection include the degree of protection required and the comfort provided as required by ANZI or equivalent requirements.

In addition to damage from physical and chemical agents, the eyes are vulnerable to the effects of radiant energy such as that produced during welding. Visible and non-visible bands of the light spectrum can produce harmful effects upon the eyes and special attention must be paid to the selection of eye protection from these hazards.

All Approach Company Subcontractors employees on the job site will wear safety glasses.

9.4 FACE PROTECTION

Face shields protect the face and neck from flying particles, sprays of hazardous liquids, splashes of molten metal, and hot solutions. Where required, safety spectacles and chemical goggles shall be worn under the face shield.

Full Face Shields shall be worn by operatives during Grinding Works.

9.5 HAND GLOVES

Welders' gloves: must be worn by all welders at work.

Working gloves: must be worn by all workers whenever there is a danger of damaging their hands by handling rough surfaces or substance that could burn, cut or tear.

Rubber gloves: those who handle hazardous liquids or acid shall wear an appropriate type. (Rubber can burn or melt)

Gloves should not be used near moving and/or rotating machinery as they can be caught and trap the hand before it can be released from the glove.

9.6 SAFETY SHOES

Safety Shoes must be manufactured to the referenced ANSI standard or its equivalent.

Approved safety footwear is sturdy work shoes with leather uppers and/or leather composition with steel toe caps. The toecap is capable of withstanding both compression and impact loads - comfort is particularly important for the wearer of safety boots and footwear must fit properly.

Rubber safety boots must be worn for work in concrete or any other wet areas.

Fashion type safety "toe" shoes with canvas, nylon and/or other soft composition uppers or soles are not considered safety shoes and are not approved by Client.

9.7 HEARING PROTECTION

Hearing protective equipment will be provided and used in designated areas, or for high noise hazard jobs, in excess of 85 dBA (8 hour TWA).

<u>Ear plugs</u>

Ear plugs are placed into the canal of the outer ear. Materials used for these plugs are rubber, plastic, wax, foam or Swedish wool. Disposable types are preferred as they give good protection and are very sanitary.

When involved in high noise operations such as air hose cleaning, concrete breaking or cutting or chipping, etc. or when performing activities in areas identified to be “High Noise Areas” or close to high noise producing equipment such as compressors, etc.

Ear Muffs

Ear muff cover the external ear to provide an acoustic barrier. The effectiveness of ear muffs varies considerably due to differences in manufacturer, size, shape, seal material, shell mass, and type of suspension.

9.8 ADDITIONAL INSTRUCTION

No shorts will be worn on site and no one will be allowed to work without a proper shirt top.

Hairnets may be required for employees whose hair is a potential source of injury.
Electricians using insulated gloves must test them daily for any defects.

The supervisor shall ensure that all people under his control are using the right equipment and verify that this is used in accordance with the manufactures instructions.

Welding leathers (glove and leggings) for welders on site will be provided.

Disposable coveralls, for personnel engaged in painting, cleaning, insulation and similar activities will be provided.

Disposable dust masks, for all personnel exposed to ordinary respiratory hazards such as: dust and similar air contaminants will be provided.

Chemical cartridge respirators, where required, during activities such as painting, insulation and similar activities where respiratory hazards from mist of paints, thinner, organic vapors minute fibers, etc. exist or possible will be provided.

Chemical suits, those who are handling acid, or any chemical, which on body contact causes injury, will be provided with appropriate chemical suits.

Breathing apparatus, wherever the atmosphere is contaminated with hazardous gases / dust, the workers those who are working on that area will be provided with appropriate breathing apparatus of the standard.

10. TOOLS AND PORTABLE POWER TOOLS

10.1 HAND TOOLS

Screwdrivers should be of the correct size and tip to fit the spot of the screw. Screwdrivers shall not be hammered or twisted with the help of pliers or mole grips, and shall not in any manner be carried in pockets.

The correct kind of hammer shall be selected for the job. Hammerheads should be properly secured to handles with proper wedges.

Chisels. Cutting edges shall be kept sharp with its original shape and angle maintained. When a sledgehammer is used for striking chisel, the chisel should be held by a second person using a pair of tongs.

Picks and Shovels shall be maintained in a serviceable condition. Shovel blades shall not be allowed to become blunt, turned, split or jagged.

Spanners and Wrenches. Only the right type and size should be used. Extension leverage for spanners and wrenches shall not be used unless the wrenches are designed for such use. A wrench shall not be used as a hammer and should not be hammered to tighten a bolt unless otherwise designed for such use.

Pliers are not to be used as a wrench. They are meant for gripping round objects and for cutting soft metals and wires. When cutting metal/wire with pliers, it shall be ensured that the scrap does not fly off and cause injury. Only long handled pliers shall be used to cut wire under tension.

Jack capacity shall be ensured to be adequate and strong enough to raise and maintain the load positioned on its centerline. No one shall get under the loading being raised.

Correct type of blade shall be selected to suit the material to be cut. The blade should be set with the teeth pointing in forward direction and sufficient tension shall be applied to ensure the blade is maintained rigid with the hacksaw frame.

All hand tools shall be kept in good repair and used only for the purpose for which they are designed.

Tools having defects that will impair their strength or render them unsafe for use shall be removed from service.

Throwing tools or materials from one location to another, from one employee to another, or dropping them to lower levels, shall not be permitted.

Only non-sparking tools shall be used in locations where sources of ignition may cause a fire or explosion.

Wrenches, including adjustable pipe, open end socket types will not be used when the jaws are sprung to the point where slippage occurs.

Impact tools such as drift pins, wedges and chisels will be kept free of mushroomed heads.

The wooden handles of tools will be kept free of cracks or splinters, and will maintain a tight fit on the tool.

Ensure all personnel know the right tools for their job.

10.2 PORTABLE POWER TOOLS

Approach Company and Subcontractors employees will be given training on all electrically powered tools. Employees will be closely supervised to ensure tools are being used correctly and by trained labor. The following safety precautions will be used:

- Electrical circuits shall be protected by ground Fault circuit interrupters (GFCI) at the main switch panel board.
- Where it is necessary to make electrical splices, these shall be made with proper connector blocks or by plug and socket connectors. Taped joints shall not be permitted.
- All portable power tools should be equipped with a proper functioning “dead man switch”. Trigger locking buttons will be disabled.

10.3 MAINTENANCE AND STORAGE

A proper inspection and maintenance routine shall be established by the Approach Company Services and Subcontractors for all electrical tools. A competent standby electrician on the welding line shall carry out the inspection and maintenance of all tools at least once in every working week.

All tools shall be stored in a clean, dry place and a record of issue and receipt shall be maintained by the storekeeper.

The contractor shall ensure that all operators are provided with eye, head, and ear protection. If there is any likelihood of harmful dust being emitted, dust respirators shall be used.

10.4 GRINDERS

Examination: New wheels should be carefully checked for signs of damage before use. A certified wheel can be checked by suspending it vertically and tapping it with a light, non-metallic implement. If the wheel sounds dead, indicating a crack, it must not be used.

Storage: Most plain and tapered wheels are best supported on edge or on a central support. Cylinder wheels and large straight up wheels may be stacked on the flat side.

Wheel to wheel contact should be avoided by separation with corrugated cardboard or individual racking.

Handling: All abrasive wheels are relatively fragile and should therefore be handled with care. Do not drop or bump wheels. Stack wheels carefully for transport to prevent damage.

Every abrasive wheel shall be provided with a guard, which will be kept in position during use of the wheel.

This guard will be capable of performing two main functions i.e. to contain the wheel parts in case of a burst, and to prevent the operator from coming into contact with the wheel.

The guard should, therefore, enclose the wheel to the greatest possible extent, and be secured to the machine frame

Speed of Wheels: Over speeding is a common cause for the bursting of abrasive wheels. The maximum safe working speed expresses in meters per second or feet per minute at the circumstance has been established by the manufacturers for each type of wheel. Each wheel will be marked with the maximum speed in revolutions per minute. When mounting a wheel, the speed of the spindle must not exceed that of the wheel.

Mounting: A wheel should not be mounted on a machine for which it is not intended.

Examine every wheel for damage before mounting.

Speed of the machine must not exceed the permitted speed of the wheel.

The wheel should fit freely, but not loosely on the spindle.

The clamping nut should not be tightened more than is required to hold the wheel firmly.

The guard should be properly secured and adjusted, with the tool rest adjusted to within 1/8” or 2 mm of the wheel.

Test runs new wheels at normal speeds before use. Stand clear during testing.

Grinders shall not use without its safety cover.

Grinder operators shall not use grinding sparks to ignite torch.

10.5 DRILLS

Care should be taken not to drill too large a hole at one time. If this is not done, the drill may bind on breakthrough, and the torque set up could twist the tool against the user's wrist.

10.6 PNEUMATIC TOOLS

Only trained personnel will be allowed to operate pneumatic tools such as impact wrench, jackhammer, chipping hammer, grinder etc.

Hose connections will be made by a proper hose coupler and additionally secured by safety wire

Pneumatic tools when used at elevated locations will be tied off with a string against a stable structure or support to hold the tools in the event of accidental fall or loss of control by the operator.

The operator will ensure a firm grip and control of pneumatic tools during the operation.

Hearing protection (earplugs) will be worn by the operator and affected personnel where the use of pneumatic tools creates a high noise condition.

10.7 PERSONAL PROTECTION

Persons using an abrasive wheel will be protected from flying particles by clear plastic, full-face shields, as well as safety glasses.

Electrical and pneumatic tools: All pneumatic tools shall be secured to the hose by a positive means (not wired) to prevent the tool becoming disconnected in use. The use of hoses or electrical leads for lowering or raising tools is not permitted.

Jackhammer and rock breaking tool bits will be kept sharp. Eye and foot protection is required when using this type of equipment.

Power saws and other power operated cutting or grinding tools will only be operated with the appropriate guards in place.

11. LADDERS

Approach Company and Subcontractors will provide and ensure that only metal or timber ladders of Client approved types are provided to ensure a safe means of access and egress to the work place.

11.1 SELECTION

A ladder must be of the proper length for the job to be done. If it is to be used for access or as a working place, it shall rise to a height of at least 0.9-meter (3 feet) above the landing place.

Metal ladders, ladders with metal reinforced side rails, and ladders, which are wet, shall not be used near electrical equipment with exposed live conductors. Such ladders shall have a warning notice attached to guard

against use near electrical equipment.

Aluminum ladders shall not be used where there is a likelihood of contact with materials harmful to aluminum, such as caustic liquids, damp lime, wet cement, and seawater.

11.2 CONDITION

The user shall examine each ladder before use. Those with split or broken side rails, missing, broken, loose, decayed or damaged rungs or cleats or with other faulty equipment shall be tagged “DO NOT USE” and removed from service.

Rungs shall be properly mortised into side rails. Cleats shall be inset by one-half inch, or filler blocks used on the side rails between the cleats. Cleats shall be uniformly spaced 30.5 centimeters (1 foot) from top to bottom.

11.3 POSITION

The side rails of a ladder shall be equally supported on a firm level surface. Boxes, blocks barrels etc. shall not be used as a means of support. The area at the base of the ladder must be kept clear. Ladders shall not be used in a horizontal position as platforms, runways, or scaffolds.

Ladders shall not be supported on their rungs or cleats. Rungs or cleats shall not be used to support scaffold planks.

Whenever possible, ladders shall be set at an approximate angle of 75 degrees (one foot outward for every four feet upward).

Both side rails of a ladder shall be evenly supported at the upper resting-place. Side rails must be securely tied off to prevent movement. Where secure fixing is impracticable, other measures must be taken to prevent movement by securing the base, using side guys, or stationing a man at the base to ‘foot’ the ladder. A man at the base will be unable to control a ladder more than 6 meters (20 feet) in length.

Where ladders have to be suspended, both side rails shall be lashed top and bottom to provide equal support. Where long ladders are used, they shall also be lashed at the center to prevent lateral movement.

11.4 USE

Where an extension ladder is fully extended, the minimum overlap of section shall be four rungs. Splicing or lashing ladders together is not permitted.

Men ascending or descending ladders shall not carry tools and materials in their hands. Tools may be carried in pockets or on special belts, provided there is no risk of injury, and movement is not impaired. Material shall be lowered securely tied or in a basket.

A man working on, or from a ladder, must have a secure handhold and, both feet, on the same rung or cleat. If the work to be done requires the use of both hands, a safety belt is required. Only one person shall be on a ladder at one time.

Job-made ladders shall be constructed for their intended use and to the standards set forth by Client.

11.5 GENERAL

Ladders shall be maintained in good condition at all times. Joints shall be tight, all hardware and fittings shall be securely attached, and movable parts shall operate freely without binding or undue play.

Ladders must not be painted.

Where one man carries a ladder, the front end should be kept high enough to clear men's heads, and special care shall be taken at corners and blind spots.

12. ELECTRICAL INSTALLATION AND EQUIPMENT

Approach Company and Subcontractors shall provide 220 volts single-phase 15 and 20 amperes receptacle outlets.

All wiring should have a ground fault insulator for personal protection.

All materials and equipment used shall be in accordance with the Client Standards.

Never bridge fuses.

All materials and equipment used shall be in accordance with the Client Standards.
De-energize all lines, on which work will be performed, install padlocks and lockout tags.
All appliances, equipment and materials used for temporary electrical installations shall be constructed, installed, protected, worked and maintained so as to eliminate the potential electrical related hazards.

No work of electrical nature shall be carried out without the proper work permit.

All underground electric cables for portable offices shall be laid at safe depth.

Cooking is not permitted in any office, dormitory or private quarters except those quarters equipped with kitchen facilities.

No-essential electrical equipment and appliances shall be disconnected to turn off when not in use.

Overhead power lines shall be protected by barriers and timber or wire "goal posts". No part of any mobile crane, side boom, earth-moving equipment can approach the live cable.

The company shall be responsible for all electrical installations and equipment and safety measures associated with them in its respective living and work areas.

All electrical installation shall be inspected by the inspection department and electrical group and Loss Prevention Division area office, before mobilization.

12.1 EXAMINATION, INSTALLATION, AND USE OF EQUIPMENT

Approach Company and Subcontractors will ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment must be determined by the following:

Suitability for installation and use in conformity with the provisions of the applicable standard. Suitability of equipment for an identified purpose may be evidence by a listing, by labeling, or by certification for that identified purpose.

Mechanical strength and durability. For parts designed to enclose and protect other equipment, this includes the adequacy of the protection thus provided.

Electrical insulation.

Heating effects under conditions of use.

Arcing effects.

Classification by type, size, voltage, current capacity, and specific use.

Other factors that contribute to the practical safeguarding of employees who use or are likely to come in contact with the equipment.

12.2 GUARDING

Live parts of electrical equipment operating at 50/60 volts or more must be guarded against accidental contact. Guarding of live parts must be accomplished as follows:

Location in a cabinet, room, vault, or similar enclosure accessible only to qualified persons.

Use of permanent, substantial partitions or screens to exclude unqualified persons.

Location on a suitable balcony, gallery, or platform elevated and arranged to exclude unqualified persons.

Elevation of eight feet or more above the floor.

Entrance to rooms and other guarded locations containing exposed live parts must be marked with conspicuous warning signs forbidding unqualified persons to enter.

Electrical installations that are over 600 volts and that are open to unqualified persons must be made with metal-enclosed equipment or enclosed in a vault or area controlled by a lock. In addition, equipment must be marked with appropriate caution signs.

12.3 GROUNDING OF EQUIPMENT CONNECTED BY CORD AND PLUG

Exposed noncurrent-carrying metal parts of cord-and-plug-connected equipment that may become energized must be grounded in the following situations:

- When in a hazardous (Classified) location.
- When operated at over 150 volts to ground, except for guarded motors and metal frames of electrical heated appliances if the appliance frames are permanently and effectively insulated from ground.
- When one of the types of equipment listed below (see item 6 for exemption)

1. Hand held motor-operated tools.
2. Cord-and-plug-connected equipment used in damp or wet locations or by employees standing on the ground or on metal floors or working inside metal tanks or boilers.
3. Portable and mobile X-ray and associated equipment.
4. Tools likely to be used in wet and/or conductive locations.
5. Portable hand lamps.
6. (Exemption) Tools likely to be used in wet and/or conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of not over 50 volts. Listed or labeled portable tools and appliances protected by a system of double insulation, or its equivalent, need not be grounded. If such a system is employed, the equipment must be distinctively marked to indicate that the tool or appliance uses a system of double insulation.

12.4 SAFETY RELATED WORK PRACTICES

12.4.1 Protection of Employees

Approach Company and Subcontractors will not permit an employee to work near any part of an electric power circuit that the employee could contact in the course of work, unless the employee is protected against shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means.

Before work can begin Approach Company and Subcontractors will determine by inquiry, observation, or instruments where any part of an exposed or concealed energized electric power circuit is located.

Approach Company. and Subcontractors will advise employees of the location of such lines, the hazards involved and protective measures to be taken as well as to post and maintain proper warning signs.

Only qualified electricians will perform repair or carry out maintenance of electrical tools and equipment.

Approach Company and Subcontractors will provide barriers or other means of guarding to ensure that workspace for electrical equipment will not be used as a passageway during the time when energized parts of electrical equipment are exposed. Walkways and similar working spaces must be kept clear of electric cords.

12.4.2 Safety Related Maintenance and Environmental Considerations

Maintenance of Equipment:
Approach Company and Subcontractors will ensure that all wiring components and utilization equipment in hazardous locations are maintained in a dust tight, dust-ignition-proof, or explosion-proof condition without loose or missing screws, gaskets, threaded connections, seals, or other impairments to a tight condition.

Environmental Deterioration of Equipment. Unless identified for use in the operating environment, no conductors or equipment can be located:

- In damp or wet conditions
- Where exposed to gases, fumes, vapors, liquids, or other agents having a deteriorating effect on the conductors or equipment.
- Where exposed to excessive temperature.

Control equipment, utilization equipment and busways approved for use in dry locations only must be protected against damage from the weather during building construction.

For protection against corrosion, metal raceways, cable armor, boxes, cable sheathing, cabinets, elbows, couplings, fittings, supports, and support hardware must be of materials appropriate for the environment in which they are installed.

12.4.3 Batteries

Batteries of the unsealed type must be located in enclosures with outside vents or in well-ventilated rooms arranged to prevent the escape of fumes, gases, or electrolyte spray into other areas. Other provisions include the following:

- Ventilation. To ensure diffusion of the gases from the battery and to prevent the accumulation of an explosive mixture.
- Racks and Trays. Treated to make them resistant to electrolyte.
- Floors. Acid resistant construction unless protected from acid accumulations.
- Face shields, aprons, and rubber gloves. For workers handling acids and batteries.

- Facilities for quick drenching of the eyes and body, within 25 feet of battery handling areas.
- Facilities for flushing and neutralizing spilled electrolytes and for fire protection.

Battery charging installations must be located in areas designated for that purpose. When batteries are being charged, vent caps must be maintained in functioning condition and kept in place to avoid electrolyte spray.

12.4.4 Ground Fault Protection on Construction Sites

Insulation and grounding are two recognized means of preventing injury during electrical equipment operation. Conductor insulation may be provided by placing nonconductive material such as plastic around the conductor. Grounding may be achieved with a direct connection to a known ground.

Consider for example, the metal housing or enclosure around a motor or the metal box in which electrical switches, circuit breakers, and controls are placed. Such enclosures protect the equipment from dirt and moisture and prevent accidental contact with exposed wiring. However, there is a hazard associated with housings and enclosures. A malfunction within the equipment, such as deteriorated insulation, may create an electrical shock hazard. Many metal enclosures are connected to a ground to eliminate the hazard. If a “hot” wire contacts a grounded enclosure, a ground faults results which normally will trip a circuit breaker or blow a fuse. Metal enclosures and containers are usually grounded by connecting them with a wire going to ground. This wire is called an equipment-grounding conductor. Most portable electric tools and appliances are grounded by this means. There is one disadvantage to grounding: a break in the grounding system may occur without the users' knowledge.

Insulation may be damaged by hard usage on the job or simply by aging. If this damage causes the conductors to become exposed, the hazards of shocks, burns, and fire will exist. Double insulation may be used as additional protection on the live parts of a tool, but double insulation does not provide protection against defective cords and plugs or against heavy moisture conditions.

The use of ground-fault circuit interrupter (GFCI) is one method used to overcome grounding and insulation deficiencies.

12.4.5 What Is A GFCI

The ground fault circuit interrupter (GFCI) is a fast-acting circuit breaker which senses imbalances in the circuit caused by current leakage to ground and, in a fraction of a second, shuts off the electricity. The GFCI continually matches the amount of current going to an electrical device against the amount of current returning from the device along the electrical path, Whenever the amount “going” differs from the amount “returning” by approximately 5 mill amperes, the GFCI interrupts the electric power within as little as 1/40 of a second.
However, the GFCI will not protect the employee from Line-to-line contact hazards (such as a person holding two “hot” wires or a hot and a neutral wire in each hand). It does provide protection against the most common form of electrical shock hazard, the ground fault. It also provides protection against fires, overheating, and destruction of insulation on wiring.

12.4.6 The Hazards

With the wide use of portable tools on construction sites, the use of flexible cords often becomes necessary. Hazards are created when cords, cord connectors, receptacles, and cord-and plug-connected equipment are improperly used and maintained.

Generally, flexible cords are more vulnerable to damage than is fixed wiring. Flexible cords must be connected to devices and to fittings to prevent tension at joints and terminal screws. Because a cord is exposed, flexible, and unsecured, joints and terminals become more vulnerable. Flexible cord conductors are finely stranded for flexibility, but the strands of one conductor may loosen from under terminal screws and touch another conductor, especially if the cord is subjected to stress or strain.

A flexible cord may be damaged by activities on the job, by door or window edges, by staples or fastenings, by abrasion from adjacent materials, or simply by aging. If the electrical conductors become exposed, there is a danger of shocks, burns or fire. A frequent hazard on construction sites is a cord assembly with improperly connected terminals.

When a cord connector is wet, hazardous leakage can occur to the equipment-grounding conductor and to humans who pick up that connector if they also provide a path to ground. Such leakage is not limited to the face of the connector but also develops at any wetted portion of it.

When the leakage current of tools is below 1 ampere and the grounding conductor has a low resistance, no shock should be perceived. However, should the resistance of the equipment-grounding conductor increase, the current through the body also will increase. Thus, if the resistance of the equipment-grounding conductor is significantly greater than 1 ohm, tools with even small leakages become hazardous.

12.4.7 Preventing And Eliminating Hazards

GFCIs can be used successfully to reduce electrical hazards on construction sites. Tripping of GFCIs, interruption of current flow is sometimes caused by wet connectors and tools. It is good practice to limit exposure of connectors and tools to excessive moisture by using watertight or sealable connectors. Providing more GFCIs or shorter circuits can prevent, tripping caused by the cumulative leakage from several tools or by leakages from extremely long circuits.

13. SCAFFOLDING

Approach Company and Subcontractors will provide scaffolding that will comply with the Client Safety Requirements.
All scaffold erection should comply with Client Scaffold Safety Handbook.

All scaffolds shall be designed to enable them to safely support four times the intended load, which includes the load exerted on the scaffold from men, materials, equipment and the scaffold mass.

Each scaffold must be inspected and approved by the responsible supervisor prior to use and after alteration or moving. Scaffolds will be tagged "Safe to Use" when approved this responsible supervisor. Employees will not be permitted to work on untagged scaffold or scaffolding marked "Unsafe to Use". There is no such thing as a temporary scaffold, and all structures will be required to conform to the necessary standards.

