

# **ANNEXES Manual**

## **(Containing SHE and Work Procedures and Instructions**

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## Annex 3-1 WELDERS

### Scope

1. All the Contractor's welders shall be authorized by a Naval Class, member of IACS.
2. The Contractor's welders shall be coordinated by at least one welding skilled employee (foreman or engineer) for each site of work and during the period when welding works are executed for the Principal/Beneficiary. The names, qualifications and telephone numbers at which the welder coordinator(s) can be reached shall be submitted in writing to the Beneficiary.
3. The Contractor shall submit to the Beneficiary the list of all the welders who have to execute continuous butt or fillet welds, in semi-automatic or manual mode, and who are employed in the works conducted for the Beneficiary. The list shall indicate:
  - the welders' last and first names;
  - the welders' date and place of birth;
  - identification no. (punch no.)
  - if any; if they do not have one or if the number that they have may lead to mistaking one welder for another, they shall be granted a number that ensures unique identification, in agreement between the parties.

For authorized welders, the Contractor shall attach a copy of the authorization certificate.

4. Every time when the Contractor brings or employs one or more welders that they will use for the Beneficiary's works, the Contractor will notify the Beneficiary in writing, by mentioning the details under §3. The Contractor shall notify the Beneficiary also when one or more welders stop working for the Beneficiary's works.
5. The authorization of the Contractor's welders with a Naval Class in accordance with SR EN ISO 9606 may also be performed at the location and on the expense of the Beneficiary, based on an Order Note of Welder Authorization (Annex 3 to the present contract) issued by the Contractor.
6. In the Classification authorization process, the Beneficiary shall provide to the Contractor, free of charge, only one test, respectively a retesting per welder.
7. If the Contractor's welders, authorized by care and on the expense of the Beneficiary, do not have work continuity in the premises and on the works of the Beneficiary for at least 6 months after being authorized, the Contractor shall bear the equivalent value of the welders' authorization costs in exchange for the following basic fees (without VAT):

### **WELDING PROCEDURES**

For the works to be conducted, the Contractor shall submit to the Beneficiary copies of the welding procedures authorized by the involved Classification Society (Welding Procedure Qualification Test – "WPQT"), which they hold. If the Contractor does not hold such procedures or if they are inadequate for the works to be executed, the Contractor may receive from the Beneficiary and they may use the Beneficiary's welding procedure specifications, in the event where the welding works are executed in the premises and under the control of the Beneficiary's Technical Quality Control (TQC) and where the Classification Society agrees with this aspect. If the Contractor intends to use other welding procedures or if the Classification Society does not agree that the Contractor uses the Beneficiary's procedures, the Contractor shall have to authorize the necessary procedures together with the Classification Society.

### **EQUIPMENT AND ACCESSORIES**

The Contractor shall obtain and use all the pieces of necessary welding equipment, equipped accordingly, with the related consumables in sufficient amounts, including other necessary ancillary equipment (e.g. electrode drying oven, tight electrode holding box – for the types of electrodes for which the manufacturer

recommends it). For the performance of the works, the Contractor is required to check and to prove that all the pieces of equipment are regulated and that they operate within the parameters at their introduction on the work site.

The Contractor shall ensure the equipment of all the welders during the continuous welding execution, by including all the necessary accessories, namely:

- slag removal hammer (tool for the removal of slag);
- wire brush;
- pliers/nozzle wrench (for those who weld semi-automatically);
- anti-spatter spray/paste (for those who weld semi-automatically);
- electrode holding insulating box (for those who weld manually with shielded electrode);
- punch;
- calipers / measuring gouges;

For works in stainless steel, all the necessary accessories shall be special for stainless steel (stainless steel brush and slag removal hammer and used solely in stainless steel, grinding wheels used solely in stainless steel, and, for the semi-automatic gas welding equipment, stainless steel special wire guiding elements).

1. At the beginning of the shift and when resuming work after the lunch break, always screw tight all the welding cable connections (at the source and at the unwinder), notify the electrician who is in the closest proximity any time you note the overheating of connectors at the welding cables, and request the rectification of the problem.
2. At the antifreeze chilled equipment, perform a daily check of the level of liquid in the tank and refill any time necessary, but not with water. Never leave uncovered the tank filler inlet.
3. At the beginning of the shift and when resuming work after the lunch break, always check the protective gas flow rate at the gun and at the reducer according to the WPS that is issued; if gas leaks are found, notify the work site foreman or the utility Principal's service manager.
4. Make sure at all time that the metal parts of the welding source and of the unwinder are not in electric contact with the workpiece. Make sure that the unwinder feet are present and that they are not worn to the screw.
5. For the removal of the seam welds by the arc-air process, do not use other sources than Kempomig 5200 SW or WeldForce 5500, FastMIG KMS 400, FastMIG KMS 500 equipped with insulated pliers.
6. As soon as you notice any inconsistency in the operation of the welding equipment notifies the maintenance staff for the rectification of the failure. Do not forget to check first whether the command and control elements of the control panel (switches, potentiometers) are positioned correctly.
7. Do not use power cables if their insulation is damaged. Request to the electrician who is in the closest proximity to rectify the problem.
8. Use the anti-spatter spray/paste to avoid the depositing of droplets of molten metal in the gas shield. Clean as often as possible the gas shield with the welder's special pliers.
9. To ensure the optimum cooling of the equipment, do not cover the air inlets and outlets. The source will be covered during snow and rainfall, in order to prevent the obstruction of such inlets and outlets.
10. Do not use the equipment CABLE or gun as a "rope" to bring down or to push up the unwinder.
11. Do not throw the CABLE from a height, because the connectors of the control cable will be damaged.
12. Every week, the welding source, the unwinder and the layout of the gun wire shall be blown off with compressed air, from the tip of the gun to the coupling of the unwinder.

13. Once the gas hose is detached from the distributor, it will be fixed in a way that will not allow the penetration of impurities that may later be engaged in the solenoid valve from the unwinder (with the free end downward, but not on the ground).
14. At the completion of the work, the shield gas supply will be stopped by turning off the distributor cock (if it does not operate, notify the service staff).

***IMPORTANT! For any issue found at the welding equipment, the user shall contact the nearest electrician in the area, who has the obligation to rectify the fault or to notify the service personnel***

### Annex 3-2 PIPING PROGRESS MEASUREMENT (IN/DIA AND IN/METER)

#### A. Piping Fabrication - Progress Measurement (Inch/Dia)

In construction projects Inch Dia unit of Measure is used to measure the progress of Piping Spool fabrication.

The weld joint of the pipe size is converted to the equivalent inch/dia of welding

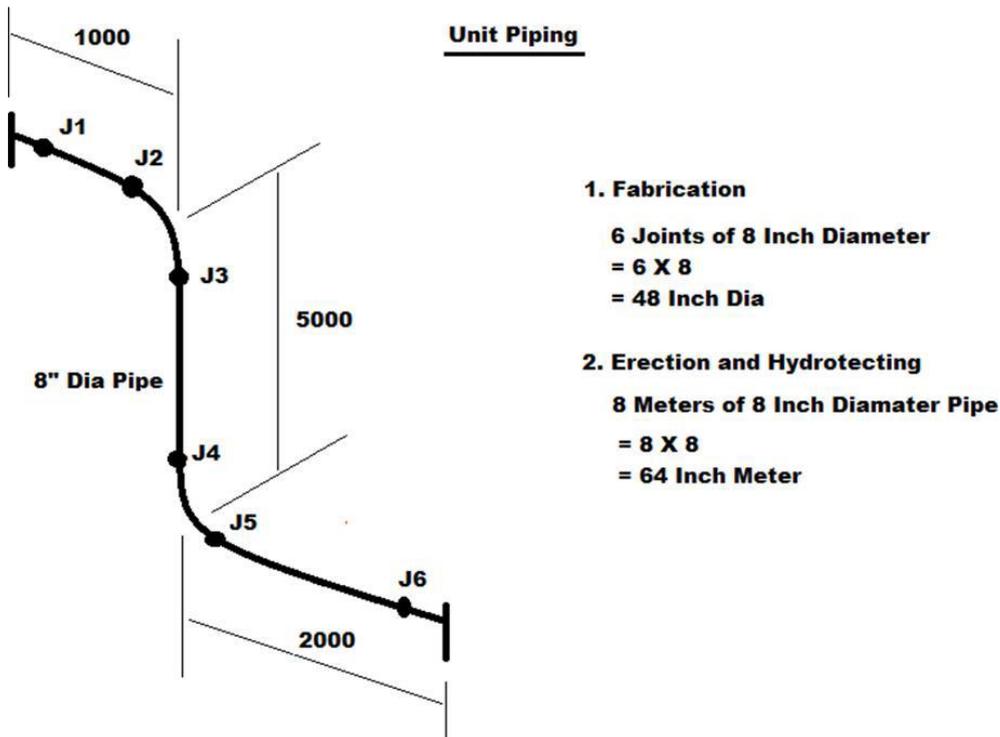
1. One welding joint of 4 inch/diameter pipe = 4 Inch Dia
2. Three welding joints of 8 inch/diameter pipe = 24 Inch Dia

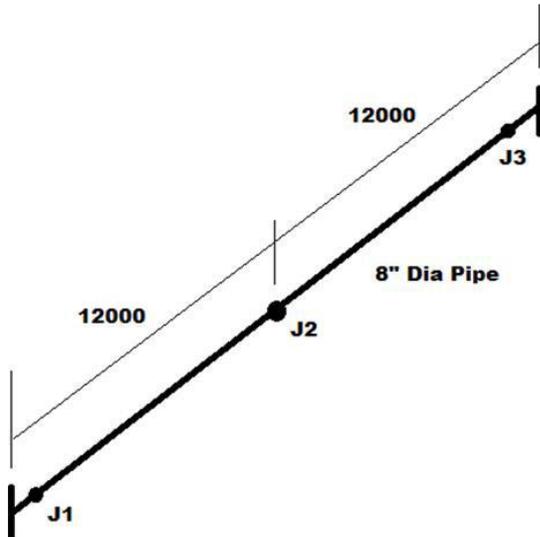
#### B. Erection and Hydrotesting – Progress Measurement (Inch/Meter)

In construction projects Inch/Meter unit of Measure is used to measure the progress of Piping Erection and Hydrotesting.

The length of pipe erected or hydrotested of the pipe size is converted to the equivalent inch Meter of erection or hydrotesting.

