EXPRO National Manual for Projects Management

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Project General Safe Working Requirements Procedure

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1.0 PURPOSE

This procedure outlines the General Health, Safety, Security and Environment (HSSE) requirements for processes and tasks not otherwise addressed in other specific procedures.

2.0 SCOPE

The scope of this procedure applies to all works performed under the National Project Management Organization throughout the Kingdom of Saudi Arabia.

3.0 DEFINITIONS

Definitions	Description
ANSI	American Nation Standards Institute
COSHH	Control of Substances Hazardous to Health
Competent:	One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
Db(A)	Relative loudness of sounds in the air as perceived by the human ear.
EN	European Norm
FOPS	Falling Object Protection Structure
GFCI	A ground fault circuit interrupter (GFCI), or a Residual Current Device (RCD) is a device that shuts off an electric power circuit when it detects that current is flowing along an unintended path, such as through water or a person
HSSE	Health, Safety, Security and Environment
IR	Infrared Radiation
JHA	Job Hazard Analysis
LPG	Liquefied Petroleum Gas
OSHA	Occupational Safety and Health Administration
PFD	Personal flotation device
PPE	Personal Protective Equipment
PSI	PSI is a unit of pressure expressed in pounds of force per square inch of area. It stands for Pounds per Square Inch
ROPS	Roll Over Protection Structure
SDS	Safety Data Sheet
LOTO	Lockout/Tagout
UV	Ultraviolet
VRD	Voltage Reduction Device
WMS	Work Method Statement

4.0 REFERENCES

- OSHA 29 CFR 1926 Subpart I Tools-Hand and Power
- OSHA 29 CFR 1926 Subpart E Personal Protective and Life Saving Equipment
- OSHA 29 CFR 1910 Occupational Safety and Health Standards
- EPM-KSS-PR-000011 Project Portable Ladders Inspection and Control Procedure
- EPM-KSS-PR-000032 Project Excavation and Trenching Procedure
- EPM-KSS-PR-000013 Project Work Over or Near Water Procedure
- EPM-KSS-PR-000002 Project Housekeeping Procedure
- EPM-KSH-PR-000008 Project Heat Stress Management Procedure
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- EPM-KSE-PR-000002 Project Waste Management Procedure
- EPM-KSS-PR-000006 Project Barricades and Signs Procedure
- EPM-KSS-PR-000033 Project Scaffolding Control Management Procedure
- EPM-KSS-PR-000031 Project Lockout/Tag out Procedure
- EPM-KSS-PR-000027 Project Manual Material Handling Procedure
- EPM-KSE-PR-000002 Project Waste Management Procedure

5.0 RESPONSIBILITIES

5.1 Project Manager

Project Manager's responsibilities include the following:

- Overall responsibility for this procedure and for supporting this process and verifying all Project entities actively participate.
- Providing the personnel, facilities, and other resources necessary to effectively accomplish this procedure.

5.2 Site Construction Manager

The Site Construction Manager is responsible for monitoring that the site is in compliance with applicable Health, Safety, Security and Environment HSSE requirements by:

- Providing the resources to implement the requirements of this procedure.
- Communicating with management concerning Project HSSE expectations concerning general safe work practices.
- Providing leadership regarding HSSE requirements and expectations for Managers, Project Supervisors, Superintendents and other leadership.

5.3 HSSE Manager

Site HSSE Manager's responsibilities include the following:

- Auditing this procedure.
- Confirming that this procedure meets the government requirements and regulations in the location of the Project facility.

5.4 Project Personnel

Project personnel's responsibilities include the following:

- Knowing and understanding the Environmental Safety and Health requirements of this Procedure that apply to the work they perform.
- Requesting additional information and further clarification before starting work if personnel receive assignments they do not understand.
- Complying and abiding by this General Safe Working Requirement Procedure for any work they perform.

6.0 GENERAL

6.1 Employees Conduct

Employees who engage in antics, fighting, gambling; or who violate and disregard the laws of the Kingdom of Saudi Arabia shall be terminated from work.

6.2 Dress Requirements

- All personnel are required to wear clothing appropriate for the work being performed. Loose clothes such as kameez shalwaar, and thobe are unacceptable for manual construction activities.
- Persons working near moving machinery must prevent clothing and body parts from being caught by moving components.
- Clothing soaked with grease, paint, thinners, solvents, or similar materials will not be worn.
- Safety boots must be worn by all persons that work or visit the construction works, and must comply with either American Nation Standards Institute ANSI or European Norm EN Standards.
- Minimum standards of PPE must be worn at all times, as defined by site rules (typically, safety helmet, eye protection, hi-visibility vest, gloves, steel cap safety boots). Task specific PPE shall be used as determined by the task risk assessment, all safety Personal Protective Equipment PPE must conform with international standards.

6.3 Communication and Electronic Equipment

- Radios, music players, or any similar equipment shall not be played on construction sites.
- Use of cell phones should not be allowed for employees engaged in work tasks or operations that may be considered critical, hazardous, or where the use of such devices could increase the potential for mishap due to distractions caused by the use of such device. Third parties such as ministries, government entities shall develop local communication devices' use policies that meet this requirement. Some sites may have 'safe zones' designated and signed, where the use of cell phones are permitted.
- Projects and entities should develop their own pre-authorization process to control the use of photographic equipment.

6.4 Smoking

Smoking is permitted only in Contractor-approved, signed designated areas and a high level of housekeeping must be maintained at all times. Designated smoking areas must contain:

- Rubbish container.
- Non-combustible reciprocals for cigarettes.
- Fire Extinguishers.
- Appropriate signage 'DESIGNATED SMOKING AREA' (In both Arabic and English)
- No smoking in vehicles on-site.
- No smoking in and within 5 m of offices, breezeways, all accommodation rooms, crib huts, storage, and warehouse areas.
- Near combustible and/or to flammable process chemicals, smoking areas shall be removed a safe distance away from the applicable areas.

6.5 Barricades, Tags and Signs

Every barricade/barrier shall have information tags or signs (In both Arabic and English) on every side and provide information regarding the hazard, entry requirements, and the name of the responsible Supervisor and controlling entity. Tags shall include:

- Name of person erecting the barricade.
- Person's contact information.
- Name of employer or organization.
- Date and time of erection.
- Nature of Hazard.