Scaffold will be inspected by Approach Company and Subcontractors competent scaffold Supervisor / Inspector prior to its use and before it can be dismantled.

The variety of scaffolds employed is large. Each has different steel, pre-formed "Kwik-fit" type, and rolling scaffolds. These are the scaffold types, which will be dealt within this section.

Major Points of the SSH:

CERTIFICATIONS: Client certified Scaffold Supervisors and Scaffold Inspectors are only allowed to inspect / Supervise / sign scaffold tags.

SPACING – Client requires a safety factor of 4 for all scaffolds. Many of the scaffolds now in use cannot meet this safety factor, unless the post spacing's are reduced. This post spacing reduction requirement covers all tube & coupler and system scaffolds.
Scaffolds material meeting Client strength requirements will be allowed to use larger post spacing's. The material will be identified by a stamp on each piece of scaffold material.

SCAFFOLD PLANKS – Scaffold planks shall be solid sawn wood planks, laminated veneer planks or fabricated planks. Solid sawn wood scaffold plank grade and shall be certified by and bear the grade stamp of a lumber-grading agency approved by the American Lumber Standards Committee.
Laminated veneer lumber shall have the words “Proof Tested Scaffold Plank” and “OSHA” (or Client accepted equivalent) embossed continuously along both edges.

13.1 INDEPENDENT (FREE STANDING) SCAFFOLD

The same precautions will apply whether constructed of standard tubular units or from prefabricated frames or kwik-fit type.

The height of the scaffold will not exceed four times the minimum base measurement, unless the scaffold is tied in to a structure. The minimum base measurement will include outriggers if these are used.

The structure will be erected on essentially firm and level ground

Base plates will support the standards, and a timber sole plate will be used where deemed necessary. Bricks, building blocks or other loose materials are not acceptable as base or sole plates.

Viewed from the front or side, a scaffold is a series of rectangular frames. The couplers joining the tubes are not designed to prevent the rectangular frame from becoming diamond shaped and collapsing. Therefore, transverse bracing is required. This will take the form of diagonal bracing, at right angles to the structure, on the width of the scaffold at each alternate level. In addition, longitudinal diagonal bracing is required across the face of the scaffold, for its full length.

All bracing connections will be made with load bearing couplers.
A prefabricated frame scaffold will normally have cross bracing incorporated in the design. If this is not the case, it will be added, before any use of the scaffold, as above.

The weight, which can be carried by a scaffold, relates to the spacing of standards. As a guide, note the values below:

- Post (Standard) Space
- 10 ft. x 6-ft. Weight 25-lb. ft squared.
- 8 ft. x 6-ft. Weight 50-lb. ft. squared.
- ft. 6 in. x 6-ft. Weight 75-lb. ft. squared.

The weights indicate a uniformly distributed load, and assume adequate diagonal bracing and spacing of ledgers and transom.

Guardrails, midrails and toe boards will be installed on all open sides of scaffolds in excess of 6 ft. in height (1m. 80 cm.). The top guardrails will be at a height of 3'6" (107 cm.).

Guardrails may be of tubular scaffold pipe or timber. If timber, the toprail will be of 2" x 4", the midrail of 1" x 4". In all cases, toe boards will be of 1" x 4" timber.
The work platforms will be fully planked with 2" x 10" timber, leaving no gaps. Planks should be cleared to avoid displacement.

13.2 SCAFFOLDING COMPONENTS

All scaffold structures shall be erected with approved metal components. Scaffolds shall be stored to prevent damage and to permit easy access for use.

Tubing:

Ordinary scaffold tubing is 4.8 centimeters (1-29/32 inches) in diameter and is referred to as two-inch tubing. It is mild steel and normally supplied in lengths of 6.4 meters (21 feet). Tubes must be free from cracks and surface flaws, laminations, excessive rust, and other defects. The ends shall be cut square and cleanly. A tube shall not deviate from a straight line by more than 1/6 of its length measured at the center.

Aluminum Tubing:

Although, aluminum tubing is dimensionally interchangeable with steel tubing, it must not be used in the same structure; the difference in the elastic constants, of the two materials results in greater deflection in aluminum tubing for the same loading conditions.

Aluminum tubing shall not be used where there is likelihood of contact with materials harmful to aluminum such as caustic liquids, damp lime, wet cement and sea- water.

13.3 FITTINGS

All fittings (couplers, clamps, etc) shall be of an approved metal type. They shall be examined regularly and care must be taken to ensure that moving parts are sound and well lubricated, and that the threads are not stripped.

13.3.1 Typical Scaffold Fittings:

Base Plate: A 15 centimeter (6 inch) by 15 centimeter (6 inch) steel plate providing a flat bearing surface for load distribution from standards. It has an integral spigot and fixing holes for use with sole plates.

Adjustable Base Plate: Used for compensating variations in ground levels. Also used for strutting and shoring.

Double coupler: Also known as a right angle or 90 degree coupler. A load bearing coupler used for connecting two tubes together at right angles.

Universal Coupler: Load bearing coupler used for connecting two tubes together at right angles or in parallel.

Putlog Coupler: A non-load bearing coupler used for mixing two tubes at right angles, e.g., intermediate putlogs or board bearers to ledgers.

Putlog Coupler S.G.B. Type-This coupler, while primarily designed for securing putlogs to ledgers can also be used as a bracing coupler.

Swivel Coupler: Used for connecting two tubes together at any angle through 360 degree. Not to be used where a load bearing double coupler is required.

End-to-End Coupler: Also known as a Sleeve Coupler. Used for connecting two tubes end to end.

Joint Pin: Also known as a Spigot. Used for connecting two tubes end to end.

Reveal Pin: Inserted into the end of a tube and adjusted to form a rigid horizontal or vertical member between two opposing surfaces. It forms a solid anchorage to which a scaffold can be tied.

13.4 PLANKS

Planks shall be of rough timber, 5 centimeters (2 inches) thick by 23 centimeters (9 inches) wide, and shall confirm to the following specifications:

- On the face of the plank, the ends shall not be split up more than 30.5 centimeters (1 foot), without fixed banding or the end bolted through.
- On the face of the plank, not more than one-third the width in any one place shall be known wood.
- On the edge of the plank, not more than half the depth shall be known wood.
- On the edge of the plank, the grain shall not cross from face to face within a distance of less than 30.5 centimeters (1 foot).
- From end to end, the plank must not be twisted by more than 1.3 centimeters (½ inch).
- Planks shall not be painted or treated in any way that would conceal defects.
- Planks, which are split decayed or warped, shall not be used, but the parts affected may be cut off to produce shorter planks with the ends banded or bolted through.
- Planks should be stacked on a suitable foundation. Where the height of a stack exceeds 20 planks, measures should be taken to tie or bond succeeding layers.
- Planks should not be stood on end and left unattended.
- Scaffold planks shall not be used for shuttering for concrete, shoring for trenches, or as sole plates for scaffolding. Planks shall be inspected for defects, including decay, prior to each use.

13.5 REQUIREMENTS COMMON TO ALL SCAFFOLDING

13.5.1 Foundations

A sound base is essential; therefore, the ground or floor on which a scaffold is going to stand must be carefully examined. Sand or made-up ground may need consolidating to ensure there are no cavities. Such bases as floors, roofs, etc. may need shoring from underneath.

Timber sole plates at least 23 centimeters (9 inches) wide by 3.8 centimeters (1½ inches) thick (not scaffold plants) will be required to spread the load on sand, made up ground, asphalt pavement, wooden floors, and slippery surfaces. A sole plate shall extend under at least two standards.

Where scaffolding is erected on solid bearing such as rock or concrete, small timber pads may be used in place of sole plates to prevent the base plates striking off.

Concrete blocks, barrels, and other loose or unsuitable materials shall not be used for the construction or support of scaffolding.
If used to compensate for variations in ground level, the adjustable base plate shall not be adjusted too more than two-thirds of the total length of the thread. The base plate shall be of a type approved for supporting scaffolding standards.

13.5.2 Standards

Standards shall be pitched on 15 centimeters (6 inches) by 15 centimeters (6 inches) steel base plates. Joints in standards should be staggered, i.e., joints in adjacent standards should not occur in the same lift. All standards shall be vertical.

The inner row of standards shall be placed as close as possible to the face of the building of structure. To avoid projections, the standards may be up to 38 centimeters (15 inches) away from the wall, or structure as necessary, provided that, where there is room to do so, the gap between the wall or structure and the inner standard, shall be closed with a single plank on extended board bearers. The outer row of standards shall be approximately 101 centimeters (3 feet, 4 inches) from the inner row to allow for four 23-cm (9-inch) planks between them.

13.5.3 Ledgers

Ledgers shall be securely fixed to standards with 90-degree load beading couplers and shall be horizontal. Joints in ledgers should be staggered, i.e., joints in adjacent ledgers should not occur in the same bay. Ledgers should be secured end to end by sleeve couplers and not by joint pins.

Ledgers shall be vertically spaced at 1.8 meters (6 feet) to 2.1 meters (7 feet) to give adequate headroom along the platforms.

13.5.4 Transoms

Transoms shall be placed on the ledgers within 30.5 centimeters (12 inches) of each standard and secured with 90-degree load bearing couplers. These transoms must remain in position, as they are a structural part of the scaffold.

13.5.5 Board Bearers

Board bearers shall be secured to the ledgers between transoms where necessary to support decking. These may be removed when no longer required to support decking.

13.5.6 Bracing

Ledger bracing at right angles to the building or structure at alternate pairs of standards is necessary for the full height of the scaffold. These braces should be fixed to the ledgers with 90-degree load bearing couplers as close to the standards as possible. Where such a fixing is impracticable, swivel couplers may be used to fix the braces to the standards.

Longitudinal bracing to the full height of the scaffold is necessary. This may extend diagonally across the face of a scaffold at an angle as close to 45 degree as possible, or it may be the "dog leg" type at each end of the scaffold. A maximum distance of 30.5 meters (100 feet) allowed between each line of "dog leg" bracing. Only 90-degree load bearing couplers or swivel couplers may be used. Joints in cracks shall be made with end-to-end or parallel couplers.

Temporary rakers will normally be required to brace the scaffold against the ground when setting out. Permanent braces replace these rakers when the scaffold has been plumbed, leveled, and tied.

13.5.7 Ties

It is essential, that all scaffolds, with the exception of certain tower and mobile scaffolds be securely tied to the building or structure throughout their length and height to prevent movement of the scaffold, either towards or away from the building or structure. This should be done by connecting a tie tube to either ledgers or standards, and coupling this to a through tie or column box tie assembly.
Where the foregoing is impracticable, tubes may be securely wedged between opposing surfaces on the building or structure by the use of reveal pins and coupled to the tie tubes. Where reveal ties are used, they shall not exceed 50% of the total number of ties. Two-way ties or column box ties shall be evenly distributed over the scaffold area. To ensure the security of reveal ties, it is necessary to check frequently for tightness.

Scaffolding shall be secured to the building or structure at least every 8 meters (26 feet) vertically and 9 meters (29.5 feet) horizontally. All tie assembly connections shall be made with 90-degree load bearing couplers.

13.5.8 Decking

All decking shall be planked with each plank resting on at least three supports. Planks shall extend over their end supports by not less than 15 centimeters (6 inches) and not more than 30.5 centimeters (12 inches).

Supports for scaffold planks shall be spaced with due regard to the nature of the platform and the load it will bear. Supports for 5 centimeters (2 inches) planks shall never be more than 3 meters (10 feet) apart.
Except on decking contiguous to the surface of cylindrical or spherical structure, planks shall be laid flush.

Planks shall be secured in position to prevent displacement by high winds.

Adequate space for men to pass in safety shall be provided and maintained wherever materials are placed on decking or if any higher platform is erected thereon.

Decking shall be kept free of necessary obstructions, materials, and projecting nails.

Decking which has become slippery with oil or any other substances shall be sanded, cleaned, or otherwise treated as soon as possible.

Slopes in decking shall not exceed 1 vertical to 4 horizontal and stepping cleats at 0.3 meters (1 foot) intervals shall be provided.

All decking shall be loosed planked for the full width of the scaffold structure and shall never be less than three 23 centimeter (9 inch) in width.

13.5.9 Guardrails and Toe boards

Guardrails and toe-boards shall be fitted at edges of decking from which men or materials could fall a distance of more than 3 meters (10 feet). Guardrails shall be 106 centimeters (42 inches) and 51 centimeters (20 inches) in length and supported at intervals every 2.4 meters (8 feet).

13.5.10 Access

Access to working platform is best achieved by providing a separate ladder tower or a cantilevered access platform so as not to obstruct the working platform and to minimize the risk of persons falling through the gap in the guardrail or decking. Access must be provided to working platforms.

13.5.11 Workmanship

Scaffolding shall be erected, altered, and dismantled by experienced men working under the direction of a competent supervisor.

Standards shall be set accurately in place and checked vertically by using a spirit level or by using horizontal lines on the building or structure.

Scaffolding couplers should be tightened with proper scaffolding spanners. The use of an ordinary spanner or tool giving leverage is apt to damage the screw threads and render the coupler unserviceable.

Scaffolding materials shall not be thrown or dropped from height

13.5.12 Inspections:

All scaffolds shall be inspected daily and after weather that is likely to have affected stability. Main points to be checked are as follows:

- BASE: Standards pitched on base plates and adequate timber sole plates.
- STANDARDS: Correctly aligned and not damaged or displaced.
- LEDGERS: No undue deflection.
- TIES AND BRACES: Adequate and secured.
- COUPLERS: Correct type in use and properly tightened.
- PLANKS: Sound, closely laid, properly supported and secured.
- GUARDRAILS AND TOEBOARDS: In place to prevent falls wherever men or materials could fall more than 1.8 meters (6 feet).
- LADDERS: In good condition, properly supported and secured.

13.6 SYSTEM SCAFFOLDING

System scaffolding, also known as Unit Frame, Tubular Welded Frame, or Patent Scaffolding, is composed wholly or partly of prefabricated sections. There are many types of system scaffolding available, which vary in design and methods of erection and the following matters warrant particular attention.

To be erected, altered and dismantled by experienced men, under the direction of a competent supervisor.

Periodic inspection shall be made of all parts and accessories. Broken, bent, altered, excessively rusted, or otherwise structurally damaged frames or accessories shall not be used.

All system scaffolding shall be constructed and erected to support four times the maximum intended loads.

Scaffold legs shall be pitched on steel base plates and on timber sole plates or pads as necessary. Adjustable base plates shall be used to compensate for variations in ground level.

Scaffold shall be properly braced by cross braces or diagonal braces, or both, for securing vertical members together laterally. The cross braces shall be of such length as will automatically square and align vertical members so that the erected scaffold is always plumb, square, and rigid. All brace connections shall be made secure.

The frames shall be placed one on top of the other with coupling or stacking pins to ensure proper vertical alignment of the legs.

Where uplift may occur, panels or frames shall be locked together vertically by pins or other equivalent suitable means.

System scaffolding over 38 meters (125 feet) in height shall be specially designed.

13.7 INDEPENDENT TIED SCAFFOLDS

Tube and coupler Construction. An Independent Tied Scaffold (also commonly known as a Double Pole Scaffold) consists of a double row of standards connected together longitudinally with ledgers and with transoms at right angles to the ledgers. Braces and ties are essential for stability. This is the most common form of access scaffolding and is divided into three groups:

- ❑ Light Duty: for painting, cleaning, etc.

- General Purpose: When the materials are deposited on the platforms.
- Heavy duty: Where the deposited material is of a more substantial nature.

13.7.1 Light Duty Independent Tied Scaffolds:

Design, Loading and Dimensions. A light duty Independent Tied Scaffold shall have only one working platform in use at any one time, and maximum distributed load on the platform shall be (15 LB/sq. ft) with standards 2.7 meters (9 feet) apart longitudinally. Not more than one other platform may be planked out for the purpose of erecting, dismantling, or access.

Decking. The decking between the standards shall not be more than four 23-centimeter (9-inch) planks wide. It is permissible to place an additional plank between the inner standards and the building or structure if the space allows and it is properly secured.

Limitations. Light duty Independent Tied Scaffolds erected in accordance with these directions, with not more than one working platform and one additional platform, may be used up to a maximum height of 38 meters (125 feet). Light Duty Independent Tied Scaffold departing from these directions shall be specially designed.

13.7.2 General Purpose Independent Tied Scaffold:

Design, Loading, and Dimensions. A General Purpose Independent Tied Scaffold may have up to four working platforms in use at any one time. The maximum distributed load on each platform shall not exceed (37 LB/sq. ft) with standards not more than 2.1 meters (7 feet) apart longitudinally. Not more than one other platform may be planked out for the purpose of erecting, dismantling, or access.

Decking. The decking between standards should not be more than five 23-centimeter (9-inch) planks wide. It is permissible to place one plank between the inner standard and the building or structure, if space allows and if properly secured.

Limitations. General Purpose Independent Tied Scaffold erected in accordance with these directions, with not more than four working platforms, may be used up to a maximum height of 38 meters (125 feet). General Purpose Independent tied Scaffolds departing from these directions shall be specially designed.

13.7.3 Heavy Duty Independent Tied Scaffolds;

Design, Loading and Dimensions. A Heavy Duty Independent Tied Scaffolding may have up to two working platforms in use with a maximum distributed load of (60 LB/sq. ft) on each platform. An additional two general purpose platforms with a maximum distributed load of (37 LB/sq. ft) on each platform may be used. The standards shall be no more than 1.8 meters (6 feet) apart longitudinally. Not more than one other platform may be planked out for the purpose of erecting, dismantling, or access.

Decking. The decking shall be five 23-centimeter (9-inch) planks wide. It is permissible to place a sixth plank between the inner row of standards and the face of the building or structure, if the space allows, and if properly secured.

Limitations. Heavy Duty Independent Tied Scaffold erected in accordance with these directions, with not more than two maximum load-carrying platforms and two general purpose platforms as specified, may be used up to a maximum height of 38 meters (125 feet). Heavy Duty Independent Tied Scaffolds departing from these directions shall be specially designed.

13.8 TOWER SCAFFOLDS

A Tower Scaffold consists of four or more standards connected together longitudinally with ledgers and transoms at right angles to the ledgers, forming a square or rectangular tower. Alternatively, a Tower Scaffold may be constructed of System Scaffolding. It has a single working platform and is a common form of access scaffolding for painters and others who do work of a light nature and of short duration.

Design, Loading and Dimensions. A Tower Scaffold shall have only one working platform and the maximum distributed load shall be (30 LB/sq. ft) distributed over the working platform. The height from the base to working platform of a tower scaffold shall not exceed four times the minimum base dimension. In no case shall the minimum base dimension be less than 1.2 meters (4 feet).

Ledgers and Transoms. The vertical spacing of ledgers and transoms shall not exceed 2.7 meters (9 feet) or be greater than the minimum base dimension of the tower. The lowest ledgers and transoms shall be as near to the base as possible. Ledgers and transoms shall be secured to the standards with load bearing couplers.

Sway bracing is necessary on all four elevations to the full height of the scaffold. Plan bracing is also required at the base, at the top and at every third lift to prevent racking.

Tower Scaffolds more than 9.8 meters (32 feet) in height shall be adequately tied to a building or structure. Where tying to a building or structure is impracticable, one of the following methods of ensuring stability shall be used:

- Guy wires at a slope of approximately 45-degree connected to the tower at high level.
- Bottom corners of the tower securely anchored. Adequate weights at the base of the tower.
- Adequate weights at the base of the tower.
- Outriggers extending to the ground shall be used.
- The strength of the guy wires shall be calculated, having due regard to the horizontal wind forces, and other known forces, which will be applied, to the tower.

Decking. The single working platform of a Tower Scaffold shall not project beyond the base area.

Access. Where the means of access to the working platform is outside the tower structure, due consideration must be given to the effect of such means of access on the stability of the scaffold. Where a slopping ladder would cause instability, a securely fixed vertical ladder may be used.

Limitations. Tower Scaffolds erected and used in accordance with these directions and with one working platform may be used up to a maximum height of 12 meters (40 feet). Tower Scaffolds departing from these directions shall be specially designed.

13.9 MOBILE TOWER SCAFFOLDS

The requirements for Tower Scaffolds apply also to Mobile Tower Scaffolds with the exception, that wheels are used, in place of base plates and sole plates.

Foundations. Wheels or casters, not less than 12.7 centimeters (5 inches) in diameter and fitted with brakes which cannot be released accidentally, shall be securely fixed to the bases of the standards by lock pins or dowels.

A Mobile Tower Scaffold shall only be used and moved on surfaces sufficiently firm and level to ensure stability. Where the scaffold is to be used on a suspended floor, it shall be designed to apply loads no greater than the bearing capacity of the floor.

Temporary foundations or track laid on soft or uneven ground to facilitate the erection and movement of the tower shall be constructed and anchored so that its bearing capacity is not exceeded due to imposed loading from the tower. The track shall be level and properly secured.

Operation. A mobile tower scaffold shall be moved only by pushing or pulling at the base. Force must not be applied at a height greater than 1.4 meters (4 feet, 6 inches) above the base. No men, equipment or materials shall be on the working platform or elsewhere on the structure while it is in motion. Wheel brakes shall be applied at all times when men are on the stationary mobile tower scaffold. Observe any obstructions, holes or ramps before moving a scaffold.

Limitations. Mobile tower scaffolds, erected and used in accordance with these directions, supported on four wheels and with one working platform, may be used up to a maximum height of 12 meters (40 feet). Mobile tower scaffolds departing from these directions shall be specially designed and properly secured.

13.10 SCAFFOLD TERMINOLOGY

Where possible, the scaffold terminology used in this document is based on ANSI A10.8-1988: Scaffolding - Safety Requirements. A list of common ANSI scaffold terms is included, and in brackets are equivalent British Standard (BS 5973: 1990 scaffold terms, where an equivalent term exists.

1. Access Platform. A fully boarded out bay, which provides step off points for ladder access.
2. Base Plate. A metal plate with a spigot or screw jack for distributing the load from a post or other load bearing tube.
3. Bay Length. The distance between two adjacent standards along the face of a scaffold.
4. Bearer (Transom). A horizontal tube across runners to form the support for a platform or to connect the outer posts to the inner posts.
5. Board Bearer (Intermediate Transom). A tube spanning across ledgers at mid span, to support a working platform.
6. Board. A softwood or metal board used with similar boards to provide access platforms, working platforms or toe boards, etc. (Where softwood boards are used these must be treated and approved as “Flame Retardant”)
7. Brace. A tube placed diagonally with respect to the vertical and horizontal members of a scaffold and fixed to them to give stability.
8. Buttress. A well braced tubular structure erected against existing scaffolding for the purpose of strengthening it.
9. Castor. A swiveling wheel with a lock device secured to the base of a standard for the purpose of making a scaffold mobile.
10. Coupler. A device for locking together component parts of tube and coupler scaffold.
11. Design Load. The maximum intended load; that is, the total of all loads including the worker(s), material and the equipment placed on the unit.
12. Drop line. A vertical line from a fixed anchorage, which is independent of the work platform and it’s rigging, and to which the lanyard is affixed.
13. Fabricated Tubular Frame Scaffold. A system of tubular frames (panels) field erected with bracing members.
14. Guardrail System. A rail system erected along open sides and ends of platforms. The rail system consists of a toprail and midrail and there supports.
15. Hoop Iron. Metal bond fitted to the ends of a softwood board to prevent splitting.
16. Lanyard. A flexible line to secure the wearer of a body belt or harness to a drop line or a fixed anchor.
17. Ledger. A horizontal tube secured to the standards, with load bearing fittings. It prevents standards from bowing and acts as a support for transoms, board bearers and ledger-to-ledger diagonal bracing.
18. Lift. The assembly of ledgers, transoms and board bearers forming each horizontal level of a scaffold.
19. Load Ratings. Maximum loading for the following categories:

- Heavy Duty. Scaffolding constructed to carry a working load of 75 lb./ft2 such as for masonry work, with storage of materials on the platform.
- Medium Duty. Scaffolding constructed to carry a working load of 50 lb./ft2 such as for bricklayers with the weight of materials in addition to workers.
- Light Duty. Scaffolding constructed to carry a working load of 25 lb./ft2 and is intended for workers only, with no material storage other than the weight of tools.
- Special Duty. Scaffold designed and constructed to carry specific types of objects.