1. 10 Meter of 4 inch/diameter pipe Erected or Hydrotested = 40 Inch/Meter
2. 20 Meter of 8 inch/diameter pipe Erected or Hydrotested = 160 Inch/Meter





**1. Fabrication**

**3 Joints of 8" Diameter Pipe**  
= 3 x 8  
= 24 Inch Dia

**2. Erection or Hydrotesting**

**24 Meters of 8 Inch Diameter Pipe**  
= 24 X 8  
= 192 Inch Meter

### **Annex 3-3 STORAGE AND HANDLING OF COMPRESSED GAS CYLINDERS**

1. Compressed gas cylinders (empty or full) shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being moved. Empty cylinders shall be marked.
2. A suitable cylinder truck, chain or other secure fastening shall be used to keep cylinders from being knocked over while in use. When cylinders are transported they shall be secured in a vertical position.
3. Valve protection caps shall be in place at all times, except when cylinders are connected for use. All cylinders shall be checked for leaks or other possible damage upon delivery from gas supplier. This is done with a mixture of dish soap and water sprayed on valves, connections and pressure relief plugs.
4. While in use, cylinders are to be secured by a chain or bar in a special carrier or cart. Cylinder storage area is to be clearly marked with warning signs.
5. Cylinders are to be kept far enough away from the actual welding or cutting operation so that Sparks, hot slag, or flame will not come in contact with the cylinders. Fire resistant shields may be used.
6. When cylinders are hoisted, a rack or other suitable platform shall be used. Cylinders shall not be hoisted or transported by means of magnets or choker slings. Never drop cylinders or permit them to strike one another violently, or use them as rollers or supports, even when empty.
7. Regulators shall be removed and valve protection caps put back in place before cylinders are moved unless cylinders are firmly secured on a special carrier intended for this purpose.
8. Cylinder valves shall be closed when work is finished, when the cylinders will be left unattended, when cylinders are empty and when cylinders are moved at any time.
9. Cylinders of acetylene and other fuel gases shall not be stored with cylinders of oxygen. They shall be separated by distance.
10. Compressed gas cylinders shall not be taken into confined spaces. Cylinders are not to be stored or staged for use inside vessels, tanks or other confined spaces.
11. Fuel gas cylinders shall be placed with valve end up.
12. Cylinders shall be located so as not to be subjected to sparks, hot slag, flame, hot metal, or other sources of heat, artificial or otherwise.
13. Smoking, spark-producing work, and open flame activities are not allowed within 6 meters of any cylinder storage area containing cylinders of flammable gas. No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner or person authorized by the owner of the cylinder shall refill a cylinder. Cylinder contents shall not be used for purposes other than those intended by the supplier.
14. Cylinders shall be placed where they cannot become part of an electrical circuit.
15. No damaged or defective cylinders shall be used.
16. Fuel gas cylinders in which leaks occur shall immediately be taken out of use and handled in accordance with the following procedure:
  - The valve shall be closed; the cylinder tagged and removed out-of-doors away from sources of flame or sparks and the supplier notified. A regulator attached to the valve may be used temporarily to stop a leak through the valve seat.
  - If the leak occurs at the fuse plug or other safety device, tag the cylinder, remove it out- of-doors

away from sources of flame or sparks, and leave the valve slightly open to permit the gas to escape slowly.

- Warnings against approaching the leaking cylinder with lighted cigarettes or other sources of ignition must be posted. The supplier shall be notified immediately and follow his/her instructions for returning the cylinder and preferably have the supplier pick up the cylinder.

### **Annex 3-4 WELDING AND CUTTING . WELDING/BURNING - HOT WORK PERMIT**

This section addresses some specific safety rules for the different craft disciplines and is to be used at the project at the Weekly Safety Tool Box Meetings when retraining is necessary.

#### **Welding and Cutting**

A. Welding current must not be allowed to pass through any of the following materials:

- Fuel gas, oxygen or other compressed gas cylinders.
- Tanks or containers used for gasoline, oil or other flammable or combustible material.
- Pipes carrying compressed air, steam, gases or flammable or combustible liquids.
- Conduits carrying electrical conductors.
- Chains, wire ropes, metal hand railings or ladders, machines, shafts, bearings, motors, etc.

B. Fire resistant screens to protect other employees from flash burns and from flying objects shall shield arc welding and cutting operations.

C. A fire-resistant bucket or container shall be provided for disposal of electrode studs.

D. The ground for the welding circuit shall be mechanically strong and electrically adequate for the service required.

E. Where it is necessary to couple or uncouple several lengths of cable for use as a welding circuit, insulated cable connectors or boots over the connections shall be used on both the ground line and the electrode holder line. Soldered and taped splices may be used for permanent connections.

F. An electrode holder of adequate rated current capacity, insulated to protect the operator against possible shock and to prevent a short or flash when laid on grounded material, shall be used.

#### **PERSONNEL PROTECTION.**

1. All safety procedures described specific projects safety procedures and the Safety rules will be followed as it pertains to welding and cutting operations.

2. Protective clothing and safety equipment for any welding operation will depend on the size, nature, and location of the work.

3. Mandatory and suggested protective measures for welders and helpers are:

- Proper and approved eye and head protection shall be worn.
- Combination approved hard hats-welding helmets are required in special situations where welders may be exposed to hazards of falling objects from overhead.
- Heavy work may require flame-resistant gauntlet gloves, fire-resistant leggings, high boots, and flame-resistant aprons.
- Clothing shall be free of oil, grease and other flammable material. Collars and cuffs will be buttoned and pant leg cuffs shall be turned up inside the pant legs. Pockets shall be covered with flaps and buttoned or eliminated from the front of vests, shirts, and aprons.

5. Workers engaged on welding or cutting must wear a welding hood or safety goggles equipped with suitable filter lenses.

6. All employees whose eyes are exposed to flying objects, resulting from chipping grinding or similar operations, shall wear approved eye protection such as face shield or goggles. No welding, burning, or open flame work shall be performed on any staging suspended by means of fiber or synthetic rope. An approved and proper fire extinguisher shall be placed near all welding and cutting operations. In some locations a fire watch may have to be employed to stand by with an extinguisher.

7. Approved and adequate ventilation meeting applicable regulations shall be provided whenever welding, cutting, or heating is performed in a confined space.
8. Principal's Superintendent shall thoroughly instruct employees in the safe use of fuel gas, as follows:
  - Before a regulator is attached to a cylinder valve, the valve shall be opened slightly and closed immediately. (This action is termed as "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand behind or to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where gas would reach welding work, sparks, flames, or other sources of ignition.
  - The cylinder valve shall always be opened slowly to prevent damage to the regulator. For quick closing, valves on fuel gas cylinders shall not be opened more than 1-½ turns. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of an emergency. In the case of manifold or coupled cylinders at least one wrench shall be placed on top of a fuel gas cylinder, when in use, for quick closing of the valve in case of an emergency.

#### **FIRE PREVENTION**

- A. Before starting to burn or weld, the work area around and below must be inspected to ensure that sparks or molten metal will not fall on workers or flammable/combustible materials. Certain project sites may require hot work permits prior to any flame or spark producing work being performed.
- B. Areas where welding and cutting operations are performed shall be kept clean and all accumulations of trash, rags, and other flammable/combustible materials shall be removed. Consideration must be given to the distance that sparks and slag can travel.
- C. If the object to be welded or cut cannot be moved, all movable fire hazards in the vicinity shall be taken to a safe place. If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards. If not possible to move or guard all fire hazards then welding and cutting work shall not be performed.
- D. A fire extinguisher must be maintained in the work area the welder.
- E. A Fire watch is required whenever welding or cutting is performed in locations where sparks or molten metal has the possibility of contacting ignitable materials, or any of the following conditions exist:
  1. Appreciable combustible material, in metal construction or contents, closer than 10 m to the point of operation.
  2. Appreciable combustibles are more than 10 m. away but are easily ignited by sparks.
  3. Wall or floor openings within a 10 m. radius expose combustible material in adjacent areas including concealed spaces in walls or floors.
  4. Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.
- F. Assigned fire watch personnel shall have fire extinguishing equipment readily available, be instructed as to the anticipated fire hazards, the use of fire fighting equipment to be used and be familiar with the procedures for sounding an alarm in the event of a fire. They shall watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch shall be maintained for at least a half hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.
- G. Drums, vessels, containers, or hollow structures, which have contained toxic or flammable substances, shall be thoroughly cleaned, ventilated, and tested prior to any welding, burning or heating.

- H. When cutting and welding operations are performed above gratings, decks, or near floor and wall openings, suitable protective measures must be used to prevent the sparks and slag from being directed through the nearby openings. Do not allow hot slag to remain on surfaces long enough to cause combustion or damage.
  - 1. Sparks and slag must be contained in congested work areas.
  - 2. Fire resistant blankets, tarps or other similar protective coverings shall be used to contain sparks or molten metal on floor gratings and open floor or wall openings.
  - 3. When it is impossible to contain sparks and slag, the danger area shall be barricaded.
- I. All hoses, fittings, leads, torches and regulators shall be inspected daily prior to use. Damaged or defective equipment shall be removed from service.
- J. Before welding, cutting, or heating any surface covered by a protective coating, the flammability and toxicity of the coating must be determined. Flammable or toxic coatings must be stripped back or removed a sufficient distance away from the area to be heated to prevent ignition or the release of toxic fumes. Additional safety measures such as respiratory protection may be required.

### GENERAL REQUIREMENTS

***The Principal's Superintendent is responsible to inspect and approve all welding and cutting areas to ensure the areas meet the requirements prior to the start of work.***

- A. No welding or cutting is to be done on a closed vessel or tank, which has not been properly cleaned and tested for hazardous, combustible or toxic contaminants.
- B. Welding and cutting equipment shall be inspected before use. Flashback devices shall be installed attached between the regulators on both the oxygen and acetylene hoses.
- C. Work areas shall be inspected for flammable solvents, vapors, and gases.
- D. Flammable and combustible materials shall be removed.
- E. Suitable fire extinguishing equipment shall be available in the work area.
- F. A fire watch will be posted during welding / cutting operations and for one half hour following these operations, when conditions make it.
- G. A welding and cutting permit, if required for your work area, shall be obtained and site welding and cutting guidelines followed. Identify if work will be in a confined space, if so follow confined space and entry work procedures.
- H. Identify the type of metal to be worked on and protective coatings that have been applied.
- J. Identify what type of respiratory protection is required, if applicable, and other types of personal protective equipment to be used.
- K. The contents of drums, tanks, barrels, piping or other containers shall be ascertained. Containers shall be thoroughly cleaned so that no flammable vapors will be present.
- L. Employees should be alerted for potential hazards created by other employees in the work area. Adequate ventilation (natural or mechanical) must be provided for all welding, cutting, brazing, and other related operations. Welding, burning and heating performed in confined spaces requires general mechanical or local exhaust ventilation to reduce the concentrations of smoke and fumes to acceptable levels. If adequate ventilation cannot be provided, employees must be provided with and required to use proper respiratory protective equipment. When sufficient ventilation cannot be obtained without blocking the means of access, employees must be provided with and required to use proper respiratory protective equipment.
- Q. Employees welding, cutting or heating metals of toxic significance shall use approved filter-type

respiratory protection.