All barricades shall have appropriate signage communicating the type of hazard associated with the barricading. The meaning of safety signs shall be communicated to the workforce at the induction, toolbox meetings, and Pre-start meetings. Barricade signs/tags shall:

- Be erected on the barricade to ensure all personnel are aware of the associated hazard
- Be a combination of words and symbols, where practicable
- Be formed in a number of different languages where appropriate
- Be suitable for the intended purpose and environment.

6.6 Emergency Flushing, Eyes and Body

If personnel are exposed to injuries from corrosive or toxic materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. The use of emergency eye wash stations shall be reported immediately, so the equipment can be refilled and the individual can be evaluated for any additional required medical treatment.

6.7 Hand, Air, and Electrical Tools

All hand tools shall be used as per the “Manufactures Operating Manual”. No modifications shall be made to any device without the manufacturer’s permission.

- Damaged and defective tools must be taken out of service, tagged “Do Not Use” and stored in a controlled area until appropriate repairs have been made.
- Tools are not to be altered in any way and will be operated in accordance with manufacturing specifications.
- Tools, such as power saws and grinders, will have safety guards in place during their operation. Under no circumstances are the safety guards to be removed during use.
- Tools will be inspected prior to each use for defects such as cracked handles, damaged cutting edges, splitting or cracked parts, and broken adjusting components. Damaged tools must not be used.
- Tools will be used only for their intended purpose and no modifications shall be made.
- All electrically powered tools will be double insulated or grounded.
- Grinders must be equipped with a constant pressure switch.
- The rated speed of the grinding disc or wheel shall be checked prior to use to ensure that it is rated to be equal to or greater than the maximum speed of the grinder.
- User must follow all manufacturers’ requirements for mounting grinding wheels, to include:
    - The mounting nut shall not be tightened excessively.
    - Grinders shall be unplugged from the power source (electrical or pneumatic) before changing wheels.
- Users shall ensure that portable grinders are properly configured for use for a left or right handed person, as applicable portable grinders must be used with side handles installed, as required by the manufacturer (using a grinder without the safety handle in place shall be prohibited).
- Supervision shall ensure that frequent light dressings on bench grinders are performed.
- When operating a bench grinder, users shall stand off to one side until the wheel has come up to full speed.
- Personnel shall conduct a "ring test" before using a bench grinder (i.e., gently tap the wheel with an object and there should be a metallic tone or "ring". If there is a "dead" sound, the wheel shall be taken out of service).
- Electric bench grinders shall be equipped with an anti-restart feature to prevent restart after an electrical power outage.
- Air hoses for tools and other equipment will be secured together to preclude uncontrolled whipping in the event hose couplings become separated while under pressure.
- Air supplying hoses exceeding 1.2cm internal diameter will be protected by excess flow valves to prevent “whipping” in the event of hose separation or failure.
- The pressure of compressed air used for cleaning purposes must be reduced to 30 psi or less.

6.8 Electrical Installations - General Requirements

- Lamps for general illumination will be protected from breakage, and metal shell sockets will be grounded.
- Temporary lights will not be suspended by their cords, unless they are so designed.
- Portable lighting used in wet or conductive locations, such as tanks or manholes, will be operated at no more than 12 volts or will be protected by Ground Fault Circuit Interrupter GFCI.
- Extension cords will be of the three-wire type. Extension cords and flexible cords used with temporary and portable lights will be designed for hard or extra hard usage.
- Listed, labeled, or certified equipment will be installed and used in accordance with instructions included in the listing, labeling, or certification.

6.9 Jacks, Rollers and Devices

- All capacities, warnings, and other safety related information originally provided on the equipment by the manufacturer must be maintained in legible condition, and shall be complied with.
- Do not overload jacks, stands, and rollers. Know their capacity and the weight of the object to be supported.
- Positive stops must be provided to prevent over-travel. Blocking or cribbing as necessary to provide stability must be provided. After raising or moving a load, the load must be positively blocked or cribbed to prevent unintended movement.
- Daily or before use inspections must be performed on jacks, rollers and other devices.
- Do not use jacks or stands that have deformed bent or damaged parts.
- All such equipment shall be protected against freezing and properly stored when not in use.
- Inspection of the equipment must be performed regularly by a qualified person and recorded on a register. Examples as follows:

    - On a quarterly basis.
    - After major repair or service.
    - Upon receipt from storage or issuing facility.
    - After being subjected to abnormal conditions or shock loading.
    - Before each use.

- Never allow anyone under a jack, or stand, that is supporting a load.
- Do not modify jacks or stands.
- Do not attempt to extend the supporting components of a jack or stand by adding pipe or wood blocks to the jack or stand. Only use extension devices that have been approved by the jack or stand manufacturer.
- Use jacks only on level stable surfaces able to support the intended load. Matting, wood or plate may be required to provide an appropriate supporting surface.
- Secure set screws and safety devices after adjustments of jack/stand height, and before placing a load on the jack/stand.
- Do not push or pull loads that are sitting on jack stands.

6.10 Concrete and Masonry Work

- No construction loads will be placed on a concrete structure or portion of a concrete structure unless clear information that this portion of the structure is capable of supporting the loads is available.
- All protruding reinforced steel onto and into which employees could fall will be guarded to eliminate the hazard of impalement. Impalement caps are to be used which meet the international standards.
- No person shall work above uncovered reinforced steel unless steel capped impalement caps are inserted or the steel has been bent over.
- Formwork must be engineered designed, fabricated, erected, supported, braced, and maintained so that it is capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated. A qualified engineer is to inspect formwork prior to any formwork is subjected to any force.

- Forms and shores (except those used for slabs on grade and slip forms) will be erected, inspected, put into use and not be removed until a qualified engineer determines that the concrete has gained sufficient strength to support its weight and superimposed loads. Usually a Temporary Works design will be required for this work
- A limited access zone will be established whenever a masonry wall is being constructed. The limited access zone will conform to the following:

    - The limited access zone will be established prior to the start of construction of the wall.
    - The limited access zone will be equal to the height of the wall to be constructed plus 1.2m and will run the entire length of the wall.
    - The limited access zone will be established on the side of the wall that is not protected by scaffolds.
    - The limited access zone will be restricted to entry by employees actively engaged in constructing the wall. No other employees will be permitted to enter the zone.
    - The limited access zone will remain in place until the wall is adequately supported to prevent overturning and to prevent collapse. Where the height of a wall is more than 2.4m, the limited access zone will remain in place until the requirements of this section have been met.