20. Mobile Scaffold. A scaffold assembly supported by casters and moved along manually.
21. Needle Transom. A transom extended from a scaffold.
22. Node Point. Common point where ledgers, standards and transoms are fixed.
23. Plank. A wood board or fabricated component that is a flooring member.
24. Platform Unit. Individual wood planks, fabricated planks, fabricated decks, and fabricated platforms.
25. Platform. An elevated work surface composed of one or more platform units.
26. Post (Standard). Vertical scaffold tube that bears the weight of the structure.
27. Puncheon. A vertical tube secured at its lower end, with a load bearing coupler, to a horizontal tube. The load is not transmitted directly into the ground or into a base plate.
28. Putlog (Truss). A fabricated tube, upon which the platform rests, the putlog has a flattened end, to rest in or on part of the brickwork.
29. Raker. An inclined load bearing tube.
30. Rated Load. The manufacturers recommended maximum load.
31. Runner (Ledger). A horizontal scaffold tube that extends from post to post, that supports putlogs or bearers and that form a tie between the posts.
32. Scaffold Access. A separate, attachable or built-in means of access to and from a scaffold or work unit.
33. Scaffold Deck 'Fabricated'. A work unit equipped with end hooks that engage the scaffold bearer.
34. Scaffold. A temporary elevated or suspended work unit and its supporting structure used for supporting worker(s) or materials, or both.
35. Scafftag. A tag strategically displayed, normally at the access point to every scaffold, which indicates that the scaffold has been inspected within the previous seven (7) days and is Safe to use.
36. Sill (Sole Plate). A timber, concrete or metal spreader used to distribute the load from a post or base plate to the ground.
37. Sleeve Coupler. A fitting, which fits over a scaffold tube and is used to join one tube to another, end to end.
38. Sole Plate. A timber (normally a short scaffold board) used to spread the load from the base plate over an extended area.
39. Spigot (Joint Pin). A fitting, which fits inside a scaffold tube and is used to join one tube to another, end to end.
40. Standard. A vertical tube used to transmit the load to ground or ground level.
41. Tie. A device used between scaffold components and the building or structure to enhance lateral stability.
42. Toe board Clip. Used to fix a toe board to a scaffold tube.
43. Toe board. A barrier secured along the sides and the ends of a platform unit to guard against the falling of material, tools and other loose objects.
44. Top rail. The uppermost horizontal rail of a guardrail system.
45. Transom. A tube connecting the outer standards to the inner standards. It spans across ledgers and forms the working platform.
46. Tube and Coupler Scaffold. A scaffold system consisting of tubing that serves as posts, bearers, braces, ties and runners; a base supporting the posts; and special couplers that serve to connect the uprights and join the various members.
47. Unit Beam. A purpose made lattice beam incorporated into a scaffold structure to form a bridge where an extended opening between standards is necessary.
48. Working Platform. The boarded out deck from which work is carried out.

14. CRANES AND RIGGING EQUIPMENT

Approach Company and Subcontractors will ensure that all lifting equipment, including gear and others shall be in good mechanical condition, constructed from sound material, with adequate strengths, and free from any defect. The equipment will be inspected and stickered by approved crane inspectors. Crane operators shall be certified for the specific crane they operate.

'Man basket' crane lifts shall not be performed in wind speeds exceeding 32 km/h (20 mph-17.4 knots) as reported from the nearest Client control room.
Ordinary and critical crane lifts shall not be performed in wind speeds exceeding the manufacturers' limitations. In the absence of the manufacturer's wind speed limits being specified, the above limit of 32 km/h shall be enforced.

All chains, hooks, slings, shackles, wire ropes, and other equipment used with lifting equipment shall meet Client standards. In addition, a record shall be kept on site.

All Approach Company and Subcontractors personnel will be made aware of the requirements of prohibits moving any crane, elevating or heavy equipment involved in an accident, prior to investigation.

All lifting equipment operators will be made aware of the general operating instructions specified in the Client crane safety handbook.

Lifting equipment working in an operating area must display a current inspection sticker. Operators must have a valid License, and Client certificate for the type of lifting equipment they are operating Approach Company and Subcontractors will provide only competent operator with valid heavy equipment license and Client Crane Operator certificate to operate cranes.

Cranes/side boom must not enter a restricted area, or operate within 1 ¼ boom length of an oil line, gas line or overhead power line, unless a specific work permit has been issued, by the supervisor involved.

14.1 CRANES AND DERRICKS

Approach Company and Subcontractors will comply with the manufacturer’s specifications and limitations applicable to the operation of all cranes and derricks. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified engineer competent in this field and such determinations will be appropriately documented and recorded. Attachments used with cranes shall not exceed the capacity, rating or scope recommended by the manufacturer.

14.2 CRITICAL LIFTS

Critical lift plans shall be developed by a certified Rigger 1.

Critical lifts include two primary groups of crane lifting operations.

- Crane lifts performed in high-risk work environments.
- Special lifts.

High-risk work environments include the following examples:

- All cranes working around energized electrical lines.
- All cranes working around hydrocarbons and pressurized piping areas. Cranes working in close proximity to, or having to suspend a load over vessels, piping, and equipment containing either hydrocarbon, steam, or other pressurized liquids. NOTE: Local work permit requirements shall be observed.

- All cranes working around populated/traffic areas. Cranes working in close proximity to, or having to suspend a load over: pedestrians, vehicle traffic, occupied construction equipment, and occupied buildings.
- Special critical crane lifts which are hazardous by their nature and require special training, rigging, and/or boom attachments.

Special lifts include, but are not limited to, the following specific examples:

- Tandem, multiple or tailing lift.
- Personal platforms (man baskets)
- High level or long reach crane lift.

Cranes to be used on site shall be fitted with Safe Load Indicator (SLI)

A crane shall not be operated with an expired safety inspection sticker, or a reject sticker.

Load charts and range diagrams shall be displayed in every crane cab.

Rated load capacities and recommended operating speeds, special hazard warnings or instruction shall be conspicuously posted on all equipment. Instructions or warning shall be visible to the operator while he is at his control station.

Hand signals to crane and derrick operators shall be those prescribed by the applicable ANSI standard for the type of crane in use. An Illustration of the signals shall be posted at the job site.

Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains or other reciprocating, rotating, or other moving parts or equipment shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. .

Accessible areas within the swing radius of the rear of the rotating superstructure of the crane, either permanently or temporarily mounted, shall be barricaded in such a manner as to prevent an employee from being struck or crushed by the crane.
All exhaust pipes shall be guarded or insulated in areas where contact by employees is possible in the performance of normal duties.

Whenever internal combustion engine powered equipment exhausts in enclosed spaces, tests shall be made and recorded to see that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres.

All windows in cabs shall be of safety glass or equivalent that creates no visible distortion that will interfere with the safe operation of the machine.

Where necessary, for rigging or service requirements, a ladder, or steps shall be provided to give access to a cab roof.

Guardrails, handholds and steps shall be provided on cranes for easy access to the car and cab.
Platforms and walkways shall have anti-skid surfaces.

Fuel tank filler pipe shall be located in such a position, or protected in such manner as to not allow spill or overflow to run onto the engine exhaust or electrical equipment of any machine being fueled.

Cranes must have seat belts fire extinguishers, back up alarms, spark arrestors of safe load indicators.

Except where electrical distribution and transmission lines have been de-energized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery have

been erected to prevent physical contact with the lines, equipment or machines shall be operated proximate to power lines only in accordance with the following:

There is an area surrounding every power line that is referred to as the “Absolute Limit of Approach”. It is strictly forbidden to move any crane boom or load line or load into this area, unless the line has been de-energized or insulated. There are no exceptions. The absolute limit of approach varies according to the following:

Line Voltage	Absolute Limit of Approach
Up to 250,000 volts	20 feet (6 meters)
Over 250,000 volts	25 feet (7.5 meters)

For lines rate 50 kV or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet:

For lines rated over 50 kV. Minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 KV over 50 KV, or twice the length of the line insulator, but never less than 10 feet.

In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltage less than 50 kV. And 10 feet for voltages less than 50 kV, and 10 feet for voltage over 50 kV, up to and including 345 kV, and 16 feet for voltages up to and including 750 kV.

A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.

Cage-type boom guards, insulating link, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation.
Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages;

The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom.

Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with non-conductive poles having large alligator clips, or other similar protection, to attach the ground cable to the load.

Combustible and flammable materials shall be removed from the immediate area prior to operations.

14.3 OPERATIONS

All riggers shall carry Client Rigger certificate for the appropriate classification: Rigger I, II or III.

Each synthetic and natural fiber rope sling shall be permanently marked to show:

- Name or trademark of manufacturer

- Manufacturer's code or stock number
- Rated loads for the types of hitches used
- Type of natural or synthetic material
- Date of manufacture

Slings that are damaged or defective will not be used.

Slings will not be shortened with knots or other makeshift devices.

Slings will not be loaded in excess of rated capacities.

Slings used in a basket hitch shall have the load balanced to prevent slippage.

Slings will be padded or protected from any sharp edges of their loads.

Suspended loads will be kept clear of obstruction.

Employees will keep clear of loads about to be lifted, and of suspended loads.
Employees will keep hands and fingers away from a sling and load when the sling is being tightened during initial lifting.

Shock loading is prohibited.
A sling will not be pulled from under a load while the load weight is on the sling.
An inspection of all slings will be made before any use of the sling.

A tag line will be used with all loads.

14.4 WIRE ROPE SLINGS

All wire rope slings shall be manufactured, inspected, and load tested by a recognized manufacturer.

Most wire rope slings are pre-formed in manufacture and in differing constructions, each one having its own particular use.

The construction can be determined by checking;

- The number of wires in each strand,
- The number of strands in each rope,
- The spiral of strands and wires,
- The main core material (fiber or wire).

(E.g. 6 x 7 fiber main core (the rope has six strands each of seven wires, with a fiber main core).

Damaged slings shall be totally destroyed if there is evidence of:

- Kinking, crushing or other damage that results in detrimental distortion of the Wire Rope
- Ten (10) random broken wires in one lay.
- Four (4) broken wires in one strand of a rope lay.
- One (1) broken wire at the fitting.

- Cracked, deformed, or worn end attachments.
- Evidence of heat damage or damage from electrical arcing or welding arcs.
- Severe localized abrasion or scraping

14.5 MAINTENANCE

Correct lubrication of wire ropes is necessary for ensuring long life and good service. The wires in a rope bear against each other with high pressure when the rope is under tension, and it is very important to maintain a film of lubricant to reduce friction.

Use:

- Gloves should be worn to handle wire rope.
- Fiber core wire rope, of any grade, will be removed from service if it is exposed to any temperature in excess of 90 degree centigrade.
- Non-fiber core wire rope, of any grade, if used at temperatures above 200 degree centigrade or below-65 (minus 65) degree centigrade, will be subject to the manufacturer's recommendation.

Storage:

- Store ropes in an even temperature to prevent deterioration from condensation.
- Keep the ropes clear of the ground, and coiled or rolled on a drum.
- All rigging gear will be visually inspected each month and the Rigging/Equipment Superintendent will maintain a record.
- All rigging gear will be re-certified annually or replaced. A record will be maintained on all wire rope and synthetic sling.

Inspection:

- All lifting equipment shall be inspected by a competent person prior to it initial use at the job site and monthly thereafter, or more often should the working condition require.
- Inspection records should be available at the site safety office for review.

14.6 WIRE ROPE CLAMPS

Clips must be fitted with the "U" bolts on the short end of the wire rope ("dead end").

Stagger clamps at a distance of 6 times the diameter of the wire rope. A minimum of 3 clamps should be installed on all wire rope ½" or better in size. All clamps should be fitted on the same side ("U" bolt on the dead end).

With correctly fitted clips, the working load will be safely assumed at 80% of the original rope. However, this figure will be considerably reduced if the clips are not correctly fitted.

Use an eye thimble in the wire rope loop. This will prevent twisting when applying clips, and protect the rope.

After an initial use the clip bolts will require inspection and tightened as follows:

3/8" rope	25 ft.-lbs.
1/2" rope	40 ft.-lbs.
3/4" rope	100 ft.-lbs.

1” rope	165 ft.-lbs.
1¼" rope	250 ft.-lbs.
1½" rope	375 ft.-lbs.
1 3/4" rope	560 ft.-lbs.

14.7 SAFE WORKING LOADS

Sling is made up of a main ring, coupler or intermediate ring(s), leg(s), and hook(s).

The permissible working load of the main ring must be at least twice that of one sling leg, in a two leg sling, three times in a three leg sling, four times in a four leg sling, and so on.

Intermediate rings in a four-leg sling must have a permissible working load of twice that of one sling leg. The hook-working load must equal that of one leg.

The safe working load of a two-leg sling is usually given at 90 degree, as the lifting capacity varies with sling angle. (Do not exceed a 90-degree angle where possible).

Sling legs are normally 6 x 19, or 6 x 37 construction.

14.7.1 Synthetic Web Slings

Each sling will be marked to show the rated lifting capacity.

Synthetic webbing will be of a uniform thickness and width, with the edges not split from the webbing width.

Sling fittings will be of a rated capacity equal to that of the sling.

Stitching is the only approved method to attach end fittings to webbing, and to form eyes. The stitching will be sufficient to develop the full breaking strength of the sling.

In use, the following precautions are required:

Nylon web slings shall not be used in the presence of any acid or mist, vapor or fumes thereof.

Polyester or polypropylene web slings shall not be used where any caustic liquid, or mist, vapors or fumes thereof are present.

Any web sling with aluminum fittings shall not be used where any caustic liquid, or mist, vapors or fumes thereof are present.

Polyester or nylon web slings shall not be used in temperatures exceeding 80 degree centigrade.

Polypropylene web slings shall not be used in temperatures exceeding 90 degree centigrade.

On site, repairs of slings are not permitted. Any sling repaired by the manufacturer will be tested and certified by the independent repair center. Temporary repairs are not permitted.

Synthetic web slings will be removed from service if any of the following conditions are present:

- Acid or caustic burns.
- Melting or charring of any part of the surface.
- Snags punctures, tears or cuts.
- Broken or worn stitching.
- Distortion of fittings.

Elongation exceeding manufacturer's specification.

14.7.2 Shackles

Safe working loads (expressed in short ton of 2,000 lbs.) will be marked on all shackles and these safe-working practices will be followed:

- Welding on or modification to shackles is not permitted.
- Shackles with pins at least one size larger than the diameter of the size of a wire rope sling will be used to maximize the D/d ratio.

14.7.3 Hooks

Hooks should be regularly inspected for signs of damage.

If no S.W.L. is available, the hook will be tested at twice the load to be lifted before use.
Hooks will be removed from service if:

- If there are visible cracks
- If it is twisted 10o out of place
- If there is a 15% throat opening beyond the manufacturer's specification

14.7.4 Eyebolts

Dynamo eyebolt is usually a permanent fixture, screwed into the top of a dynamo or electric motor, and has an eye large enough to accommodate a hook of the same safe working load.

NOTE: It is designed for a force applied along its long axis only.

Collar eyebolt may also be a permanent fixture, but it is more often used as loose gear. Generally, they are used in pairs with a two-leg sling attached to shackles connected to the eyes.
The rated S.W.L. is based on a force through the vertical axis, but some angled loading is possible.

However, there is a reduction in S.W.L. as the angle varies, as follows:

Reduction Factor Angle (apex of slings)

0.63 (of normal)	0 degree - 30 degree
0.40 (of normal)	30 degree - 60 degree
0.25 (of normal)	60 degree - 90 degree

15. MECHANICAL EQUIPMENT

Approach Company and Subcontractors will follow all applicable requirements of Client Construction Safety Manual.

15.1 OPERATORS

15.1.1 Qualification

Only trained personnel should operate all mechanical equipment. Operators should be trained in the procedures and functions relevant to that specific piece of equipment. They must be fully aware of the capabilities and limitations of the machine, and have knowledge of the day-to-day maintenance it requires.

The only safe way of using mechanical equipment is to have properly trained operators, working with well-maintained equipment, and carrying out the work for which it was designed.

15.1.2 License

Operators of mobile heavy equipment shall be in possession of a Sudan Government license for that particular class of machinery, and a Client certificate issued by the Client heavy equipment operator testing and training unit.

15.1.3 Machinery Guards

All moving machinery must be guarded. This is particular so with gears, pulleys, V-belt drives, fans and revolving shafts; all of which are present on most of the static equipment used on or around construction sites. Cooling fans on compressor and generators, the main drive shafts on pumps and dumpers, and the cable drum on winches and concrete mixers, must be guarded.

15.2 GENERAL REQUIREMENTS

All machinery should be inspected before being placed in service and at regular intervals thereafter.

All heavy equipment should be provided with a properly functioning automatic back-up alarm.

Maintenance schedules shall be established for each piece of equipment, and strictly followed.

No repair, adjustment, or replacement of parts on moving machinery is permitted.

Equipment traveling or working on the highway must have lights and reflectors.

When vehicles are left unattended, engines will be stopped and parking brakes applied, and the wheels choked. Blades, scraper bowls, and other hydraulic equipment must be lowered to the ground before the operator leaves the machine. The ignition key will be removed.

Where the operator of a mobile machine cannot see the area all around his machine, an attendant will be in a position and assists the operator.

The operators are held responsible for maintaining his machine and equipment in a safe and satisfactory operating condition.

Site supervision shall ensure that all mechanical equipment provided is maintained in good working order.

All posted speed limits will be observed at each job site.

No mechanical equipment will be taken onto a job site without specific authority from Client, or the Project Manager. All equipment will be inspected and/or repaired prior to deployment to the job site.

Passengers are not permitted on any mechanized equipment, heavy equipment, forklift trucks, or dump trucks.

No persons will be carried in or on any piece of mechanical equipment, in a manner, which is likely to expose that person to risk or injury.

All equipment operating during the hours of darkness will be equipped with warning lights, and the work area will be lit.
No mechanical equipment will be parked or used in such a manner as to restrict the free access of emergency vehicles or equipment.

No equipment will be moved from a parked position until it is assured that no persons are in front, behind or underneath the equipment.

15.3 COMPRESSORS

Compressors are one of the most common pieces of equipment used on a construction work site.

The dangers of compressed air will be impressed on all employees on site. It will not be used in dusting off clothes or machinery. Horseplay is strictly forbidden.

Compressors will be properly inspected, tested and maintained.

When compressors supply air for breathing; the air intake shall be located so that it does not draw in exhaust gas. There shall be a filter to remove oil mist. There shall be a high temperature shutdown and CO_2 alarm to prevent delivery of combustion products in the air.

Compressor shall be properly grounded.

Compressed air will not be used near hot work operations.

When not in use, compressed air hoses will be coiled and hung on the hook provided for that purpose.

Compressed air must never be used for cleaning dust or dirt from the skin or clothing.

15.4 CONCRETE MIXERS

All chains, gears, and revolving shafts will be guarded.

Safety chains and catches will be operative, and the lifting mechanism will be in good order.

Men will not be allowed to work under or near the loading skip unless it is held in position by a safety chain or catch, or positively blocked.

Cement bags will not be allowed to accumulate in the mixer's area; they will be collected and disposed of at regular intervals during the day.

The approach to the sand and aggregate bins will be barricaded, and the barricades will be removed only to allow access for vehicles delivering materials.

Personal protective equipment such as respirators, earmuffs, and safety goggles will be worn.

15.5 DUMPERS AND DUMP TRUCKS

These vehicles are commonly used in construction work. In many cases, they also travel on public highways; therefore, they will be properly maintained.

The latch on dumper skips will be in good working order, and the release mechanism will function smoothly.

Dumpers are not designed to carry passengers. It is strictly forbidden for employees to ride in the skip or on the engine cover.

When repairs and maintenance are being carried out on a hydraulically operated dump truck, the dump body will be fully lowered. If it is necessary to have it in the raised position, it will be blocked. Reliance will not be placed on the hydraulic ram to support the raised body for an extended period.

15.6 EXCAVATORS

Before any mechanical excavator is used in a restricted Area, a work permit will be obtained. In most cases, the permit will require that an initial hand dig be made to locate underground pipelines or cables.

Operators of excavators must possess a valid Sudan Government license for the machine and a valid Client Certificate issued by the Client Heavy Equipment Operator Testing Unit.

An attendant will be appointed, and during operations will be positioned so that he can assist and guide the operator in his work.

Booms on excavators will be latched before travel.

Flagman shall be provided if necessary, to control the vehicular traffic on the right of way.

15.7 GENERATORS

There will always be a competent electrician available to ensure that electrical connections are properly made. The operator will be responsible only for the mechanical function of the machine.

All pulleys, belts, and fans will be totally enclosed or otherwise guarded.

The side panels to the engine cover are designed to give access to the machinery for maintenance or repair. They will be closed at all times when the engine is running.

The machine will be properly grounded before each use.

Ground fault insulation circuit shall comply.

15.8 GRADERS, DOZERS AND SCRAPERS

Heavy items of earth moving equipment permit the operator, only a limited view of the immediate area. It is, therefore, essential that a banks man be appointed to warn the driver of hazards that cannot be seen from the driver's position. A valid Sudan Government Heavy Equipment License, and a valid Client Certificate issued by the Client Heavy Equipment Operator Testing Unit, will be required for each operator of such equipment.

Before moving a machine, the driver shall walk around to see that the area is clear.

Men must not be allowed to sit or lie in the area around the machine.

The engine will not be left running when the driver is not in the controls. On leaving a machine, a driver will shut off the engine and remove the ignition key.

Blades, scraper bowls, etc. will be lowered to the ground before the driver leaves the unit.

16. TRANSPORTATION

Transportation will include buses, trucks and sedans to transport workers and equipment from and to the work site Approach Company and Subcontractors will follow Traffic and vehicle safety on and off the project site

All vehicles and mechanized equipment will be maintained in a safe working condition.

A Portable fire extinguisher shall be provided for all passenger transport buses.

All posted speed limits will be observed at each job site.

No vehicle will be driven at a speed, or in a manner, which is dangerous to other employees or equipment, in respect to the type of vehicle and the area of its use.
No motor vehicle will be taken onto a job site without specific authority from the Project Manager.

Passengers are not permitted on any mechanized equipment, heavy equipment, forklift trucks, pickup truck, or dump truck.

No persons will be carried in or on any vehicle in a manner, which is likely to expose that person to risk of injury.

All vehicles operated during the hours of darkness will be equipped with lights required by Traffic Regulations for normal highway use.

No vehicle will be parked or used in such a manner as to restrict the free access of emergency vehicles or equipment.

Getting into or out of any motor vehicle while it is in motion is prohibited.

Do not move from a parked position until you have checked and you are certain that no persons are in front, behind or underneath the vehicle.

No vehicle shall be so loaded as to obscure the driver's view to the front or sides.

Seat belts will be worn by all employees operating any motor vehicle equipped with seat belts.

Keys will be left in the ignition at all time when on the job site.

At no time will employees be allowed to ride in the rear of any truck.

