



**ABU DHABI WATER AND ELECTRICITY  
AUTHORITY (ADWEA)**

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**CONTRACTORS' HSE REQUIREMENTS BOOKLET**

Approved by:  
Planning & Development Director:



**CONTRACTORS' HSE REQUIREMENTS  
BOOKLET**

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**1. Introduction**

The contract requirements should comply with ADWEA HSE Policy Statement to ensure the protection of life, property and environment; and foster construction efficiency. These requirements vary with respect to the project scope, nature, complexity, location, etc.

The HSE contract requirements and the Contractor's HSE Programme/Plan shall aim to:

- eliminate of personal injuries and damage to property,
- minimize the effects of accidents on both the individuals and on the project,
- comply with ADWEA Health, Safety and Environmental policy, and procedures
- comply with all UAE Federal and State statutory requirements and standards,
- avoid fatalities and accidents,
- avoid lost time due to accidents,
- avoid penalties, and
- Work in safe manner.

**2. Purpose**

The purpose of this document is to present the following.

- HSE Administrative Requirements.
- HSE Project Requirements.
- Specific Safe Practices/ Procedures.

**3. Scope**

These requirements, which may vary depending on the work scope, apply to all Contractors who carry out work on any Company facility/location. These requirements shall be submitted to contractors as an Appendix to the Call for Tender, mainly to the construction/service contracts for works within the existing plants/facilities and or new projects.

**4. ADWEA HSE Policy**

The Policy of Abu Dhabi Water and Electricity Authority (ADWEA) and its Companies, in carrying out all its activities, is to pursue a sound Health, Safety and Environmental System and Program in order to protect the safety and health of employees, contractors, customers and the community at large. To minimize the impact to environment in compliance with the Federal and Local Legislation concerning HSE and the applicable international rules and standards.



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ADWEA and its Group Companies believe that good HSE performance will contribute and determine the success of the business and that HSE is a shared responsibility across ADWEA and its Companies, particularly line Managers and Supervisors.

ADWEA and its Group of Companies will:

- Set HSE standards that ensure commitment of compliance to all relevant regulatory and legislative requirements; and other requirement which ADWEA subscribes that relates to HSE hazards.
- Develop systems and procedures aimed at reducing HSE risks, and systematically audit work practices and identify potential HSE hazards with the commitment of prevention injury and ill health.
- Be committed to continual Improvement in HSE management and performance through regular self-assessment and performance measurement/targeting; Design / Modify the facilities in a manner to reduce all HSE risks to acceptable level;
- Progressively reduce the environmental and health impacts of its operations by reducing emissions, effluents/discharges and wastes and improve efficient use of natural resources and energy;
- Demonstrate and promote pollution prevention, environmental preparedness and waste minimization;
- Ensure high quality products that can be cost effective and used safely by our customers;
- Pursue innovative activities, products, research and investments that provide a healthy, accident-free workplace and a sustainable, quality environment for future generations;
- Integrate and enhance HSE considerations into all business processes;
- Inform and encourage employees in their duty to act responsibly and to take all precautions necessary, not only to protect themselves but also others, from injury, occupational illness and environmental damage that could arise from their actions;
- Ensure that all employees receive adequate and suitable training to enable them to understand and perform their role to achieve superior HSE performance; and
- Ensure that where contractors are employed, their commitment to HSE is of an equal standard to that set by ADWEA and its Companies and to ensure the availability of these standards to all interested parties.

To this end, all personnel are responsible for understanding the HSE impacts, hazards and risks associated with their jobs and for following the proper procedures to minimize or eliminate those impacts, hazards and risks. All employees and contractors are required to perform their duties having in mind that individual responsibility for HSE cannot be delegated.



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**5. HSE Requirements**

**5.1 General**

The health, safety and welfare of ADWEA and Contractors employees is of prime importance to ADWEA and together with protecting the environment is essential to the operation of the undertaking.

The following rules and conditions have been prepared to ensure the safety of ADWEA and Contractors' employees. The Contractor shall see that his employees are conversant with the rules and that they comply with them.

These rules do not exempt the Contractor from his statutory duties on HSE issues, but are intended to assist him in attaining a high standard of compliance with those duties.

**5.2 Contractor's HSE Policy**

The Contractor shall issue an HSE Policy Statement to the ADWEA REPRESENTATIVE which shall be dated and signed by the Contractor's most Senior Representative. The Contractor shall bring this policy statement to the attention of all his personnel.

**5.3 Contractor's HSE Plan**

Preparation for contracts, large or small, must include the same systematic process of hazard identification, assessment, control and recovery, together with the evidence that a system is in place to manage these hazards. In a major project this HSE Plan will be a comprehensive document. In the other extreme, e.g. for one-man contract undertaking a simple repetitive task, indication that this person recognize and understand the hazard is likely to be adequate.

For small or short duration contracts, HSE planning must not be ignored or treated superficially. In such cases, the work is likely to include the use of basic practices (e.g. scaffolding, welding, excavating, etc) and the contractor should be able to demonstrate good general HSE management in each of these basic practices. In addition, the contractor should be able to understand and carry out hazard assessment when these practices are put together in different combinations, particularly in association with the hazards of the workplace (e.g. working in confined spaces, in energized equipment, isolating electrical systems, etc).

The plan shall also have provisions for all necessary precautions to prevent injury to the public or damage to property of others. The public is defined, as all persons not employed by or under contract or subcontract to the Company.

The HSE Plan shall conform to the following structure:

1. Brief description of the project scope of work.
2. Leadership and Commitment

Contractor shall define how senior management set personal examples, demonstrate involvement and participation, communicate to employees, etc on HSE.

3. Policy and Objectives

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Contractor shall define the HSE policy statements that are to be observed and to identify his HSE objectives for the specified project.

**4. Organization, Resources and Competence**

Contractor shall define the formal structure for organization, allocating resources, defining communications and responsibilities on HSE issues between the Group Company/Consultant and the contractor, setting minimum competence levels and training requirements in HSE expected on the project for his personnel and specifying documentation control. The following headings are as a minimum for consideration:

- HSE organization and responsibilities
- HSE communications
- HSE meeting program
- HSE promotion and awareness
- HSE competence requirements
- Employee orientation program
- HSE training matrix

**5. Evaluation and Risk Management**

Contractor shall describe how hazards and effects are to be identified, assessed, controlled and how recovery in the event of loss of control will be carried out.

This will include the following headings as minimum:

- Identification, assessment and control of hazards and aspects.
- Methods and procedures for hazards and effects management
- Assessment of exposure of the workforce to hazards and aspects
- Material data sheets for safe handling of chemicals and other hazardous material (if available)
- Methods and procedures for waste management

**6. Planning, Standards and Procedures**

Contractor shall describe how the controls for hazards and effects management are to be implemented, develop a comprehensive listing of HSE standards and procedures applicable to the project and describe emergency response procedures.

The minimum topics to be considered are:

- HSE standards, procedures and legislations
- Basic HSE rules
- Emergency response procedures
- HSE equipment and its inspection, including check lists
- Personal protection equipment (P.P.E)
- First aid
- Occupational health
- Environment
- Waste management
- Site restoration



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- Road transport
- Managing sub-contractors

**7. Implementation and Monitoring**

Contractor shall define how HSE performance is monitored, the criteria for HSE performance and how the corrective action is to be taken. The main issues to be considered are:

- HSE performance – General
- Incident investigation and reporting
- Monthly reporting
- HSE inspections and audits
- HSE meetings
- Near misses

**8. Audit and Review**

Contractor shall define the basis under which internal and external HSE auditing and management reviews will be conducted.

Note: Any format(s) will be used by contractor related to HSE is to be attached to the HSE Plan.

**5.4 Compliance with Statutory Regulations**

The Contractor shall carry out his work in accordance with statutory legislation including but not limited to:

1. 'Abu Dhabi Emirate Law No.8 of the year 1978' Conservation of Petroleum Resources.
2. Ministry of Labor and Social Affairs 'Federal Law No.8 of the year 1980'.
3. Ministry of Labor and Social Affairs 'Ministerial Order No.32 of the year 1982'.
4. Federal Environmental Law No.24 for the year 1999.
5. Law No.21 for the year 2005 with respect to Waste Management within Abu Dhabi Emirate.
6. ADWEA and its Group Companies/Affiliates HSE Rules, Regulations, Procedures and Guidelines, such as but not limited to:
  - Group Company/Affiliate System Safety Rules and Permit To Work System
  - ADWEA Incident Reporting, Investigation and Analysis Procedure – Chapter 1.
  - ADWEA HSE Requirements of Contractors – Chapter 2.
  - ADWEA HSEIA Procedure – Chapter 3.
  - ADWEA HSE Audit Procedure – Chapter 5.
  - ADWEA HAZOP Review Procedure – Chapter 6.
  - ADWEA Risk Management Guidelines – Chapter 9.
  - ADWEA Waste Management Procedure – Chapter 10.