- All masonry walls more than 2.4m high will be adequately braced and engineered approved, to prevent overturning and to prevent collapse unless the wall is adequately supported so that it will not overturn or collapse. The bracing will remain in place until permanent supporting elements of the structure are in place.
- Lift-slab operations will be designed and planned by a registered professional engineer who has experience in lift-slab construction. Such plans and designs will be implemented by the project/facility and will include detailed instructions and sketches indicating the prescribed method of erection.
- Jacking equipment will be capable of supporting at least two and one-half times the load being lifted during jacking operations and the equipment will not be overloaded.
- No employee, except those essential to the jacking operation, will be permitted in the building/structure while any jacking operation is taking place unless the building/structure has been reinforced sufficiently to ensure its integrity during erection.
- Equipment will be designed and installed so that the lifting rods cannot slip out of position. Other measures will be instituted, such as the use of locking or blocking devices, which will provide positive connection between the lifting rods and attachments and will prevent components from disengaging during lifting operations.

6.11 Saws

All saws must follow the below requirements as a minimum and are operated as per the Operators Manual. It is important that before each use the saws are inspected to ensure they are in good condition and are fit for purpose.

6.11.1 Band Saws

- All portions of band saw blades will be enclosed or guarded, except for the working portion of the blade between the bottom of the guide rolls and the table.
- Band saw wheels will be fully encased.

6.11.2 Portable Circular Saws

- Portable, power-driven circular saws will be equipped with guards above and below the base plate or shoe.
- The lower guard will cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work.
- The lower guard will automatically return to the covering position when the blade is removed from the work.

6.11.3 Radial Saws

- Radial saws will have an upper guard that completely encloses the upper half of the saw blade. A device that will automatically adjust to the thickness of and remain in contact with the material being cut will guard the sides of the lower exposed portion of the blade.
- Radial saws used for ripping will have non-kickback fingers or dogs.
- Radial saws will be installed so that the cutting head will return to the starting position when released by the operator.

6.11.4 Swing (or Sliding Cut-Off) Saws

- All swing or sliding cut-off saws will be provided with a hood that will completely enclose the upper half of the saw.
- Limit stops will be provided to prevent swing or sliding type cut-off saws from extending beyond the front or back edges of the table.
- Each swing or sliding cut-off saw will be provided with an effective device to return the saw automatically to the back of the table when released at any point of its travel.
- Inverted sawing of sliding cut-off saws will be provided with a hood that will cover the part of the saw that protrudes above the top of the table or material being cut.

6.11.5 Table Saws

- Circular table saws will have a hood over the portion of the saw above the table, so mounted that the hood will automatically adjust itself to the thickness of and remain in contact with the material being cut.
- Circular table saws will have a spreader aligned with the blade, spaced no more than 1.26cm behind the largest blade mounted in the saw. This provision does not apply when grooving, or rabbeting.
- Circular table saws used for ripping will have non-kickback fingers.
- Feeder attachments will have the feed rolls or other moving parts covered or guarded so as to protect the operator from hazardous points.
- Push sticks will be used when feeding material.

6.12 Compressed Air Tools

- Compressed air shall not be used for cleaning or blowing dust from any part of the body or clothing.
- Air-supplying hoses for tools and other equipment shall be secured together by pins and whip-check connector lanyards to preclude uncontrolled whipping in the event hose couplings become separated while under pressure.
- Air-supplying hoses exceeding 13 mm internal diameter shall be protected by excess flow valves to prevent “whipping” in the event of hose separation or failure.
- Air-supplying hoses shall be protected from damage, inspected regularly, and maintained in good condition.
- Air-supplying hoses and hose connections used for conducting compressed air shall be designed for the pressure and service to which they are subjected.
- The pressure of compressed air used for cleaning purposes shall not exceed 30 psi when the nozzle end is obstructed or dead ended, and then only with effective chip guarding and PPE.

6.13 Abrasive Blasting

Abrasive blasting operations shall require an approved Job Hazard Analysis JHA. During abrasive blasting operations the following requirements shall be met:

- Personnel performing blasting shall be trained and qualified to use the equipment.

- Blasting equipment shall be inspected before use and hoses must be rated for the blasting media and manufacturer's recommended pressure.
- Blasting equipment shall be equipped with an operable automatic safety shut-off (dead-man switch).
- Proper blasting hoods, body protection, and respiratory protection shall be used in accordance with Occupational Safety and Health Administration OSHA Standards.
- Air supplied to respiratory protection shall be provided from a breathing air compressor and meet applicable breathing air standards.
- Abrasives shall not contain more than 1% crystalline silica.
- Health hazards arising from grit dust produced from any surface coating present shall be identified and precautions specified.
- Blasting media may be considered regulated waste. Removal plans for the media must be approved before blasting commences.
- Pressure vessels used in blasting operations must be manufactured in accordance with the applicable pressure vessel code.
- All air hose connections shall have whip-checks, in addition to clips or other restraints that are used as part of the manufacturers coupling system, to prevent whipping.
- Precautions shall be taken to address electrostatic discharges. The metal casing and frame of the compressor and all other metal equipment including scaffolding shall be earthed. Hoses shall be constructed of conductive rubber or include metal braid to provide an electrical bond between hose and coupling.

6.14 Petrol Powered Tools

- Petrol powered tools shall not be used in unventilated areas.
- Petrol shall be dispensed only in approved and labelled metal safety containers.
- These containers shall be properly labelled and stored.
- Tools shall not be refueled while the engine is running or hot.
- Fuel shall only be stored in designed and certified metal fuel containers with proper labels attached.

6.15 Powder Actuated Tools

Only personnel who have been trained and certified in the operation of the particular tool in use shall be allowed to operate a powder-actuated ("explosive powered") tool. The employee will follow these observations.