- R. The following components, which can be found in metals and coatings, have Permissible Exposure Limits. If these materials are encountered in welding, cutting or brazing operations refer to material safety data sheets (MSDS).
- S. Welders or helpers when engaged in welding or cutting operations shall not carry matches or butane lighters. Keep all welding leads and burning hoses up off floors, walkways, and stairways.

#### Welding Operations

- A. Before starting to weld or cut, welders shall inspect the work area to ensure that sparks or molten metal will not fall on combustible materials or other employees.
- B. Inspect welding leads prior to use to ensure that the insulation is not damaged and that the conductor is not exposed.
  - 1. Repair or discard damaged cord sets.
  - 2. Repairs shall be made by a qualified person, using only correct repair materials
- C. Only cable free from repair or splices for a minimum distance of 3 m from the cable end to which the electrode holder is connected shall be used. All arc welding cables shall be completely installed, flexible type and capable of handling the maximum current requirements of the work
- D. Welding leads shall not be secured to supports with conductive ties (wire, welding rod, etc.)
- E. Welding leads shall not be tied in a knot.
- F. Welding leads must be removed from vessels and other confined spaces anytime they are not actively used.
- G. Welding leads must not be routed across roads or travel ways where they can be driven over by mobile equipment. Welding leads should be elevated above the walking/working area if possible.
- H. Welding machines shall be shut down any time the job is left unattended. Portable welding machines shall be shut down when being refueled.
- I. Welding machines and leads must be inspected prior to their initial use on site.
- J. All welding leads must be adequately insulated from the machine connection to the electrode holder or ground clamp.
- K. Do not leave a rod in the holder when it is laid down. Put stub ends in proper containers, not on the ground or floor.
- L. Cables with splices within 3 m of the holder shall not be used. The welder should not coil or loop welding electrode cable around parts of his body.
- M. Workers should report any equipment defect or safety hazard to Principal's Superintendent the use of the equipment shall be discontinued until its safety has been assured.
- N. Modification and repairs to welding equipment shall only be performed by the equipment manufacturer or a qualified service technician. Machines which have become wet shall be thoroughly dried and tested before being used. Cables with damaged insulation or exposed bare conductors shall be replaced. Joining lengths of work and electrode cables shall be done by the use of connecting means specifically intended for the purpose. The connecting means shall have insulation adequate for the service conditions.

*Fire protection, personal protection, health protection and ventilation are requirements for work by every employee.*

## Annex 3-5 METAL/STEEL ERECTION GENERAL REQUIREMENTS

These rules provide minimum requirements for metal/steel erection and installation of constructions. The greatest hazard in metal/steel erection is the possibility of workers falling due to loss of footing, loss of balance, being knocked off a structure by swinging materials, or workers falling through unprotected openings. Even though workers are exposed to a potentially hazardous work environment, falls and other accidents during metal/steel erection can be prevented through the combined efforts of management, supervision, and individual workers. A written steel erection plan that includes construction specifications and safety provisions must be developed before the actual steel erection of the structure may begin.

### FALL PROTECTION REQUIREMENTS

All workers, including connectors, bolt up operations, decking operations, roofing operations, etc. shall be provided with positive fall protection 100% of the time.

#### Definitions

**Column** - A load-carrying vertical member that is part of the primary skeletal framing system. Columns do not include posts.

**Competent Person** - 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.

**Connector** - An employee who, working with hoisting equipment, is placing and connecting structural members and/or components.

**Controlling Contractor** – Is the prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the project -- its planning, quality and completion.

**Personal Fall Arrest System** – Is the system used to arrest an employee in a fall from a working level. A personal fall arrest system consists of an anchorage, connectors, a body harness and may include a lanyard, deceleration device, lifeline, or suitable combination of these.

**Metal/Steel Erection** - Is the alteration, erection or repair of metal/steel structures used during the process.

### PLANNING

The commencement of metal/steel erection, repair activities cannot begin until written verification of Principal's Project Superintendent. No repairs, replacement or field modifications shall be performed without the approval of the project technical rules of structural engineer of record.

Adequate access roads into and through the site must be provided for the safe delivery and movement necessary equipment, for the staging and erection of the material as well as allowing for free movement. A site specific erection plan must be prepared to define the erection sequence and procedures to be followed. The following factors must be considered when planning the work:

1. Site preparation, identify material staging, storage and delivery locations and how erection activities will be coordinated with other trades and subcontractors.
3. The qualifications and training of personnel.
4. Detailed, specific job and safety instructions for each worker.
5. Scheduling (identify who, what and when for each task).
7. A description of metal/steel erection activities and procedures, including any temporary bracing and guying of the structure. The plan should identify the erection piping and mechanical equipment as well as the steps to be taken to decrease the hazard exposure.

8. Tools appropriate to the task - Field-modified tools are not allowed.
9. Barricades, warning signs, and other protection for personnel and equipment.
10. Proper PPE including Fall Protection equipment.
12. Availability and location of emergency equipment and procedures.

#### **UNLOADING, STORING AND HANDLING METAL/STEEL.**

When unloading materials, a minimum tagline is required on all suspended loads. When lifting a load of steel, keep hands away from the load, make sure that the remaining steel does not obstruct, or get entangled with the load.

#### **CONNECTING, BOLTING, AND GUYING METAL/STEEL**

Do not work directly over other workers. This restriction protects employees at lower levels from being struck or other debris.

**Do not throw tools.** Always keep clear of moving loads. When erecting steel, keep hands clear.

When connectors are working together, designate only one person to give signals. That person makes sure that his or her partner, or others working on the job, are in the clear. Each person must select a position where he or she cannot be struck by a swinging load.

On multiple level metal/steel constructions, provide ladders or other safe means to the protected level immediately . When climbing ladders, do not hand carry any tools or materials, use three point contact rule.

Power tools shall be used with caution with special attention to the following:

1. Power sources shall be secured and hose lines shall be bled off prior to disconnecting tools or hose sections.
2. Airlines hose connections shall be wired or tied together to prevent accidental separation.
4. Appropriate eye and hearing protection shall be provided and used by workers using
5. Have a firm footing when with hand or power tools.

Turnbuckles shall be secured to prevent unwinding under stress. Use appropriate PPE. Always wear gloves.

## **Annex 3-6 - PERSONAL PROTECTIVE EQUIPMENT**

**APPROPRIATE PERSONAL PROTECTIVE** - Equipment Appropriate personal protective equipment (PPE) shall be worn by personnel working where the potential for injuries and/or health hazards exist. The purpose of this procedure is to define the safety requirements as they pertain to personal protective equipment (PPE). In some cases the client may require additional PPE's. PPE is designed to protect the employee from health and safety hazards that cannot practically be removed from the work environment. PPE is designed to protect many parts of the body including eyes, face, head, feet and ears.

### **CONDITION OF EMPLOYMENT**

The wearing of suitable personal protective equipment is a condition of employment. Individuals and employees that disregard this condition will be removed or terminated from the project. The company will not take disciplinary action against employees who refuse to perform work when the company has not provided suitable personal protective equipment

### **HAZARD ASSESSMENT:**

- A. Approved for use by the General Management to Gal-IV Ltd, Project Management .
- B. Manufactured in accordance with standards for performance and materials. Standards are typically set by the ISO Standards.
- C. Durable, readily available and maintainable by project personnel, if possible.
- D. Provide desired protection to workers against hazard exposure.
- E. Maximum comfort with minimal weight.
- F. Minimum restriction of essential body movement, vision, etc.

### **RESPONSIBILITIES**

#### **A. Principal's Superintendents**

- 1. Must be aware of the activities
- 2. Train employees in the proper use of Personal Protective Equipment (PPE).
- 3. Assurance that appropriate personal protective equipment is worn.
- 4. Review issuing practices and records to control equipment misuse.
- 5. Administering the program and approve temporary deviations.

#### **B. Employee**

- 1. Employees are responsible for PPE maintenance and are accountable for the care and use of assigned PPE. Defective PPE's must be turned in for replacement immediately upon discover.
- 2. Employees shall inform their superintendent whenever a need arises to use PPE for which the employee has not received training, or when a condition exists where adequate PPE is not available.
- 3. Employees that want to use their own PPE's must obtained approval from the Project Superintendent prior to use. If approved the employee must adhere to the same standards of use as required to Company issued PPE's.

### **3.6/1 HEAD PROTECTION**

- A. Employees working in areas where there is the possible danger for head injury from the impact of falling or flying objects, striking against objects, electrical shock and/or burns, or any combination of these hazards will be protected by protective hard hats/helmets. Hard hats will be worn on all projects unless this condition violates a client's procedure.
- B. Hard hats are designed to protect the employee from impact and penetration cause by objects hitting

their head and from limited electrical shock or burns and shall meet the specifications contained in National and European Standards (BDS, EN, ISO).

- C. The suspension, which consists of the headband and strapping, is even more critical for absorbing impact. It must be adjusted to fit the wearer and to keep the shell a minimum distance above the wearer's head. Hard hats may not be altered in a way that will downgrade their efficiency. Typical prohibition alterations include: painting, drilling holes in the shell, application of metal jewelry, etc. Hats with these alterations or excessive scratches will be replaced.
- D. The headband must be kept snug enough to keep the hard hat on when the wearer leans over, looks up, or not be blown off in a strong wind gust. The hat should not be so tight that it leaves the band mark on the forehead.
- E. Never attempt to repair a damaged or cracked shell. Damaged hats are to be replaced immediately. H. Hard hats should be worn with the bill or visor to the front over the eyes. The bill keeps chips, dust, and dirt particles from going behind the safety glasses and into the eyes.
- F. Hardhats shall be worn at all times in "Hard Hat" designated areas.

Welding and cutting operations required head protection (welding hood or hard hat and welding hood goggles). Hard hats will be available for use when welding helmet is removed.

### **3-6/2 HEARING PROTECTION**

- A. Wherever it is not possible to reduce the noise levels by engineering methods or limit the duration of exposure to acceptable levels, hearing protection devices shall be provided and used.
- B. The two types of hearing protection available to reduce the exposure to excess noise levels are:
  - 1. Ear Plug
  - 2. Ear Muffs
- C. Ear protection devices inserted in the ear shall be fitted or determined individually by a competent person.
- D. Allowable noise exposure is computed based on the number of hours in an 8-hour workday.
- E. Plain cotton is not an acceptable protective hearing device.
- F. When earmuffs are used for hearing protection, they must be cleansed and disinfected prior to issue to another employee.
- G. Hearing protection is always required when performing the following task or when working in the vicinity of this type of work:
  - 1. Pile Driving
  - 2. Jack Hammering
  - 3. Operating a Grinder
  - 4. Chipping Steel
  - 5. Other types of equipment and tools may also require hearing protection.
- H. Pay particular attention to areas in plants or around industrial machinery, which, due to the sound levels present, require hearing protection.
- I. Contact the Project Management or Foreman/Superintendent for additional information on hearing protection and other PPE concerns.