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- ADWEA Personal Protection Equipment Procedure – Chapter 19.
- ADWEA Excavation Guidelines – Chapter 20.
- ADWEA Material Handling and Lifting Guidelines – Chapter 24.
- ADWEA Confined Space Guidelines – Chapter 25.
- ADWEA Scaffolding Guidelines – Chapter 26.
- ADWEA Contractors' Camps & Temporary Buildings Guidelines – Chapter 27.
- ADWEA Color Coding System for Loose Lifting Gear (Appendix 4).

The Contractor shall at all times carry out his work in accordance with the above Procedures/Guidelines, Rules and Conditions. **It is the Contractor's responsibility to ensure that he has a copy of the above as applies to his scope of work and that the HSE requirements within these procedures are clear and understood by him at the tendering stage.**

The Contractor shall ensure that all personnel under his control are aware of and follow the said Rules and Conditions.

**5.5 Qualifications and Training of Personnel**

The Contractor shall ensure that all personnel under his control regardless of position are given a HSE induction prior to arrival on site, and on arrival, a job orientation course.

The Contractor shall ensure that all personnel under his control regardless of position are given specific HSE training as the scope of work and work conditions dictate. The contractor shall ensure that all personnel are also trained in both general awareness of environmental issues and specific procedures aimed at avoidance of environmental damage.

The Contractor shall submit to the ADWEA/Consultant Representative(s) an HSE training program for his personnel for the duration of the contract. The Contractor shall provide documented evidence of all HSE training and instruction given to personnel under his control to the ADWEA/Consultant Representative(s), together with practical demonstrations of such training if requested.

The Contractor shall ensure that all personnel are qualified in the particular job that they are performing and undergo further training to meet the needs of the working environment, if required.

The Contractor shall provide copies of all qualifications for personnel under his control prior to arrival on Site and shall if required by the ADWEA/Consultant Representative release his personnel at the Contractor's expense to sit an examination to determine their competency.

**5.6 HSE Responsibilities**

The Contractor, as a minimum, shall:

- Be directly responsible for the implementation and administration of his HSE Program/Plan and that of its subcontractors. Any violation of policies, standards and programs shall be attended within 24 hours of written notification.

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- Document the specific responsible authority and interrelation of all personnel who implement the HSE activities.
- Appoint his HSE Engineer who shall have the defined authority and responsibility for ensuring that the HSE requirements in the contract and any additional instructions issued by the Projects Management Team are implemented and maintained.
- Submit for approval to the Projects Management Team within 30 days of Notice to Proceed, a resume of the qualifications and work experience of the HSE Engineer proposed for assignment to the project. Contractor's proposed HSE Engineer may be required to appear for a personal interview.
- Take all necessary action to ensure that his sub-contractors and others employed by them comply with the Contractor's approved HSE Program/Plan.

**5.7 HSE Meetings/Information**

The Contractor shall provide ADWEA/Consultant Representative(s) with a plan showing the frequency of HSE meetings within its own organization shall invite the ADWEA/Consultant Representative(s) to attend and shall provide copies of HSE meeting minutes.

The Contractor shall provide ADWEA/Consultant with a flowchart showing the flow of HSE information to all employees under his control.

The Senior Contractor's Representative on site or his immediate superior in his organization shall attend and actively participate in the HSE Meetings.

**5.8 Certification of Equipment and Equipment Standards**

The Contractor shall ensure that all lifting tackle, lifting appliances, mobile work platforms and hoists under his control are in possession of current up-to-date certification and are color coded in accordance with ADWEA specifications. Prior to their use, the Contractor shall provide copies of test certificates and records of Thorough Examinations to the ADWEA/Consultant Representative(s).

In addition, Contractor shall adhere to the standards listed below, for some of the equipment:

- Cranes
  - Operators are responsible for the exercise of caution necessary for the safe operation of their equipment. Operators shall immediately report unsafe conditions, including defects in the machine, to their supervisor.
  - Operators shall not permit anyone to ride the hook, headache ball or load.
  - When the operator leaves the machine or repairs are being made, it is the responsibility of the operator to set the brakes, secure the boom; take the machine out of gear and turn off the engine.
  - When making any lift, the operator will take operational signals only from the authorized signal person. The only exception is that an emergency stop signal given by anyone will be acted upon by the operator.



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- It is the joint responsibility of the operator and the riggers to see that all hitches are secure and that all loose material is removed before the loads are lifted.
- Safety hooks, or properly moused hooks, shall be used on all operations where loads are being handled. Suspended loads shall be controlled by tag lines.
- Booms shall be equipped with a boom angle indicator and approved boom stops. Boom heads, load blocks and hooks shall be painted with high visibility paint.
- All cranes, except crawler cranes and boom type excavators, shall be equipped with outriggers of a design and strength suitable for the work being performed. Outriggers shall be used in accordance with the Manufacturer's Instructions.
- Hooks, wire rope, bearings, gears, friction clutches, chain drives and other parts subject to wear must be inspected at regular intervals and repaired or replaced as required. Records of such inspections shall be maintained by the Contractor.
- All cranes over three tons manufacturer's rated capacity shall be certified annually. This certification shall be submitted to the Projects Management Team Leader and Consultant prior to use of the crane.
- All overhead electrical lines shall be considered as High Voltage lines and no crane or any part of a crane shall be permitted to work within ten feet of an overhead electrical line.
- Vehicular and/or pedestrian traffic shall not be allowed to pass beneath the boom of any crane. When the boom of a crane must be placed over a street or pedestrian walkway the traffic, vehicular and/or pedestrian shall be stopped or rerouted.
- Boatswain's chairs shall not be suspended from any crane.

**Reference shall be made to ADWEA Material Handling and Lifting Guidelines and to ADWEA Color Coding System for Loose Lifting Gear (Appendix 4).**

- Construction Equipment
  - The equipment shall be thoroughly checked at the beginning of each shift.
  - Operators shall not start or operate any equipment while other personnel are oiling or adjusting the equipment.
  - The glass in the cabs of cranes, loaders and other equipment shall be approved safety glass.
  - Runways, stairways and/or platforms shall be provided whenever required for the safe operation of the equipment.
  - No more than one person, the operator, shall ride any equipment unless the equipment is equipped with seats to accommodate such riders.
  - Back-up alarms are required.

**5.9 Incident Reporting**



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The Contractor shall promptly provide notification to the ADWEA/Consultant Representative(s) of any incidents that occur at the work-site. For all Incidents Reporting and Investigation **Contractor shall refer to ADWEA Incident Reporting Procedure under item 5.4 above.**

**Incident Reporting Formats to be used by the Contractor are in appendices 1 & 2.**

**5.10 Personal Protective Equipment (PPE)**

The Contractor shall provide free of charge all personnel under his control with personal protective clothing and other equipment, as required in connection with the safe performance of the work, which shall be maintained in good condition or replaced.

The Contractor shall ensure that all personal protective equipment under his control conforms to **ADWEA Personal Protection Equipment Procedure under item 5.4 above**, but as a minimum Contractor shall:

- Safety helmets and safety shoes shall be worn by all personnel while in the vicinity of any construction activity.
- Safety goggles or face shields shall be worn by all personnel performing grinding/ chipping, chiselling/ cutting, welding or any other similar acts which may produce dust, sparks, gases and/ or flying particles, and by those in the affected vicinity.
- Dust goggles shall be used when working in areas subject to blowing dust or sand.
- Protective gloves shall be provided and used when working with sharp material.
- All employees shall be required to wear appropriate work pants or overalls for skin protection.
- Safety ladders and fans shall be provided and used where necessary during the work. Lifelines and safety belts shall have a minimum breaking of 2,500 kg. Safety belt lanyards shall not be longer than 2 meters, if not otherwise covered in the specifications.
- All personnel protective devices shall be inspected regularly and maintained in good working conditions.

**5.11 Occupational Health and Hygiene**

The Contractor shall ensure that all necessary arrangements have been made to identify any hazardous exposures to health of his employees and that precautionary measures have been taken to protect personnel and the workplace.