- The tool shall be inspected each day before loading to see that safety devices are in proper working condition. The method of inspection shall be in accordance with the manufacturer's recommended procedure.
- Any tool found not in proper working order, or that develops a defect during use, shall be immediately removed from service, tagged "Out of Service," and not used until properly repaired.
- Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any personnel. Hands shall be kept clear of the open barrel end.
- Check and establish an Exclusion Zone on both sides of the fastening face prior to the loading of the tool, to ensure that nobody is working or can enter the area on the other side or behind the wall face.
- Charges are to be kept secured and only sufficient chargers for task withdrawn from stores. All charges to be accounted for. Misfires are to be returned to the Supervisor. After two misfires, tag out the tool and report to Superintendent.
- Loaded tools shall not be left unattended.
- Fasteners shall not be driven into very hard or brittle materials, including cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, or hollow tile.
- Avoid driving into materials easily penetrated unless such materials are backed by a substance that shall prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side.
- No fastener shall be driven into a damaged area caused by an unsatisfactory fastening.
- Tools shall not be used in an explosive or flammable atmosphere.

- All tools shall be used with the correct shield, guard, or attachment recommended by the manufacturer.
- PPE for using powder actuated tools shall include a full face shield, approved hearing protection, and hand protection.

More information can be found in EPM-KSS-PR-000037 Project Powder Actuated Tool Procedure.

6.16 Welding and Burning

6.16.1 Welding

- Treated welding rods, where able, to be replaced with less hazardous product. Where unable to be replaced, grinding the tip of the rod requires the use of dust suppression and containment devices for example a tungsten grinder.
- All electric welding machines must comply with the relevant standard. This includes the requirement to fit voltage reduction devices (VRD) or similar protection against electrocution.
- A suitable, approved fire extinguisher shall be ready for instant use in any location where welding is being performed.
- Screens, shields, or other safeguards shall be provided for the protection of personnel, equipment, and materials exposed to sparks, slag, molten metal, falling objects, or ultraviolet (UV)/infrared (IR) radiation.
- Welders shall wear approved eye and head protection. Persons assisting the welder shall also wear protective glasses/lenses. Welders shall wear a hard hat while performing welding operations.
- Electric welding leads shall be elevated over walking areas to keep them off the walking surface and prevent trip hazards. When elevated, they pose less danger to personnel and are less susceptible to damage by construction activities.
- Welding leads or cords that cross a pathway or roadway shall be protected from damage
- Welding leads with broken insulation shall be tagged Out of Service or repaired. Ground leads can be repaired with tape provided the safe current-carrying capacity is not compromised.
- To protect installed equipment such as electrical motors, pumps, hoists, instruments and controls, and to prevent fires from unforeseen ground paths, welding being conducted upon areas involving such equipment shall require that the ground for welding shall be installed within 200mm of the point of arc, or between the point of arc and the nearest such equipment. This applies to tubing, pipe, electrical fixtures, and any supports that should be a part of or secured to such equipment, unless it can be demonstrated that the ground path shall in no circumstances deviate through such equipment, or unforeseen path.

6.16.2 Burning

- Do not use matches or lighters to ignite torches. Spark igniters must be used. Torches must not be used to light smoking materials.
- When a wrench is required to operate the acetylene cylinder valve, the wrench must be kept in position on the valve
- Do not use oxygen to blow off clothes or clean welds, serious skin burns or death may result
- Turn off all hoses and regulators when they are not in use and disconnect them from the cylinder/tank at the end of shift
- Wear approved burning goggles to protect against infrared radiation
- Before plasma air arcing/burning determine what metals are present. Additional precautions may be necessary if Chromium or other heavy metals are present.

6.17 Safety Watches

In order to maintain a safe work environment and for the early detection and warning of deteriorating conditions and potentially unsafe situations, certain activities at the Project require the use of a safety watch.

Personnel assigned to perform safety watch responsibilities are specifically trained and assigned to warn others of potentially unsafe situations or emergency conditions and to provide safety action as necessary.

There are essentially six types of safety watches:

- **Fire Watch** (standby watch for hot work) is a person, other than the operator of spark producing welding, cutting, or grinding equipment, assigned to constantly scan the work area for fires and other hazardous conditions

- **Man-way** (or entry) Watch is a person assigned as an attendant stationed outside of a confined space to monitor the conditions of authorized entrants, conditions inside and outside of the confined space, and perform other duties required by the confined space procedure
- **Man-way** (or entry) Watch when using Respiratory Protection is an additional person assigned to monitor the safe operation and use of air supplied respiratory protection, keep supply hoses in order, and monitor the status of the air supply
- **Traffic Watch** (Flagman) is a person assigned to control traffic or to direct traffic through or around a construction area or other temporary traffic control zone
- **Equipment Watch** (Flagman) is a person assigned to perform traffic control duties for equipment, warn others of equipment hazards, and signal or direct equipment operators to assist safe equipment movement
- **Hazard Watch** (Spotter) is a person assigned to specifically control works near (between 6 m to 3 m) an overhead hazard or to control reversing vehicles. In these specific circumstances positive and continuous communication shall be maintained between the spotter and the primary operator or driver.

An appropriate number of safety watches shall be provided to safely complete affected work activities.

Safety watches shall stop work whenever conditions are at risk or if conditions change from that referenced on the JHA.

Safety watches shall not leave an assignment until they have been replaced by another qualified safety watch. Safety watches must remain in place for at least 30 minutes after completion of hot work.

Before performing watch duties (confined space or fire), selected Project personnel shall be given training and shall be ready to indicate that they are authorized and have received the appropriate Safety Watch training.

6.18 Vehicle Safety

No un-authorized vehicles may enter the site. If visitors are to enter a designated parking area is to be established in a location that is safe to do so away from heavy equipment.

All Mobile equipment that has not been authorized or has been inspected by a third party, cannot enter the site. If equipment is required, a quarantine area is to be established equipment must remain in this area till inspection by the authorized third party is completed and documented.