16.1 DRIVER REQUIREMENTS

It is the Sudan Government law that each person driving a motor vehicle must possess and have on his person a valid Sudan Government driver's license.

16.2 DRIVER'S RESPONSIBILITIES

It is the responsibility of the driver to ensure that his vehicle is safe to operate.

It is the responsibility of each driver to take his vehicle to the proper facility for servicing and repairs when they are required or scheduled.

The driver of the vehicle is fully responsible and accountable for the mechanical and physical condition of the vehicle. He must report any damage, beyond normal wear and tear, immediately.

The driver is responsible for transporting materials properly and ensuring that a load does not exceed the manufacturer's design load capacity. All loads must be properly secured and tied down. Materials should not extend over the sides of the truck. Loads extending beyond the front or rear shall be marked with a red flag. Also such loads must be equipped with visible brake and taillights at their rear end points.
Tires, which have breaks in the casing, or with exposed fabric, shall not be used.

Sand tires present a hazard if used on vehicles, which are, operated at excessive speed especially when they are not properly inflated.

Drivers shall not transport unauthorized persons in Company vehicles. The driver's supervisor shall authorize all passengers in the vehicle.

The driver and all passengers of a Company vehicle shall wear seat belts at all times while the vehicle is in motion.

Drivers have full authority to refuse to transport any passenger who refuses to use seat belts. Conversely, passengers may refuse to ride with a driver who refuses to wear his seat belt.

Passengers shall not be transported in the rear of pickups or on truck beds.

Drivers should not transport more passengers than the number of seat belts provided in the vehicle.

The driver must not exceed the posted speed limit. This is the maximum speed allowed in a certain area. Every driver is expected to reduce his vehicle's speed under hazardous weather or road conditions.
Where there is no signpost indicating the maximum speed limit, no vehicle may be driven at a speed greater than the following:

- 100 kilometers per hour for light motor vehicles outside city limits.
- 70 km/hr for vehicles with sand tires.

Drivers shall comply with all Sudan Government and Client traffic signs.

All vehicles shall be parked correctly and/or in designated parking areas. Parked vehicles shall not obstruct other vehicles, roadways, access ways or fire hydrants.

16.3 INGRESS & EGRESS

All employees shall follow the established routes at the job site, both vehicular and foot traffic.

Vehicle horns will be used for safety and at blind corners.

The vehicle's turn signals will be used when operating a motor vehicle.

All vehicles on this project will be of the approved type, as indicated in the Client standard.

16.4 VEHICLE CONDITION

The driver is responsible for inspecting his vehicle before use, and determines if the following is satisfactory:

- Steering system.
- Tires
- Seat Belts
- Horn
- Headlights, taillights, stoplights, and turning indicator lights.
- Rear view mirrors
- Windshield wipers and washers
- Crankcase, and radiator level
- Back up alarm

Approach Company. and Subcontractors shall develop and implement a road transportation plan for transporting workers to and from the worksite, and during working hours, after mobilization.

17. PLANT OPERATIONS

17.1 REQUIREMENTS

Any construction operation, which could affect the safety of Approach Company. or Subcontractors employees, or the productivity of Client, must be planned and performed in accordance with the procedures of the Client.

Failure to follow the operating rules can result in not only destruction of Client property, but also the death of construction and operating personnel.

17.2 WORK PERMIT SYSTEM

Any Approach Company or Subcontractors employee planning to do work in a restricted area must obtain a work permit from Client.

To obtain this permit, Approach Company will have personnel with a valid certificate to receive work permits.

The work permit is written permission to proceed with the work in accordance with the plans and the restrictions written on the form. Without a proper permit, work will not be allowed in the area. Work permits shall be maintained on site and be available for inspection for the duration of the work.

The work permit receiver shall remain on site for the duration of the work. If he must leave the work area, the permit shall be handed to an approved alternate.

17.2.1 Types of Work Permits

Work permit forms must be issued as appropriate for specific work on a specific site. The work permit forms are for all types of work in restricted areas. There are four types of Work Permits;

1. **Release of Hazardous Liquids or Gases**

Release of Hazardous Liquids or Gases is the actual or possible release of low flash (below 130° F/54° C) liquids, liquids at or above their flash point, or injurious materials, in amounts which would create a hazard. A release permit is not intended to authorize a release but to ensure that if there is a potential for one, then the appropriate precautions are addressed.
Example: Opening a line, draining a vessel.

2. **Hot Work**

Hot Work is any work that develops sparks, flames or heat sufficient to cause ignition. This will apply to the use of spark or flame producing tools and equipment, including the use of internal combustion engines.
Example: Work on or in close proximity to live electrical apparatus, vehicle entry into a plant, welding, burning, grinding, blasting, etc.

3. **Cold Work**

Cold work is work that will not produce sufficient energy to ignite flammable atmospheres/materials.
Example: Work with hand tools, sand removal, brush painting etc.

4. **Confined Space Entry**

Confined Space Entry is the entry of personnel into any space or structure (tank, vessel, vault, excavation when four (4) feet or deeper, etc.) not normally intended for human occupancy, in which entry, movement within or exit is restricted.
Example: Tank cleaning, tank inspection, or work in sewers or trenches 4 feet or deeper.

17.2.2 Responsibilities of the Work Permit Issuer

The issuer will issue the work permit after he (or his designated representative) has visited the site, performed the appropriate gas tests, listed applicable precautions and restrictions and reviewed aspects of the job with the receiver. The issuer's signature plus any other approvals and signatures must be on the completed form. These additional approvals or signatures are required for extended permits or for some jobs, superintendents must countersign the permits.

Before issuing the work permit all necessary actions to approve the proposed work and/or possible configuration changes must be completed. The issuer must see that the receiver's certificate is valid and approved for the type or work to be done.

The issuer must obtain the approval and signature of other operations supervisors (issuers) whose operations will be affected, before issuing a permit.

During an emergency the issuer may permit work without work permits. However, he should issue work permits as soon as he can.

The issuer is responsible for the safety of people and equipment in the area. The issuer is responsible for specifying precautions so the work can be done without incident.

For some jobs the issuer may determine a joint site inspection is not required. Such jobs have extremely low risk and could include cold work in a safe area, carpentry, lubricating, cleaning, painting, certain classes of non-flash photography, instrument checking in the control room and vehicle entry to a non-hazardous area. When there is any doubt about whether a hazard exists, the joint site inspection must be made.

When the issuer determines a joint site inspection is not required, he must explain why in the appropriate space on the permit.

The issuer may stop a job and withdraw a work permit if he feels that safety of the job does not meet with conditions specified on the work permit.

When work is stopped the issuer must pick up the work permit, write on the permit the reason for stopping the work, the time and other relevant information. When conditions are safe again the issuer may issue a new work permit.

The issuer shall keep the original copy of the work permit or permits for a minimum of three (3) months.

17.2.3 Responsibilities of the Work Permit Receiver

The craft supervisors, craftsmen, or others who have been certified by their division or department head to sign and receive work permits in the case of company employees, and sponsoring organization heads in the case of contractors.

The receiver requests work permits from the operations supervisor of the facility. The receiver's signature plus any other approvals and signatures must be on the completed form. The receiver's certificate is valid and approved for the type of work to be done. The receiver is responsible for performing the work in accordance with the conditions and requirements agreed upon with the issuer and written on the work permit.

The receiver of a work permit must keep a copy in his possession or within view of the job site for the duration of the job so that it may be available for inspection and cancellation if necessary. If he must leave the job site, he shall, if the issuer concurs, give the permit to a senior crew member to keep until he returns.

Work permit shall be closed by the signatures of both the issuer and the receiver except where distances and remoteness make signing impractical and it is so stated when the work permit is issued.

17.2.4 Operation Of Plant Equipment

It is expressly forbidden for any Approach Company or Subcontractors employee to operate any valves, switches, push buttons, or other devises in an operating area. If the work dictates such action Approach Company or Subcontractors personnel will call the operations supervisor to perform the service.

If the job involves work on equipment, which is in service, a specific set of written procedures will have to be prepared and approved in advance by Client operating and safety personnel. Approach Company or Subcontractors shall strictly follow these procedures. No deviations will be permitted without the prior approval of the Client operation supervisor.

17.2.5 Emergency Procedures

All Approach Company or Subcontractors employees will familiarize themselves with the Disaster Control Plan for the plant and area in which the job is located. Each person working Approach Company. or Subcontractors will know exactly what to do when the emergency evacuation alarm is sounded, and do it without any delay.

If the emergency is a result of a construction operation, Approach Company or Subcontractors will notify operating personnel immediately. Client operating personnel will initiate the alarm procedures, and direct activities in controlling the emergency.

When the emergency alarm is sounded, for any reason, all Approach Company or Subcontractors personnel will immediately shut down their job, make it safe, and proceed in an orderly manner to the designated assembly point.

Periodically, Client holds disaster drills to ensure the smooth function of its disaster plan. Approach Company will participate in these drills.

17.2.6 Gas Release Emergency Procedures

If there is a reason to suspect a gas release in the area through which you are driving or working:

- Immediately shut off the vehicle engine, and do not try to restart it.
- Check the wind direction by looking at the windsock.
- Get out of the vehicle and walk to a safe location, generally in a crosswind direction, away from the point of release.
- Inform Client plant operation employees of the situation.
- Do not go and investigate, leave this to operations.

18. INJURY AND DAMAGE REPORTING

Approach Company. shall ensure that an immediate oral report is made to the Company Representative in the case of all:

- Fatal Injuries.
- Injuries requiring medical attention, which result in lost time.
- Damage over SR 10,000 to Approach Company plant or equipment.
- Damage, in any amount, to Client's equipment or property.
- Fires.
- Damage and near misses to cranes and heavy equipment.

For accidents involving Approach Company or Subcontractors employee fatalities, serious injury to five or more employees, or damage to Client equipment or property, a preliminary written report shall be submitted within 24 hours, followed by a detailed written report submitted within three days, to the Company Representative.

Approach Company shall maintain, in a format approved by the Company Representative, a current record showing all:

- Work Injuries.
- Fires.
- Incidents of property damage over SR 10,000.
- Motor vehicle collisions.
- Incidents involving damage to Client equipment and property.
- Damage and near misses to cranes and heavy equipment.

This record shall be available for inspection at all times and shall be submitted to Client on request.

A final written report shall be prepared and submitted to the Company Representative. In the case of serious accidents, however, a detailed account of the circumstances, witness's statements and descriptive photographs will be provided.

In addition to the reports, required above, Approach Company shall keep a record of all injuries and damages on a form approved by the Company Representative. A copy of this record shall be sent to the proponent department, and to the project management team. Monthly summary reports will be provided in addition to the individual reports.

Site HSE Coordinator will analyze all the information and submits a monthly report to the Resident Manager.

Approach Company shall encourage all workers to report Near Misses to their supervisors. Every Near Misses reported must be promptly investigated and necessary corrective action must be taken without any delay.

18.1 ACCIDENT INVESTIGATION

The main reasons for conducting an accident investigation are:

- To find the causes so that similar accidents may be prevented.
- To determine the point at which “unplanned” events took over from the “planned” sequence of events.
- To recommend what corrective action should be taken.

18.1.1 Responsibilities For Investigation

The Site HSE Safety Coordinator shall carry out an immediate investigation of any accident, which occurs within his area of responsibility. In the case of serious injury or major damage, the Company Safety Manager will head the investigation. Every Accident/Incident/Near Miss reported must be promptly investigated and necessary corrective actions must be taken without any delay.

Approach Company will use the following classifications to analyze industrial accidents:

1. Falls (Of persons from heights)
2. Falls (Of persons on the level)
3. Handling objects.
4. Striking against objects.
5. Struck by objects.
6. Equipment
7. Hand Tools.
8. Transportation.
9. Lifting appliances.
10. Hazardous Atmospheres.

19. EXCAVATION

All excavations shall comply with requirements “Excavation, Trenching and Shoring” of the Client Construction Safety Manual and “Work Permit System”.

In any excavation or trench more than 1.50 m (5') deep there is a risk of material collapsing or falling. Proper timbering, shoring or sheeting will be used to safeguard personnel. Proper sloping may also be considered where allowable work area permits access.

A suitable method of protecting workers from cave-ins will be employed and will be determined by a competent person. Those methods may be any one, or a combination of the following:

Shoring

Hydraulic, timber or mechanical systems that support the sides of an excavation, designed to prevent cave-ins.

Hydraulic Shoring

A pre-engineered support system of aluminum hydraulic cylinders (cross-braces) used with vertical rods (uprights) or horizontal rods designed specifically to support sidewalls of an excavation to prevent cave-in.

Benching

A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal steps, with a vertical rise between steps.

Sloping

A method of excavating in which the sides of an excavation are laid back to a safe angle to prevent cave-ins. (The safe angles required vary with different types of soil, exposure to the elements and superimposed loads. There is no single angle of repose. Soil classification must be identified to select safe sloping and benching methods.)

Trench Boxes

A structure that is able to withstand the forces imposed on it by cave-ins, and in the process, protects employees inside the structure.

19.1 INSPECTIONS

Excavations and trenches will be inspected prior to the selection of a protective method and a soil classification will be determined.

This categorizing of the soil and rock deposits will be placed into 3 types of stability. Those types (A, B, and C) will be in decreasing order of stability. Soil type is determined by analysis of the soil's properties, and how it performs under exposure to the elements, and superimposed loads.

There after, and each day, prior to the entry of personnel,

AND

After any explosive charges have been fired,

AND

After heavy rain or flooding,

AND

After any collapse, failure of timber, shoring, or damage to it, an inspection will be performed prior to workers entering the excavation.

19.2 SAFETY RULES TO BE IMPLEMENTED

No vehicles, mechanical equipment, or "Spoils" will be permitted within four (4) feet of any excavation or trench.

Access ladders will be placed every twenty-five feet, and extend three feet above the top of the excavation or trench. Ladders shall be placed at an angle of 75º, and extend at least 0.9 meter (3 feet) above the stepping-off point. Ladders shall be securely fixed.

All material used for timbering or shoring must be inspected before use and defective material must not be used.

Uncontrolled ingress of water will not be permitted while persons are working within the confines of any trench or excavation.

Mechanical excavation methods shall not be used until the presence and location of underground cables, pipes or vessels has been determined.

Mechanical excavation methods will not be used directly over the heads of personnel in trenches.

If any existing structure is likely to be affected by excavation work approved shoring or supports must be provided to prevent collapse of that structure.

Open trenches, excavations, shafts or pits will be clearly marked and barricaded. Whenever it is necessary to place, or operate power shovels, derricks, trucks, materials, soil banks or other heavy objects, on a level above, and near an excavation, the side of the excavation shall be sheet-piled, shored, and braced as necessary to resist the extra pressure due to such superimposed loads. When mobile equipment is utilized or allowed adjacent to excavations, substantial stop logs or barricades shall be installed.

If possible, the grade should be away from the excavation. If men or vehicles are in the vicinity after dark, fixed warning lights shall be used to mark the limits of the work.

If access for personnel is required over any open trench, excavation or pit, it will be via a bridge access fitted with secure guardrails.

19.2.1 Before Work Starts

In order to begin excavation work with minimum risk to men, plant and equipment and to enable the work to proceed without interruption, the following factors must be considered well before the job starts:

- Size and purpose of the excavation.
- Nature of the ground including the proximity of made-up ground.
- Stability of adjacent structures.
- Position of underground obstructions such as pipes, electric cables, and other utilities.
- Weather and soil moisture conditions, especially high water table.
- Sources of soil vibrations (highway traffic, railroads, machinery, etc.).
- Adjacent roads and footpaths.
- Method of excavation.
- Excavation plan submitted to Loss Prevention as required.

Consideration of these factors will indicate the safety measures, which must be implemented, to proceed with the job, and whether the sides of the excavation can be sloped and benched to a safe angle, or whether other protective systems will be required. It is important to provide adequate and suitable protective systems for use whenever excavation work is to be carried out to a depth of 1.5 meters (5 feet) or more. Excavations work to a depth of less than 4 feet may also require protective systems.

19.2.2 Work Permit

In operating facilities, work permits must be obtained from the appropriate authority before excavation work is started. A Confined Space Entry Work Permit is a second work permit and is required for trenches deeper than 1.2 meters (4 feet).

19.2.3 Hazardous Atmospheres and Materials

Ventilation

Where there is reason to suspect oxygen deficiency or the presence of a hazardous atmosphere in an excavation, gas tests must be carried out by a qualified person. Where necessary, mechanical ventilation shall be used, or other appropriate precautions shall be taken before men enter.

Note: Toxic, oxygen and flammable gas tests are to be conducted before entering hazardous excavations in Restricted Areas.

Hazardous Atmospheres

Prior to entry into excavations greater than four feet deep or confined spaces, a work permit shall be issued. Gas tests shall verify that the oxygen level is 20-21%, combustible gases 0.0 LEL, and H2S is 0 ppm. Corrective measurers may include use of air movers, identification and isolation of sources from fuel lines, sewers, open tanks or other measures to return the breathing atmosphere to normal readings. Subsequent testing is required to monitor the area during the work so appropriate precautions can be taken as necessary.

Emergency Rescue Equipment

Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may develop during work in an excavation. This equipment will be attended by a standby man outside the trench when in use.

Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, will wear a harness with a lifeline attached to it. The lifeline will be separate from any line used to handle materials, and will be individually attended at all times while the employee wearing the lifeline is in the excavation. Mechanical devices shall be available to lift incapacitated employees from excavations.

Exhaust Gases

Where an internal combustion engine is used in an excavation, special precautions must be taken to ensure that exhaust gases are discharged so as not to be a hazard to men working in the excavation.
Maximum Allowable Slopes

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V) [1] FOR EXCAVATIONS LESS THAN 20 FEET DEEP [3]
STABLE ROCK	VERTICAL (90°)
TYPE A [2]	3/4 : 1 (53°)
TYPE B	1:1 (45°)
TYPE C	1-1/2 : 1 (34°)

NOTES:
Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off
A short-term maximum allowable slope of 1/2H : 1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m).

20. FIRE PREVENTION

Fire prevention will be given the highest priority by Approach Company on the project.

20.1 FIRE CLASSIFICATION

On all projects we will be dealing with the following classifications of fire:

Class A
Fires Involving solid materials such as wood, paper, textiles etc.

Class B
Fires involving flammable gases and liquids such as gasoline, oil, thinners, paint or liquefiable solids such as grease, fat and tar.

Class C
Electrical equipment fires, involving wiring, motors, panels, switches, generators or appliances.

Types of Extinguisher

Approach Company will be using two types of extinguishers on this project:

- ABC Dry Chemical Powder
- Carbon Dioxide

Servicing:

All fire extinguishers will be checked/serviced on a monthly basis. This service will include the following:

1. Check extinguisher is numbered and in the correct location.
2. Check for signs of having been used i.e. traces of powder, fall in pressure, safety pin removed, broken seal. Recharge as necessary.
3. Check hoses, nozzles, brackets and extinguisher for damage or misuse.
4. Complete monthly inspections report form, and retain at site safety office.
5. Check hydrotest date on extinguisher. Remove from service if expired.

20.2 TRAINING

Employee fire extinguisher training and periodic fire drills shall be conducted and documented.

20.3 FIRE PREVENTION GUIDELINES

Smoking

Smoking restrictions as dictated by Client will be strictly observed.

Electrical Wiring and Appliances

All electrical extension cords will be equipped with non-conductive plugs. Cord will not be spliced, draped over nails, metal objects or rafters.

The use of extension cords by means of multiple outlet plugs from single outlets is prohibited.

Electrical extension cords will not be used as permanent, fixed wiring in facilities.

Non-essential electrical equipment will be disconnected or turned off when not in use.

All electrical services, alterations and equipment installations will be performed only by authorized electricians.

Bare wires will not be connected to a power socket outlet.
Flammable Liquid (Diesel) Storage & Dispensing.

Diesel fuel will be kept in approved tanks, either underground or on the surface, relief vented and separated by no less than 10 meters from any building or equipment.

The tank will be labeled with its contents. A sign stating “Danger” and “No Smoking” must be strategically placed and enforced.

Any Flammable Liquid storage tank must be enclosed by a dike wall or equivalent method, so as to avoid spillage in case of leak.

Anti-static grounding shall be installed via a flexible grounding lead, attached to vehicles when refueling.

Only approved dispensing hoses with self-closing nozzles and leak free connections are to be used.

A multi-purpose ABC class fire extinguisher will be used for protection of diesel tanks, and dispensing areas.
When refueling a vehicle, the engine will be turned off, and the ignition switch will be in the off position.

Flammable Liquids (Other Types)
Flammable liquids will not be stored in any office or accommodation.

When flammable liquid must be stored for construction or operational use, such as maintenance shops, paint stores etc. only approved metal containers will be used for quantities of 40 liters or less. Containers will be clearly labeled to avoid confusion.

Plastic or glass containers are prohibited for storing or transporting flammable liquids.

The use of gasoline or diesel for cleaning is prohibited.

Waste Containers

Waste containers with lids will be provided for general refuse.

Metal waste containers with self-closing lids will be provided for the safe disposal of flammable waste and rags.
Flammable waste will be discarded in the approved disposal area.

As a general rule “Waste flammable containers intended for disposal when recycled should not be welded or torched to avoid possible rupture due to the accumulation of flammable gas inside the container, when heated”.

Waste Removal

Waste containers will be emptied when full, to prevent rubbish being thrown around.

Waste materials will not be accumulated in working areas.

Storage Areas

Stores supervisors will ensure that their personnel are aware of emergency and fire alarm procedures, and any stored material for which a special procedure is required.

Good housekeeping practices will prevail.

Smoking and heat producing devises are prohibited.

All materials must be stored in such a manner that will not create a hazard, and will protect the materials from damage.

The method of storage will not block aisles, means of exit, fire extinguisher or the access thereto.

Do not obstruct or block any doors, maintain a clearance of at least 1-meter around all doors, to ensure unimpeded exit in an emergency.

21. FORM WORK

Form work and shoring shall be designed, erected, supported, braced, and maintained so that it will safely support all vertical and lateral loads that may be imposed upon it during placement of concrete.

Personnel shall not be allowed under or in close proximity of the formwork during pour operations.

Personnel not engaged in the pour operation shall stay clear of the pour area. A clear area shall be maintained at 1-1/2 times the highest point of the formwork.

Stripped forms and shoring shall be removed and stockpiled promptly after stripping, in all areas in which persons are required to work or pass. Protruding nails, wire ties, and other form accessories not necessary to subsequent work shall be pulled, cut, or other means taken to eliminate the hazard.

Imposition of any construction loads on the partially completed structure shall not be permitted unless such loading has been considered in the design and approved by the engineer-architect.

21.1 VERTICAL SLIP FORMS

The steel rods or pipe on which the jacks climb or by which the forms are lifted shall be specifically designed for the purpose. Such rods shall be adequately braced where not encased in concrete.

Jacks and vertical supports shall be positioned in such a manner that the vertical loads are distributed equally and do not exceed the capacity of the jacks.

The jacks or other lifting devices shall be provided with mechanical dogs or other automatic holding devices to provide protection in case of failure of the power supply of the lifting mechanism.

Lifting shall proceed steadily and uniformly and shall not exceed the predetermined safe rate of lift or concrete cure.

All vertical lift forms shall be provided with scaffolding or work platforms completely encircling the area of placement with intermittent tie breaks to ensure that superimposed loads on the scaffold/work platforms cannot pull down the entire scaffold works.

21.2 TUBE AND COUPLER SHORING

Couplers (clamps) shall not be used if they are deformed, broken, or have defective or missing threads on bolts, or other defects.

The material used for the couplers (clamps) shall be of a structural type such as dropforged steel, malleable iron, or structural grade aluminum. Gray cast iron shall not be used.