The Contractor shall provide and agree with the ADWEA/Consultant Representative(s) arrangements for provision of medical facilities and services for all his personnel including, but not limited to, physical examination for fitness to work and freedom from contagious diseases, consultation and treatment of sickness and injury.

Medical examinations for employees shall be provided by the CONTRACTOR at the periods specified in accordance with the "UAE Ministry of Health Regulations".

**5.12 Permit To Work System**



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All the ADWEA Group Companies/Affiliates operate a "Permit to Work System"(PTW) which the Contractor shall adhere to fully, when working on or within an existing facility.

The Contractor shall ensure that all personnel who are required to work under the Permit to Work system of any of the Group Companies/Affiliates shall understand and shall be tested to be authorized and competent in dealing with the Permit, prior to commencing work.

**5.13 Environmental Protection and Waste Disposal**

The Contractor shall pay due regard to the environment by preserving air, water, soil, animal and plant life from adverse effects of the Contractor's activities and shall provide to the ADWEA/Consultant Representative(s) and detailed procedures for protecting and monitoring the environment (e.g. oil and chemical spill contingency measures, site restoration etc.) and waste disposal prior to starting work on site.

**ADWEA Waste Management Procedure under item 5.4 above shall be referred to and followed.**

**5.14 Emergency Plans**

The Contractor shall have a written Emergency Action Plan as a part of his HSE Program/Plan including, but not limited to, the following:

- Injuries to employees.
- Injuries to the general public on or adjacent to the work site.
- Property damage with particular emphasis on utilities.
- Fire.
- Environmental damage,
- Natural disasters such as earthquakes.
- Other exposures or potential hazards that may occur at the work site.
- Roles and Responsibilities
- Communications and contact numbers

Emergency Procedures shall be compatible with procedures of UAE police, fire and other related authorities.

In formulating an Emergency Action Plan, the Contractor shall provide for the establishment and staffing of appropriate first-aid facilities for the treatment of on-the-job injuries. A first-aid kit adequate to service the crew (s) shall be available on site at all times. The location of first-aid kits shall be discussed at the weekly tool box HSE meetings.

Emergency Procedures shall ensure that the Contractor's Project Manager or most senior supervisor present takes charge and directs the handling of the emergency.

Emergency Procedures and actions required shall be discussed regularly with the Contractor's supervisory personnel and at tool box Safety Meetings.



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#### 5.15 Audits, Monitoring and Inspection

The Contractor shall carry out regular inspections at no longer than seven day intervals, to cover his worksites, industrial areas, camps and messing facilities. Copies of inspection reports shall be submitted to the ADWEA/Consultant Representative(s). The Contractor shall also carry out planned audits to review safety management and procedural aspects of his operation.

The Contractor shall develop an annual HSE audit and inspection plan/schedule and shall ensure an effective system is in place for monitoring the follow-up and implementation of inspection and audit actions.

ADWEA/Consultant shall have the right at any time to audit/inspect the Contractor's facilities, procedures and safety management systems. The Contractor shall fully co-operate in such reviews and shall implement recommendations at his own cost where ADWEA or statutory rules and regulations are contravened.

#### 5.16 Stopping of Work and Prohibition of Unsafe Practices and Environmentally Damaging Acts

The ADWEA/Consultant Representative(s) shall have the right to suspend work being performed by the Contractor at any time, if the ADWEA/Consultant Representative(s) deems that the Contractor has or is about to violate statutory or ADWEA health, safety or environmental rules and regulations. The cost of such stoppages of work in this regard will be borne by the Contractor.

### 6.0 SAFETY PRACTICES/PROCEDURES

#### 6.1 Hazardous Substances

The Contractor is responsible for effective control of all hazardous substances within the site. He must ensure that procedures are in place to enable all the following requirements to be achieved:

- Procedures/Instructions for the control of hazardous substances are available and implemented.
- Material Safety Data Sheets (MSDS) are available prior to the acquisition or use of hazardous substances, or the information supplied on the substance packaging is adequate to enable suitable procedures for the control of the substance to be developed.
- All substances to be used within the site are correctly packaged and labelled.
- Suitable personal protective equipment is identified, provided and properly used as appropriate.
- Personnel working with hazardous substances receive adequate information, instruction, training and supervision.
- All spills are promptly dealt with in accordance with the instructions on MSDS or the substance container.



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- Waste materials are disposed of in accordance with the instructions on the MSDS and in accordance with **ADWEA Waste Management procedure under 5.4 above**.
- Making all personnel aware of the hazards associated with substances being used and ensuring the use of the correct procedures and appropriate personal protective equipment, where required.
- Reporting of spills and defective equipment.

**6.2 Office Safety**

Reference shall be made to ADWEA Contractors' Camps & Temporary Buildings Guidelines, but as a minimum, Contractor shall ensure that:

- Safety signs giving information and instruction about escape routes, emergency actions, etc. must be prominently displayed and arrangements made to keep signs up to date.
- Floors must be kept free from obstruction or material likely to cause a person to slip, trip or fall. Floors must be regularly maintained and worn or loose floor coverings repaired, or replaced with material that is non-slip, fire retardant and anti-static.
- Stairways and corridors must not be used for the storage of goods and materials.

**Reference shall be made to ADWEA Contractors' Camps & Temporary Buildings Guidelines**

**6.3 Orderliness/ Housekeeping**

Contractor shall ensure that, at any time, each and every piece of equipment, tool, material, facility, or apparatus shall be stored, stacked, located, placed, temporarily spotted or set up for manipulation in such a manner as will render an accident highly improbable and gives the direct and obvious impression of a clean and orderly work place.

Orderliness Responsibility

The Contractor shall designate storage areas with the approval of the Consultant and Projects Management Team. The Contractor will correct any non-compliance.

The following basic requirements shall be expected by all Contractors and employees.

- Do not block access ways.
- Work areas will be cleaned daily as work progresses.
- Do not leave cables, cords or loose objects in passageways, stairways, walkways or underfoot.
- Remove all materials, tools and equipment such as shackles, slings, ladders, safety equipment, etc. from work areas and return them to storage areas when not needed.
- Return all tools, supplies, materials and equipment to their proper storage area after completion of job.
- Welding rod, nuts, bolts and round stock shall be kept in proper containers and not piled on floors, or deck.



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- Trash containers shall be placed at appropriate locations for disposal of all rubbish, trash and debris.
- Rubbish, trash and/or debris shall be removed from the work area daily.
- Daily checks of work area by the Contractor shall be made for the removal of rags, boxes, paper and other debris for housekeeping and fire prevention.
- Dune shall be stored in neat storage piles or removed from the job-site daily.

**Reference shall be made to ADWEA Contractors' Camps & Temporary Buildings Guidelines under item 5.4 above.**

**6.4 Lock-Out/ Tag -Out Clearance Procedure**

The following procedure is intended to provide a controlled method for rendering electrical equipment or operating systems inactive (including mechanical or piped) when equipment is down for any reason, such as repair, removal or replacement of equipment and any installation of new equipment.

This procedure includes the three basic phases of work on any system:

- Shutting down equipment.
- Repairing or installing equipment.
- Start-up of equipment.

In any of the above cases, the "lock-out" clearance procedure must be observed to ensure the safety of the operation.

**A. Shutdown of Equipment or System**

- The craft supervisor shall cause equipment to be shut down in a manner consistent with good operating practice.
- The main disconnect shall be opened in addition to any remote control switches. On electrical work, it is advisable as a further precaution, that the electrician removes all of the supply fuses. On piped systems, the main valves shall be closed and pressures relieved.
- After assurance that the equipment has been properly shut down in accordance with prescribed procedures, the craft supervisor shall positively determine that the equipment or system has been locked and tagged as follows.
- A padlock, to which only the craft supervisor shall have access to keys, shall be placed on the equipment in such a manner as to render operation of the equipment or system impossible.

**B. Repair or Installation**



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- Each individual craftsperson assigned to the job shall attach to the equipment or system a separate standard danger tag. The tag shall be dated, signed, and a short explanation for the reason for the tag should appear in the provided spaces.
- The craft supervisor responsible for the work must ensure that the equipment has been deactivated and properly tagged before permitting his/her personnel to perform any work.

**C. Starting Up Equipment or System**

- As soon as the work is completed, the tags shall be removed only by the individuals installing them.
- In the event the shift ends before the work is completed, the status of the work is to be reported in detail to the oncoming shift personnel and the names on the tags changed.
- Upon completion of the work, the supervisor will make certain all worker's tags have been removed and that everyone is clear of the equipment or system. The supervisor shall return the equipment to normal operating conditions.