- Project personnel required to operate vehicles on the Project must be trained and authorized to do so. Motor vehicles are only to be operated by personnel in possession of a valid driving license and required certificates. All posted speed limits and other traffic signs shall be strictly observed. Where weather or other conditions dictate, additional precautions must be taken such as:
    - Reduce speed limit
    - Use proper headlights
    - Drive in low gear
- Seat belts shall be worn at all times when traveling or operating vehicles or machinery.
- All personnel on the Project are prohibited from riding on loads, fenders, running boards, side boards, and tailgates; NO SEAT – NO SEATBELT – NO RIDE.
- All vehicles in use shall be checked at the beginning of each shift to ensure that all parts, equipment, and accessories that affect safe operation are in proper operating condition and free from defects
- Operation of vehicles, mobile plant and equipment is restricted to people who are trained, assessed and authorized.
- Report any vehicle deficiencies to Supervisor and note on the applicable inspection checklist
- All defects which compromise the safe operation of the vehicle shall be corrected before the vehicle is placed in service.
- Any vehicle defects must be reported to supervision and noted on the applicable inspection checklist.

- Use of Mobile Equipment – Operators must remain in control of mobile equipment at all times and not operate them in a reckless manner that disregards the health and safety of others.

6.19 Powered Industrial Trucks

High-lift rider trucks shall be equipped with certified falling object protection (FOPS) to protect the Operator from overhead/falling hazards.

Fork trucks shall be equipped with vertical-load backrest extensions when the types of loads present a hazard to the Operators.

The brakes of trucks shall be set and wheel chocks placed under the rear wheels to prevent the movement of trucks, trailers, or railroad cars while loading or unloading.

Only a trained and certified Operator for the vehicle type shall be permitted to operate a powered industrial truck.

6.20 Rollover Protection

Roll-over protective structures (ROPS) are required on all mobile ride-on or ride-in equipment, including: scrapers, front-end loaders, dozers, agricultural- and industrial-type tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments.

6.21 Scaffolds and Platforms

All scaffolding shall be erected by a certified and authorized Scaffold Erector under the supervision of a competent person (with the same credentials) in conformance with relevant standards. Each scaffold must be inspected daily by a competent person. Detail is found in the EPM-KSS-PR-000033 Project Scaffold Control Management Procedure

Scaffold inspections involve the following:

- All temporary work platforms shall have toe-boards, mid-rails, top-rails, and access-ladders.
- Where personnel shall work or walk at a lower elevation near a scaffold, the scaffold shall have mesh netting installed and maintained between the mid-rail and toe-plate to prevent objects from falling out of the scaffold.
- Materials, rubbish, and debris shall not be stored or left on scaffolds.
- Personnel shall not ride on rolling scaffolds, and the scaffold shall be inspected by the user and wheels must be locked before personnel ascend onto the scaffold after it has been rolled to a new location.
- Scaffolding shall be removed according to construction requirements and when work has been completed.
- The scaffold tagging procedure is to be observed and followed by personnel using scaffolds.
    - **Green tag** – scaffold safe for use as indicated.
    - **Yellow tag** – scaffold safe for use subject to restrictions indicated. Fall protection required.
    - **Red tag or no tag** – scaffold must not be used. Competent scaffolders should work on such scaffolds only.

6.22 Fall Protection

The use of fall protection equipment is mandatory for all work above 1.8 m where fall protection is not provided. Details are found in EPM-KSS-PR-000005 Project Fall Prevention and Protection Procedure.

Fall protection plans for specific scopes of work shall be followed.

Persons who are performing work in unguarded areas and exposed to a potential fall of 1.8 m or more must use fall protection equipment. The standard is “100% tie-off” at all times when exposed to a fall, the person must be tied-off to a suitable anchor point on the platform or structure.

In situations where a fall could result in impalement or other injury (i.e., working over a hot process, operating equipment), fall protection equipment must be used regardless of the potential falling distance.

Vertical objects that could cause impalement, such as rebar, shall have the ends capped to adequately cover the impaling end of the object. Reinforced rebar caps or a length of 100 mm x 50 mm timber are appropriate.

Personal fall prevention equipment (harness, lanyard, hooks, straps, etc.) must be inspected prior to use by the user.

Safety body harness assemblies, lanyards, and other personal fall equipment must be inspected every three months by a Competent Person.

Auxiliary fall protection equipment, such as static lines, perimeter guards, or other suitable means, shall be used by personnel traveling from one location to another in elevated positions.

6.23 Ladders

Ladders shall be inspected prior to each use and be conducted by a competent person.

- Ladders with broken or missing rungs, broken or split side rails, or otherwise damaged, shall not be used and shall be destroyed.
- Only approved type of ladders shall be used on-site.
- Portable ladders made of metal and wood (timber) are prohibited. Portable ladders shall be made of reinforced plastic and/or fiberglass type materials.
- Labels shall remain legible.
- Home-made ladders are prohibited.
- All portable ladders shall be equipped with non-skid safety feet and shall be placed on a stable base. The access areas at the top and bottom of ladders in use shall be kept clear of obstructions.
- Ladder side rails shall extend one meter above the landing. When this is not practical, grab rails shall be installed. All ladders in use shall be tied off, or otherwise secured to prevent displacement, and used at an angle of 75° (1 m out for every 4 m in height).
- Access to ladders shall be kept clear of obstructions.
- A folding ladder shall only be used in the full open and locked position.

When a ladder is used as a work platform and the user will be exposed to a potential fall, the user shall use a personal fall arrest system secured to an appropriate anchor point.

6.24 Excavation and Trenching

Prior to excavations the following shall apply:

- Never start an excavation until all underground services have been identified and located.
- Never start an excavation unless a Risk Assessment (JHA or Work Method Statement WMS) has been undertaken and a Permit to Dig has been issued
- Excavations and trenches shall be appropriately identified with signs, warnings, and barricades.
- When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means. While the excavation is open, underground installations shall be protected, supported, or removed, as necessary, to safeguard personnel.
- Each employee in an excavation shall be protected from cave-ins by an adequate protective system except when:

  - Excavations are made entirely of rock and are monitored by a Competent Person as excavation progresses
  - Excavations are less than 1.2m deep and the examination of the ground by a competent person provides no indication of a potential cave-in.