### **3-6/3 EYES AND FACE PROTECTION**

A. The company will provide employees with suitable eye and face protection equipment when machines or operations create the real risk of eye or face injuries due to physical, chemical and/or radiation hazards. Employees will be required to wear the provided eye or face protective equipment when work assignments or operations present the real risk of eye or face injuries. Employees desiring eyes and face protection, who are not normally assigned to the foregoing activities, will be provided with suitable eye protection upon request. The employee is responsible for the safekeeping of the provided eye and face protection equipment and for return of the same upon termination. The company will replace, at no charge to the employee, that equipment provided which is defective or damaged in use. The company reserves the right to charge the employee its cost to replace provided equipment, which the employee has lost or abused.

#### **B. Procedures**

1. Employees are advised of eye and face protection program at the pre-shift, pre-job, or pre-employment briefings.
2. Prescription glasses are by law impact resistant and will be accepted as eye protection provided that the prescription glasses are fitted with side shields or goggles are worn over the prescription glasses.
3. Where clients have a stricter eye protection program, all personnel will be expected to comply this.

#### **C. Contact Lenses**

The use of contact lenses in the work environment is strongly discouraged. Dust caught underneath the lens can cause painful abrasions. Some chemicals can even react with the contacts to cause permanent injury. If medical conditions, such as cataracts, make use of contacts necessary then it should be so noted on the employee's personal file. However, keep in mind that contact lenses are not considered protective devices. If eye hazards are present, the employee must wear eye protection in addition to or instead of contact lenses. Certain environments, facilities and/or clients may prohibit the use of contact lenses.

#### **D. Face Shields**

1. Face shield/hardhat combinations, in addition to safety glasses, are required for the following:
  - a. Grinding , chipping, scaling, sanding or operating similar type of power equipment.
  - b. When handling caustics, acids, solvents, or any other chemical where a spill or splash hazard exists.
  - c. When operating hydraulic or pneumatic hammers.

#### **E. Eye and Face Protection For Welding and Cutting.**

1. Welding hood/hat combination shall be worn on all field erection sites. The project superintendent/supervisor may give special permission for certain work locations due to cramped or hard to reach areas provided the work area offers no overhead hazards.
2. Welding hoods must not have any cracks or other damage, which could allow the eyes or face to be exposed to the radiant energy from the arc.
3. Welding hoods must be equipped with a lens of at least shade #10.
4. Oxygen acetylene cutting, burning and welding require either:
  - a. Eye cup type cutting goggles
  - b. Full lens type cutting goggles (will cover most prescription glasses).
5. Cutting goggles must be equipped with a lens of at least shade #3.
6. Safety glasses are not to be used as a substitute for cutting goggles.

### **3-6/4 HAND PROTECTION**

- A. Fingers, hands and arms are injured more often than any other parts of the body. Hand protection must be provided and worn when employees are exposed to hazards such as, but not limited to, those from skin absorption of harmful substances, severe cuts or lacerations, severe abrasions, punctures, chemical burns, thermal burns and harmful temperature extremes.
- B. The superintendent/foreman or project management is responsible for instructing the employee(s) on the best type of hand protection available for the job. Whatever gloves are selected, the superintendent and employee must make sure that they fit correctly.
- C. Gloves are used to protect the hands from being injured in most cases. The tops of the gloves should be taped closed to keep liquids from running inside your gloves or onto your arm.
- D. Gloves made from natural and/or man-made materials (neoprene, rubber, synthetic, vinyl, etc.) are to be used when working with most chemicals and/or petroleum- based products. Proper selection will depend on the product and its concentration.
- E. Leather or cotton knitted gloves are appropriate for handling most abrasive materials. Gloves reinforced with metal staples offer greater protection from sharp objects.
- F. Metal or metal reinforced gloves are not to be worn when working with electrical equipment or on electrical services. Proper leather and rubber gloves, designed and tested for this purpose are to be provided and used.

### **3-6/5 FOOT PROTECTION**

- A. Good work boot/shoes shall be worn on the work. Employees are wear boots/shoes with steel toes, sole penetrating and ankle protection. IF some clients require the wearing of steel toe safety footwear and employees are expected to comply.
- B. Employees not required to wear protective footwear (steel toed boots, metal tarsal protection, rubber boots, insulated boots, etc.) shall wear substantial, leather, work- type shoes or boots. In this case the proper footwear will be worn by the employees. Specialized footwear will be provided by the company.
- C. Employees are not to wear shoes with loose or worn through soles and toes, or excessively worn down heels.
- D. Employees should wear rubber boots when their work requires them to wade in fresh concrete, or when working in locations, which are constantly wet. Rubber boots are to be steel toed.
- E. Appropriate specialized protective foot wear, such as foot guards and heel and ankle shields, etc., is mandatory for the following working environments:
  - 1. Working on or around molten metal processes.
  - 2. Using harmful corrosive substances and processes such as acids or caustics.
  - 3. Having a high probability of foot injuries of a crushing nature (materials handling, barrels, cylinders, pallets, etc.).
  - 4. Performing regular assembly or disassembly of heavy systems components and/or equipment.
  - 5. Abnormal weather conditions.
  - 6. Extreme cold.
  - 7. Work around exposed electrical wires or connections require metal-free nonconductive boots

### **3-6/5 USES/ LIMITATIONS**

Personal protective equipment has its intended and its limitations. It is important that the Project Management or Superintendent properly informs and train employees in these limitations as well as the inspection, maintenance, care and storage of the PPE assigned to them.

### **3-6/6 FALL PROTECTION**

- A. Employees working over any operating machinery, open spaces, hazardous substances, unguarded heights, steep slopes or otherwise subjected to falls 2 meter or greater and not protected by fixed scaffolding, guard rails or safety nets shall be secured with a safety harness, a shock absorbent lanyard and/or lifeline.
- B. A personal fall arrest system is designed to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, and a body harness and will include a shock absorbent lanyard with double locking snap hooks, deceleration device, lifeline, or suitable combination of these.
- C. Safety harnesses, lanyards and lifelines shall be used only for safeguarding employees and for no other purposes.
- D. Safety belts shall be used only as part of an employee work positioning system and shall no longer be used for fall protection. 5. Safety harnesses, lanyards and lifelines shall be inspected and maintained in safe condition. Prior to use, they shall be visually inspected for any signs of damage or deterioration such as wear, fraying, cuts, tears, or damage cause by heat (melting, charring, burning). Safety harnesses shall be inspected also for stitch failures in fabric or worn, cracked, or deformed buckle and D-rings. Lanyards found to have one or more damaged areas which exceeds eight or more damage areas which deep, and any other fall protection equipment which is found to be damaged, shall be removed from services. Must meet standards.
- E. Any safety harness, lanyard, or lifeline, subjected to in-service loading as a result of a fall shall be removed from service.
- G. Lifelines, lanyards and safety straps shall be free of knots or splices except at the terminals.
- H. Lifelines, lanyards and safety straps shall be so arranged that the worker cannot fall more than six feet.
- I. All safety harness and lanyard hardware, except rivets, shall be capable of withstanding a tensile loading without cracking, breaking, or making a permanent deformation.
- J. One of the most important aspects of personal fall protection systems is fully planning the system before it is put into use.

### **3-6/7 SAFETY BELTS/ HARNESES**

- A. Safety/Body belt is a strap with the means for securing about the waist and for attaching to a lanyard, lifeline or deceleration device. Safety belts are to be used for employee work positioning only, they are no longer an approved means for fall protection.
- B. Safety / Body harness means a design of straps which may be secured about the employee in a manner to distribute the fall arresting forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.
- C. Employees shall be provided with and be required to use approved safety harness, adjusted to the correct size to properly fit them.
- D. The safety harness shall be attached by means of a lanyard with double locking snap hooks to either a fixed anchor or a lifeline.
- E. Where the employee must be lifted through a manhole or other opening of such size as to necessitate lifting him in a vertical attitude, that worker shall wear a harness, which will permit lifting him in such a manner. A waist-harness alone is not acceptable for this purpose.
- F. Each employee will wear a safety harness with a lanyard secured to a separate vertical lifeline while working from swing scaffolds, bos'n chairs or other suspended platforms where a falling hazard is present.

### Training – Fall Protection

- A. A training program shall be provided for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.
- B. Management of GAL-IV Ltd. is responsible for the training development and also ensure that each Project Superintendent is trained as the competent person. The Project management of Gal-IV Ltd. or Superintendent (at the project work site) will conduct the fall protection training.
- C. Employees will be re-trained if work conditions change or if the training program has been revised.
- D. Each employee must be trained by a competent person qualified in the following areas:
  - 1. The nature of fall hazards in the work area or at the project work site.
  - 2. The correct procedures/rules for maintaining and inspecting the fall protection funds to be used.
  - 3. The use and operation of guardrail systems, personal fall arrest systems, warning line systems, safety monitoring systems, controlled access zones and other protection to be used.
  - 4. The correct procedures for the handling and storage of equipment and materials for safety fall protection.

### SCHEDULE OF INSPECTIONS

- A. It is the responsibility of the USER to inspect his safety equipment daily before each use, regardless of ownership.
- B. Semi-annual inspections are to be performed and documented by a qualified person using the criteria recognized procedures, which will ensure the integrity of, fall protection systems in use.
- C. **ANY EQUIPMENT FOUND TO BE DEFECTIVE SHALL BE REMOVED FROM SERVICE! DEFECTIVE EQUIPMENT IS TO BE REMOVED FROM THE PROJECT SITE AND DESTROYED!**
- D. **In service Testing** - If used components of a fall protection arresting rules, which have been subjected to an actual fall impact, are to be destroyed to prevent reuse.
- E. **Cleaning** - Clean rope and webbing by removing dust, dirt and other foreign matter with a damp sponge. Then with a mild solution of commercial soap and warm water, work up to a thick lather with a vigorous back and forth motion. Wipe dry with a clean cloth and hang to dry, but away from excessive heat.

### 3-6/8 RESPIRATORY PROTECTION

It is the responsibility of GAL-IV Ltd. to provide its employees with a safe and healthful working environment (including responsible for negotiating safe working conditions with the contracting authority in his territory). This is accomplished with accepted engineering and administrative controls. Where these methods are not feasible or do not provide adequate protection, respiratory protection is to be provided to each affected employee, to reduce employee exposure to harmful airborne particulates and/or gases and vapors to concentrations which are predictably non-injurious to most individuals according to standards listed with professional and regulatory agencies.