**D. General**

- In an emergency, the Contractor's Safety Engineer shall have the authority to remove the tags and locks only after positively determining whether or not the equipment or system is safe for operation and that all personnel are in the clear.
- Personnel deviating from these instructions or unauthorized persons removing danger tags shall be subject to immediate dismissal.

**In all cases, reference shall be made to the Group Company/Affiliate System Safety Rules under 5.4 above.**

**6.5 Electrical Work Installations**

Contractor shall ensure that:

- All electrical work installations and wire capacities shall be in accordance with the pertinent provisions of the UAE Code.
- All switches shall be enclosed and grounded. Panel boards shall have provisions for closing and locking the main switch and fuse box compartment.
- Cables or cords passing through work areas shall be covered or elevated to protect them from damage and to eliminate tripping hazards.
- Cables or cords crossing roadways shall be covered to prevent damage from vehicles and/or equipment and they shall not be allowed to lie in water.
- Extension cords used with portable electric tools and appliances shall be heavy duty, of the three wire grounding type, and shall conform to the type and configuration required by the applicable government standard.



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- Suitable means shall be provided for identifying all electrical equipment and circuits, especially when two or more voltages are used on the same job. All circuits shall be marked for the voltage and the area of service they provide.
- All electrical work shall be performed by qualified electricians who are familiar with the codes.
- Ground-fault circuit interrupters or an approved assured grounding program shall be used. Should an assured grounding program be used, copies shall be submitted to the Company Project Management Team and the Consultant.
- Live parts of wiring or equipment shall be effectively guarded to prevent contact by personnel or objects.
- All electrical circuits and/or equipment shall be de-energized prior to any work being performed on the circuits and equipment. Exception: When electrical circuits and/or equipment cannot be de-energized and must be worked hot, then adequate voltage rated insulated gloves, mats, aprons and other protective equipment shall be used as required and shall be tested for leaks and insulating capabilities.

**6.6 Tools**

All hand tools, power tools and similar equipment, whether furnished by the Contractor or the employee, shall be maintained in a safe condition. Supervisors and craft employees shall be responsible for the inspection and repair of tools under their control. The use of many tools requires the use of a variety of personal protective equipment.

All machinery and tools shall be inspected and tested at intervals not exceeding 6 months to ensure they are in satisfactory condition and capable of safely performing the functions for which they were designed and built.

- Hand Tools
  - Insulated or non-conducting tools should be used when working near energized electrical circuits.
  - Tool handles should be tightly fitted. Wooden handles should be carefully checked: tightened with wedges, if necessary, or replaced if split or splintered.
  - All impact tools, such as chisels, punches and wedges shall be regularly dressed to eliminate mushrooming or flaring of the point of impact.

• Power Tools

Power tool accidents are caused by improper handling or poor maintenance. The following shall apply to all types of power tools.

- Only authorized personnel shall be permitted to operate or repair power tools.
- Maintenance of power tools shall be systematic. All worn or damaged tools shall be promptly repaired or replaced. All tools shall be cleaned, tested and inspected regularly.



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- Power tools shall not be used if safety equipment, such as shields, tool rests, hoods and guards have been removed or otherwise rendered inoperative.
- Employees using tools under conditions that expose them to the hazards of flying objects or harmful dusts shall be provided with the required personal protective equipment.
- All electrically powered tools shall be properly grounded.
- Gasoline-powered tools shall not be used in unventilated areas. Gasoline shall be dispensed only in approved safety cans.
- Portable grinders shall be provided with hood type guards with side enclosure that covers the spindle and part of the wheel as per international standard/ satisfaction of the supervisor and/or responsible team. All wheels will be inspected regularly for signs of fractures.
- Bench grinders shall be equipped with deflector shields and side covers guards. Tool rests and tongue guards shall have a clearance from the wheel as per international standard.
- Hoses supplying pneumatic tools shall have coupling, whip checks and/ or tie wires, secured to prevent accidental disconnection.
- Air-supply lines shall be protected from damage, inspected regularly and maintained in good condition.
- Air sources supplying hoses exceeding ½ inch inside diameter shall 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 shall be 30 PSI or less (does not apply for cleaning forms, etc).
- All hand-held power drills, tapes, fastener drivers, horizontal, vertical and angle grinders, disc sanders, belt sanders, reciprocating saws, saber saws and all other similarly operating powered tools shall be equipped with a momentary contact on-off control switch/trigger.
- All personnel who operate pneumatic, electric or gasoline-powered chain saws shall be trained in the safe operation of a chine saw. Documentation attesting to this training shall be on file in the Contractor's office and available upon request.
- All chain saws shall be equipped with but not limited to the following:
  - ~ safety tip
  - ~ hand guard/chain brake
  - ~ spark arrester (gasoline only)
  - ~ chine catcher
  - ~ bumper spikes

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- Powder-Actuated Tools
  - Only employees who have furnished evidence of having been trained in its use shall be allowed to operate a power-actuated tool. Eye protection shall be worn by all personnel using the tool.
  - Tools shall not be loaded until just prior to use. Loaded tools shall not be left unattended.
  - Tools shall not be used in an explosive or flammable atmosphere. Cartridges (power source) shall be kept separated from all other material.
  - Powder-actuated tools used on this project shall meet all applicable requirements of federal code.
- Pneumatic Nailers/ Staplers
  - To prevent accidental discharge, all pneumatically driven nailers and staplers shall have a safety device on the tool which shall prevent the tool from being operated unless the muzzle of the tool is in contact with the work surface.
  - When not in use, the nailer and/or stapler shall be disconnected from the air supply.
  - All personnel, who operate pneumatic nailers and/or staplers, shall be trained in their safe operation. Documentation attesting to the training shall be on file in the Contractor's office and available upon request.

**6.7 Welding, Burning and Cutting**

- Welding
  - A suitable, approved fire extinguisher shall be available for instant use in locations where welding is done. Screens, shields or other safeguards shall be provided for the protection of personnel or materials below or otherwise exposed to sparks, slag, falling objects or the direct rays of the arc.
  - The welder shall wear approved eye and head protection. Persons assisting the welder shall wear protective glasses.
  - Electric welding equipment, including cable, shall meet the requirements of applicable regulations.
- Burning or Cutting
  - When gas cylinders are stored, moved or transported, the valve protection cap shall be in place.
  - When cylinders are hoisted, they shall be secured and upright in an approved cage or basket.
  - All cylinders shall be stored, transported, and used in an upright position. If the cylinder is not equipped with a valve wheel, a key shall be kept on the valve stem while in use.



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- An approved fire extinguisher shall be readily available in the event of fire.
- Appropriate personal protective equipment, such as burning glasses, shields and/or gloves must be used.

**6.8 Access, Egress & Working at Height**

Access/egress to all working places shall be clear, free of obstruction and the use of any such access/egress shall not give rise to additional hazards, e.g. falling debris on demolition sites, vehicular hazards on earth moving sites. Access/egress routes shall be clearly defined and/or marked out.

**Gangways, Including Runs and Ramps:**

These may be necessary to afford access/egress between working places at different levels in an elevated position or across excavations, etc. The following shall be followed:

- Materials used in the construction of any gangway shall be in good condition.
- The access/egress shall be constructed so that it is well able to support the loads being imposed upon it.

**Minimum Width of Gangways:**

- 430 mm if used for the passage of persons only.
- 600 mm if used for the passage of material

Any slope on a gangway shall not be greater than 1 vertical in 1.5 horizontal.

Where the slope of a gangway is such that persons may be likely to slip, and in any case where the gangway slope exceeds 1 vertical to 4 horizontal, stepping laths shall be used to provide a firm foothold. The laths shall extend over the full width of the gangway, with a gap of not more than 100mm, to allow free movement of wheelbarrows.

Gangways shall not be allowed to become slippery.

Guard-rails and toeboards shall be provided where persons can fall more than 2m, or from where they can fall into water, and possibly drown. They shall also be provided where falls of less than 2m give rise to a particularly serious hazard, (e.g. protruding starter-bars).

**Batters (an artificial, uniform steep slope):**

Consideration shall be given to the provision of suitable access across batters. Such an access extensively used by persons carrying material, and without suitable provision, is likely to become slippery.

A scaffold handhold at a height of between 910 mm and 1.15 m shall be provided at the site of the access.

Steps shall be cut into the batter, but on shallow batters, where material providing a firm foothold (e.g. blinding) is used, steps shall not be necessary.



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**Stairs**

Where persons can fall more than 2 m from the step edge or edges of the stairway, a double guard-rail, i.e. one fixed at a height of between 910 mm and 1.15 m and another fixed halfway between the upper guard-rail and the stairs shall be provided.