All base plates, shore heads, extension devices, or adjustment screws shall be in firm contact with the footing sill and the form material and shall be snug against the posts.

21.3 SINGLE POST SHORES

For stability, single post shores shall be horizontally braced in both the longitudinal and transverse directions and diagonal bracing shall be installed. Such bracing shall be installed as the shores are being erected.
All base plates or shore heads of single post shores shall be in firm contact with the footing sill and the form materials.

When formwork is at an angle, or sloping, or when the surface shored is sloping, the shoring shall be designed for such loading.

Adjustment of single post shores to raise formwork shall not be made after concrete is in place.

Fabricated single post shores shall not be used if heavily rusted, bent, dented, re-welded, or having broken weldments or other defects. If they contain timber, they shall not be used if timber is split, cut, has sections removed, is rotted, or otherwise structurally damaged.

All timber and adjusting devices to be used for adjustable timber single post shores shall be inspected before erection.

Timber shall not be used if it is split, cut, has sections removed, is rotted, or is otherwise structurally damaged.

Adjusting devices shall not be used if heavily rusted, bent, dented, re-welded, or having broken weldments or other defects.

All nails used to secure bracing or adjustable timber single post shores shall be driven home.

22. FIRST-AID FACILITIES

First aid is the immediate help that is provided at the site to an injured or seriously ill person before professional medical help can be obtained. Approach Company will ensure that proper first aid is available to their employees on all job sites. Provisions shall be made prior to start-up of the project for prompt medical attention in case of medical emergencies.

22.1 PROVISION OF FIRST AID FACILITIES

Approach Company shall provide or ensure there are first aid facilities on all sites. The first aid facility shall be kept in a sanitary condition at all times.

23. DUST CONTROL

Good housekeeping is an important part of our safety program. It is the responsibility of all employees and supervisors to practice good housekeeping.

Scrap and debris will be removed from all work areas, storage areas on a daily basis during the course of construction. All scrap with protruding nails will be removed or cleaned up immediately. Containers must be used and emptied promptly.

Burning of waste materials will not be done on work site. All combustible debris shall dispose of at a properly licensed location.

A sufficient number of rubbish containers will be provided throughout the work areas.

A safe means of entry and exit will be provided at all times and work areas will be kept clear and unobstructed.

Materials and supplies shall be stored in locations, which will not block access and will allow for easy clean up.

Dust will be controlled on a daily basis by frequent sweeping or wetting of the work area.

Equipment that may drip oil or grease will have a fire proof sheet or drip pan placed under it. This applies to both old and new floors.

24. JOB SITE INSPECTIONS

24.1 DAILY INSPECTION BY FOREMAN

Foreman will conduct daily work inspections in his respective areas as part of their daily activities, and will initiate prompt corrective actions as to noted deficiencies, unsafe conditions or practices.

24.2 PRE-JOB INSPECTION

Approach Company and Subcontractors workers will inspect their tools, equipment and personal protection prior to commencement of work. Items to be inspected but not limited to the following:

1.- Hand and power tools
2.- Body harnesses
3.- Ladders
4.- Slings and rigging equipment etc.

Supervisors and Foreman will check that work area and surrounding facility, including tools and equipment to be used are all physically reviewed and verified to be in safe condition before any work activity begins.

24.3 POST JOB INSPECTION (END-OF-SHIFT-CHECKS)

All site supervisors will conduct an inspection of his work area, tools and equipment after each completion of the job especially before quitting time. These post-job inspections will be strictly enforced particularly in areas where hot work is or has to been performed.
Inspection frequency and format are declared on Appendix-2

25. GENERAL SAFETY RULES

25.1 PROCEDURE

No contractors' employee shall be required to work in surroundings or under working conditions, which are unsanitary and dangerous to his health and safety.

Employees shall be physically qualified, have the proper attitude and shall be sufficiently trained, before assigning them to a job.

- Employees shall be instructed:
- Not to take risks or short cuts.
- To know their jobs. If in doubt, they shall ask their Supervisor.
- To be rested and fit to give full attention to their work.
- To report any unsafe act or conditions to their Supervisors.
- To warn other employees against unsafe act or conditions.
- To report all accidents or injuries immediately to their Supervisors and get prompt medical treatment for injuries.
- To avoid horseplay or practical jokes while at work.
- To check and determine what hazards or problems may exist before starting a job.
- To fully understand what to do in case of a fire or emergency.
- To use the safety equipment required for a particular job or area of work.
- To practice good housekeeping.
- Not to use compressed air in contravention of the applicable rules.
- Not use flammable liquids for cleaning purposes.
- To observe smoking restrictions.
- Check the location of fire alarms and fire fighting equipment in their area.
- In the use of Work Permit systems.
- To wear Personal Protective Equipment (PPE) such as hard hats, safety spectacles and safety shoes are mandatory for all personnel at all work locations. Ear protection, respirators, face shields and similar personal protection will be worn whenever required.
- Full body harness will be worn when working in areas 6 feet above ground, without complete guardrails. Safety belts will be allowed in work areas protected with guardrails.
- No activity shall take place in a restricted area unless our Work Permit Receiver obtains a signed hot or cold work permit from the Operation Supervisor.
- All vehicles will be parked at the designated parking area only.

25.2 SAFETY REQUIREMENTS FOR SUB-CONTRACTORS

No Sub-Contractors shall be allowed on a job until the appropriate contracts and other documentation have been signed and returned to the head office.

The Resident Manager will ensure that Sub-Contractors undergo thorough job site indoctrination including hazards, potential hazards, and equipment in the area. Also covered shall be emergency signals, evacuation routes, telephone communications, reporting, and emergency services. Documentation shall be established and maintained.

Before beginning work, the Sub-Contractor shall furnish the Project Manager with documentation that its employees have received indoctrination, including requirements covered by this manual and other standards. (Each new employee shall undergo a similar indoctrination before beginning work).

26. EMERGENCY EVACUATION PROCEDURES

26.1 GENERAL

It is the responsibility of each member of management and supervision to familiarize himself with the Emergency Procedures, which apply to the plants, and areas, in which he has men working.

Action To Be Taken.

When an emergency condition exists or on hearing the 'Stop Work Alarm" every supervisor shall ensure the following:

1. All work is stopped at once.
2. All equipment is shut down.
3. All men are evacuated to a pre-determined assembly point.
4. A roll call is taken and every man is accounted for.

No one is permitted to return until notification has been received from operation or from the company representative that it is safe to do so.

Help In Emergency

In the event of an emergency situation (serious personal injury, fire, critical damage to operating equipment. etc.) help may be obtained by contacting the nearest Client Main Gate. This may be done:

- By telephone. Dial the Emergency Number
- By radio. If the main gate cannot be contacted directly, radio an operation that has a telephone in the Client system and ask them to dial the emergency number
- By messenger, send a messenger to the nearest telephone, radio, or whichever is the nearest.

When transmitting message by telephone, radio, or messenger, employee will identify their self by giving:

1. Name
2. Badge number
3. Exact Location
4. Nature of emergency
5. Seriousness of emergency

Remove the casualty from further danger.

The nurse in charge at Approach Company First Aid Station will respond immediately to the site with an Ambulance, and upon his assessment/diagnosis, the injured may be brought to Approach Company First Aid Station or transferred directly to the nearest well equipped hospital, as is necessary.

Place cards giving the names, telephone and radio numbers of the persons in charge of first aid facilities will be displayed on Notices Boards fixed on strategic places to facilitate prompt assistance in case of a medical emergency.

27. HAZARDOUS MATERIAL AND WASTE MANAGEMENT

All Approach Company and their Subcontractors employees who handle hazardous material will be trained to handle such material, and will wear all manufacturers recommended safety equipment.

Hazardous waste shall not be disposed on-site; they shall be temporary stored in tightly closed, leakage proof containers in a designated on-site area prior to be collected and transported in an approved contractor waste management facilities.

The Site HSE Coordinator is responsible for the management of the waste streams and, that all sub-contractors comply with the Waste Management Procedures.

Treatment and disposal of asbestos and asbestos containing wastes, if any, shall conform to requirements of Client "Asbestos hazard management".

This section summarizes the handling, treatment and disposal of liquid and solid wastes generated during the construction and pre-commissioning phases.

Hazardous Material, Waste Disposal Management Procedures and Pollution Contingency Plan will comply with Approach Company Waste Management Program for Construction and with the Pollution Contingency Plan for Construction.

27.1 SOLID WASTE MANAGEMENT

27.1.1 Waste Disposal System

The solid waste portion of Approach Company Waste Disposal Program shall include provisions for temporary site storage, collection, transportation and disposal practices.

27.1.2 Containers And Storage

Solid, waste shall be stored such that it will not constitute a fire, health, safety or environment hazard, or be accessible to animals and vectors. All refuse containing food waste shall be stored in covered or closed containers which are leak proof, durable and designed for safe handling and easy cleaning. Construction debris and demolition material will not be allowed to accumulate so that it presents an environmental health and safety hazard. Domestic wastewater shall be disposed in an on-site sewage treatment plant with evaporation pond to dry the sludge. If waste originates from construction operations containing asbestos..

27.1.3 Hazardous Waste Storage And Handling

All hazardous waste shall be stored in tightly closed, leak proof containers made of, or lined with, material, which is compatible with the hazardous waste to be stored. Containers shall be marked with warning labels to accurately describe their contents, and detail appropriate safety precautions. Incompatible hazardous wastes shall not be stored in the same storage or transportation container. Hazardous chemicals shall be stored and handled in accordance with Client Chemical Hazard Bulletins (CHB) issued by Preventive Medicine Services Division, Manufacturer's Material Safety Data Sheet (MSDS) or as defined by the Company Representative. Approach Company or their designated sub-contractors will have available all relevant CHM/MSDS's at the chemical storage area, and the location where chemicals are being used.

27.1.4 Method Of Collection

Approach Company or designated sub-contractors shall promptly clean up all spillage and waste lost from any vehicle on route to the disposal site. Hazardous waste containers shall be collected and transported by authorized sub-contractors in a manner, which minimizes environmental, fire and explosion hazard, and worker exposure. Transporting vehicles shall be properly marked and drivers shall carry the appropriate documents describing and nature of the waste transported and its degree of hazard. All vehicles and containers shall be designed to prevent the release of transported liquid and solid wastes. Drivers shall have specialized training related to the handling and disposal of their cargo and carry on board the relevant CHB / MSDS's.

27.1.5 Requirements For Establishing A Landfill Disposal Site

Approach Company and their designated sub-contractors responsible for the management of waste may choose

to operate their own solid waste disposal system, or to utilize a central waste management system. Prior to establishing or operating a landfill disposal site on Client controlled land shall obtain through the Company Representative a Land Use Permit (LUP).

27.1.6 Solid Waste Disposal, Site Design And Operations

Provision shall be made to restrict access and dumping of unauthorized material. Incompatible wastes shall not be placed in common cells, tanks or containment areas. Exceptions to this include the intentional combination of certain hazardous wastes to achieve neutralization and detoxification by qualified waste management personnel. Domestic wastewater treatment plant sludge containing greater than or equal to fifteen percent solid shall be disposed in a Class II waste disposal site. The sludge shall be placed over the working face (the area of a landfill in which waste is currently being deposited) and shall be mixed in an appropriate ratio with dry waste to absorb moisture. Landfill operations shall not cause or allow the discharge of contaminants into the environment or adversely impact surface or groundwater systems.

27.2 AIR POLLUTION MITIGATION

Fugitive emissions of pollutants in air during construction will be minimized. Vehicle traffic shall be minimized in order to limit emissions of particulate matter.

All vehicles shall be properly maintained to minimize excessive exhaust emissions.

27.3 NOISE CONTROL

Control of noise shall be accomplished in accordance with “Noise Control”. For construction related noise, Approach Company shall use appropriate abatement and mitigation control measures.

27.4 POLLUTION CONTINGENCY PLAN

27.4.1 Introduction

This section summarizes the handling treatment of pollution control generated in the course of construction project and shall be performed in full compliance. Approach Company management, staff and personnel have the responsibility to ensure pollution controls are practiced on projects. However Approach Company Construction team shall ensure to comply with the “Pollution Contingency Plan for Construction”.

All garbage shall be stored such a way that it will not constitute a fire, health, safety or environmental hazard, or be accessible to livestock.

27.4.2 Water Supply Protection

Approach Company will comply and properly dispose of liquid waste in accordance with Client Engineering Standards to ensure that water sources and supplies are not contaminated.
All wastewater treatment units and disposal of sanitary, industrial wastewater shall comply with the Client Engineering Standards.

27.4.3 Hydrotest

Hydrotest shall be “Disposal of wastewater from cleaning, flushing, and dewatering pipelines and vessels “Hydrostatic Testing Fluids And Lay-up Procedures”, Disposal of waste water from cleaning, flushing, and dewatering pipelines and vessels”.

27.5 DUST CONTROL

Dust control shall be accomplished by properly wetting all the work area prior to commencing the work and or other approved measures.

28. SECURITY PROCEDURES

Approach Company will provide a warehouse and lay down yard for storage of materials and equipment, enclosed by a type IV fence separated from the workshops, labor rest, and change rooms.

The site office/warehouse and lay down yard will be fenced off, and gates installed. Control locks will be provided to restrict access by unauthorized personnel, on the main gate, lay down yard and warehouse and the keys will be available from the storekeeper. All high-risk material (valves, fittings, small parts, etc.) shall be stored in the warehouse and the rest of the project materials will be stored in the lay down area.

The office will be fenced by wire mesh with all doors and gates locked at night.

Equipment left/parked up on the work site will be provided with a watchman, if required.

A logbook for visitors will only be kept for visits outside normal working hours.

29. IONIZING RADIATION

A certified radiographer shall conduct radiation operations.

All Approach Company Ionizing Subcontractors will be approved and have “Permits to Use Material/Equipment Producing Ionizing Radiation.

Execution of the radiography shall be performed by competent persons. Only qualified and trained employees shall be assigned to install, adjust, and operate the equipment.

Proof of qualification of the equipment operator shall be available, and in possession of the operator at all times, at the workplace.

Employees involved in the operation shall be provided with a dosimeter to monitor allowable dosage exposure.

Radiation warning signs/placards shall be posted around the work area, and be clearly visible to anyone approaching the work area, where the radiography will take place.

Radiography work area shall be clearly cordoned off, by marker tape or equivalent.

A flashing red light shall be provided and used, while the work is in progress.

All personnel not involved in the radiography shall be kept a minimum distance of 50 meters away from the work area.

Approach Company Safety Officer to ensure that all safety provisions are in place and the personnel in the work area is kept to a minimum, before allowing the radiographer to start. Area to be cordoned off and warning signs to be in place, before any other preparatory work is carried out.

Signs or notices shall be placed in a prominent position and shall read “Warning: Keep Out - Radioactive Material Storage”.

Barriers and notices are to be erected around the storage place at a distance dedicated by the radiation level, which must not be more than 2.00 mr/hr at 30 cm from shielding.

All employees will be advised, either during an orientation, or during weekly toolbox meting, if they are to be working around Ionizing Radiation.

30. ABRASIVE BLASTING & PAINTING/COATING

30.1 GENERAL

This procedure provides guidance for the protection of personnel engaged in shot, sand, or other abrasive blasting operations, which involve air contaminated with high concentrations of rapidly moving abrasive particles. All operators must possess a valid Client certificate.

Approach Company will comply with applicable requirements of Client Construction Safety Manual for abrasive blasting, painting and coating work.

30.2 PROTECTIVE EQUIPMENT

The following protective equipment will be used or worn by personnel engaged in abrasive blasting operations:

- An airline respirator of the continuous-flow type with a protective hood to cover the head, neck, shoulders, and chest.
- An air purifier and filter for removal of oil, water, and any other organic-matter contaminant that might be discharged from the compressor.
- A pressure regulator, with an attached gauge, if the pressure of the compressor exceeds 25 psig.
- A pressure relief valve if the pressure regulator should fail.
- An airline hose of not more than 300 feet for each man.
- Hood view ports made of impact-resistant safety glass or plastic covered by a metal screen.
- Gauntlet-type leather gloves.
- Regular leather shoes or laced boots (safety toes required).
- Clothing made of strong-fiber material to resist flying abrasive material wear or damage.
- Adequate hearing-protection devices.

30.3 INSPECTION AND CARE OF PROTECTIVE EQUIPMENT

Interiors of masks should be cleaned daily. If a mask is worn by other than one person, the mask will be sterilized. All valves and regulators must be checked before each use. The "pet cock" valve at the bottom of the purifier should be opened daily to remove excess water.

The air supply hood will be cleaned and stored as required for other respirators.

30.4 AIR SUPPLY EQUIPMENT

The air supply hood will be a non-electrical conductor. Hose lengths will be joined by metal couplings secured to the outside of the hose to avoid erosion and weakening of the couplings.

Nozzles will be attached to the hose by fittings that will prevent the nozzle from becoming disengaged. Deadman controls will be provided at the nozzle end of the hose. Nozzles shall be grounded to dissipate any build-up of static electrical charges.

Safety chains or cable ¼" in diameter will be provided for, and used on, each hose connection to prevent the hose from whipping or thrashing around in case a coupling becomes disconnected.

30.5 WORK AREA

The blasting nozzles must be equipped with an automatic shut off device (Dead mans handle), which will shut off the flow if the operator looses control of, or drops the nozzle.

Blasting operator clamps must be fitted on the hose, so that it will not twist during operation.

All equipment must be properly grounded.

The work area will be barricaded and posted with a signboard “NO ENTRY, SAND BLASTING OPERATION”. Warning signs in English and Sudan will be erected.

30.6 PAINTING

A Work Permit will be obtained before any painting work starts. Painting work will not be carried out any time near or below an on-going hot work

Only the quantity of paint required for the specific painting work for the particular work shift will be brought in the area. No excess quantity of paint or thinner will be stored at any time within work area.

A 30 lbs. Portable dry chemical (ABC) type fire extinguisher will be within the immediate area, wherever painting work is being conducted.

Proper paint storage will include: adequate ventilation and will be provided with Warning notices, .e. “Danger, Flammable, No Smoking”, etc.

Proper number of fire extinguishers for storage location.

31. LOCK OUT AND TAG SYSTEM

All electrical supervisors are to receive the Client Permit Receiver course, which covers the use of Isolation, lock out and hold tags. Approach Company policy on lockout is to have all energy sources locked in the “OFF” or “DE-ENERGIZED” position, prior to permitting employees to work on equipment. In the event of fluid or gas systems being involved, precautions will be taken by installing blinds, before work on the system will take place. The following additional precautions will be taken:

Client Operations shall identify and isolate all required lines and equipment before Approach Company or Subcontractors employees will accept a line to work on. Approach Company supervisors may assist operations as requested.

Locks and hold tags will be provided to employees to put on isolation panels after operations has fitted their locks. Permit receiver must also fit his own lock to ensure safety.

Lockout keys will be kept by the permit receiver for his own lock. The transfer of keys will be done in the presence of the employees’ supervisors.

Approach Company recognizes that during installation/servicing/maintenance of equipment, our employees have the potential to be involved in a serious or fatal accident caused by the unexpected start-up of equipment or the release of stored energy. This policy has been developed to establish Approach Company procedures for the control of hazardous energy hereafter called Lockout/Tag out. This policy is intended to comply with all OSHA standards.

31.1 IMPORTANT DEFINITIONS

Affected Employee:

A person whose job requires him to operate or use a machine or equipment on which installation/servicing/maintenance, is being performed under lockout or tagout, or whose job requires him to work in an area in which such installation/servicing/maintenance, is being performed.

Authorized Employee:

A person who locks out or tags out a machine or equipment in order to perform work on that machine or equipment.

Cord and Plug Connected Equipment:

Equipment where the only energy source is electrical power provided by a plug-in connection.

Energy Source:

Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Energized:

Connected to an energy source, or containing residual or stored energy.

Energy-Isolating Device:

A mechanical device that physically prevents the transmission or release of energy. This includes: locks; hairpins; tongs; lockable valves; clam shell devises for valves; blank flanges and blinds for piping systems; and restraining devices to prevent movement of parts.

Lockout:

The placement of a lockout device on an energy-isolating device, in accordance with an established procedure, ensuring that the energy-isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout Device:

A device that utilizes a positive means such as a lock to hold an energy-isolating device in the safe position, and prevent the energizing of a machine or equipment.

Lockout/Tagout Specific Procedure:

A written procedure developed specifically for each piece of machinery or equipment capable of unexpectedly releasing hazardous energy. This procedure outlines in detail how lockout/tagout will be performed.

Normal Production Operations:

The utilization of a machine or equipment to perform its intended production function.

Installation/Servicing /Maintenance:

Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include: lubrication; cleaning or unjamming of machines or equipment, and making adjustments or tool changes where employees could be exposed to the unexpected energization or start-up of the equipment or release of hazardous energy.

Tagout:

The placement of a tagout device on an energy-isolating device, in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled may not be operated until the tagout device is removed.

31.2 APPLICABILITY

An operation is regulated by the lockout/tagout policy when:

- Any employee or contractor is required to remove or bypass a guard or other safety device.
- Any employee or contractor, is required to place any part of his body into the mechanism of a piece of equipment or path of hazardous energy unless:
- The activity is routine, repetitive and integral to the use of the equipment for production and the operator has been properly trained in the precautionary steps necessary to perform the activity safely or is provided other protection (guarding).

31.3 TRAINING REQUIREMENTS

Each authorized employee or contractor involved in, or affected by, lockout will be trained in the following areas before being allowed to work in the area.

1. The recognition of hazardous energy sources;
2. The type and magnitude of the energy located in the workplace;
3. The procedures for energy isolation and control including specific procedures developed for equipment and systems;
4. The purpose and use of energy-control (Lockout/Tagout) procedure;
5. The prohibition and penalties for attempts to restart or re-energize equipment which has been locked out or to work on equipment without following the lockout/tagout procedures.

Affected employees will be trained in the purpose and use of the lockout/tagout procedure. All employees whose work operations may be in an area where lockout/tagout procedures may be utilized, will be trained about the procedure, and about the prohibition relating to attempts to re-start or re-energize machines or equipment that are locked/tagged out. These personnel are not required to be familiar with specific procedures for equipment and systems.

Retraining or refresher training will be conducted whenever one of the following exists:

1. The employee has a change in job assignment.
2. There has been a change in the equipment or process.
3. There has been a change in the energy-control procedure.
4. An inspection reveals deviations from the standard procedures or inadequacies in the employees' knowledge or use of the lockout/tagout procedure.
5. An accident occurs as a result of unexpected energy release.

All employees training and retraining will be documented and verified. These records are to be maintained with the written lockout/tagout procedures and updated annually.

31.4 LOCKOUT/TAGOUT PROCEDURE

31.4.1 Background

This procedure has been developed to establish formal methods, procedures, and equipment to be used to ensure that before any employee or contractor, performs any work on a machine or equipment where the unexpected energizing, start-up. Or release of stored energy could occur and cause injury, the machine or equipment shall be isolated and rendered inoperative.

It is the stated intent of this program to use locks wherever possible with identification tags to provide positive energy isolation. If, in the judgment of company management, the equipment cannot be locked out, warning tags may be used.

31.4.2 Lockout Procedures

Equipment will only be locked or tagged out by authorized employees who have been trained in the company's procedure, and who are familiar with the specific procedures for the equipment.

All affected employees will be notified of the application of the lockout devices and/or tags, at the beginning of the lockout procedure.

All energy sources will be identified according to the specific procedures for the affected equipment. (Energy sources include electrical, mechanical, hydraulic, pneumatic, thermal, chemical, and others.)

Equipment will be shut down following written specific procedures developed for the equipment.