It is the policy of this company that all employees, when using respirators or administrating the respiratory program, are to adhere to the requirements of this program and to maintain respiratory protection consistent with the goal of protecting our employees.

### PROGRAM ADMINISTRATION

Unless notified otherwise, the Project Management or Principal's Superintendent on each project (work site) is designed as the person responsible for the implementation and administration of the respiratory

program. The Project Management together Principal's superintendent is to act on any and all matters relating to the operation and administration of the respiratory program and to coordinate all activities with the to provide remedies.

### **MEDICAL EVALUATION**

1. Each employee required to wear a respirator as a requirement of his duties is to be evaluated initially upon employment or job assignment, and periodically thereafter, as to whether the employee can wear the required respirator without undue physical or psychological risk.
2. Employees are not to be assigned tasks requiring the use of respiratory equipment unless it has been determined by a licensed physician that the employee is physically able to perform the work and properly use the respiratory equipment and that the employee will not suffer undue physical or psychological harm due to wearing the equipment.

**USE OF APPROVED RESPIRATORS** - Only those respirators approved by the international and national standards for compliance with safety criteria are to be used in any operation by employees of this company. Employees are not allowed to purchase their own respirators and use them in any work area (including in the work site territory of the contracting authority).

### **HAZARD EVALUATION**

1. Proper respirator selection is to be made only after the determination has been made as to the real and/or potential employee exposure to harmful concentrations of contaminants in the workplace atmosphere has been made (hazard evaluation in the work site territory of the contracting authority connected with exposure to harmful concentrations of contaminants is the responsibility of the principal).
2. This determination is to be made prior to the start of any routine or non-routine task, which requires respiratory protection. A review of the respiratory protection and the real/potential exposures are to be conducted periodically thereafter to determine if the protection provided is still adequate or if the exposure still exists. (All respirator selections and respiratory hazard evaluation are to be coordinated with the Principal).

#### Respirator Selection

1. Respirators are to be selected on the basis of the hazards to which employees are exposed. They are to be appropriate for the hazard and used only in those locations and/or job functions for which they are approved.
2. Respiratory hazards can be classified as follows:
  - a. Oxygen Deficiency
  - b. Gas and Vapor Contaminants:
    - 1) Immediately dangerous to life and health (IDLH).
    - 2) Not immediately dangerous to life and health.
  - c. Particulate Contaminants (aerosols, dusts, fumes, fog, mist, smoke and spray):
    - 1) Immediately dangerous to life and health (IDLH)
    - 2) Not immediately dangerous to life or health.
  - d. Combination of Gas, Vapor and Particulate Contaminants:
    - 1) Immediately dangerous to life or health.
    - 2) Not immediately dangerous to life or health.

**RESPIRATOR FITTING:** - No employee is allowed to wear a respirator in a work situation until it is

demonstrated that an acceptable fit has been obtained. Either a qualitative or a quantitative fit test is to be performed to determine that a proper fit of the respirator can be obtained. Respirator fitting is to be done initially upon employment or assignment of any employee who is required to wear a respirator and is to be performed periodically thereafter. The employee is to wear only the same type of respirator with which the fit test was performed.

#### **RESPIRATOR TRAINING:**

1. Employees are to be given training in the use, inspection, maintenance and the capabilities and limitations of the respirators in use initially upon employment or assignment to any job, which requires the use of respirators and is to be performed periodically thereafter. No employee is allowed to wear a respirator in a work situation until proper training has been performed.
2. Employees shall use the respiratory equipment provided in accordance with the manufacturer's instruction and the training received.
3. All required fit testing and training are responsibility of Principal (if the remedies respirator are his property)

### **3-6/8 EYE AND FACE PROTECTION/ FACIAL HAIR**

**EYE AND FACE PROTECTION:** Goggles, face shields, welder's helmets, safety glasses or other personal protective equipment may be worn with a respirator provided that they do not interfere with the normal positioning or seal of the face piece.

Corrective lenses : Corrective glasses with temple bars will interfere with the seal of full- face respirator and are not to be worn. If corrective glasses are needed to perform normal job functions, corrective glasses inside the face piece will be provided which do not interfere with the respirator seal.

Facial Hair : When respiratory equipment is required to be worn in areas of hazardous substances, beards, goatees, sideburns, or any other type of facial hair which would prevent the ability of the respirator to obtain a seal to effectively keep contaminants from the employee, shall not be permitted and must be removed.

Issuance of Respirators : Only the project Principals superintendent or foremen are permitted to issue respirators, and only to those individuals who have been medically evaluated, and properly fitted and trained in the use, inspection, maintenance and the capabilities and limitations of the respirator issued.

#### **RESPIRATOR INSPECTION AND MAINTENANCE**

1. *Inspection (to work place of Principal)* - Prior to use, the respirator is to be inspected by the wearer for defects and signs of deterioration, which could affect its ability to protect against exposure. No respirator is to be worn with a known defect. If found defective during inspection, the respirator is to be turned in to the Principe's supervisor for repair or replacement.
2. *Maintenance:*
  - a. During cleaning and maintenance, all respirators are to be inspected for defects and worn or deteriorated parts are to be replaced prior to use. No attempt is to be made to make repairs on a respirator which is beyond that recommended by the manufacturer.
  - b. If possible respirators are to be assigned to individuals for their exclusive use. Employees assigned respirators are responsible for inspecting, cleaning and performing minor maintenance on the equipment. Respirators are to be cleaned, inspected and maintained as per the manufacturer's instructions and the training received.
  - c. Respirators are to be cleaned daily after each use.

## Responsibilities During Respirator Use

1. Principals Superintendent: It is the responsibility of the project superintendent and/or foremen to supervise the use of respirators on the project site and/or foremen to supervise the use of respirators on the project site and to ensure that respirators are used when required and in the manner in which the wearer has been trained.

### 2. Respirator Wearers:

- a. It is the responsibility of each respirator wearer to properly wear the respirator when and where it is required, to ensure that the respirator is fully functional at all times, and to report any malfunction of the respirator to the appropriate supervisor.
- b. It is the responsibility of each respirator wearer to guard against mechanical damage to the respirator, and to ensure that the respirator is cleaned and maintained as instructed.
- c. A clean and sanitary location will be provided for each respirator and it will be the responsibility of each individual to maintain the respirator in the clean and sanitary location between wearing.

## EMERGENCY USE RESPIRATORS

In the event of an emergency where respirators are required for the protection of employees, due to a particular hazard, a program of evaluation, use, training, inspection, and maintenance are developed for the project site.

## TRAINING – GENERAL

### A. Requirements which must be answered include:

1. When is PPE necessary?
2. What PPE is necessary?
3. How to don or put on PPE.
4. How to remove the PPE.
5. Limitations of the PPE.
6. Proper care and maintenance of PPE
7. Useful Life of PPE
8. Proper disposal of PPE

### B. When training is to be performed:

1. Upon initial assignment to an area or activity that requires PPE.
2. Changes in the workplace that render previous training obsolete.
3. Changes in PPE, which render previous training obsolete.
4. Employees no longer demonstrate proficiency with their assigned PPE.

## **Annex 3-7 CLOTHING REQUIREMENTS**

### **WORK CLOTHES**

- A. Wear clothes that are suitable for your work. Working without shirts/overalls is not permitted. Buttoned, long sleeved cotton shirts/overalls should be worn when burning, welding, grinding or performing other types of work where sparks or hot metal are present, or where the work involves the handling of chemicals, solvents, oils, etc.
- B. On projects where the client has special requirements pertaining to work clothes, such as fire retardant clothing and other requirements, the client's requirement pertaining to work clothes, such as fire retardant clothing, the client's requirement will be adhered to.
- C. Loose, torn or ragged clothing creates a special hazard when operating lathes, drill presses, reamers, and other machines with revolving spindles or cutting tools, and shall not be worn while working. Welders are recommended to wear approved safety glasses in addition to welding helmet. Shaded lenses are recommended when welders are working close to one another.
- D. Approved ear plugs or muffs should be worn when there is a usual hazard of sparks, molten metal, etc. entering the ears from burning, welding, or gouging; or where high noise levels may exist.
- E. Avoid wearing oily or paint - soaked clothing. Should your clothes become coated with such substance, keep away from fires or operations where hot metal or sparks may ignite clothing?
- F. It is recommended that rings, watches, and other hand or arm type jewelry not be worn during working hours.
- G. If an employee's hair is long enough that it may become entangles in machinery, the employee will be required to contain the hair in a safe manner.
- H. Long shirttails should be tucked in to prevent entanglement in machinery

## **Annex 3-8 HEALTH AND SANITATION**

### **POTABLE WATER (WATER SUITABLE FOR DRINKING)**

- A. An adequate supply of potable water shall be provided in all places of employment (in the territory of the Principal, drinking water is his responsibility).
- B. Portable containers used to supply drinking water shall be capable of being tightly closed and equipped with a tap. Water shall not be dipped from containers.
- C. Any container used to distribute water shall be clearly marked “DRINKING WATER” and shall not be used for any other purpose.
- D. The common drinking cup is prohibited.
- E. Where disposable single service cups are used, both a sanitary container for the unused cups and a receptacle for the disposal of the used cups must be provided.
- F. If water fountains are used they shall:
  - 1. Be connected to a potable water supply.
  - 2. Be connected to a sanitary sewer, storm sewer or French drain.
  - 3. Maintained in a clean and sanitary condition.

### **NON-POTABLE WATER (WATER UNSUITABLE FOR DRINKING)**

- A. Outlets for non-potable water, such as water for firefighting or industrial purposes, shall be identified by signs clearly indicating that the water is unsafe and is not to be used for drinking, washing or cooking purposes.
- B. There shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing non-potable water.

### **TOILET FACILITIES**

- A. Toilet facilities shall be provided for employees.
- B. Under temporary field conditions, provisions shall be made to assure not less than one toilet facility is available.
- C. Project sites not provided with a sanitary sewer, shall be provided with chemical toilet facilities services and maintained in a sanitary condition.
- D. Toilets in poor repair shall be removed from the jobsite and replaced.
- E. The requirements of this section do not apply to mobile crews having transportation readily available to nearby toilet facilities.

### **Workplace health and safety welfare**

*Health and safety regulations for the workplace cover a wide array of issues to promote safe working environment. As employers or as employees, our duty is to know all the requirements of the workplace regulations so that the potentially dangerous health and safety hazards can be avoided.*

Health and safety regulations for the workplace cover a wide array of issues to promote safe working environment. As employers or as employees, our duty is to know all the requirements of the workplace regulations so that the potentially dangerous health and safety hazards can be avoided. These regulations are aimed at protecting the health and safety of all workers within the workplace and ensuring that the best safety welfare facilities are accessed by the employees.