Where persons cannot fall more than 2 m, one edge of the stairway shall be provided with a scaffold handhold at a height of between 910 mm and 1.15 m.

**Portable Ladders**

Ladders shall be inspected on a daily basis and before use, and those with missing or damaged rungs or damaged strings shall not be used. To permit the inspection, ladders shall not be painted. Where it is possible to cut off the damaged part of the ladder, the shortened good part may be used.

Ladders shall be erected at a working angle of approximately 75° to the horizontal, i.e. one unit out of the base for every four units of height.

Ladders shall rest on a firm level base. If it is intended to rest the ladder on an uneven base or stairways etc., then a leveling device shall be used. Loose packing shall not be used.

Where possible, all ladders shall be secured near the top, (to prevent the base sloping outwards and the top slipping sideways or twisting) by lashing or clamping each stile to a convenient secure anchorage.

Ladders shall extend at least 1m above the stepping off point.

Ladders shall be placed so that there is a clear space behind each rung to permit the secure placing

A resting platform shall be provided at vertical intervals of 9 m. Where persons can fall more than 2 m from these platforms, then guardrails and toeboards shall be provided.

If a ladder protrudes through a working platform, then the opening shall be as small as possible, and in any case 500 mm maximum width.

Suitable access to a working place shall be provided at the stepping off point. Persons shall not be required to climb over or through guardrails and toeboards. Gaps in toe boards and guardrails shall however, be kept as small as possible.

Single board runs to ladders shall not be used.

Ladders that are used to gain access to scaffold platforms, working places, etc. shall be single pole ladders. Extension ladders or aluminum ladders shall not be used.

Aluminum, wooden and extension ladders may be used where the ladder is used as a working place. Aluminum ladders, however, must never be used where electrical hazards exist.

Only one person shall be permitted on a ladder at any one time, another person shall always foot a ladder when anyone is climbing a ladder which is not secured at its top.



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Ladders shall not be used to support a working platform other than that, which is supplied with the Ladder Limpet System.

**Important Note:** A ladder shall only be used as a workplace after careful consideration that it is suitable for the purpose.

Tools and materials shall not be carried by persons ascending or descending ladders except that tools may be carried in purpose designed pockets or special belts (waist belt), provided they do not impair movement.

A person working on or from a ladder shall always have both feet on the rungs and a secure handhold. If the work to be done necessitates the use of both hands, safety harness clipped to a secure anchorage shall be used.

**Roof Work:**

Flat roofs (i.e. 10° or less pitch) from which persons can fall more than 2 meters shall be provided with guard-rails to a height of between 910mm and 1.15 meters and toe-boards to a minimum of 150 mm. The gap between the top of the toe-board and the guardrail shall not exceed 765 mm.

Sloping roofs (i.e. more than 10° pitch) from which persons can fall more than 2 meters shall be guarded in similar fashion or an external scaffold provided.

However, where work from a flat or sloping roof is not extensive (i.e. total duration of the activity less than one hour) and is of light nature, it may be possible for persons to work from crawling ladders with a safety harness attached.

On sloping roofs that are likely to become slippery, and in all cases when the pitch exceeds 30° crawling ladders shall be provided, secured, and used.

**WALKING ON PURLINS, SHEETING BOLTS ETC. SHALL NOT BE PERMITTED.**

**Safety Harnesses:**

When a working platform cannot be provided, fitted with guard-rails and toe-boards as per Section 5, full body safety harnesses shall be used where persons can fall more than 2 meters.

All harnesses shall be in good condition and inspected prior to use.

Fixing points shall be established such that, persons have free movement without the need to constantly unclip the harness. A running line is recommended where free movement is required.

When the foregoing distances do not permit sufficient range of movement, then approved and certified inertia reels may be used, provided that the maximum free fall distances are not exceeded.

Employees shall be provided with full body harnesses used in conjunction with safety lanyards, for attachment to anchorage points. Harnesses may be built into lightweight carrier suits.

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Freedom of movement must be provided, but when the combined effects of the position of the anchorage, the length of the lanyard, the attachment point on the harness and the length of any webbing limits the drop to a maximum of 2 m.

**6.9 Scaffolding**

- General
  - Scaffolds shall be designed, built and inspected by competent persons. To avoid the use
  - Of makeshift platforms and scaffolding, each job should be carefully planned to ensure that scaffolding is used where required and that such scaffolding conforms to safety Standards.
  - Guardrails and toe boards shall be installed on all open and ends of scaffolds. Guardrails shall be of 5×10 cm stock, midrail 5×10 cm stock, or comply with international/ UAE standards. The top rail should be approximately 100 cm high or satisfy international/ UAE standards and midrail placed halfway between top rail and the platform.
  - The toe-board, 10 cm minimum height or satisfy international/ UAE standards, shall be securely fastened in place.
  - Wooden railing posts (verticals) shall be made of at least 5×10 cm stock or satisfy international/ UAE standards, and be spaced so as not to exceed 250 cm on center.
  - When working from a scaffold which is not completely decked and/or guardrails are not installed, fall protection shall be used.
- Other types, sizes and arrangements of railing construction are acceptable, provided they meet the following requirements:
  - A smooth surfaced top rail approximately 1.0 meter or as per international/ UAE standards above the floor.
  - A strength to withstand the minimum of 1.0 meter or as per international/ UAE standards top rail pressure with a minimum of deflection.
- Stair Railings
 

A stair railing shall be constructed similar to a standard railing, but the vertical height shall be not more than 85 cm nor less than 75 cm from the top rail to the surface of the tread in line with the face of the riser at the forward edge of the riser. All hand rails shall be provided with a clearance of approximately 7.5 cm between the hand rail and any other surface or object.
- Stairways
 

During construction, Stairs shall be provided on all structures that are two or more floors or more than 6.0 meter or as per international/ UAE standards in height.

  - Permanent stairway placement should follow as soon as practical.



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- All parts of stairways shall be free of hazardous projections. Debris and other loose material shall not be allowed to accumulate on stairways.
- Permanent steel stairways having hollow pan type treads and landings that are to be used prior to concrete placement shall have the pans filled with solid material to the level of the nosing.
- Riser height and tread width shall be uniform throughout any flight of stairs.

**Reference shall be made to ADWEA Scaffolding Guidelines under item 5.4 above.**

**6.10 Excavations, Trenching and Shoring**

- The determination of the angle of repose and design of the supporting system shall be based on careful consideration of the following: depth of the cut; anticipated changes in the soil due to air, sun and water; and ground movement caused by vehicle vibration or blasting, and earth pressures.
- Positive barrier or plating shall be provided when a trench is placed adjacent to any roadway.

**Reference shall be made to ADWEA Excavation Guidelines under item 5.4 above.**

**6.11 Confined Space**

All confined spaces shall include areas which:

- have limited openings for entry and exit;
- may contain or produce toxic air contaminants;
- have a high concentration of an inert gas;
- are not intended for continuous occupancy; and
- may have an oxygen deficient atmosphere (less than 19.5%).

Examples include, but are not limited to, storage tanks, process vessels, pits, vats, vaults, sewers, tunnels, manholes, cells, ducts, shafts, trenches and rooms with less than proper size openings for easy access with no mechanical ventilation.

Confined space areas shall be identified and evaluated by the Contractor. A draft plan ensuring that the elements of the Confined Space Entry Policy are met shall be submitted by the Contractor to Projects Management Team for approval.

Contractor shall comply with the requirements of the confined space entry procedure, and ensure that their employees and supervisors are trained in Confined Space Entry Procedure and use most stringent standard for compliance. This includes all Contractor and Subcontractor personnel involved in confined space operation.

**Reference shall be made to ADWEA Confined Space Guidelines under item 5.4 above.**



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**6.12 Asbestos**

- The Contractor shall not expose any employee to an airborne concentration of asbestos in excess of current Safety Standards.
- Anyone working with asbestos shall be currently certified and licensed and will comply with all requirements applicable to asbestos.

**6.13 Radioactive Material**

In the use, handling, or possession of radioactive material, the Contractor shall abide by regulations governing the use of radioactive material. These regulations are established by U.S. Health and Safety Code Sections 25800 through 25870.

**6.14 Blasting and Spray Painting**

Blasting is done by entraining special grit in an air-stream and directing the stream against the surface to be prepared to remove existing coatings, corrosion and scale.

Spray painting uses materials, often containing volatile solvents, pumped at high pressures to apply coatings to surfaces prepared by blasting or by other means such as washing or wire brushing.