All energy sources are to be locked out. Each employee involved with the operation will place his lock on each energy-isolating source. Multiple locks will be attached using hairpin or tong devices. The locks must be applied with a warning tag describing why the equipment is locked out, who placed the lock on the equipment, and the date. Locks used for lockout will have two keys. One key will remain in the possession of the individual locking out the equipment. The other key will be in the custody of the HSE Coordinator, in a secure location. All locks used in the facility must be keyed individually.

Stored or residual energy must be relieved, disconnected, blanked off, restrained, and otherwise rendered safe. Energy sources subject to re-accumulation, such as capacitors, hydraulic reservoirs, air tanks, steam taps, etc., should be controlled by isolation and locking out. If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation shall be continued until the work is completed.

When all steps involved with shutdown, listed in the specific procedures for equipment have been completed, make sure that all personnel are clear, and attempt to start or activate the equipment to make sure that all energy sources have been locked out. Return controls to "off" position.
Cord-and-plug-connected equipment does not require lockout/tagout if the following conditions exist:

The authorized employee is within sight of the equipment.

Unplugging the equipment isolates the equipment from all energy sources.

The equipment has no stored energy.

If equipment must be left unattended or if all of the above conditions do not apply, then the equipment will be locked and tagged out by attaching a tag to the on/off switch, and attaching a lockout device to the plug to prevent it from being plugged in.

31.4.3 Tagout Procedures

It is Approach Company policy not to use tags alone in an energy isolation procedure. The Company Safety Manager must authorize the only exceptions to this, with written justification as to why the equipment or process does not lend itself to being physically locked out. If this equipment is upgraded or modified so that it becomes possible to lock out the equipment, lockable switches, fittings, or valves will be added.

Tags are to be used with locks to identify the employee, the hazard, and the date.

Tags must be durable and able to withstand the environment in which they are used.

Tags are to be attached with pull ties, and must be securely attached so that it is readily apparent what the tag is warning about. Alternate methods of attaching tags may be used as long as they are not easily removed or reusable and must withstand 50lbs unlocking strength. (Rubber bands, wire ties, and string are not permissible means of attachment)

Any employee, who removes, bypasses, ignores, or otherwise defeats a tag without permission of the authorized person responsible for it, or proper management approval, is subject to immediate dismissal.

In employee training, employees must be made aware that tags do not protect against the unexpected energization of the equipment, and that they should be extraordinarily alert around tagged out equipment and systems that are not also locked out.

31.4.4 Steps For Restoration Of Equipment And Removal Of Locks And Tags

These procedures are extremely important and must be followed whenever any locked or tagged out equipment will be brought back into service or whenever locks or tags are to be removed.

The work area is to be inspected to ensure that all personnel, tools, loose parts, and non-essential items are in a safe position and that guarding is in place. If the equipment is to be brought on-line for set-up or adjustment temporarily without guarding, affected employees must be adequately protected.

All employees who would be affected by the start-up of the equipment must be notified of the removal of the lockout devices before they are removed.

Unauthorized removal of a lock or tag, on a properly locked-out piece of equipment, will result in immediate dismissal.

To remove locks or tags from a piece of equipment without the individual who locked it out requires the approval of the Company Safety Manager, who must have verified that the individual who locked out the equipment is not at risk, and who has inspected the equipment and determined that it is safe. This procedure is to be done only after every effort has been made to have the individual who locked out the equipment remove his lock and tag. Whenever someone has removed a lock/tag other than the person who applied it, the person who originally locked out the equipment must be notified before he returns to the work area.

31.5 ANNUAL REVIEW

The nominated competent person will conduct an annual audit of the lockout procedures, written program, and training, to ensure that the procedures are adequate, and that they are being followed. If deviations from these procedures are discovered, the employees involved must be retrained and the training documented. The audit should include verification that training has been completed for all authorized and affected employees, involved in the lockout/tagout procedure. Authorized and affected employees should know the location of specific written procedures for equipment. Employees must be able to explain the purpose of this procedure, and the details of how it works.

32. HEAT STRESS

32.1 HEAT STRESS MANAGEMENT PROCEDURE

The purpose of this procedure is to reduce the exposure to heat related injury/illness from working in high heat environments.

The goal is to eliminate heat related injuries or illnesses on the jobsite.

Common Hazards

Your body operates in a narrow temperature range. When the environment is too cold or too hot the body will cease to function properly if steps to control the exposure are not taken. Extremes in body temperature elevation can be life threatening. There are many factors that affect body temperature. Some of these that can cause elevated body temperature are listed below:

1.- Lack of proper fluid replacement.
2.- Electrolyte imbalance.
3.- Extreme air temperature.
4.- Lack of air movement – oven effect.
5.- Reflected heat or sun rays.
6.- Being in the direct sun (can raise temperature by as much as 15 degrees).
7.- Convection of heat through walls or steel.
8.- Prolonged or strenuous activities.
9.- High humidity.
10.-Medications, diet, excess salt intake.
11.-Physical fitness (lack of, weight, acclimatization).
12.-Excessive or layered clothing.

32.2 NEW EMPLOYEES

The first step in managing heat stress is to determine if the new employee is used to working in the heat. A person who is not used to working in high heat conditions cannot be expected to perform, as an acclimatized employee would be able to perform. The new employee must be introduced to the new environment carefully. The tasks assigned must take into account the persons abilities, strength, and acclimatization. Prolonged strenuous activity or exposure to extreme heat must be limited by rotating employees until all are accustomed to the new environment. A normal acclimatization process takes 2-3 weeks to complete before the employee is comfortable working in high heat environments.

The supervisor is the essential person to provide an acceptable acclimatization period with appropriate tasks to ensure the safety of the new employee. Several factors will give a supervisor clues as to whether a new employee will acclimatize quickly or not.

Physical Fitness – A fit person will generally have a higher heat tolerance and acclimatize sooner.

Previous Experience – Someone who has worked in a high heat environment either will be acclimatized or will have a better knowledge of how to acclimatize themselves.

Fluid Intake/Breaks – A person who works steady with regular breaks will acclimatize quicker than someone will who takes sporadic and more frequent breaks.

Attitude – A new employee who is eager and not worried about working in the heat will acclimatize more quickly than someone who is anxious when working in hot environments will. Care must be taken with the eager employee because he may push himself too much and too quickly.

32.3 CURRENT EMPLOYEES

This group is generally more susceptible to heat stress than some of the new employees. These employees are already acclimatized and feel that they are able to "handle the heat" or they are introduced to the heat for the first time of the season, and feel that they are fine when, in fact, they are not. Sometimes the experienced employees are trying to show the new employees "how to do it" and are caught doing more than he should.

32.4 IDENTIFICATION OF HEAT STRESS SYMPTOMS

Many heat stress management programs focus on the identification of heat illnesses. While the ability to identify the particular heat stress problem is important, it is far more important to never reach the need to identify which particular heat related problem is being experienced. There are many publications, which we all should have, available to identify the various levels of heat stress symptoms. This procedure will focus on the prevention of heat related illnesses. The following information targets identification of initial symptoms of heat stress before problems occur.

The first signs of overheating usually are feelings of being hot, uncomfortable, and just getting plain tired. It's not serious yet, but these are good signs that someone is not as usual. It tells you that you need to change something in your environment such as more fluid, more air movement, or needing shade. The following are symptoms that can lead to problems that are more serious:

1.- Dizziness
2.- Rapid Heartbeat.
3.- Nausea.
4.- Cramps.
5.- All Over Weakness
6.- Headache.
7.- Dry Skin (no sweating).
8.- Chest Pain.
9.- Breathing Difficulty.
10.- Diarrhea.

An alert supervisor will know his employees faces. Heat stress shows early in the face as being tired, very profuse sweating, off-color, and sometimes confusion. Employees that are found with any of these symptoms should be taken to a cool location before a problem occurs.

32.5 PROACTIVE MEASURES AGAINST HEAT STRESS

The best measures to take to prevent heat stress are to address it before it ever becomes a problem. Anticipate high heat days through weather forecasts and prepare for them with proactive measures. The following are a few recommendations to aid in the prevention of heat related problems:

1. Begin drinking fluids early in the day – waiting until the hottest portion of the day to replenish body fluids is too late. Avoid caffeine and alcohol the night before and during the day.

2. Dress for the conditions. Lightweight, loose clothing is best. Avoid layering clothing underneath coveralls.

3. A well balanced diet will help. Heavy, fatty foods do not support the body well in high heat conditions. Fruits, vegetables, proteins, and starches work best.

4. Electrolyte solutions help to maintain energy levels. Do not drink more electrolyte solution than water. Avoid taking salt tablets unless directed to do so by your physician.

5. Use sunscreen and cover your face and neck from the sun.

6. Provide shaded areas for mini-breaks, and water stations, as much as possible when there are no existing shaded structures.

7. Strongly encourage short (1-2 minutes) water breaks every 20-30 minutes during high heat conditions.

8. Provide specially marked water barrels containing ice and water for soaking neck towels, arms, sleeves, bandannas, etc.

9. Make available the bandannas that can be refrigerated during the night and soaked in cold water during the day. (Magic Bandanna, Cool Bandanna, etc.)

10. Provide specific areas for employees to go to on a scheduled basis and cool off when working in full sun areas. These would be considered mandatory breaks (In addition to the short water breaks). This should be done every 1 to 1 ½ hours. Fans and sitting areas should be provided so those employees can sit with their coveralls unzipped and cool down. This break should be 10-20 minutes in length.

11. Using a thermo scan type instrument, monitor personnel in their work areas to assure that there are not any consistently high core body temperature problems. Core body temperature should never exceed 101 degrees. Pay particular attention to areas that have restricted airflow such as foundations, excavations, and vessels.

12. Monitor work areas for ambient temperatures. Use the heat index chart to determine the apparent temperature. Areas with apparent temperatures over 95 degrees should be monitored for personnel problems. Begin providing extra measures for the workers.

MOST IMPORTANTLY: Do not let schedule or productivity influence awareness or caution in high heat weather. Pressure from foremen or self-induced pressure is the most dangerous hazard. This program has to be supported from the Project Manager down through every level.

32.6 APPARENT TEMPERATURES

The apparent temperature is the combined index of heat and humidity, or what it really feels like to the body.

Using the apparent temperature as a guide, prevention measures are enacted when specified apparent temperatures are reached. Three stages are used to determine what action is to be taken. Listed below is a matrix of recommended actions to be taken when specific apparent temperatures are reached.

PROACTIVE MEASURE MATRIX

Apparent Temperature	90 – 96ºF Level One	97 –104ºF Level Two	105 – 115ºF Level Three
Proactive Measures (Refer section 42.5)	1, 2, 3, 4	5, 6, 7, 8	9, 10, 11, 12

Water Intake	1-2 cups each 20-30 min	2-4 cups each 15-25 min.	4-6 cups each 15-20 min.
Breaks	Frequent 1-2 min. water breaks plus 15 min. cool down breaks shade / fans	Frequent 1-2 min. water breaks plus 15-20 min. cool down breaks shade / fans	Frequent 1-2 min. water breaks plus 15-20 min. cool down breaks shade / fans
Fluid Supplies	Begin to provide electrolyte solution	Provide electrolyte solution and more than adequate supply of water	Provide more than adequate water and electrolyte solution. Strongly encourage frequent short breaks.

32.7 FLUID INTAKE

High apparent temperatures can cause the body to lose large amounts of fluid through sweating. This fluid loss must be replaced to maintain normal bodily functions. The chart below shows the effect of fluid loss in terms of weight. You can see that there is a noticeable change when fluid loss occurs.

Weight Loss Examples
(Pounds)

Beginning Weight	Weight at 1% Loss	Weight at 2% Loss	Weight at 2.5% Loss
150	148.5	147	146.3
175	173.3	171.5	170.6
200	198.0	196.0	195.0
225	222.8	220.5	219.4

The chart in section six shows the recommended amounts of fluid intake. As the temperature increases, the fluid intake should increase accordingly. Electrolyte solutions are beneficial in the fight against heat stress.

Water is the essential ingredient and the worker should never drink more electrolytes than water. A good rule of thumb is to drink 2-3 glasses of water to one glass of electrolyte solution.

Do not wait until the temperature gets high to begin replacing fluids. The body can absorb and store excess amounts of fluids. Begin drinking water early in the day to establish a “store” of extra fluid for use when the heat rises. This will help to prevent attempts to “catch up” by drinking large amounts of water when it gets really hot. Trying to catch up does not work. You must replace the fluids in a fashion, which keeps the fluid intake slightly ahead of the fluid loss. Drinking large amounts of fluids in an attempt to catch up can cause stomach cramps, which will cause the person to vomit most of the time.

Strongly encourage short, frequent water breaks in anticipation of high heat workdays.

32.8 STEPHENSON SHELTER

The following information was obtained from the National Weather Service in Houston Texas. This information is provided to be able to obtain accurate temperature measurements on the job site.

The “Stephenson Shelter” is the National Weather Service’s recommended method for obtaining accurate temperature measurements. The following information outlines the steps for construction of the device.

- A box approximately 12-18 inches square must be made.
- The material can be wood, metal, or plastic.
- The bottom should be open and the top should be covered.
- There should be louvers or vents along each side for good airflow.
- The box should be a white color (paint or white plastic).
- The box should be suspended approximately 6 feet off the ground.
- The box should be placed in an open field or area in direct sunlight.
- The thermometer or temperature probe should be placed in the center of the box.
- If reading humidity also, place the measurement device in with the temperature probe.

33. MATERIALS HANDLING AND STORAGE

How construction materials are handled can have a considerable effect on the efficiency of production and on the safety record of the site. Because of the temporary nature of site work and the frequent change of the work place, it is not possible to mechanize material handling to the same extent, as it would be in a more stable operation. However, there are many areas in which labor intensive, inefficient, costly, and frequently dangerous, manual material handling work can be replaced by the use of machines.

To have an effective material handling and storing safety and health program, managers must take an active role in its development. First-line supervisors must be convinced of the importance of controlling hazards associated with materials handling and storing and must be held accountable for employee training. An on going safety and health program should be used to motivate employees to continue to use necessary protective gear and to observe proper job procedures.

Instituting these practices, along with providing the correct materials handling equipment, can add a large measure of worker safety and health in the area of materials handling and storing.

Approach Company. will handle hazardous materials in compliance with Identifying, Ordering, Receiving, Storing, Issuing and Disposing of Hazardous Materials”.

33.1 PLANNING

Successful mechanization of material handling requires that the correct machines be available and properly used.

The storage and movement of the various materials must be carefully arranged to make optimum use of the machines so that efficient service can be provided and ensure that all vehicle, crane and heavy equipment operators hold current Sudan Government License and Client Certification where required.

Planning for materials handling operations begins as the production schedule is being drawn. Ensure that the layout of storage areas provides for adequate access for necessary mechanical equipment.

Selection of the storage area should be made with due consideration for drainage and protection from rain and sandstorms.

Open storage areas should be planned to minimize the reversing and maneuvering of trucks especially into and out of confined areas.

Access ways must be wide enough to allow for the passage of fire trucks. Fire fighting equipment should be located throughout the area.

Cribbing timber, racks, or pallets should be used to ensure that all materials are stored off the ground.

Protection should be provided for materials such as cement, insulation, and other bulk material, which could be damaged by moisture.

All machinery, equipment, and valves should be maintained fully assembled and securely closed. All machined surfaces must be covered and fully protected from exposure to the weather.

Flammable stores shall be kept separated.

Such a policy should greatly reduce losses due to pilferage or damage. Once these factors have been established, the staffing of the storage areas can then be considered.

33.2 POTENTIAL HAZARDS

Handling and storing materials involves diverse operations such as hoisting steel with a crane, driving a truck loaded with concrete blocks, manually carrying drums, barrels, kegs, lumber or loose bricks. The improper handling and storing of materials can cause costly injuries.

Workers frequently cite the weight and bulkiness of objects being lifted as major contributing factors to their injuries. The second factor frequently cited was body movement. Bending followed by twisting and turning were the more commonly cited movements that caused back injuries.

In addition, workers can be injured by falling objects, improperly stacked materials, or by various types of equipment. When manually moving materials, however, workers should be aware of potential injuries, including the following:

Strains and sprains from improperly lifting loads, or from carrying loads that are either too large or too heavy.

Fractures and bruises caused by being struck by materials, or by being caught in pinch points.

Cuts and bruises caused by falling materials that have been improperly stored, or by incorrectly cutting ties or other securing devises.

Since numerous injuries can result from improperly handling and storing materials, it is important to be aware of accidents that may occur from unsafe or improperly handled equipment and improper work practices, and to recognize the methods for eliminating, or at least minimizing, the occurrence of these accidents.

33.2.1 Methods Of Prevention

General safety principles can help reduce workplace accidents. These include:

- Good work practices.
- Ergonomic principles.
- Training and education.

Whether moving materials manually or mechanically, employees should be aware of the potential hazards associated with the task at hand, and how to exercise control over their workplaces to minimize the danger.

33.3 MOVING, HANDLING AND STORING MATERIALS

When manually moving materials, employees should seek help when a load is so bulky it cannot be properly grasped or lifted, when they cannot see around or over it, or when a load cannot be safely handled.

When an employee is placing blocks under raised loads, the employee should ensure that the load is not released until his hands are clearly removed from the load. Blacking materials and timbers should be large and string enough to support the load safely. Materials with evidence of cracks, rounded corners, splintered pieces, or dry rot should not be used for blocking.

Handles and holders should be attached to loads to reduce the chances of getting fingers pinched or smashed.

Workers should also use appropriate protective equipment. For loads with sharp or rough edges, wear gloves or other hand and forearm protection.

When the loads are heavy or bulky, the mover should also wear steel-toed safety shoes or boots to prevent foot injuries if the worker slips or accidentally drops a load.
When mechanically moving materials, avoid overloading the equipment by letting the weight, size, and shape of the material being moved dictate the type of equipment used for transporting it. All materials handling equipment has rated capacities that determine the maximum weight the equipment can safely handle and the conditions under which it can handle those weights. The equipment-rated capacities must be displayed on each piece of equipment and must not be exceeded except for load testing.

When picking up items with a powered industrial truck, the load must be centered on the forks and as close to the mast as possible to minimize the potential for the truck tipping or the load falling. A lift truck must never be overloaded, because it would be hard to control and could easily tip over.

Extra weight must not be placed on the rear of a counterbalanced forklift to offset an overload.

All stacked loads must be correctly piled and cross-tiered, where possible.

Stored materials must not create a hazard. Storage areas must be kept free from accumulated materials that may cause tripping, fires, or explosions, or that may contribute to the harboring of rats and other pests.
When stacking and piling materials, it is important to be aware of such factors as the materials height and weight, how accessible the stored materials are to the user, and the condition of the containers where the materials are being stored.

All bound materials should be stacked, placed on racks, blocked, interlocked, or otherwise secured to prevent it from sliding, falling or collapsing.

Where applicable, load limits should be conspicuously posted in all storage areas.

When stacking materials, height limitations should be observed. For quick reference, walls or posts may be painted with stripes to indicate maximum stacking heights.

Used lumber must have all nails removed before stacking. Lumber must be stacked and leveled on solidly supporting bracing. The stacks must be stable and self-supporting.

When masonry blocks are stacked higher than 6 feet, the stacks should be tapered back one-half block for each tier above the 6-foot level.

Bags and bundles must be stacked in interlocking rows to remain secure. Bagged material must be stacked by stepping back the layers and cross-keying the bags at least every ten layers. To remove bags from the stack, start from the top row first. Boxed materials must be banded or held in place using crossties or shrink plastic fiber.

Drums and barrels must be stacked symmetrically. If stored on their sides, the bottom tiers must be blocked to keep them from rolling. When stacked on end, put planks, sheets of plywood, or pallets between each tier to make a firm, flat, stacking surface. When stacking materials two or more tiers high, the bottom tier must be chocked on each side to prevent shifting in either direction.

Structural steel, bar stock, poles, and other cylindrical materials, unless in racks, must be stacked and blocked to prevent spreading or tilting.

33.4 ERGONOMIC SAFETY AND HEALTH PRINCIPLES

Ergonomics is defined as the study of work and is based on the principle that the job should be adapted to fit the person, rather than forcing the person to fit the job. Ergonomics focuses on the work environment and items such as design and function of workstations, controls, displays, safety devices, tools, and lighting to fit the employees' physical requirements and to ensure their health and well being.

Ergonomics includes restructuring or changing workplace conditions to make the job easier and reducing stresses that cause cumulative trauma disorders and repetitive motion injuries. In the area of materials handling and storing, ergonomic principles may require controls such as reducing the size or weight of the objects lifted, installing a mechanical lifting aid, or changing the height of a pallet or shelf.

Although no approach has been found for totally eliminating back injuries resulting from lifting materials, a substantial number of lifting injuries can be prevented by implementing an effective ergonomics program and by training employees in appropriate lifting techniques.

In addition to using ergonomic controls, there are some basic safety principles that can be employed to reduce injuries resulting from handling and storing materials, these include taking general fire precautions and keeping aisles and passageways clear.

In adhering to fire safety precautions, employees should note that flammable and combustible materials must be stored according to their fire characteristics. Flammable liquids for example must be separated from other material by a firewall. In addition, other combustibles must be stored in an area where smoking and using an open flame or spark-producing device is prohibited. Dissimilar materials that are dangerous when they are exposed to each other must be stored apart.

When using aisles and passageways to move materials mechanically, sufficient clearance must be allowed for aisles at loading docks, through doorways, wherever turns must be made, and in other parts of the workplace. Providing sufficient clearance for mechanically moved, materials would prevent workers from being pinned between the equipment and fixtures in the workplace, such as walls, racks posts, or other machines.

Sufficient clearance will also prevent the load from striking an obstruction and falling on an employee. All passageways used by employees should be kept clear of obstructions and tripping hazards. Materials in excess of supplies needed for immediate operations should not be stored in aisles or passageways, and permanent aisles and passageways must be marked appropriately.

33.5 TRAINING AND EDUCATION

A formal training program will be introduced to help reduce materials handling hazards. The content of the training will emphasize the factors that will contribute to reducing workplace hazards including the following:

Alerting the employee to the dangers of lifting without proper training.

Showing the employee how to avoid unnecessary physical stress.

Teaching workers to become aware of what they can comfortably handle without undue strain.

Instructing workers on the proper use of equipment.

Teaching workers to recognize potential hazards and how to prevent or correct them.

Because of the high incidence of back injuries, safe-lifting techniques for manual lifting should be demonstrated and practiced at the work site by supervisors as well as employees.

A training program to teach proper lifting techniques should cover the following topics:

Awareness of the health risks to improper lifting.

Knowledge of the basic anatomy of the spine, the muscles, and the joints of the trunk, and the contributions of intra-abdominal pressure while lifting.

Awareness of individual body strengths and weaknesses, determining one's own lifting capacity.
Recognition of the physical factors that might contribute to an accident, and how to avoid the unexpected.

Use of safe lifting postures and timing for smooth, easy lifting and the ability to minimize the load-moment effects.

Use of handling aids such as stages, platforms, or steps, trestles; shoulder pads, handles, and wheels.

Knowledge of body responses-warning signals-to be aware of when lifting.

34. PRESSURE TESTING

It is essential that safe practices be observed during pressure testing, due to the potential hazards associated with high-pressure liquids and gases.

It is the policy of Approach Company that the safety of personnel and existing live plant is of paramount importance at all times. This is especially relevant when conducting operations involving high pressure testing.

34.1 PREPARATION

Approach Company shall assign persons to be responsible for:

- Preparation of the test procedure.
- Delivery of the approved test procedures to job sites.
- Safety aspects of the pressure test.
- Co-ordination and implementation of the pressure test in a safe manner.