According to these regulations, each member of the workforce has the right to basic health and safety requirements and it also includes the people with disabilities. Also, the health and safety measures must be

‘suitable’ for everyone at work.

So what are the considerations that can make health and safety welfare programmes within a workplace an ultimate success?

### **HEALTH - ENVIRONMENTAL FACTORS**

**Temperature:** In order to ensure that they can focus on their tasks well, organisations must ensure that the temperature maintained within the workplace is a decent one and up to the mark. It must also be ensured that the environmental factors such as heat and humidity are not made to combine with the personal issues of employees. Even though the individual preferences can’t always be taken into consideration, having a decent maintenance of temperature in the workplace is mandatory.

**Ventilation:** Organisations must ensure that the workplaces have adequate ventilation facilities. Furthermore, ventilation facilities should be capable of keeping a check on the dilute and humid air and it should be giving workers a great sense of freshness. Ventilation should help in releasing foul air and keep the surrounding hygienic. Even though windows and various other openings can give way to good ventilation, mechanical ventilation systems should be allowed and with proper maintenance.

**Work Environment – Hot or Cold:** When conditions in the workplaces seem to move away from what they call “comfortable”, risk to the health and safety of the workers naturally increases. Issues like stress resulting from heat, uncomfortably low or high temperatures and various other concerns should be checked in time so that the best preventive measures can be taken. Exposure to extremely high thermal radiation and relatively higher levels of humidity should be controlled with the help of proper and suitable health and safety measures.

When the organisations are assessing the risks to the health and safety of the employees working in a cold or hot environment, they should consider both the environmental and the personal factors. Personal factors mostly include the kind of clothing that rests on the body, physical activity, exposure and duration. On the other hand, environmental factors include radiant heat, an ambient temperature, rain, velocity of wind, etc.

**Lighting:** Lighting is one aspect that helps a lot in the performance and productivity but it is also an important factor in health and safety at workplaces. Organisations must ensure that the lighting is adequate so that the workers can move around freely and work comfortably. Light fittings should be installed in a way such that they don’t lead to any hazards. Arrangements should be made for a good and suitable solution to sudden loss of light. Automatic emergency lighting would serve the purpose hence organisations must mandatorily get them installed at the earliest.

**Cleanliness:** Workplaces should have a special focus on the cleanliness. It should be kept in mind that the furniture, fittings and furnishings are maintained and kept neat and clean. It is also important to keep the walls, surfaces and ceilings clean so that accidents and injuries resulting from them can be avoided. Removal of waste and cleaning should be carried out on a regular basis depending on the requirements for cleanliness in the work area. Organisations should not hesitate in arranging a casual cleaning system at least twice in a day. Waste should also be stored suitably so that infection and diseases can be kept under control.

**Room Dimensions:** Workrooms should be spacious and decent in size so that the workers can move around safely without them leading to a chaos. Depending on the layout, type and the nature of the work to be carried out by the workers, workplace areas should allow enough mobility keeping away any scope for suffocation.

**Seating Arrangements:** Workstations must be suitable for the employees and the work they are required to do. Employees should be made to sit in such a way that they can leave the workstation instantly in case of any emergency. If the work requires the employees to sit for long hours then they should be provided a comfortable seating. For the employees who are not capable of placing feet straight on the floors, arrangements for foot rest should be made. Seating must allow the workers to have suitable support for their back so that the related and health issues can be avoided in the long run.

### **Safety:**

Maintenance: Equipment's and systems in the workplaces should be maintained so that they remain efficient without actually posing a threat to the health and safety of the workers. In case a fault comes into view, it should be immediately attended.

Employees should also consider reporting the issue if they happen to take note of it beforehand. It will ensure that the best health and safety welfare measures are taken that are further capable of preventing the hazards.

**Floor Routes:** This includes fixed ladders, doorway, stairs, gateway, etc. Traffic routes must be sufficient so that the vehicles and the people can move around comfortably and safely. One of the best ways to ensure safe mobility is to keep the path of the pedestrians and vehicles apart. This is also mandatory under the regulations covering the security at gates and doors of workplaces.

Since it can become extremely tough for the drivers to see what lies behind the vehicle while they are reversing, the best way out is to plan the traffic routes that won't at all require them to reverse. Driving through the loading areas and utilising the one-way systems can be a good solution. It is also important to ensure that the speed limits of all the vehicles are set in advance and they are being followed along with other traffic rules. In order to let the pedestrians and drivers know where they are required to go, route markings along with signs should be provided for guidance.

Make sure that the crossing points are marked and visible clearly. They should also be warned of any potentially dangerous hazards so that they know it very well where they are required to go and what set of rules should apply to the routes they are supposed to undertake. Traffic and floor routes must have the capability to bear the load and heavy traffic. Surfaces in use must not have holes. They should not be slippery and uneven at the same time. Maintenance systems should be flexible and open to providing immediate repair facilities whenever required.

Open sides of all the staircases must be fenced decently and handrail can also be provided on both the sides, in case there are possible haunting risks. Make sure that the access from one floor to the other should not be through steep stairs and ladders as they can pose threat to the safety of workers using them.

**Dangerous Falls:** Falling into the potentially dangerous substances can have dire consequences hence one must ensure high level of security and protection. If there are any dangerous substances in the pits or tanks, they should be fenced properly. Companies must also take special measures to prevent falls that can result from height; conforming to the work at height regulations is important.

Protection Against Breakage & Poor Quality Materials: Walls, partitions and doors must be made up of quality materials; they should be safeguarded against any form of breakage. If a breakage occurs then it should be marked so that the people who can possibly come in contact with it stay alert well ahead.

**Window Safety:** Windows, ventilators and skylights must be capable of being opened comfortably. On opening, they must not pose any threat to the safety of the workers around. They must be regularly checked for any undue risk and must be designed in such a way that they can be opened and cleaned with ease.

**Gates & Doors:** Gates and doors in the workplaces must be suitably constructed. They should be fitted with quality and safety devices. Make sure that the power operated doors can boast of exclusive safety features so that people can prevent getting trapped or stuck. They should be capable of being stopped instantly in case any emergency occurs. They must boast of a control that is both accessible and identifiable.

**Escalator Safety:** Moving walkways, stairs and escalators must be functioning properly and they should be fully equipped with safety devices necessary for the access. It is mandatory for them to have the safest and secured emergency stop controls which should be maintained from time to time.

## ANNEX 3-9 FIRE PROTECTION AND PREVENTION

This section will define the safety terms and procedures applicable to fire protection and prevention.

### DEFINITIONS:

A. Approved - Equipment listed or approved by a nationally recognized testing laboratory, i.e. Factory Mutual Engineering Corporation or Underwriters Laboratories.

B. Closed Container - A container sealed by means of a lid or other device in which neither liquid nor vapor will escape at ordinary temperatures.

C. Combustible Liquids - Liquids with a flash point at or above 100 degrees °C

D. Combustion - A chemical process, which involves oxidation sufficient to produce light or heat.

E. Fire Brigade - An organized group of employees knowledgeable, trained, and skilled in the safe evacuation of employees during emergency situations and assisting in fire-fighting operations.

F. Fire Resistance - Materials resistant to fire for a specified period time and under conditions of standard heat intensity. The material will not fail structurally nor permit the side opposite the fire to become hotter than a specified temperature.

G. Flammable - Capable of being easily ignited, burning intensely, or having a rapid rate of flame spread.

H. Flammable Liquids - A liquid with a flash point of below 100 degrees °C

I. Flammable Range - The difference between the lower and upper flammable limits expressed in terms of percentage of vapor or gas in air by volume.

### FIRE PROTECTION

A. The approved fire protection program will be followed throughout all phases of work. There shall be no delay in providing the necessary equipment as fire hazards occur. When work is done at work site of Principal - fire protection are his responsibility.

1. Access to available firefighting equipment shall be maintained at all times.
2. Firefighting equipment will be inspected monthly and maintained in operating condition. Defective equipment will be immediately replaced. (Inspection are the responsibility of the contracting authority - when work is done at his work site).
3. Firefighting equipment are conspicuously located and not obstructed from view in the workplace.
4. The Project Superintendent will provide a trained and equipped firefighting organization (fire brigade) to assure adequate protection on initial project startup and annually thereafter.

B. A temporary or permanent water supply (sufficient volume, duration, and pressure) required to properly operate the firefighting equipment will be made available as soon as combustible materials accumulate.

**Fire Hose and Connections** - with a nozzle capable of discharging water or a fire extinguisher in the designated area, provided the hose line can reach all points in the area.

**Fire Alarm Devices:** An alarm system, e.g., telephone system, siren, etc., are established to alert employees on the site and the local fire department of an emergency. The alarm code and reporting instructions will be conspicuously posted at phones and at all employee entrances.

### Project Site Requirements:

- A. Material storage areas will be equipped with fire extinguishers adequate for their size, construction, and the material stored therein.
- B. Welding, cutting, grinding, and burning shall not be done near any material fuel storage area. Fire extinguishers will be provided at the site of welding, cutting or other hot work operations.

- c. Flammable materials will be stored as far as possible from the working area. Safety cans will be used when handling and transporting fuel, gas, and other flammables.
- d. Fire extinguishers will be located on all self-propelled equipment.
- e. Fire extinguishers used to protect areas involving welding, cutting or grinding shall be checked daily prior to start of operation.
- f. Only approved solvents are to be used for cleaning purposes.
- g. Extinguishers are to be adequately maintained.
- h. The telephone number of the nearest organized fire-fighting group is to be displayed at the project site telephones.

### **Fire Prevention**

The purpose of this section is to identify the safety requirements for fire preventions.

#### **A. Ignition Hazards**

- 1. Electrical wiring and equipment for light, heat, or power purposes shall be properly installed.
- 2. Internal combustion powered equipment will be located with the exhausts positioned away from combustible materials.
- 3. Smoking is prohibited at or in the vicinity of operations, which constitute a fire hazard. These areas shall be conspicuously posted: "NO SMOKING".
- 4. Portable, battery powered lighting equipment, used in connection with the storage, handling, or use of flammable gases or liquids will be approved for the hazardous locations.
- 5. The nozzle of air, inert gas, and steam lines or hoses, used in the cleaning or ventilation of tanks and vessels containing hazardous concentrations of flammable gases or vapors, will be bonded to the tank or vessel shell. Bonding devices will not be attached or detached while in hazardous concentrations of flammable gases or vapors.
- 6. The method of piling combustible materials will be solid and in orderly, regular piles.
- 5. Portable fire extinguishing equipment, suitable for the fire hazard involved, will be provided at convenient, conspicuously accessible locations in the area. Portable fire extinguishers, shall be placed to assure maximum travel distance to the nearest unit will not exceed 150 meter.