There are hazards associated with both activities and they include:

- injury from the blasting and painting processes.
- injury resulting from blasting holes in live pipelines.
- health risk from exposure to harmful substances.
- environmental pollution from grit and paint spillage.
- flammable atmospheres from spray painting processes.
- ignition sources from discharged static electricity.

All painting materials including paint, solvents, thinners, additives and cleaners must be stored in a non-enclosed area remote from sources of heat and combustion and protected from direct sunlight. In areas where major painting projects are undertaken, materials storage should be in a dedicated paint storage container fitted with explosion proof air conditioning and light fittings, and a fire extinguishing system. Portable fire extinguishers must be kept in the immediate vicinity of paint containers and areas where significant amounts of painting materials are stored. Access to paint storage areas should only be made in accordance with an entry procedure and a notice of this requirement displayed at the entrances.

All materials must be contained in manufacturers original containers, durably and legibly marked with descriptions of the contents. This includes the specification number, colour reference number, method of application for which it is intended, batch number, date of manufacture, manufacturer's name, initials or recognised trade mark, and any specific storage instructions.



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Materials Safety Data Sheets (MSDSs) must be available for all paint materials.

Materials must be stored in accordance with manufacturers' special instructions or procedures and any stipulations set out in MSDSs. Incompatible volatile substances must be segregated.

Unidentified painting materials must not be accepted or kept in store.

In addition to basic personal protective equipment requirements, protection should be given by the use of air-fed helmets with a constant supply of breathing quality air. The addition of an air cooler to maintain the air supply within an acceptable temperature range is strongly recommended. Also recommended is the use of visor outer surface 'tear-offs' in acetate or similar material to enable operators to maintain full visibility.

The action of spray painting produces airborne paint particles in the form of a mist which can cause irritation to the eyes, nose, throat and lungs and may possibly lead to more severe health problems.

**6.15 Fire Prevention/ Fire Protection**

Fire prevention/fire protection is of special importance during construction. There are considerably more hazards present during construction than will be present in the completed facility. Constant attention to the fundamentals of fire prevention/fire protection is vital.

The Contractor shall comply with the recommendations of the UAE Fire Protection Association and applicable UAE Fire fighting regulations.

The Contractor's Safety Representative shall make fire hazard inspections of the entire project on a regular basis. Immediate correction of substandard conditions is mandatory.

- Particular care shall be taken when welding and cutting in locations where combustibles are present. When such welding or cutting is done, the surrounding area must be protected with fire retardant blankets and an adequate number of approved fire extinguishers must be immediately available. A fire watch and hot work permit shall also be at the site of the work.
- The operation and maintenance of temporary heating equipment shall create no fire hazards. The use of solid fuel salamanders shall be prohibited. Clothing must not be dried by placing on or near heaters.
- All flammable and combustible materials shall be stored, piled and handled with due regard to their fire characteristics. Flammable liquids must be stored in an approved manner and dispensed only in acceptable safety containers. Welding gases shall be stored and segregated by type of gas. Lumber should be stacked in small piles that are interspersed with wide aisles. Lumber storage should be as far as possible from any structure.
- Temporary shacks or similar structures shall be constructed of fire resistant materials.
- Rubbish and debris shall not be allowed to accumulate.
- Fire extinguishers shall be located throughout the work area. The fire extinguishers shall be checked at least once every three months and records kept as to service and maintenance.

**Reference shall be made to ADWEA Contractors' Camps & Temporary Buildings Guidelines under item 5.4 above.**

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### 6.16 Crane-Suspended Work Platforms

The use of crane-suspended work platforms shall be permitted on all Projects Division projects only when all other means of reaching the work area are not feasible. The following minimum procedure shall be strictly adhered to:

- Request Procedure
  - Requests for use of a crane-suspended work platform shall be submitted to the Projects Management Team with the following:
    - ~ A statement of why conditions, methods or operations require the use of a crane-suspended work platform.
    - ~ A description of the crane to be used and the manufacturer's requirements in the use of the crane to suspend personnel work platform.
    - ~ The Contractor shall certify, by letter, that the work platform and other components, including hardware, have been designed and/or reviewed by a qualified registered civil, mechanical or structural Engineer.
    - ~ Documented emergency plan in the event of a crane failure.
  - The Contractor shall notify the Projects Management Team, in writing prior to putting the crane and work platform into service that he has complied with all the crane and work platform requirements.
  - Copies of the last Annual Crane Inspection Report and the latest Monthly Crane Inspection Report shall be submitted to the Projects Management Team and the Consultant.
  - The Contractor shall ensure that daily inspections of the crane are made and that the Projects Management Team Leader and the Consultant receives copies of the Daily Crane Inspection Reports.
  - When a crane and work platform are to be used the Contractor shall be responsible for ensuring compliance with the most stringent regulations governing the use of a crane -suspended work platform.
  - The Contractor shall comply with the crane manufacturer's recommendations in the selection and use of a crane for suspending personnel on a work platform.

- Crane Safety Requirements

Cranes used to suspend personnel on work platforms shall have the following safety features installed and operating.

- The minimum safety factor for the wire rope hoist line shall be seven times the intended load. Manufacturer's Specifications shall be made available.



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- There shall be a means for the operator to make sure that the crane is level.
- An anti-two-block device having audio/visual warning and lock out capabilities shall be provided to prevent damage to the wire rope and/or other components.
- Shall have a spring-loaded return to neutral or dead-man control. The load automatically stops when the controls are released.
- Boom Angle Indicator.
- Load Charts.
- Manufacturer's Instruction Manuals.
- Radio or Telephone Communication System for voice communication between the crane operator, signal person, and personnel on the platform.
- Any modifications to the crane shall be prohibited unless prior written authorization is obtained from the manufacturer. The manufacturer shall physically inspect all modifications or alterations and provide a letter certifying that the work meets the manufacturer's specifications. The crane shall be re-certified.
- Cranes with telescoping booms shall be marked so the operator knows the extended length.
- Crane Test and Load Requirements
  - The combined weight of the personnel platform and any attachment device, personnel, tools or other equipment shall not exceed fifty percent of the lifting capacity of the crane's load chart at any given radius. Calculations shall be made available.
  - The platform shall be load-tested at one 150% of the intended load prior to handling personnel. No one shall ride in the platform while the test is being conducted.

The weight of the platform, personnel, attachments and all equipment contributing of the total weight of the load shall be calculated to determine the maximum allowable load. Calculations by the Contractor shall be made available to the Construction Manager upon request.
  - A simulated lift with a loaded platform shall be performed to include movement of the platform through its entire range of motion. Once the simulated lift has been performed, the crane and platform shall be inspected for any signs of damage or defects. If any are found, they shall be corrected prior to handling personnel.
- Inspection of the Crane and Personnel Platform
  - The crane shall be inspected daily when being used to handle a personnel platform and each time the crane is converted from material handling to personnel operations.
  - The personnel platform shall be inspected immediately before any lifting operations.
  - The Resident Engineer and Safety Manager shall be given copies of the Daily and Monthly Crane Inspection Reports.



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- Work Platform Design Criteria
  - The platform shall be designed by a qualified registered civil, mechanical or Structural engineer. Design calculations shall be made available.
  - The platform shall be limited to a capacity of six persons.
  - The platform and attaching devices shall have a minimum safety factor of seven. Design calculations shall be made available.
  - The platform shall be designed for a minimum of four-point suspension.
  - The platform shall have guardrails and toe boards.
  - The flooring of the platform shall be of a non-slip material.
  - Provision shall be made to secure tools and materials while the platform is in motion.
  - The platform shall have a plate specifying the following:
    - ~ Weight of the empty platform including attaching hardware.
    - ~ Maximum number of people it is designed to carry, not to exceed six or as per international/ UAE standards.
    - ~ Name of the platform manufacturer, serial number and date manufactured.
  - The platform shall have overhead protection when there is an overhead hazard.
  - The platform shall be easily identifiable by high-visibility color or markings.
  - Access doors, if installed, shall open only to the interior of the platform and have a locking device.
- Rigging Requirements
  - Wire rope, shackles, bull rings, cable eyes and other rigging hardware shall have a safety factor of seven. Specifications shall be made available.
  - The platform shall be suspended by a bridle consisting of at least four separate wire ropes with an angle of at least sixty degrees from the horizontal.
  - The bridle and rigging hardware shall not be used for any other purpose.
  - The bridle and rigging hardware shall be marked with the same high visibility colour or markings as the platform.
  - All cable eyes shall be manufactured with thimbles. Manufacturer's Specifications shall be made available.
  - The cable legs of the bridle shall be connected to a bull ring or shackle as a means of attachment to the load line.
- Securing Personnel



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Personnel inside the platform shall wear safety belts with lanyards attached above the headache ball. If this is not possible, they shall be attached to the platform. The platform shall have overhead protection when there is an overhead platform or the possibility of objects falling from above.