- Protective systems shall have the capacity to resist, without failure, all loads that are intended or could reasonably be expected to be applied or transmitted to the system.
- Personnel shall be protected from open excavations or materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 1m from the edge of excavations, or by using retaining devices that are sufficient to prevent materials or equipment from failing or rolling into excavations, or by a combination of both if necessary.
- A Competent Person shall conduct daily inspections of excavations, the adjacent areas, and protective systems for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. The Competent Person shall conduct an inspection prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence. These inspections are required when employee exposure can be reasonably anticipated.
- Where a Competent Person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed personnel shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.
- Where personnel are required to enter an excavation/trench to perform any type of work including inspection the following is mandatory:

  - The trench is no greater than 1.2m deep; or
  - If the trench is greater than 1.2m deep, the side walls are benched or battered back; or
  - The trench is shored.

- A stairway, ladder, ramp, or other safe means of egress shall be in trench excavations so that no more than 7.5m of horizontal travel for personnel is required.

For more information regarding Excavations, refer to EPM-KSS-PR-000032 Project Excavation and Trenching Procedure.

6.25 Working Over or Near Water

Work over or near water includes work in any area in which drowning is a potential (filled tanks, marine areas, drainages, ponds, etc.).

General requirements include:

- A JHA for work over or near water shall be prepared and approved prior to start of work
- Personnel shall wear personal flotation devices (PFD) when working over or near water, or in areas that could present drowning hazards
- When an unprotected fall exposure exists, personnel shall use a personal fall arrest system attached to an appropriate anchor point in addition to wearing a PFD that is designed to accommodate the fall protection harness
- Personnel shall not enter areas where the potential for drowning exists (such as marine areas) alone
- Emergency communications shall be available for use by persons working over or near water
- Prior to work over or near water, personnel shall verify that required lifesaving equipment is readily available for use and is set up as required At least one rescue boat shall be in the immediate area and rescue personnel immediately available to respond to a man in water situation.

6.26 Confined Space

Never enter a confined space without an approved Confined Space Entry Permit and appropriate training. Details are found in EPM-KSS-PR-000007 Confined Space Operations Procedure.

Confined spaces can be defined as any space where the access or egress is limited, where oxygen deficiency could occur, or where toxic substances or other hazards could accumulate in an enclosed work area. Confined spaces may include but are not limited to tanks, vessels, hoppers, bins, tank cars, steam boilers, pipes, sumps, ducts, scrubbers, manholes, excavations, and sewers.

Internal combustion engines and gas cylinders shall not be placed in or in close proximity to the openings of confined spaces. Torch hoses shall be removed from confined spaces during breaks and between shifts.

Proper ventilation shall be established and verified prior to any confined space entry.

Where energy isolation or Lockout Tag out LOTO is required, each person entering the space shall follow the EPM-KSS-PR-000031 Project Lockout and Tag out Procedure.

Hot Work inside a confined space requires a separate Hot Work Permit.

6.27 Housekeeping

Housekeeping is a fundamental and necessary activity and shall be performed by all personnel working on the Project.

- Site conditions shall be monitored on a daily basis by Supervisors and Management. Any remedial actions shall be implemented immediately to prevent accidents.
- Housekeeping shall be discussed in pre-job briefings and during the JHA
- Work areas, passageways, stairways, and all other areas shall be kept free of debris, equipment, and materials
- All emergency equipment must remain unobstructed
- Access routes for emergency response, evacuation, and access to scaffolds, ladder ways, or any other work areas must remain clear of obstructions, equipment, and debris
- Debris generated during the shift shall be continuously controlled or removed from the work area during the shift to prevent tripping hazards and other accidents. Debris must be removed from the work areas prior to the end of shift or properly secured to prevent wind-blown debris.
- Appropriate rubbish/recycle containers shall be placed strategically and used for disposal of scrap materials and other generated debris.
- Storage areas shall be kept clean and materials neatly stacked or placed. Materials shall be stored or placed in an orderly manner.
- Material staging around work areas shall be maintained in an orderly condition and safe access and egress to the work areas shall be maintained
- Any materials that are not immediately required for current activities shall remain outside of work areas and stored in an orderly manner
- Electric welding leads, cords, wires, electrical cables, hoses, and other temporary systems shall be kept off the walking surface in an elevated position 2m, or run in such a way as to prevent damage and eliminate trip hazards
- Containment boxes under oiled equipment shall be maintained in good condition and covered when not in use to prevent spills
- Whenever materials are to be dropped more than 5m, an enclosed chute must be used. An enclosed chute is a slide, closed in on all sides, through which material is moved from a high place to a lower one.
- Debris shall be removed from elevated areas by way of appropriate containers. Debris shall not be dropped from elevated areas or through holes in the floor.

6.28 Painting

Painting activities shall be coordinated to protect flammable paints and solvents from sources of ignition, and to protect Project personnel from exposure to harmful paints and solvents:

- Paints and solvents shall be stored in paint lockers when not in use.
- Practical precautions shall be implemented to minimize paint waste and over-spray.
- Paint waste shall be properly collected, labeled and disposed of.
- Precautions shall be implemented to prevent paint, solvent, and vapors from entering air intake or ventilation equipment.
- Spray painting cannot be performed without coordination from surrounding work activities
- Proper PPE must be worn by employees mixing and applying paint, and cleaning paint tools and equipment.
- No smoking is permitted in paint storage, mixing, applying, and cleaning areas.
- Painting activities shall stop in the event of a Project emergency, until Contractor HSSE Representative states it is safe to restart.
- Housekeeping must be maintained always in painting areas.
- Safety Data Sheets or Control of Substances Hazardous to Health (COSHH) sheets for painting/coating materials must be readily available and reviewed by affected personnel prior to starting painting activities.

6.29 Waste Material

Details are found in EPM-KSE-PR-000002 Waste Management Procedure. Appropriate disposal of waste materials includes the following:

- All scrap timber, waste material, and rubbish shall be removed from the immediate work area as the work progresses. Nails shall be removed from used lumber and timber, or bent flush with the surface of waste lumber and timber, as it is removed from service.
- All solvent waste, oily rags and flammable liquids shall be kept in fire-resistant covered containers
- Waste materials shall be segregated and placed in the proper receptacle for disposal or recycling
- Only clean waste is to be placed in rubbish bins
- Oil, oily rags, solvents, aerosol cans, etc. are to be placed in the appropriate drums labelled and designated as such
- Spills shall be reported immediately to the company-specific Supervisor and the Contractor Environmental Coordinator. Spills shall be properly cleaned up immediately and clean-up waste shall be disposed of in a properly labelled waste container.
- Questions concerning waste disposal should be directed to the HSSE representative, BEFORE the waste are generated and prior to disposal.