#### **D. Indoor Storage**

- 1. Storage shall not obstruct, or adversely affect, means of exit.
- 2. Materials will be stored, handled, and piled with regard to their fire characteristics.
- 3. Non-compatible materials which may create a fire hazard, will be segregated by a barrier.
- 4. Materials shall be pile to minimize the spread of fire internally and to permit convenient access for firefighting.

#### **Temporary Heating Devices**

This section is to identify the safe operating requirements for temporary heating devices.

#### **A. Ventilation**

- 1. Fresh air shall be supplied in sufficient quantities. Where natural means of fresh air supply are inadequate, mechanical ventilation shall be provided.
- 2. Heaters used in confined space, require special care to be taken to provide sufficient ventilation in order to ensure proper combustion, maintain the health and safety of workmen, and limit temperature rise in

the area.

***B. Clearance and Mounting***

1. Heaters used in the vicinity of combustible tarpaulins, canvas, or similar coverings shall be located at least 10meter from the coverings. The coverings shall be securely fastened to prevent ignition or upsetting of the heater due to wind action on the covering or other material.
2. Heaters designed for barometric or gravity oil feed shall be used only with integral tanks.
3. Heaters specifically designed and approved for use with separate supply tanks may be directly connected for gravity feed, or an automatic pump, from a supply tank.

## **Annex 3-10 HOUSEKEEPING AND CLEAN-UP**

The term “housekeeping” means a clean and orderly arrangement of tools, materials, operations, equipment, storage facilities and supplies. Your compliance with the following rules and recommendations will make your job and that of others as safe as possible.

### **A. General Requirements**

1. General waste, scraps, debris and rubbish shall be cleared from work area, passageways and stairs, in and around buildings and other structures on a daily basis. When the work is carried out on the work site of the contracting authority, the rules for collection and temporary storage of waste and consumables are defined.
2. Oil, grease, or other hazardous materials shall not be allowed to accumulate so as to prevent slipping or fire hazards.
3. All stairways, gangways and accessways shall be kept free of materials, supplies and obstructions at all times. are responsibility of principal.
4. Dispose of empty boxes, cans, oily rags, etc. promptly in the appropriate container provided and specified by the contracting authority project.
5. Tools, material extension cords, hoses and/or debris shall not be strewn about in a manner, which may cause tripping or other hazards.
6. Keep material and equipment out of aisles and walking area. Always return tools and equipment to their proper place after using them.
7. Pile all materials in a neat and orderly manner. Be careful where and how you place material overhead; you may cause injury to yourself or to others should it fall.
8. If you see something on the floor or ground that might cause someone to trip or fall, pick it up and put it in a safe place.
9. It is important to keep machinery and equipment as clean as possible at all times.
10. It is the responsibility of each employee to maintain good housekeeping in his or her immediate area.
11. Locker rooms, toilet facilities, water supplies, and washrooms are provided for your convenience. Help keep them clean and sanitary for your own protection.

### **B. Disposal**

1. Metal or other approved containers shall be provided in adequate numbers to handle waste and rubbish disposal.
2. Garbage and other hazardous waste be stored in approved, covered containers. Containers are to be appropriately labeled as to contents.
3. Employees, while cleaning up, shall not throw drop materials from upper levels to lower levels or to the ground unless disposals are provided or the area below is barricaded or secured.

### **C. Storage**

Materials shall be maintained in safe, neat stockpiles for ease of access and to prevent collapse or falling.

## **MANUFACTURING**

### **A. General Requirements**

1. All areas shall be kept clean to the extent that the nature of the work will allow.
2. General waste, scraps, debris, and rubbish shall be cleared from work areas, passageways and stairs on

daily basis.

3. All stairways, gangways and accessways shall be kept free of materials, supplies and obstructions at all times.
4. Tools, materials, extension cords, hoses and/or debris shall not be strewn about in a manner, which may cause tripping or other hazards.
5. Oil, grease or other hazardous materials shall not be allowed to accumulate so as to prevent slipping or fire hazards.
6. The floor of every work area shall be maintained, so far as practicable, in a dry condition.

**B. Disposal**

1. Approved containers for putrescible solid or liquid waste or refuse shall be provided. These containers shall be thoroughly cleaned and maintained in a sanitary condition on a daily basis.
2. All sweepings, solid or liquid waste, refuse and garbage shall be removed on a daily basis.
3. Metal or other approved containers shall be provided in adequate numbers to handle waste and rubbish disposal.
4. Hazardous waste shall be stored in approved, covered containers. Containers are to be appropriately labeled as to contents.

## **Annex 3-11 TOOLS**

### **General**

- A. Only non-sparking tools shall be permitted in locations where sources of ignition may cause fire or explosion.
- B. Tools shall be used only for the purpose for which they were designed.
- C. Defective or unsafe tools shall be replaced and turned in for repair immediately.
- D. When working overhead, unused tools shall be kept in containers or otherwise secured to prevent them from falling. Tools shall not be left in passageways, access ways, and walkways or on ramps, platforms, stairways or scaffolds where they can create a tripping hazard.
- E. Throwing or dropping of tools to another area or level shall be prohibited.
- F. When not in use, tools shall be stored in suitable tool rooms, toolboxes, racks or other containers.
- G. All power-operated tools designed to accommodate guards shall be equipped with such guards when in use.
- H. Tools must be kept clean and free from oil and grease to prevent slipping.
- I. When workers furnish their own tools, such tools must conform to the requirements demanded for satisfactory, efficient work and for safety.
- J. The Principal's Superintendant is responsible for the safe conditions of tools and equipment used by employees, including tools and equipment, which may be furnished by employees.

### **HAND TOOLS**

#### **A. Chisels, Drift Pins and Wedges.**

- 1. Chisels, drift pins and wedges shall be kept free of mushroomed heads.
- 2. A machinist hammer or sledgehammer and not a carpenter's hammer should be used to drive metal wedges.
- 3. Dull points require heavier blows and cause splintering, chipping and mushrooming. Keep points sharp. Use a coolant in sharpening to prevent loss of temper.
- 4. Eye protection should be provided and worn to prevent eye injuries from flying splinters or chips.
- 5. Impact tools must be held in a secure, safe manner.
- 6. A cold chisel becomes brittle when it is cold enough to gather frost. Warm to about 65 degrees Fahrenheit before using.
- 7. The chisel should be held in the most secure and comfortable position. With a firm grip, there is less chance of mashing fingers and hand if the point slips. When working with a helper, tongs should be used.
- 8. Be sure the work piece is solidly supported.
- 9. When flying splinters or chips are being produced, the work should be shielded to protect other workers.

#### **B. Files**

- 1. Files shall not be used as a chisel or hammer as they are made of hard brittle metal and may chip.
- 2. Files should be kept clean and free of accumulations. A sharp, clean file requires little pressure.

3. A handle should be placed on the tang (sharp point of a file) and the file should be stroked in the direction away from the edge being filed.
4. Chalk rubbed into the teeth of a file will help prevent slipping and a possible injury.
5. The metal in a file is not made for use as knives, punches or chisels. Do not make other tools from files.
6. Keep files free of oil and grease and store each file separately. If files are store together, they wear and chip each other.
7. Use a soft metal scraper and file card to remove accumulations from file teeth.
8. Select the proper file needed for a job, use it correctly and keep it in good condition.

### **C. Hacksaws**

1. The metal to be cut should be in a firm, secure position. A rolling piece of metal may break the brittle blade and cause an injury.
2. A sharp blade with fine teeth should be used to cut hard metal and a sharp blade with coarse teeth should be used to cut soft metal.
3. The metal in hacksaw blades is brittle and breaks easily and should not be bent or otherwise stressed so that it may break and cause injuries.
4. Do not attempt to sharpen a hacksaw blade. Get a new one. The manufacturer sharpens the blade and then hardens it.
5. Select the proper blade to cut metal to prevent breaking the blade and possible injury.
6. To start a cut safely, be sure the blade is taut on the frame. Score the cutting line with two (2) or three (3) up strokes.
7. To complete a cut, use pressure on the forward or cutting stroke. Stay clear of falling pieces to avoid foot injuries.
8. A coat of oil or antirust will protect the hacksaw when not in use.

### **D. Hammers**

1. The right weight and type of hammer should be selected for each job.
2. When working with hammers where there is danger of chips or other flying objects, eye protection should be worn.
3. Use the hammerhead to strike the work. It is hardened for this purpose and may be checkered or scored to prevent slipping. Grasp a hammer near the end of the handle. The hand will stand a better chance of escaping injury in case of a miss or if something gives.
4. Hold nails near the head with the thumb and forefinger to start the drive. The fingers will likely be driven away in case of a miss and not crushed.
5. Use the claws of a hammer to draw nails – not to strike objects. When withdrawing nails, use a wood block under hammerhead to increase handle leverage.
6. A steel hammerhead may cause sparks if striking against metal. Remember, sparks may ignite flammable mixtures of air and vapors or air and explosive dusts. Special hammers made of non-sparking metals should be used when conditions described above are known or suspected.
7. Keep hammers free from oil and grease.
8. Hammer handles should be free of splinters and made of hickory, ash or maple. A band of friction tape around the end of the handle will keep it from slipping out of your hand.
9. Redress any hammerhead that becomes marred.

### **E. Wrenches**

1. The right size and type of wrench should be selected for each job.
2. Hammering on a wrench or the use of extension pipes “cheaters” is dangerous, can break the wrench and is not a safe work practice.
3. The teeth of pipe wrenches should be kept clean and sharp to avoid chips.
4. Wrenches used improperly may break, slip or spread. Hammering a wrench may break the handle; so will extension of the handles to get more leverage. Check on other ways to do the job.
5. An adjustable wrench has more parts. Inspect the knurl pin and the adjustable jaws. Replace defective parts.
6. Workers should be positioned to avoid striking hands or body parts in case the wrench slips or falls.
7. Do not use a shim to make jaws fit. This is an unsafe practice. Get a wrench that fits.
8. When working at high levels, do not place wrenches where they can be jarred or accidentally knocked into machinery or fall on employees working at lower levels.
9. Use extensions and universal joints when reaching for difficult parts with a wrench. Then keep hands out of danger zones.

### **F. Screwdrivers**

1. Screwdrivers should not be used as a chisel, pry or wedge.
2. Screwdrivers should be used in a manner such that the hand will not be punctured or will not strike the work piece in case of a slip.
3. Use the proper size and type of screwdriver for the kind of screw to be driven.
4. Screwdrivers slip when not securely held or the use is off balance. The work piece should not be held by hand. Secure the work piece with clamps or a vise.
5. While working around electrical equipment, wear protective equipment or use an insulated screwdriver to avoid shock. Use safety glasses to avoid flash burns.
6. Replace a split screwdriver. Dress a screwdriver tip if it becomes dull or chipped. Use other tools for work that a screwdriver is not designed to do.