• **Operating Requirements**

- The crane shall be level within one degree and on firm ground. When outriggers are used, they shall be fully extended and set with the tires off the ground. Locking devices on the outriggers to prevent loss of support shall be engaged.
- The hoist drum shall have a minimum of three wraps on the drum when the platform has reached its lowest point of travel.
- Lifting and lowering speeds shall not exceed one hundred feet per minute.
- The operator shall conduct operations slowly and cautiously at all times.
- The Crane Operator shall remain at the controls at all times when handling personnel on the platform. If for any reason the operator must leave the controls, personnel shall be removed from the platform prior to the operator leaving.
- The Crane Operator shall be medically verified for his physical and mental fitness and ability to communicate with the personnel on the platform.
- The crane operator shall be thoroughly familiar with safe craning practices, trained and experienced with the equipment being used, and have a complete understanding of all Manuals including Maintenance and Operating Instructions provided for the specific crane in use.
- Personnel shall not ride on the platform while the crane is travelling.
- All brakes and locking devices shall be engaged when the platform is in the working position.
- The platform shall be used only with the crane for which it was approved and tested.
- A qualified signalman shall be assigned to the operation and have no other duties while personnel are on the platform.
- Personnel platforms shall not be used for working on energized electrical lines or any devices used to generate or transmit electrical power.

When the crane with a personnel platform is working in the vicinity of electrical lines or devices, the minimum clearances shall be at least twice those recommended for the voltages present.

- The personnel platform shall not be used during weather conditions, which might endanger the safety of those on the platform. Such conditions are high winds (20 KPH or comply with international/ UAE standards), electrical storms, snow, ice, fog and darkness.



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- If the crane is equipped with a free fall load line then steps shall be taken to make sure the free capability is completely inoperable when the personnel platform is in use.
- A meeting shall be held prior to the lift with the crane operator, signalman, personnel to be lifted, and Contractor Personnel responsible for the work to be performed to review all procedures that must be followed.

**6.17 Working Safely near Overhead Power Lines**

Contractor shall

- collect information about the routes of Over Head Power Lines, safe operating distances, maximum working heights permitted under each span of overhead line, other safe work practices, etc;
- prepare a training plan for workers identifying the hazards, precautions to follow and what to do if they do contact a power line,
- prepare emergency action plan in the event of an accident,
- use barriers and signs/posts to limit access,
- ensure orientation of workers on hazards prior to starting of an assignment, training to lessen or prevent accidents, and precautions to follow in case of an event.

**Reference shall be made to the Group Company/Affiliate System Safety Rules under 5.4 above.**

**6.18 Demolition**

**Method Statement:**

A detailed method statement shall be produced, prior to work starting.

The method statement shall identify problems and their solutions, and form a reference for the site supervision. The method statement shall be easy to understand, shall be known to all levels of supervision and employees involved in the demolition, and shall include such matter as:

- the sequence and method of demolition or dismantling of the building or structure with details of personnel access, working platforms and machinery requirement;
- specific details of any pre-weakening of structures which are to be pulled down or demolished with explosives;
- arrangements for the protection of personnel and the public and the exclusion of un-authorized persons, with details of areas outside the site boundaries that may need to be controlled to improve safety during critical aspects of the work;
- details of the removal or making safe of electrical, gas and other services and drains;



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- details of temporary services available or required to be used;
- details of methods for dealing with flammable materials and gases which may have been retained or deposited as residue in process machinery, pipe work or storage;
- details of methods to establish the presence of substances which may be hazardous to health and the environment, the methods to be used for their disposal and any necessary protective equipment;
- arrangements for the control of site transport used for the removal of demolition debris;
- identifying persons with responsibilities for the control and co-ordination of safety arrangements.

**General Considerations and Precautions:**

**Protection of the Public:**

A fence shall be erected enclosing the demolition operation. The fence shall not be less than 2 m high and shall not be capable of being easily climbed. Access gates shall be secured outside working hours. Warning signs shall be installed along the fence.

At sites where it may not be reasonably practicable to erect a perimeter fence, excavations shall be fenced, vehicles and plant shall be effectively immobilized and gas and electricity supplies shall be isolated or enclosed in locked compounds. Outside of working hours, ladders which provide access from the ground to the first landing place shall be removed and stored in a secure area.

Where necessary, debris fans and facade netting shall be provided to prevent persons being accidentally struck by falling objects. Debris fans shall not be used as a means of access or allowed to become loaded with debris.

**Sequence of Demolition Operation:**

The sequence of operations shall be established to clear the accumulated debris on a regular basis so that floors will not become overloaded and horizontal pressure on walls is avoided.

**Controlled Areas and Safe Distances:**

The method statement shall set out areas affected by each phase of the work, to which access will need to be controlled. Restrictions and control shall be necessary during:

- the dropping of debris;
- pre-weakening activities;
- deliberate collapse or pulling over of buildings;
- the use of explosives.



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During debris dropping, a radius of 6m, or half the drop height (whichever is the greater), shall be used to determine the restricted area to be kept clear.

Similarly, a space of 6m minimum width from the face of the building to be demolished is allowed for the operation of cranes, grabs, balling machines, pusher arms and similar equipment. If wire rope pulling is used, a distance of three-quarters of the exposed length of pull rope shall be allowed on either side of the rope and also behind the winch or pulling vehicle.

When tall structures are being felled, a distance of not less than one and a half times the total height shall be allowed from the proposed line of fall to cater for parts coming free in flight, or bouncing and rolling on impact. Structures shall be felled into clear areas. On slender structures, a 20 degree arc either side of the line of fall shall be clear of obstruction and an area of radius not less than one and a half times the total height shall be cleared of persons before the actual felling.

**Hand Demolition Operations:**

Buildings and other structures shall generally be demolished in the reverse order to which they were constructed.

Where work cannot be done safely from the ground or from part of a building or structure, scaffolding shall be provided and maintained in a safe condition.

Where material is to be allowed to fall freely to the ground then the height of fall shall not exceed half the available horizontal distance, or 6m, whichever is the greater, unless sufficient protection is made available to adjacent buildings, general public and site personnel.

Where material would otherwise be dropped from a structure into an area to which site personnel or members of the public may have access, then chutes shall be used.

Chutes shall be so positioned that all material will fall into the skip or other containers.

Chutes shall be totally enclosed and shall be constructed so that there is no projection inside which may cause a blockage of material.

When there is a risk of material ricocheting from skips, particularly as they become full, additional screens shall be fixed to the skips to contain such material.

Excessive debris shall not be allowed to build up on floors against lower walls or other parts of a building structure.

When only a portion of a building or structure is to be demolished, the stability of the remaining part shall be checked during and after demolition.

At all times, walls and supporting members shall be left in a stable condition.

Regular clearing operations shall be carried out.

Where sheeted scaffolds are provided to contain flying debris or dust the wind loading on the scaffold shall be taken into account.



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Competent scaffolders shall only remove the ties securing any scaffold to the building or structure. As the building is demolished, scaffolds shall be reduced to the extent necessary to ensure that excessive scaffolds do not remain unsupported as the building height is reduced.

Checks shall be made to ensure that the structure to which the scaffold is tied is strong enough to provide a suitable anchorage during the period that the tie is required.

Care shall be taken to support beams or columns whilst they are being cut.

Members (beams) may spring, due to the removal of restraints. Each member shall be lowered to the ground.

### **6.19 Handling/Storage/Use & Disposal of Gas Cylinders**

#### **General Identification Codes:**

All gases contained in cylinders are identified by the color or combination of colors painted on the cylinders. The color code used must conform to the latest British Standard Specification No.'s 349 and 1319.

As a further means of distinguishing between flammable and non-flammable gases, the outlets of industrial gas cylinder valves feature screwed 5/8in BSP thread:

- right-hand for oxygen and non-flammable gases;
- left-hand for acetylene, hydrogen and flammable gases.

All filled cylinders shall be examined on arrival to ensure that cylinders are correctly color-coded in accordance with the above BS Specification, have been tested and the date stamped within the past two years.

Cylinders not easily identifiable are not to be accepted and shall be returned to the supplier immediately.

Serial numbers of all cylinders shall be recorded, together with gas identification and dates of issue.