6.30 Hazardous Waste

Hazardous wastes (such as paints, solvents, thinners, oils, and greases) and any other material or containers which have contained chemicals shall be handled and disposed of in accordance with the requirements on the associated SDS (or COSHH sheets), and the EPM-KSE-PR-000002 Project Waste Management Procedure and in compliance with applicable regulatory requirements.

6.31 General Ergonomics

- Perform tasks with good posture and use large muscle groups when lifting, placing or moving objects (bend your knees, not your back)
- Keep wrists in a relaxed, neutral position when using hand or power tools
- Evaluate body position for good balance, and be aware of body position when using power tools that can bind or “kick back”
- Use three points of contact when ascending or descending equipment, stairs, ladders, or ramps
- When work tasks involve stooping, squatting or other non-neutral positions, stop as needed to stretch muscles and ligaments.

Further information can be found in EPM-KSS-PR-000027 Project Manual Material Handling Procedure.

6.32 Back Injury Prevention

Back injury prevention shall be continually emphasized through safety meetings, tool box meetings, pre-job briefings.

Mechanical aids shall be designed into work methods with adequate access.

Supervisors:

- Shall be trained in the Manual Handling Risk Assessment techniques and conduct risk assessments.
- Conduct a risk assessment where manual handling is unavoidable and follow up with personnel before work starts.
- Evaluate storage areas to reduce risk to personnel from moving heavy loads and over-reaching.

When manual lifting is anticipated, the following guidelines are provided to minimize the potential for back injuries:

Assess the Load:

- Are loads heavy, bulky, or difficult to grasp?
- Are loads stable, or can contents shift?
- Are there sharp edges?
- Is there enough space to allow for good posture?
- Are slings attached to make it easier for loading?
- Are handhold points strategically placed to assist the best body position for the load, preventing excessive bending, stretching?
- Is the load weight evenly distributed?
- Is the load free of debris, dust, oil, etc.?
- Is the work surface sound and free of obstructions (e.g., trip, fall hazards)?
- Are storage areas and vehicle access routes identified and clearly marked?
- Is access and manual handling to different levels restricted (can mechanical lifting be utilized instead)?
- Does work area have sufficient lighting?

Once these basic questions have been considered, take appropriate steps to minimize the weight of the load by:

Minimize the packaging of the load – make it smaller.

- Specify lower package weights to suppliers.
- Sort loads by category.
- Make it easier to grasp – assess handle, grip, indents on cartons, etc., to make lifting the load easier.

Poor posture during manual handling introduces the additional risk of loss of control and sudden, spontaneous increase in physical stresses on the body, let alone the back. Stress on the back increases with:

- Twisting
- Stooping
- Reaching upwards
- Excessive lifting and over reaching
- Pushing and pulling
- Sudden movement or jerking or load

- Prolonged or frequent physical effort
- Insufficient rest periods/breaks
- Work rate governed by process system
- Handling while seated

A combination of the above seriously increases the risk of back injury. Assessment of the load and using correct posture is essential.

Follow these steps for correct manual lifting:

- Assess the load - if additional help or mechanical assistance is needed, stop and obtain help or aide needed.
- Use good balance and a stable base with the leading leg forward.
- Bend the knees and keep hands close to the waist, while keeping the back straight, and the shoulders facing the same direction as the hips.
- Use a hook grip. Keeping hands inside the boundary of your legs.
- Lift smoothly; do not jerk the load.
- Move your feet to turn, don't twist.
- Keep the load close to your body.
- If precise positioning of the load is necessary, put it down first then slide it into position.

6.33 Heat Stress

When heat is combined with physical activity, loss of fluids, fatigue, and other conditions, heat related illness may occur.

Heat stress can be reduced by:

- Drinking plenty of water and electrolyte containing drinks.
- Wearing and re-applying sun screen product frequently.
- Eating properly – don't skip meals and avoid heavy meals.
- Wearing light colored clothing, preferably cotton clothing.
- Getting plenty of rest at night.

Personnel shall be trained by applicable company to understand the signs and symptoms of heat stress. These include the following:

- **Heat cramps –** Heat cramps are painful muscle cramps caused by a loss of body salt through excessive sweating.
- **Heat exhaustion –** Heat exhaustion indicates that the body's cooling system is not working properly. The victim may sweat heavily, their skin may be cool and moist, and they may seem tired, confused, clumsy, irritable, or upset. The victim may tell you that they are okay, even with obvious symptoms because their ability to exercise good judgment may be lost.
- **Heat Stroke –** Heat stroke is the deadliest of all heat stress conditions. The body temperature will rise; the victim's skin may be hot, red, and dry.

6.34 Hearing Conservation

Feasible engineering or administrative controls shall be used to protect personnel against sound levels more than those shown below:

Threshold Limit Values for Noise Exposure

Duration (hours/day)	Sound Level, dB(A) slow response
12	82
10	84
8	85
4	88
2	91
1	94
½	97
¼	100

Exposure to impulsive or impact noise should not exceed 140 dB (A) peak sound pressure level.
When engineering or administrative controls fail to reduce sound levels within the limits shown above, approved ear protective devices shall be provided and used.

In all cases where the sound levels exceed the values shown, a continuing, effective hearing conservation program shall be administered.

Employees shall be trained in the proper fitment of hearing protection by their company.

6.35 Access and Egress

- Every building designed for human occupancy will be provided with exits sufficient to permit the prompt escape of occupants in case of emergency.
- In hazardous areas, or where employees may be endangered by the blocking of any single means of egress due to fire or smoke, there will be at least two means of egress remote from each other.
- Exits and the way of approach and travel from exits will be maintained so that they are unobstructed and are accessible at all times.
- All exits will discharge directly to the street or other open space that gives safe access to a public way.
- Exit doors serving more than 50 people, or at high-hazard areas, will swing in the direction of exit travel.
- Readily visible, suitably illuminated exit signs will mark exits. Exit signs will be distinctive in color and provide contrast with surroundings. The word "Exit" will be of plainly legible letters, not less than 15cm high.
- Any door, passage, or stairway that is neither an exit nor a way of exit access and that is so located or arranged as to be mistaken for an exit, will be identified by a sign reading "Not an Exit" or similar designation.
- Access and egress associated with construction sites shall be managed based upon conditions at that particular site and shall be regularly reviewed as site conditions change during construction phases.