The person in charge of hydrostatic testing procedure should have read and fully understand the safety requirements and procedures involved with pressure testing. All persons who will work on the pressure test must be informed of the potential hazards and the necessary safety precautions.
A work permit shall be issued prior to commencement of hydrostatic test operations.

Written, approved procedures shall be provided to all concerned personnel at least two days before testing, and be available at the job sites, for pressure tests. The test procedures shall be conducted in accordance with the applicable code.

- Filling and pressurizing shall be done on the upstream side of check valves in the system. The test fluid shall be injected at the lowest point in the system to minimize entrapped air. When filling at the lowest point

is not practical, the Inspection Department/ Operations Inspection Engineering Unit shall be consulted. All vents shall be open during filling.

- After the test pressure is reached and before commencement of inspection of the system, the isolation valve between the temporary test manifold/piping and the piping/equipment under pressure test shall be closed and the test pump disconnected.
- During the application of the test pressure, all in-line valves if not used, as test isolation valves shall be in an open position.

Piping, vessels, supports and foundations designed for gas service shall not be overloaded by the extra weight of the test liquid. Temporary supports and braces may be required where specified by engineering department.

The person in charge of hydrostatic testing shall ensure before testing that vents have adequate capacity and are installed at high points, to vent air / gas from the item while it is being filled with the test liquid. Hazardous gases or vapors must be vented clear of any area where personnel are working or where there is any possible source of ignition. Drains must be installed at a suitable location to allow removal of the test liquid.

Where isolation valves are used to contain test pressures, they must be of adequate rating for the pressure to be encountered. If isolation valves are used in lieu of blinds, provisions shall be made to ensure that no over-pressurizing can occur in equipment that is not being tested, due to possible valve leak.

Prior to testing, investigations shall be carried out to verify whether or not temporary restraints are required to restrict the movement of piping and joints during testing; when necessary, adequate restraints shall be provided.

Appropriate test equipment shall be used to assure a controlled pressure increase, no overpressure, and safe depressurization.

Appurtenances not part of the pressure test shall be blinded to exclude equipment, which cannot withstand the test pressure. If isolation valves are used in lieu of blinds, provisions shall be made to ensure that no over-pressuring can occur in equipment that is not being tested, due to possible valve leak.

Portions of the system such as supports, vessels, piping, and foundations shall not be overloaded by the weight of a test liquid.

Materials Safety Data Sheets or Chemical Hazard Bulletins shall be reviewed for all chemicals to be handled.

The metal temperature during a pressure test shall be in accordance with, General Requirements for Pressure Testing.

Personnel shall be posted at specific points on the plant to keep the test area clear of people not connected with the test.

Personnel carrying out the test shall be provided with a safe place from which the progress of the test can be observed and controlled.

Warning signs shall be placed at locations where people could be exposed.

34.2 GENERAL REQUIREMENTS

Do not approach system never previously tested, corroded piping or vessels, or vessels with welds never previously tested during the stepwise increase in pressure to the strength test pressure. The actual pressure at which the system under test will be approached for close inspection shall be specified in the test procedure.

Only calibrated test gauges shall be used and they should be mounted in the upright position. Pump discharge gauges must be visible to the pump operator for the duration of the test.

The pressure rise during a pressure test should be gradual and under control to allow time for material to strain, and time for personnel to check for leaks.

A system under test shall be depressurized (with the exception of pressure due to a liquid head) before any work is done to stop leaks or repair weakness, including the tightening of bolts. In tightness tests, bolts may be tightened without depressurizing, if specifically approved in the written test procedure.

After preliminary checks for leaks at the above pressure, the pressure shall be increased in steps, with at least 10-minute holds at each step to permit inspection for leaks and weaknesses. Do not proceed to a higher pressure until weakness has been repaired and leaks have been stopped.

A block valve is required on the line from the test pump to the equipment under test.

34.2.1 Test Liquid

Water is a normally the preferred test liquid. Alternatives must be approved by a deviation from standard or they may be used if they are specifically permitted by.

To avoid corrosion and possible resulting failures from hydrostatic test water, chemical treatment and selection of hydrostatic test water shall be followed.
Salt water must not be used for testing any material subject to stress corrosion cracking in the presence of chloride ions.
Pneumatic (gas) testing may be required. Testing with air or other gases under pressure can be hazardous due to the explosion potential.

Possible changes in pressure due to thermal expansion, contraction or hydrostatic heads must be taken into account.

Written procedures approved prior to testing shall be followed for the disposal of test mediums containing chemical additives for control of corrosion or bacteria, as per the requirements

34.3 AFTER TEST

Lines should be drained and dried mechanically when the test liquid is corrosive or otherwise hazardous.

Upon completion of the test, the system will be emptied in such a way as not to cause a vacuum and collapse. The depressurizing valve and piping shall be arranged for safe discharge of the test medium upon completion of the test. A system shall not be depressurized by loosening bolts in a flange or by unscrewing fittings, as this could lead to injury to personnel.

Written procedures approved prior to testing shall be followed for the disposal of test water containing chemical additives.

Drain the system slowly, and with the vents open, to prevent a possible vacuum.

34.4 CHECKLIST FOR PRESSURE TESTING SAFELY

Before Start of Test

1. Assign responsibility.
2. Issue written, approved procedures.
3. Use proper test medium.

4. Select and treat hydrostatic test water.
5. Use appropriate test equipment.
6. Obtain work permits
7. Isolate equipment not adequate for test pressure.
8. Prevent overloads from weight of liquid.
9. Handle chemicals safely.
10. Avoid failure by brittle fracture.
11. Control access to the test area.
12. Publicize tests interfering with traffic.

During and After Test

1. Remove air before pressurizing.
2. Control pressure rise.
3. Depressurize before stopping leaks or repairing.
4. Restrict approach to the test area.
5. Depressurize safely
6. Dispose of test medium safely.
7. Follow additional safety precautions.

35. APPENDIXES

35.1. Appendix-1: HSE Policy Statement
35.2. Appendix-2: Inspection Report Format
35.3. Appendix-3: Risk Planning& Assessment
35.4. Appendix-4: Job Safety Analysis.
35.5. Appendix-5: Internal Audit Report Format
35.6. Appendix-6: Internal Audit Check List
35.7. Appendix-7: Improvement Action Plan

إرشادات السلامة والصحة لشركة أبروتش الهندسية

لضمان الظروف الصحية والسلامة الجيدة بالمواقع ومناطق العمل والمكاتب والمستودعات ترجو الشركة إتباع التعليمات التالية للمستخدمين والعمال والزوار.

1. الترتيب الجيد لمناطق العمل والمخازن مع التأكيد علي النظافة.
2. علي جميع العاملين إرتداء أحذية السلامة وغطاء الرأس الواقي والملابس الملائمة مع النظارات الواقية.
3. في حالة اللحام أو إستخدام اللهب علي العاملين إرتداء واقي اللحام للعيون مع النظارات الواقية وعليهم التأكد من وضع أدوات الاطفاء في متناول اليد.
4. صندوق الاسعافات الاولية يجب وضعه دائماً بمكان ظاهر في مناطق العمل والمستودعات والمكاتب.
5. شركة أبروتش الهندسية ترجو من كل العاملين إزالة جميع المواد والادوات الخطرة من مناطق العمل دون الاهتمام بتبعيتها لاي جهة كانت.
6. شركة أبروتش الهندسية تنصح الجميع في حالة حدوث أي حادث بالتبليغ الفوري لمندوبها بالموقع ليتخذ ما يلزم.

في الاخير تتمني شركة أبروتش للجميع السلامة والعمل في جو معافي وسليم والتقيد بالارشادات المذكورة عاليه.

م. أحمد محمد أحمد عثمان

المدير العام

Healthy, Safety and Environmental procedure for Approach Engineering Co

For the safety and health and good environmental site and field this regulation and procedure should be restrictedly followed up for all employees, workers and visitors.

1. Good housekeeping and cleaning at working area and warehouse.
2. Worker should wear safety shoes, safety helmets, uniforms and goggles.
3. In case of welding or torch flame application the worker should wear welding shields, eye goggles and should keep fire fighting always near them.
4. The first Aid Box should be kept at work sites, warehouse and office.
5. Approach Company requesting all employees to remove any hazards materials from work site regard less to whom it is belong.
6. Approach Company advising to report of any accident occurred at site to company representative so to take action.

At last Approach Company wishing good and safe conditions for all people and to comply with all safety precautions.

Eng. Ahmed M. A. Osman

General Manager

APPROACH Engineering Co.Ltd

INSPECTION REPORT

1. Name and address of person for whom inspection was carried out.

2. Site address.

3. Date and time of inspection.

4. Location and description of place of work or work equipment inspected.

5. Matters which give rise to any health and safety risks.

6. Can work be carried out safely? **Y / N**

7. If not, name of person informed.

8. Details of any other action taken as a result of matters identified in 5 above.

9. Details of any further action considered necessary.

10. Name and position of person making the report.

11. Date and time report handed over.

12. Name of person receiving report.

RISK PLANNING& ASSESSMENT

APPROACH Engineering Co.Ltd

 ver HSRAP6a.xls

RISK ASSESSMENT Company			Conducted by			Location	When	Date to review
Ref					RATING overall			
	What are the hazards and associated risks?	Who is exposed, how many, often, for how long	SEVERITY How severe?	LIKELIHOOD How likely?	RATING	How well is the risk being controlled now?	What more needs to be done?	By whom and by when? Cost+ time
			5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐	5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐	1----5----10----15----20----25			
			5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐	5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐	1----5----10----15----20----25			
			5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐	5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐	1----5----10----15----20----25			
			5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐	5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐	1----5----10----15----20----25			
	List the hazards by stage and the risk they present. Identify relevant legislation if you can.	People exposed, what kind of people? For how long? How frequently?	5 Disablement or death 4 Days in hospital 3 Three days+ off work 2 On site first aid <time off work 1 Minor injury- no time off	Are the chances of the risk being realised 5 Very likely 4 Quite Likely 3 Likely 2 Unlikely 1 Very Unlikely	Multiplying **Severity X Likelihood** score = 1 to 25	List the controls in place and say how effective they are.	State what else needs to be done to control the hazards and the risks they present.	Name individuals responsible for action and put a time on when the result is required. Specify any significant resources needed.

Date actioned .... Date re-assessed.....................................

RISK PLANNING& ASSESSMENT

RISK ASSESSMENT CRITERIA

	Probability Rating			
Severity Rating 1.	Highly improbable but known	2. Occasional occurrence	3. Frequent occurrence	4. Almost a certainty
1. Negligible or minor injuries	1	2	3	4
2. Severe injuries	2	4	6	8
3. Single fatality	3	6	9	12
4. Multiple fatalities on site/in facilities	4	8	12	16

- The probability scoring, using the system above, is based upon the author's assessment of the risk which would occur if practice which is commonly used is adopted without special consideration of the hazards. All of the risks can be reduced if suitable measures are takenas indicated and relevant legislation, codes of practice, etc. have beenimplemented.
- If the assessment falls within the shaded area, then preventive/ precautionary/control methods are required (see below, column headedAction Required). PC = Principal Contractor.

	OWWNER NAME		APPROACH ENG. COMPANY LTD.	

CONTRACT NO.:…….

CONTRACT TITLE

Job Safety Analysis Worksheet	Date:	
Title of Job/Operation:	**Contractor /Contract Number:**	*000000000*
Prepared by:	**Sig:**	**Date:**
Endorsed by:	**Sig:**	**Date:**
Approved by:	**Sig:**	**Date:**
Personal Protective Equipment Required or Recommended:	Eye protection, Helmets, Leather gloves, Safety shoes, Proper Mask for outdoor area, Overall…etc.	

	OWWNER NAME		APPROACH ENG. COMPANY LTD.	

Risk Assessment Description:

SN	Description of Step	Hazard/Risk description	Actions and control to reduce/prevent risk
.1	Activity-1		
.2	Activity-2		
.3	Activity-3		
.4	Activity-4		
.5	Activity-5		
.6	Activity-6		

INTERNAL HSE-AUDIT REPORT FOR APPROACH ENGINEERING COMPANY LTD.

1.0 Executive Summary

2.0 Background

By definition, a HSE audit is a 'systematic examination against defined criteria to determine whether activities and related results comply with planned arrangements, and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives'. An audit of a HSWMS is separate from a workplace inspection program. Inspections are conducted to detect hazards in the workplace and to check how well risk controls are working for particular activities, processes or areas. Audits look at the procedures and processes that are intended to manage the entire health and safety program, rather than the individual deficiencies and failures identified during inspections. These two activities (audit and inspection), are complementary to each other and are not mutually exclusive.

Some of the audit criteria refer to the requirements of the relevant health and safety legislation, and conformance to these criteria should indicate that the organisation has adopted the management practices needed to fulfil its legal responsibilities. However, conformance to the audit criteria alone does not assure compliance with all statutory obligations nor does it preclude any action by a regulatory body.

The HSE audits are a tool to assess how effectively the system, including its structure, policies, planning activities, resourcing, operating procedures, and work practices combine together to manage the risks associated with the organisation's business. Audits are not designed to measure the performance of individuals working within the system. Instead, the information generated through an audit will provide evidence and rate the level of performance by the business unit against the essential and best practice audit criteria, and will provide recommendations for solutions to any identified problems.

This document specifies essential and best practice criteria against which HSE performance can be measured. It then rates the level of performance on a five-tier evaluation scale from best practice to non-conformance (i.e. A through to E).

3.0 Results Summary

Findings of the HSE management system review are detailed in the HSE Assessment & Improvement Standard – Criteria Checklist (see Attachment A). These findings may include recommendations for implementation for both the Company and the department. The HSE Improvement Action Plan (see Attachment B) included in this report will only include recommendations for the Company

A summary of the findings for each performance criteria is outlined below.

Key Element	Performance Criteria	Rating	Score
A. HSW Policy & Commitment	1 HSW Policy	A	5
	2 Management Responsibility	Insert	Insert
B. Planning	3 Planning Processes		
C. Implementation	4 Consultation		
	5 Risk Management		
	5(a) Driver Safety		
	6 Healthy Lifestyle Programs		
	7 Information, Instruction & Training		
	8 Injury Treatment & Management		
	9 Claims Management		
	10 Incident Recording, Investigation, Analysis & Review		
D. Measurement & Evaluation	11 Measuring & Evaluating HSW Performance		
E. Review & Improvement	12 Reviewing HSW Performance		
	13 Institute/Regional Director and/or DG Reporting		
Overall Rating			

4.0 Acknowledgements

5.0 Key Findings

Element A: HSE Policy & Commitment

1. HSE Policy
[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

2. Management Responsibility
[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

Element B: Planning
3. Planning Processes

[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

Element C: Implementation

4. Consultation

[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

5. Risk Management

[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

5 a. Safe Driving Program

[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

6. Healthy Lifestyle Program

[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

7. Information, Instruction & Training

[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

8. Injury Treatment & Management

[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

9. Claims Management

[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

10. Incident Recording, Investigation, Analysis & Review

[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

Element D: Measurement and Evaluation

11. Measuring & Evaluating HSE Performance

[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

Element E: Review and Improvement

12. Reviewing HSE Performance

[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

13. Institute/Regional Director and/or Director General Reporting

[Insert Evaluation Comments]
Current Rating: [Insert Evaluation Rating]

Attachment A HSE Assessment & Improvement Standard - Criteria Checklist

HSE Management System Audit Analysis

Element A: HSE Policy & Commitment

Performance Criteria 1: HSE Policy There is a HSE policy that clearly states the senior management's commitment to the HSE function outlines responsibilities for all parties and is clearly communicated to all staff.		
Essential Criteria:	**Compliance**	**Comments**
To be effective, the policy should:		
• Contain a general statement of aims and objectives for improving health and safety that are preventative in nature	[Insert Y/N]	[Insert Comments]
• Express clear commitment to health and safety of staff, visitors and contractors	[Insert Y/N]	[Insert Comments]
• Express clear commitment to improving health and safety performance, legislative compliance, and to the allocation of appropriate resources	[Insert Y/N]	[Insert Comments]
• Express a clear commitment to take a risk management approach to HSE	[Insert Y/N]	[Insert Comments]
• Recognise the key role of consultation between staff and management on HSE issue	[Insert Y/N]	[Insert Comments]
• Be clearly communicated to all staff within the business unit on a regular basis	[Insert Y/N]	[Insert Comments]
• Outline responsibilities of all parties including senior management, supervisors and employees.	[Insert Y/N]	[Insert Comments]

Best Practice:	**Compliance**	**Comments**
In addition, a best practice policy should:		
• Be signed and dated by the current Institute/Regional Director	[Insert Y/N]	[Insert Comments]

and/or Director General		
• Be dated within last twelve months or reviewed through quality procedures annually	[Insert Y/N]	[Insert Comments]
• Specify a systematic approach to planning and implementing HSE	[Insert Y/N]	[Insert Comments]
• Specify the negotiated and agreed arrangements for continuing consultation about health and safety	[Insert Y/N]	[Insert Comments]
• Include a review mechanism, which recognises the need to regularly scrutinise and review performance	[Insert Y/N]	[Insert Comments]
• Where applicable, refer to related policies such as injury management, rehabilitation.	[Insert Y/N]	[Insert Comments]
Evaluation Rating:	**[Insert Rating Letter]**	[Insert Evaluation Comments]

Recommendations:

1. [Insert recommendations]

Verification/Documentation Sighted:

[Insert Verification Document titles]

Rating Criteria for HSE Policy:

A. There is a written policy that meets all the essential and best practice criteria in the guidance.
B. There is a written policy that meets all the essential criteria in the guidance and specifies a systematic approach to planning and implementing HSE.
C. There is a written policy that meets all the essential criteria in the guidance. The policy does **NOT** specify a systematic approach to planning and implementing HSE.
D. There is evidence of a draft policy but it is not yet implemented.
E. There is no evidence of an organisational health and safety policy.

Performance Criteria 2: MANAGEMENT RESPONSIBILITY Performance agreements for Executives and senior managers include statements of responsibility for HSE.		
Essential Criteria:	**Compliance**	**Comments**
To be effective, agreements should ensure: • HSE is set out as a key accountability in performance agreements • The key accountability is supported by specific strategies • Specific HSE activities are included in senior managers' performance agreements • The HSE activities link to and reflect business unit's corporate HSE objectives • Performance measures are developed to assess senior manager's progress with HSE activities.		

Best Practice:	**Compliance**	**Comments**
In addition, to ensure best practice: • Progress with HSE activities performance are measured on an annual basis • Outcomes of progress is recorded centrally and reported to the Institute/Regional Director and/or DG on a regular basis • HSE activities are reviewed, so that they align with HSE corporate objective.		
Evaluation Rating:		
Recommendations:		
Verification/Documentation Sighted:		

Rating Criteria for Management Responsibility:

A. Performance agreements of Executives and senior managers include statements of responsibility to HSE that meet all the essential and best practice criteria in the guidance.
B. Performance agreements of Executives and senior managers include statements of responsibility to HSE that meet all the essential criteria and are reviewed annually by the DG.
C. Performance agreements of Executives and senior managers include statements of responsibility to HSE that meet all the essential criteria but they are **NOT** reviewed annually by the Institute/Regional Director and/or DG.
D. There is evidence of plans to include HSE responsibilities in performance agreements of Executives and senior managers but it has not yet been implemented.
E. There is no evidence of HSE responsibilities built into the performance agreements of Executives and senior managers.

Element B: Planning

Performance Criteria 3: PLANNING PROCESSES The planning processes include HSE as a key objective supported by defined measurable outcomes.		
Essential Criteria:	**Compliance**	**Comments**

To be effective, processes should ensure:
• The business unit has a corporate plan that includes HSE as an objective that links to the business unit's Key Result Area
• The corporate plan contains as a minimum:
  ○ clearly defined objectives and measurable targets derived from the risk assessment process
  ○ performance indicators that will allow the business unit to measure progress in achieving objectives and targets
  ○ specific actions to be taken to achieve the objectives and targets, within a set timeframe
  ○ assigned responsibility for the achievement of the objective and targets.
• The business plan contains specific HSE actions to assist in meeting the corporate HSE objective
• Planning for HSE is undertaken in consultation as per agreed consultation arrangements
• Planning considers arrangements for emergency planning.		

Best Practice:	**Compliance**	**Comments**
In addition, to ensure best practice: • Planning for HSE is based on the key priorities identified in the risk assessment process and key legislative requirements • A specific HSE plan is developed that links to the business unit's corporate and business plan, by reference to a corporate objective • Progress with HSE Plan is discussed at executive meetings and		

outcomes reported to the Institute/Regional Director and/or DG		
• Planning for HSE is reviewed on a regular basis (at least annually) in consultation with management, staff and unions, updated where required, and clearly communicated to management and staff.		
Evaluation Rating:		
Recommendations:		
Verification/Documentation Sighted:		

Evaluation
Rating Criteria for Planning Processes:

A. The business unit's plans meet all the essential and best practice criteria contained in the guidance.
B. The business unit's plans meet all of the essential criteria in the guidance. The HSE objective is based on the key priorities identified in the risk assessment process and is reviewed at least annually.
C. The business unit's plan meets all of the essential criteria in the guidance. The HSE objective is **NOT** based on the key priorities identified in the risk assessment process and/or reviewed at least annually.
D. There is evidence of the business unit's plans including an HSE objective but it is **NOT** yet implemented.
E. There is no evidence of an HSE objective in the business unit's planning processes.

Element C: Implementation

Performance Criteria 4: CONSULTATION There is a process in place for effective consultation on HSW issues.		
Essential Criteria:	**Compliance**	**Comments**

To be effective, consultation should ensure:
• A negotiated consultative arrangement is in place that is facilitated by:
  ○ a HSE committee
  ○ election of WHS representatives
  ○ other agreed arrangements
• Senior management are involved and active in the HSW consultation arrangements
• Consultation occurs whenever:
  ○ planning new facilities or refurbishing existing facilities
  ○ investigating incidents
  ○ reviewing risk assessments or implementing controls
  ○ developing, implementing and evaluating HSW programs, policies, procedures and management systems
  ○ determining training needs
  ○ planning changes to work practices, or introducing new ones
  ○ Planning to purchase new or different plant or substances.
• Information about HSE is shared with employees and employees are given the opportunity to participate in decisions affecting HSE and those views are taken into account
• The consultation process is clearly communicated to all staff.		

Best Practice:	**Compliance**	**Comments**

In addition, to ensure best practice:
• Additional forms of consultation are provided, e.g.:
  ○ Information sessions and focus groups
  ○ Including HSE on staff meeting agendas
  ○ Encouragement of staff suggestions and input into consultation process
  ○ HSE newsletters and/or inclusion of HSE matters in staff newsletters
  ○ Tool box meetings.
• The consultation process links to the HSE planning process.		

Evaluation Rating:		
Recommendations:		
Verification/Documentation Sighted:		

Evaluation
Rating Criteria for Consultation:

A. There is a process for consultation of HSE issues that meets all the essential and best practice criteria in the guidance.
B. There is a process for consultation of HSE issues that meets all of the essential criteria in the guidance. The consultation process links to the HSW planning process.
C. There is a process for consultation for HSE issues that meets all of the essential criteria in the guidance. The consultation process is **NOT** linked to the planning process.
D. There is evidence of a process for consultation of HSE being developed, but it has not yet been implemented
E. There is no evidence of a consultation process in place for HSE issues.