No alteration to the coloring of cylinders is permitted.

Cylinders must only be charged with the gas as indicated by the color coding of the cylinder, under no circumstances must the cylinder be changed from one gas to another.

Cylinders returned for refilling must be accompanied by a written statement indicating:

Identification No's  
Cylinder is empty  
Defects (if any)

If a valve is found to be defective it shall be verified by being thoroughly examined by the Maintenance Mechanical Section, labeled defective and returned to the supplier.

#### **Safe Transport and Handling:**



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Passengers shall not travel in the same compartment of the vehicle where cylinders (empty or full) are stored for transportation.

Cylinders must be secured, vertical, valves shut and free from leaks.

Cylinders must not project over the sides or rear of the vehicle.

Travelling with equipment attached to the cylinders is prohibited. Protective valve caps are to be fitted where provided.

Drivers shall be properly instructed in the safe handling loading and transport of cylinders and dealing with emergencies.

Vehicles carrying flammable gas cylinders must carry suitable fire extinguishers and prominently display the relevant warning signs. "No Smoking" and "No Naked Lights" signs.

Cylinders shall not be lifted with magnets or chains. A flat band sling may be used to lift one cylinder at a time provided it is correctly adjusted to prevent slippage.

Cylinders shall never be lifted by their valve cap or guard.

Cylinders shall not be rolled. Purpose built trolleys with the cylinders chained/secured shall be used for moving the cylinders on the ground.

Oil, grease or other readily combustible substances must be prevented from coming into contact with cylinders of oxygen, their valves or fittings to prevent the risk of explosion.

Cylinders of different gas shall not be mixed together in the same container when being transported.

Oxygen Cylinders shall not be transported together with acetylene or any other flammable materials.

**Storage:**

Storage areas shall be purpose-built compounds in the open air, fenced to a height of 2m. The fence shall be made of non-combustible material and shall not inhibit natural ventilation.

Storage areas shall be clearly identified, with the names of the gases stored.

Cylinder should be protected from direct sunlight. Tarpaulins or any other cover must not be used in direct contact with the cylinders.

Cylinders are not to be placed on materials that are likely to cause corrosion of the cylinder base.

No sources of ignition are allowed in storage compounds where compressed flammable gases are kept.

Lighting, instruments, switches and junction boxes in storage compounds containing combustible gas cylinders are to be to Class 1, Div.2 Standard.



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Suitable fire fighting equipment shall be provided, and in the event of a fire the cylinders shall, if possible, be removed to a safe location.

Full and empty cylinders shall be kept apart and 'FULL' and 'EMPTY' notices displayed accordingly.

Different categories of gas cylinders (toxic, flammable, etc.) shall be segregated and notices displayed accordingly.

Oxygen and oxidants shall not be stored with flammable gases such as acetylene or LPG, but in separate stores/storage compounds at least 6 meters away.

Acetylene and LPG cylinders must never be stacked horizontally in storage or use.

Cylinders shall normally be stored upright and secured so that they will not fall.

Personnel must not smoke, wear oil-contaminated clothes, or have any naked light in any place where flammable compressed gases are stored (or where oxygen is stored). "No Smoking" and "No Naked Light" signs shall be used.

Storage compounds must have appropriate warning signs located so that persons entering and working adjacent are aware of the gases stored and the safety precautions to be applied.

**Care in the Use of Cylinders:**

Cylinders shall not be used as rollers or supports or for any other purpose than to contain the gas as supplied.

When in use cylinders shall, whenever possible, be clamped vertically in a suitable trolley. If removed from the trolley they shall be secured to prevent toppling.

Cylinders must not be allowed to come into contact with electrical apparatus, especially arc welding tools, or live wires, since arcing may be set up which will heat or damage the cylinders.

Cylinders must be kept clear from sparks, flames or slag from welding or cutting operations.

Joint fittings or piping made of copper shall on no account be used with acetylene. Acetylene shall never be allowed to come into contact with copper or any alloy containing more than 70% copper.

Hydrogen shall NEVER be snifted as it may ignite spontaneously.

The main cylinder valve shall always be shut off when work has to be stopped for more than a few minutes or when the cylinder is empty.

Cylinders shall be removed from working areas and put back into the store at the end of the working period.

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**6.20 Noise**

Exposure to high noise levels and consequent noise induced hearing loss is one of the major health risks.

The standards for occupational noise exposure state that personnel without hearing protection must not be exposed to an intensity of noise exceeding 85 dB(A) based on an 8 hour time weighted average (TWA), as measured on the A-weighted scale. This means that if a person is working in an area where the intensity of noise exceeds an average of 85 dB(A) over 8 hours, the amount of time he may work in that area without hearing protection must be reduced in relation to the amount that the noise exceeds 85 dB(A). For example, if the noise in an area is measured at an average of 90 dB (A) over an 8 hour period, personnel may only work in that area without hearing protection for a maximum of 4 hours.

For a 12 hour work shift, unprotected personnel must not be exposed to noise intensity exceeding 83 dB (A).

The values below contain suggested criteria for noise limits in various types of environment.

Locations	Noise Limit (dBA)
Open plan offices	50
Maintenance workshops	70
Workshop offices	60
Control rooms	60
Conference rooms	45

**6.21 Heat Stress**

There is little that can be done to control ambient air temperatures but there are a number of measures that can be taken to minimise their effect.

In situations where engineering control may be impossible or impractical and where the exposure time can vary with the tasks and unforeseen critical events, e.g. working on pipelines etc., the following should apply:

- If possible, schedule hot jobs for the cooler part of the day.
- Alter rest/work regimen to permit more rest time.
- Provide cool (shaded) areas for rest and recovery.
- Consider the possibility of mechanisation of the physical components of the job, e.g. use a mechanical digger rather than a gang of men with shovels.
- Ensure an adequate supply of cool (not iced) water is available at the work place and employees take fluids at least hourly.
- If workers diet is deficient in salt or an individual is susceptible to heat stress, the water may be salted (half a level teaspoon of salt to 1 litre of water). Salt tablets are not recommended.



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People on a salt restricted diet, e.g. high blood pressure, should consult a doctor before taking additional salt.

**Reference shall be made to the Local Laws and Regulations for working hours.**

**6.22 Transportation**

- Drivers must be in possession of a current driving licence issued by the Police Department of Abu Dhabi and carried on their person at all times.
- Drivers must be fully conversant with and comply with the requirements of all traffic regulations.
- All vehicle incidents must be reported in accordance with the Company Incident Reporting and Investigation Procedure.
- The number of passengers is to be strictly limited to the authorised seating accommodation provided.
- No more than one passenger is allowed to travel in the front of a vehicle unless a bench type seat suitable for three persons is fitted.
- Under no circumstances are more than two people to be allowed to travel in the front of a vehicle where two bucket type seats are available.
- Where only one seat is provided on a vehicle such as a tractor, fork lift truck, dump truck, etc., only the driver may ride on that vehicle.
- No person may ride in any insecure position on a vehicle such as a tail-board, the side of a truck or pick-up, dump truck bucket, open flat bed, etc.
- Vehicles not principally meant for carrying personnel but which are being used for that purpose must be used with the following precautions:
  - Seating arrangements are to be fitted to all vehicles. Seating can be permanent or temporary, but if temporary, then a means of securing them must be fitted.
  - No vehicle carries more passengers than the seating capacity provided.
  - Whilst a vehicle is in motion, persons remain seated.
  - A substantial and effective safety rail is provided on all open sides of flat beds, trailers, pick-ups etc.

**6.23 Working Near Hydrocarbon Pipelines**

When working in the vicinity of a hydrocarbon pipeline, the following should be considered:

1. Prior to any excavation in the vicinity of the pipelines, the route of the pipeline shall be accurately established by the contractor.
2. Excavate by hand only within a horizontal distance of 10 meters on either side of a pipeline.



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3. Utmost care shall be observed when excavating nearby and/or under the pipelines. Minimum clearance of any crossing to the pipelines shall be one meter from the pipe surface.
4. Vehicles are not allowed to cross the pipelines except along highways, and other specifically designated roads and crossings.
5. Contractor shall display all necessary safety warning signs and notices at the location of work.

In any case, the pipeline owner shall be notified before any work is done within the vicinity, and the work methodology shall be agreed.



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**Appendix 1  
Incident Report**



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**Appendix 2**  
**Preliminary Incident Report**



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**Appendix 3  
Monthly Reports**



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**Appendix 4**

**ADWEA Color Coding System for Loose Lifting Gear**