6.36 Liquefied Petroleum Gas (LPG)

- Each system will have containers, valves, connectors, manifold valve assemblies, and regulators of an approved type.
- Every container and vaporizer will be provided with one or more approved safety relief valves or devices.
- Containers will be placed upright on firm foundations or otherwise firmly secured.
- Portable heaters will be equipped with an approved automatic device to shut off the flow of gas in the event of flame failure.

- All cylinders will be equipped with an excess flow valve to minimize the flow of gas in the event the fuel line becomes ruptured.
- Storage of liquefied petroleum gas within buildings is prohibited.
- Storage locations will have at least one approved portable fire extinguisher rated not less than 9 kg Class B and C.

6.37 Storage and Handling of Compressed Gas Cylinders

The following general requirements pertain to the use/handling, and storage of compressed gas cylinders of all sizes:

Handling/Use and Storage:

- Any damaged cylinder or any cylinder's contents that are not satisfactorily identified should not be used. The cylinder should be tagged, the deficiency clearly stated, and then reported to the Contractor HSSE Department.
- Defective valves or safety relief devices on cylinders should not be tampered with and repair should not be attempted. Such cylinders should be identified and arrangements made for returning them to the vendor immediately. These cylinders shall be tagged with "DANGER - DO NOT USE" tags.
- All cylinders must be stored in the upright position with valve caps installed where fitted, and be properly secured by means of a suitable cylinder cage, substantial chain, cable, or equivalent method. Rope is not permitted.
- Gas cylinders handled by cranes or a hoist must be in suitable cages and must never be lifted by rope, chain slings, or magnets.
- Cylinders shall not be rigged for lifting. Safety caps and valve protection rings are not to be used as attachment points for rigging. Specialized lifting devices designed for the particular type of cylinder must be used.
- Cylinders shall not be dragged or slid. The user shall use a suitable hand truck, fork truck, roll platform, or similar device with the cylinder secured for transporting in the upright position.
- Cylinders shall not be dropped when being unloaded or loaded off or onto a truck or dock. Elevator tailgates on trucks shall be utilized for unloading or loading cylinders safely.
- When using individual oxygen cylinders, the pressure regulator should be located directly on the cylinder. DO NOT use oil, grease, or pipe compound on any component associated with oxygen.
- Cylinders are uniquely threaded (by cylinder type) to minimize contamination. The use of adapters or systems that compromise this safeguard is prohibited.
- Cylinder-to-cylinder connections are prohibited for the purpose of gas transfer. Manifold or multiple cylinder systems designed for this purpose are an exception.
- Wherever there is danger of material flowing back into the cylinder, a check valve and flashback arrester shall be installed on the downstream side of the regulator valve.
- Cylinders must not be taken into confined spaces.
- Cylinders are not to be stored in un-vented enclosures.

Many cylinders are provided with a removable protective cap that screws over the valve on the end or top of the cylinder to protect the valve and associated components from damage when the cylinder is not in use. For cylinders designed with such caps:

- A cap shall be kept on the cylinder at all times, except when a cylinder is in service to the extent of being connected to a line or hose. The cap should be hand tight.
- The protective cap should never be used for lifting or handling the cylinder.
- Every time a cylinder is moved by any means from one location to another, the cap shall be on the cylinder.
- Manifold systems on wheeled carts must have the wheels chocked and secured to prevent motion when not being repositioned.
- Signs shall be posted identifying types of cylinders, and smoking restrictions.

Cryogenic Liquid Cylinders

Cryogenic liquid cylinders are insulated, vacuum-jacketed pressure vessels. They come equipped with safety relief valves and rupture disks. Handling and use of cryogenic cylinders shall comply with the following:

- Do not use handling ring to rig or lift cylinders.
- Do not plug, remove, or tamper with any pressure relief device.
- Use a suitable hand truck for container movement.
- Containers should be handled and stored in an upright position. Do not drop, tip, or roll containers on their sides.
- Cylinders shall be located on stable level surfaces.
- Do not bring cylinders into confined spaces.
- Never allow any unprotected part of the body to come in contact with un-insulated pipes on the container.
- Do not remove or interchange cylinder connections, valves or other devices.
- Cylinders with damaged or defective parts shall be tagged out of service and removed from the work area.
- Cylinders shall only be filled or serviced by authorized, trained personnel using specific procedures and specialized protective equipment.

6.38 Underground Construction

- A safe means of access and egress to all work areas will be provided and maintained.
- Access to all openings will be controlled to prevent unauthorized entry underground.
- Unused chutes, man ways, or other openings will be tightly covered; bulk headed, or fenced off, and will be posted with signs indicating "Keep Out" or similar language. Complete or unused sections of the underground facility will be barricaded.
- A check-in/check-out system shall be maintained (unless underground facilities are sufficiently completed so that the permanent environmental controls are effective and the remaining construction activity will not cause any environmental hazard or structural failure within the facilities). This will ensure that aboveground-designated personnel can determine an accurate count of the number of person's underground in the event of an emergency.
- All employees will be instructed to recognize and avoid hazards associated with underground construction activities.
- A Competent Person will be assigned to perform all air monitoring to determine proper ventilation and quantitative measurements of potentially hazardous gases.
- Fresh air will be supplied to all underground work areas in sufficient quantities to prevent dangerous or harmful accumulation of dust, fumes, mists, vapors, or gases.

6.39 Work Permits

Work permits are required to be submitted, coordinated and approved by the applicable Contractor and Subcontractor personnel. Examples of hazardous activities that may require a permit are detailed below:

- Confined Space.
- Excavations.
- Hot Work (Outside designated Safe Hot Work Areas)
- Man Basket (Work Box)
- Lockout/Tag out.
- Pressure Testing.
- Radiography.

7.0 ATTACHMENTS

N/A