Performance Criteria 5: RISK MANAGEMENT – INCLUDING SAFE DRIVING PROGRAM Health and safety risks are systematically identified, assessed, eliminated or controlled and recorded on a continuous basis.		
Essential Criteria:	**Compliance**	**Comments**

To be effective, risk management should ensure:
• There is a process in place for the identification, assessment and elimination or control of all hazardous activities associated with:
  ○ work premises, materials and equipment
  ○ the layout and condition of the workplace
  ○ work practices, work systems and shift work arrangements
• The process includes hazards such as the potential for workplace stress and violence.
Hazard Identification
• Health and safety risks are systematically identified:
  ○ prior to procurement of goods and services
  ○ prior to completion of design work for new and refurbished premises
  ○ through regular workplace inspections
  ○ reviewing hazard/incident data
  ○ through task analysis.
Risk Assessment
• Risk assessment takes into consideration:
  ○ frequency of exposure of staff and others
  ○ potential severity of outcome
  ○ likelihood of occurrence
  ○ prioritisation of risks
  ○ need for risk assessment review process e.g. new hazards, change in work process
  ○ consultation with managers, staff and unions.		

Risk Control • Agencies plan the management and control of activities, products or services that can pose risks to the health and safety of employees. Risk control strategies consider risk management principles e.g.: Elimination, Substitution, etc.		

Best Practice:	**Compliance**	**Comments**
In addition, to ensure best practice: • Prioritised risks should be documented in a risk register or action plan • Prioritised safety improvements should be included in the planning process and aligned to senior managers' performance agreements • There should be a mechanism for the early reporting of significant risks to the Institute/Regional Director and/or DG • There is a mechanism for the ongoing review of the risk management process.		
Evaluation Rating:		
Recommendations:		
Verification/Documentation Sighted:		

Evaluation
Rating Criteria for Risk Management – including Safe Driving Program

A. There is a process in place for the identification, assessment and elimination or control of health and safety risks that meets all the essential and best practice criteria in the guidance.
B. There is a process in place for the identification, assessment and elimination or control of health and safety risks that meets all of the essential criteria in the guidance. A risk register or action plan is developed and it is linked to the business unit planning processes.
C. There is a process in place for the identification, assessment and elimination or control of health and safety risks that meets all the essential criteria in the guidance. A risk register or action plan is developed, but it is **NOT** linked to the business unit planning processes

D. There is evidence of a process for the identification, assessment and elimination or control of health and safety risks but it is **NOT** yet implemented.
E. There is no evidence of a hazard identification risk assessment process in place.

Performance Criteria 5a: SAFE DRIVING PROGRAM This audit criteria was endorsed by the QFleet Driver Safety Sub-Committee on 7 February 2007.		
Essential Criteria:	**Compliance**	**Comments**

To be effective, programs should ensure:
 	
• The safe driving program should be included as an objective in the business unit's planning process including
  ○ clearly defined objectives and targets
  ○ specific actions to be taken within a set timeframe
  ○ performance indicators that will allow the business unit to measure progress in achieving objectives and targets.
• The business unit must have a safe vehicle use policy/guideline/standard which addresses at least each of the following elements:
  ○ courteous and safe driving behaviours
  ○ vehicle induction and familiarisation
  ○ operating conditions
  ○ seatbelts and other safety features
  ○ speed
  ○ journey planning and fatigue management
  ○ rural and remote driving
  ○ licensing
  ○ fitness to drive
  ○ alcohol and other drugs
  ○ mobile phones and other distractions.
• A strategy for communicating the safe vehicle use policy/guideline/standard to all employees and examining employee understanding of the policy
• The incorporation of safe vehicle use policy into induction		

procedures for all staff • All vehicle crashes and incidents included in WH&S incident recording and reporting processes • Training and education for officers required to operate four-wheel drive vehicles (or other non-standard vehicles) and/or operate vehicles in off-road conditions or remote locations.		

Best Practice:	**Compliance**	**Comments**
In addition, to ensure best practice: ▪ A needs assessment performed annually ▪ The inclusion of a safe driving program in the business unit's WH&S management system ▪ Processes for monitoring the safety of drivers and for providing feedback to employees about their driving safety. An incentive/reward program for safe driving may also be developed ▪ Where a position requires an employee to spend a significant amount of working hours driving a vehicle, driving should be included in the position description for the position and in performance appraisal processes ▪ Education programs for drivers, including a focus on factors influencing driving behaviour and self examination of attitudes and behaviours.		
Evaluation Rating:		
Recommendations:		
Verification/Documentation Sighted:		

Rating Criteria for Safe Driving Program:

A. There is a safe driving program as a key objective supported by defined measurable outcomes that meets all the essential and best practice criteria.
B. There is a safe driving program included in the business unit's planning process and all of the essential criteria are met. Two or more of the best practice criteria are also met.
C. There is a safe driving program included in the business unit planning process and all of the essential criteria are met.
D. There is evidence that a safe driving program has been included in the business unit's planning process.
E. There is no evidence of a safe driving program included in the business unit's planning process with defined and measurable outcomes.

Performance Criteria 6: HEALTHY LIFESTYLE PROGRAM The business unit's planning processes include a healthy lifestyle program as a key objective supported by defined measurable outcomes.		
Essential Criteria:	**Compliance**	**Comments**

To be effective, programs should ensure:
• The healthy lifestyle program should be included as an objective in the business unit's planning process including:
  ○ clearly defined objectives and measurable targets
  ○ specific actions to be taken within a set timeframe.
• The healthy lifestyle programs should include:
  ○ a worksite based committee comprising the functional areas of the workplace including HSE, HR, health promotion, etc.
  ○ an organisational profile which identifies organisational, environmental and individual factors to be undertaken
  ○ voluntary participation by staff
  ○ a marketing and communication plan
  ○ infrastructural planning to ensure appropriate human and material resources have been identified
  ○ a needs assessment which allows staff to identify health issues of interest to them
  ○ program planning including multiple strategies at the organisational, environmental and individual level with defined measurable outcomes
  ○ a comprehensive evaluation plan including process, impact and outcome measures
• The healthy lifestyle program is clearly communicated to all staff
• Performance indicators that will allow the business unit to measure progress in achieving objectives and targets
• Information about healthy lifestyle is shared with all staff and staff are given the opportunity to participate in decisions about the		

healthy lifestyle program and those views are taken into account.		

Best Practice:	Compliance	Comments
To ensure best practice: • The needs assessment should occur on an annual basis • The healthy lifestyle program considers the interactive nature of factors affecting the health of staff such as job demands, worker characteristics, work culture, work environment and extra-organisational influences • Parameters for the evaluation of the healthy lifestyle program include cost-benefit and efficiency • Includes an annual review mechanism, which recognises the need to regularly scrutinise and review performance • There is a written policy and program plan for the healthy lifestyle program which is posted in every work area and/or staff noticeboard/ business unit intranet etc.		
Evaluation Rating:		
Recommendations:		
Verification/Documentation Sighted:		

Evaluation
Rating Criteria for Healthy Lifestyle Program:

A. There is a healthy lifestyle program as a key objective supported by defined measurable outcomes that meets all the essential and best practice criteria in the guidance.
B. There is a healthy lifestyle program that meets all the essential criteria in the guidance. The healthy lifestyle program is included as a key objective in the business unit's planning processes.
C. There is a healthy lifestyle program that meets all the essential criteria in the guidance. The healthy lifestyle program is NOT linked to the business unit's planning processes.

D. There is evidence of a planning process including healthy lifestyle program as a key objective but it has not yet been implemented.
E. There is no evidence of a planning process including healthy lifestyle program as a key objective supported by defined measurable outcomes.

Performance Criteria 7: INFORMATION, INSTRUCTION AND TRAINING There is a process in place for providing information, instruction and training for all staff on HSE issues.		
Essential Criteria:	**Compliance**	**Comments**
To meet the essential criteria, a process should be in place to ensure: • Each new employee receives induction training • Employees exposed to risks in the workplace are informed of procedures to maintain safety • Staff responsible for identifying, assessing and controlling workplace hazards are provided with information, instruction and training • Staff are trained whenever new equipment/plant is purchased or there are changes to the work environment • Managers and senior managers are provided with specific HSE information, instruction and training • HSE practitioners undertake specific professional development training • Staff with HSE functions such as First Aid Officers, Fire Wardens, Rehabilitation Coordinators, committee members etc. are provided with ongoing specific business unit information, instruction and training • Information, instruction and training is easy to understand, e.g. where English is a second language, consider providing information in the employee's native language • Information, instruction and training delivered is centrally recorded.		

Best Practice:	**Compliance**	**Comments**
To ensure best practice: • A needs analysis is carried out to identify information, instruction and training required within the business unit • The needs analysis is linked to the planning processes		

• Information, instruction and training provided is evaluated • Information, instruction and training needs are reviewed on at least an annual basis.		
Evaluation Rating:		
Recommendations:		
Verification/Documentation Sighted:		

Evaluation
Rating Criteria for Information, Instruction and Training:

A. There is a process in place for providing information, instruction and training to all staff on HSE issues that meets all the essential and best practice criteria in the guidance.
B. There is a process in place for providing information, instruction and training to all staff on HSE issues that meets all the essential criteria in the guidance. An information, instruction and training needs analysis is undertaken.
C. There is a process in place for providing information, instruction and training to all staff on HSE issues that meets all the essential criteria in the guidance. An information, instruction and training needs analysis is **NOT** undertaken.
D. There is evidence of a plan for providing information, instruction and training to all staff on HSE issues but it is not yet implemented.
E. There is no evidence of a process for providing information, instruction and training of staff on HSE issues.

Performance Criteria 8: INJURY TREATMENT AND MANAGEMENT There is a process in place for providing information, instruction and training for all staff on HSE issues.		
Essential Criteria:	**Compliance**	**Comments**
To satisfy the essential criteria a business unit should have a process in place for injury treatment and injury management that includes the following: **Injury treatment** • First-aid facilities (e.g. first aid officers, kits, rooms, trained personnel) • Arrangements with local Medical centre/GP/Staff health centre for priority treatment (These arrangements must recognise the right of workers to select their own medical practitioner) • Notification to Rehabilitation Coordinator or other relevant personnel of injury. **Injury management** • Appointment of Rehabilitation Coordinators in accordance with legislation • Notification of injuries to WorkCover within required reporting timelines • Participation in the development of an injury management plan for significant injuries with WorkCover • Early intervention e.g. early contact with injured worker to establish nature and severity of injury • Early injury management e.g. contact with treating doctor • Early and safe return to work e.g. support of return to work plans, modification to work environment/tasks, establishment of suitable duties • Monitoring of progress e.g. ensuring injured worker's progress is consistent with agreed rehabilitation plan		

• Managers of injured workers are actively informed of and involved in injury management.		

Best Practice:	Compliance	Comments
To ensure best practice: • Establishment of injury treatment and/or injury management policy • Communication of injury treatment/injury management process to all staff • Injury treatment and management processes are regularly reviewed • The business unit provides adequate financial and budget support to the injury treatment and injury management process.		
Evaluation Rating:		
Recommendations:		
Verification/Documentation Sighted:		

Evaluation
Rating Criteria for Injury Treatment and Management:

A. There is a process in place for the treatment and management of injuries that meets all the essential and best practice criteria in the guidance.
B. There is a process in place for the treatment and management of injuries that meets all of the essential criteria in the guidance. The process is clearly communicated to all staff and managers.
C. There is a process in place for the treatment and management of injuries that meets all of the essential criteria in the guidance. The process is **NOT** clearly communicated to all staff and managers.
D. There is a draft process in place for the effective treatment and management of injuries but it is not yet implemented.
E. There is no evidence of an effective injury treatment and/or management process in place.

Performance Criteria 9: CLAIMS MANAGEMENT There is a process in place for the timely and effective management of workers compensation claims.		
Essential Criteria:	**Compliance**	**Comments**
To meet the essential requirements, the worker's compensation claims management process implemented by the business unit should: • Obtain data, statistics and reports from WorkCover and track the progress of all claims • Conduct quarterly claims reviews and if required contact WorkCover claims manager's • Provide continuous case management of claims to ensure a return to work or the settling of the claim • Ensure managers and supervisors are actively involved in claims management and advise relevant parties about any information which may impact on the claim.		

Best Practice:	**Compliance**	**Comments**
In addition, to facilitate continuous improvement of claims management, the process should: • Ensure regular reporting and analysis of claims data is undertaken by business unit to understand claims trends and identify improvements and opportunities in claims management • Ensure outcomes of analysis and actions for improvement are reported to the senior manager responsible for claims management and outcomes for improvement are incorporated into the planning processes • Produce an annual report to Institute/Regional Director and/or DG on progress of workers' compensation claims management.		
Evaluation Rating:		
Recommendations:		

Verification/Documentation Sighted:

Evaluation
Rating Criteria for Claims Management:

A. There is a process in place for the management of workers' compensation claims that includes all essential and best practice criteria.
B. There is a process in place for the management of workers compensation claims that meet all of the essential criteria. Regular reporting and analysis of claims data is undertaken, reported to a senior manager and outcomes incorporated into the planning processes.
C. There is a process in place for the management of workers compensation claims that includes all of the essential criteria. Regular reporting and analysis of claims data is **NOT** undertaken, reported to senior manager and/or outcomes included into the planning process.
D. There is evidence of development of a claims management process, however it is not yet implemented.
E. There is no evidence of a claims management process in place.

Performance Criteria 10: INCIDENT RECORDING, INVESTIGATION ANALYSIS AND REVIEW There is a process in place to record, investigate, analyse and review all workplace related incidents.		
Essential Criteria:	**Compliance**	**Comments**
To satisfy the essential criteria a business unit should have a process for incident recording, investigation and analysis that includes the following: **Incident recording** • A register of injuries as required under section 134 of the WHS Regulation 2008 • Mechanism for notifying Workplace Health and Safety Queensland in accordance with section 135 of the WHS Regulation 2008. **Incident investigation** • An established incident investigation process • Investigations of incidents that lead to a workers compensation claim or hazard report to determine underlying causes • Repository for centrally recording results/ corrective actions of incidents • Mechanism for informing Institute/Regional Director and/or DG of all serious incidents. **Incident Analysis** • Injuries, ill health and other unplanned events are analysed yearly • Notices issued by Workplace Health and Safety Queensland are reviewed • Regular management reporting which result in management action • Results of the analysis are reviewed by Institute/Regional Director and/or DG. **Incident Review** • Incidents reviewed are prioritised and implemented to reduce the incidence and severity of accidents/injuries		

• Prioritised actions are incorporated into the planning process • Risk assessment of activity/process where injury/illness occurred is reviewed.		

Best Practice:	**Compliance**	**Comments**
To ensure best practice: • One form is used for recording all incidents • The incident recording system is automated • Investigation of all incidents is undertaken • Senior managers investigate serious incidents • Recommendations corrective actions following incident investigation are implemented • Incident information is analysed quarterly • Analysis of accidents, injuries, incidents and notices are available to all staff.		
Evaluation Rating:		
Recommendations:		
Verification/Documentation Sighted:		

Evaluation
Rating Criteria for Incident Recording, Investigation, Analysis and Review:

A. There is a process in place for the recording, investigation, analysis and review of all workplace incidents that meet all the essential and best practice criteria in the guidance.
B. There is a process in place for the recording, investigation, analysis and review of all workplace incidents that meets all the essential criteria in the guidance. There is a mechanism in place for checking corrective actions recommended from the incident investigation and analysis are implemented.
C. There is a process in place for the recording, investigation, analysis and review of all workplace incidents that meets all of the essential criteria in the guidance. There is **NOT** a mechanism in place for checking corrective actions recommended from the incident investigation and analysis are implemented.

D. There is evidence of the development of an incident reporting and investigation process but it is not yet implemented.
E. There is no evidence of an incident reporting and investigation process in place.

Element D: Measurement and Evaluation

Performance Criteria 11: MEASURING AND EVALUATING HSE PERFORMANCE There is a process in place to measure and evaluate the ongoing performance of the HSE management system.		
Essential Criteria:	**Compliance**	**Comments**
HSE Performance monitoring should: • Take place in consultation with key stakeholders, including employees, supervisors, key OH&S specialists and management representatives • Identify applicable HSE, Injury Management and Workers' Compensation legislation which applies to the business unit's activities • Assess degree of compliance with legislation • Determine proactive and reactive performance indicators e.g. outcomes of audit process, injury rates, costs and return to work rates • Identify successful strategies and current gaps in the HSE management system • Identify specific areas/issues which require improvement • Recommend improvements to be made to senior management.		

Best Practice:	**Compliance**	**Comments**
To ensure best practice: • HSE performance monitoring should be conducted at least annually • Results of monitoring should be reported to Institute/Regional Director and/or DG • Actions for improvement should be included in business unit's planning processes and/or other plans as necessary e.g. Human Resources, IT, procurement and design.		

Evaluation Rating:		
Recommendations:		
Verification/Documentation Sighted:		

Evaluation
Rating Criteria for Measuring and Evaluating HSE Performance:

A. There is a process in place for the ongoing monitoring and review of the HSE management system that meets all essential and best practice criteria in the guidance.
B. There is a process in place for the ongoing monitoring and review of the HSE management system that meets all the essential criteria in the guidance. Results are incorporated into the business unit's planning processes.
C. There is a process for the ongoing monitoring and review of the HSE management system that meets all the essential criteria. Results are **NOT** incorporated in the business unit's planning processes.
D. There is evidence of process for the monitoring and review of HSE performance being developed but it is not yet implemented.
E. There is no evidence of a process developed or being developed for the ongoing monitoring review of the HSE management system.

Element E: Review and Improvement

Performance Criteria 12: REVIEWING HSE PERFORMANCE Reviews of HSE performance feed into the planning processes of the business unit. Establish if review processes are integrated into the management system. Review results are planned and implemented.		
Essential Criteria:	**Compliance**	**Comments**
To be effective and ensure currency the review should include consider the outcomes of the measurement and evaluation processes in regards to: • Implementation of the HSE policy • Progress with achieving HSE accountabilities in Institute/Regional Director and/or DG's performance agreement and activities in senior managers' performance agreements • Implementation and effectiveness of HSE planning processes • Implementation and effectiveness of risk, injury and claims management processes • Arrangements for consultation • Progress with delivery of information, instruction and training against plan and increase in awareness of employees and management with HSE issues • Implementation of incident recording, investigation and analysis processes • Reporting to Institute/Regional Director and/or DG • Corrective actions implemented • HSE performance monitoring • In addition, outcomes of the review should be incorporated into the business unit's planning process.		

Best Practice:	**Compliance**	**Comments**

To be effective, a review of HSE management systems will also consider: • Changes in legislation		
• Changing expectations and requirements of interested parties		
• Changes in the products or activities of the organisation		
• Changes to the structure of the organisation		
• Advances in science and technology		
• Market preferences		
• Feedback, particularly from employees.		
Evaluation Rating:		
Recommendations:		
Verification/Documentation Sighted:		

Evaluation
Rating Criteria for Reviewing HSE Performance:

A. There is a process in place for reviewing HSE performance that meets all the essential and best practice criteria in guidance.
B. There is a process in place for reviewing HSE performance that meets all the essential criteria in guidance. The review also considers changes to the structure of the organisation and/or the services provided by the organisation.
C. There is a process in place for reviewing HSE performance but it does **NOT** consider changes to the structure of the organisation and/or the services provided by the organisation.
D. There is a draft process for reviewing HSE performance but it is not yet implemented.
E. There is no evidence of a review of HSE performance within the business unit.

Performance Criteria 13: INSTITUTE/REGIONAL DIRECTOR AND/OR DIRECTOR GENERAL REPORTING The Institute/Regional Director and/or Departmental Director General is informed of and regularly updated on the business unit's HSE performance.		
Essential Criteria:	**Compliance**	**Comments**

To be effective, the reporting should ensure:
 	
• The Institute/Regional Director and/or DG receives at least yearly reports on business unit's progress with:
  ○ planning for HSE
  ○ incident statistics
  ○ HSE litigation
  ○ senior manager's progress against HSE performance targets
  ○ HSE training
  ○ HSE reviews
  ○ Workers' compensation claims management
  ○ Workers' compensation premium
• There is a mechanism for immediately notifying the Institute/Regional Director and/or DG of:
  ○ significant risks
  ○ serious incidents
  ○ prohibition and improvement notices.		

Best Practice:	**Compliance**	**Comments**
To ensure best practice: • Ensure Institute/Regional Director and/or DG is informed on at least a yearly basis of HSE performance against pre-determined indicators • Ensure Institute/Regional Director and/or DG is actively involved in planning processes and decision making regarding HSE		

improvements		
• Ensure Institute/Regional Director and/or DG is informed of penalty and improvement notices issued.		
Evaluation Rating:		
Recommendations:		
Verification/Documentation Sighted:		

Evaluation
Rating Criteria for Director General Reporting:

A. There is a process in place for informing and regularly updating the Institute/Regional Director and/or DG on the business unit's HSE performance that meets all the essential and best practice criteria in the guidance.
B. There is a process in place for informing and regularly updating the Institute/Regional Director and/or DG on the business unit's HSE performance that meets all the essential criteria in the guidance. The Institute/Regional Director and/or DG is actively involved in the HSE planning processes and decision making regarding HSE improvements.
C. There is a process in place for informing and regularly updating the Institute/Regional Director and/or DG on the business unit's HSE performance that meets all the essential criteria in the guidance. The Institute/Regional Director and/or DG is **NOT** actively involved in the HSE planning processes and decision making regarding HSE improvements.
D. There is evidence of a plan to inform and regularly update the Institute/Regional Director and/or DG on the business unit's HSE performance but it is not yet implemented.
E. There is no evidence that the Institute/Regional Director and/or DG is informed and regularly updated on the business unit's HSE performance.

Internal Audit Checklist

HSE Elements to be examined for audit

- ❑ HSE Policy and secondary policies
- ❑ HSE Objectives, targets, Performance Indicators
- ❑ mechanism for review of policy
- ❑ mechanism for updating staff on content/amendments to policy
- ❑ process for development of performance agreements
- ❑ copies/examples of performance agreements for senior officers which demonstrate inclusion of health and safety statements
- ❑ mechanism for review and update of performance agreements
- ❑ HSE Plan
- ❑ Corporate Business Plan
- ❑ organisational charts for HSE showing reporting lines to senior management and CEO
- ❑ job descriptions of appointed HSE personnel
- ❑ training program for HSE personnel
- ❑ communication/consultation strategy, policy, procedures, arrangements
- ❑ current committee structure, reporting lines and membership
- ❑ current activities of committees
- ❑ risk management strategy, policy, procedures arrangements
- ❑ workplace safety inspection reports
- ❑ risk assessment pro forma and examples of completed risk assessments
- ❑ examples of specialist risk assessments completed
- ❑ risk register, action plan
- ❑ Injury Register
- ❑ mechanism for Injury reporting
- ❑ incident report form
- ❑ completed Incident investigation reports
- ❑ incident analysis reports
- ❑ workers compensation/injury management policy
- ❑ workers compensation statistics/reports and related data
- ❑ First Aid policy and arrangements for first aid
- ❑ workers compensation review reports
- ❑ process for notification of injuries/claims to Insurer
- ❑ training strategy, policy, arrangements
- ❑ example of training records
- ❑ copy of HSE Induction program
- ❑ HSE manuals
- ❑ review strategy, policy, process
- ❑ review pro forma
- ❑ results of review
- ❑ Institute/Regional Director and/or DG Reports
- ❑ identification of key stakeholders
- ❑ method of communication with stakeholders

HSE IMPROVEMENT ACTION PLAN

Recommendation	Improvement Strategies	Accountable Officer	Review/ Completion Date
• [Insert recommendations]	•		
•	•		
•	•		
•	•		
•	•		
•	•		
•	•		
•	•		