## **POWER TOOLS**

1. All power tools and similar equipment shall be maintained in a safe condition.
2. Do not issue nor permit the use of unsafe tools.
3. Power tools that are designed to accommodate guards shall be equipped with such guards when in use.
4. Employees using hand and power tools and exposed to hazards of falling, flying, abrasive and splashing objects or exposed to harmful dust, fumes, mist, vapors or gases shall be provided with, trained in their use and required to utilize approved personal protective equipment.
5. Tools shall be used only for the purpose for which they were designed.
6. Defective or unsafe tools shall be replaced and turned in for repair immediately.

### **ELECTRICAL POWER TOOLS**

1. Electric power operated tools shall either be of the approved double-insulated type or grounded in accordance with the National Electric Code.

2. The use of the electric cord for hoisting and lowering electric tools is an unsafe practice and should not be permitted.
3. All handheld powered platen sanders, grinders with wheels 5 sm. diameter or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaw less may be equipped with only a positive “on-off” control.
4. All handheld powered drills, tappers, fastener drivers, horizontal, vertical and angle grinders with wheels greater than 5 sm. in diameter, disc sanders, belt sanders, reciprocating saws, saber saws and other similar operating powered tools shall be equipped with a momentary contact “on- off” control and may have a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.
5. Electric cords are not to be jerked or pulled from receptacles. Strain relief is to be maintained on all electric tools.
6. All other handheld powered tools such as circular saws, chain saws and percussion tools without positive accessory holding means shall be equipped with a constant pressure switch that will shut off the power when the pressure is released.
7. Inspections of all electrically powered tools and cords are to be made. Assured Equipment Grounding Program. Generators greater than five (5) kilowatts and other power sources must also be grounded. Test power sources to ensure that they are wired correctly. Use a 3-wire circuit analyzer to perform these tests.
9. All electric cords and cables must be covered or elevated to a height prevent damage and to eliminate tripping hazards.
  - a. Covers are to be sturdy enough to withstand the traffic in the area.
  - b. When elevating cords, hoses or leads, non-metallic non- conducting material is to be used, such as rope, twine, tape, etc. Never use wire, nails or welding rod.

#### **PNEUMATIC POWERED TOOLS**

1. Employees are strictly forbidden from engaging in horseplay with compressed air hoses. Practical jokes with compressed air can cause serious injury.
2. Hose lines shall be so placed to eliminate tripping hazards.
3. Employees shall not use compressed air for the purpose of cleaning or blowing off clothing or otherwise directing compressed air towards themselves or others. Even when reduced to 30-psi compressed air can penetrate the skin and cause serious injury.
4. Pressure shall be shut off and exhausted from the line before disconnecting the line from any tool or connection.
5. Safety clips, chains, wires or other retainers shall be used to secure sections of hose together and to secure the hose to the power source and the tool to the hose in order to prevent dangerous whipping in case of disconnection or failure.
6. Compressed air shall not be used for cleaning purposes unless the pressure is reduced to 30 psi or less. This rule does not apply for concrete from mill scale, green cutting, and similar cleaning operation. Personnel involved in these operations shall be provided with adequate personal protective equipment including safety goggles or face shield, hearing protection, etc.
7. Safety chains or other suitable retaining devices must be used at connections on pneumatic hoses of 2,5 sm. inside diameter or larger.
8. Safety clips or retainers must be installed on all pneumatic tools to prevent the accidental release of the tool from the barrel. Compressed air receivers shall be equipped with drain valves, pressure gauges, and

automatic pressure relief valves.

10. Check all hoses and connectors for cuts, breaks and loose fittings prior to pressurizing the system. Hose clamps should not be used as a substitute for press type clamps.
11. Before making adjustments or changing tools, unless equipped with quick-change connectors, the air supply shall be shut off and the hose bled at the tool before breaking any connections.

#### **HYDRAULIC TOOLS**

- A. The manufacturer's safe operating pressures for hoses, valves, pipes, filters, and other fittings shall not be exceeded.
- B. The manufacturer's rated capacity shall be legibly marked on all jacks and shall not be exceeded.
- C. Do not break fittings or connections until hydraulic pressure has been released.
- D. Employees are not to work under raised loads until proper cribbing or blocking has been installed.
- E. Do not try to cover a pinhole leak with your hand; the pressure of the hydraulic fluid can inject the oil into your hand.

## **Annex 3-12 LADDERS**

- A. **Extension Ladder** – A portable ladder, adjustable in length, consisting of a base section and an adjustable extension section, with a suitable means of locking the sections together.
- B. **Step Ladder** – A portable ladder with a hinged frame for steadying
- C. **Ladder, Type I** – Portable ladder that supports at least 113 kilograms of weight.
- D. **Ladder, Type IA** – Portable ladder that supports at least 135 kilograms of weight.

### **EQUIPMENT**

- A. Except where permanent stairways, temporary stairways, suitable ramps or runways are provided, ladders must be provided to give safe access to all elevations.
- B. A stairway or ladder shall be provided at all personnel access points where there is a break in elevation of 0,6 m. or more and no ramp, runway or other means of access is provided.
- C. There are many different types of ladders available for use. There is no excuse for using a makeshift means to access the work area.
- D. Self-supporting (stepladder) and non-self-supporting (extension) portable ladders must be able to support at least four times the maximum intended load, except extra-heavy- duty metal or plastic ladders, which must be able to sustain 3.3 times the maximum intended load. Ladders shall not be loaded beyond the manufacturer's rated capacity or the maximum intended load. Never use boxes, crates, wire spools, chairs, equipment, etc. as a substitute for ladders. Ladder rungs, cleats, or steps must be parallel, level, and uniformly spaced when the ladder is in position for use.
- E. Rungs must be so shaped that an employee's foot cannot slide off, and must be skid-resistant.
- F. Foldout or stepladders must have a metal spreader or locking device to hold the front and back sections in an open position when in use. The area around the top and bottom of ladder must be kept clear. Ladders must not be tied or fastened together to provide longer sections, unless they are specifically designed for such use.
- N. Do not use metal ladders around electrical services or welding. Only non-conductive ladders (wood, fiberglass) may be used near energized electrical lines or equipment. Ladders & ladder sections shall never be tied or fastened together to provide additional length unless designed to do so. Do not splice together short ladders to make a longer ladder. Sections of extension ladders shall not be taken apart and used separately.
- U. Ladders shall not be used horizontally or as makeshift scaffolds.
- V. Never use a ladder for any purpose other than the one for which it was designed.
- W. Wood ladders shall not be painted in such a manner as to hide the grain structure, deterioration, or defects. Wood ladders may be kept coated with a suitable transparent preservative material. (Cross-grain in rungs, cleats, and steps are not permitted.)

### **INSPECTION**

#### **A. Periodic**

1. Ladders shall be inspected quarterly by a qualified person. This inspection shall be indicated. Ladders with illegible marking systems shall be considered unsafe and shall be removed from service.

#### **B. Daily**

1. Ladders shall be inspected daily and prior to each use by the user to ensure that they are in proper working order.
2. Damaged or defective ladders must be tagged (do not use) and returned to the tool room immediately.

3. Under no circumstances may ladders in need of inspection or repair remain in service.
4. Ladders with broken or missing rungs and steps, broken or split side rails or other faulty and defective parts must not be used. When discovered with such defects, ladders shall be immediately withdrawn from service and marked for destruction or repair.

#### USAGE

- A. Ladders should not be used for working except for limited periods of time. Ladders are primarily for ascending or descending from one level to another. Where work requires the use of tools and material, or the job is of considerable duration, it is advisable to use a platform stepladder, scaffold, or some other acceptable working base.
- B. Two or more employees shall not work from the same ladder unless it is specifically designed for that purpose.
- C. All straight and extension ladders must be secured (tied off to a secure anchorage) to prevent displacement during use.
- D. Ladders must not be placed against insecure or movable objects. Straight and extension ladders must extend at least 0,9 m. beyond the supporting object or landing. Straight and extension ladders are to be equipped with a section of rope to adequately "tie off" the ladder to prevent displacement when in use.

**\*NOTE: In situations where non-routine access is required, such as climbing vertical steel to make initial connections and where fall protection systems are used, then the concern of fall injury is addressed and ladders are not required. However, frequent access to the same location or access by 2 or more employees will negate the finding that the access requirements are non-routine and a ladder may be required.**

#### LADDER'S RULE BOOK

- A. Ladders must be capable of supporting specified loads.

Verify that the following types of ladders are capable of supporting the specified. Loads without failure:

- a. Self-supporting portable ladders - At least 4 times the maximum intended load, as applied in a downward vertical direction, except that each extra- heavy-duty type 1A metal or plastic ladder must sustain at least 3.3 times the maximum intended load.
- b. Another employee must hold the ladder secure whenever an employee is ascending or descending a ladder that is not tied off. Portable ladders should be placed so the horizontal distance at the bottom of the ladders is not less than one quarter (1/4) of the vertical distance to the top support. Ladders shall not be used in a horizontal position as platforms, runways, and scaffolds or as support for other materials.
- B. Ladders shall be placed on stable and level footing. Ladders shall not be placed in passageways, doorways, driveways or any location where they may be displaced by other work activities, unless protected by barricades or guards. Employees shall be instructed and required to ascend/descend ladders in the proper manner; facing the ladders and holding on the side rails with both hands, maintaining three points of contact (i.e. two hands + one foot or two feet +one hand). Material shall be raised or lowered with lines or hoisting equipment and not carried in one hand while ascending or descending.
- C. When working from a ladder, one hand should be free at all times to allow a firm grip on the ladder. Exception – both hands may be used when working through the rungs of a ladder. Never lean from side to side or away from the ladder. Always keep both feet and at least one shoulder within the rails of the ladder. Always move the ladder to avoid overreaching. Keep both feet on the ladder rungs or steps.

## **STORING AND TRANSPORTING**

- A. When not in use, ladders will be stored on racks in locations protected from the elements, with good ventilation, away from excessive heat. Storage racks will have sufficient supporting points to avoid sagging. Long ladders need support every 1.8 meters. Other materials are not to be stored on ladders.
- D. Ladders being transported by motor vehicles will be properly supported. Supporting points will be made of material such as wood or rubber-covered iron pipe to minimize chafing and the effects of vibration and movement during transport. Ladders over 3.7 meters long will be carried by two employees.

## **TRAINING**

- A. Each employee who uses ladders will be trained in the following areas, as applicable:
  - A. The nature of fall hazards in the work area;
  - B. The proper construction, use, placement, and care in handling of ladders;
  - C. The maximum intended load-carrying capacities of ladders used;
  - D. The Portable Ladder Inspection Procedure. Training must be done with any employee that uses ladders. The program must teach each employee to recognize hazards related to ladders and to follow procedures to minimize certain hazards.

Verify that each employee who will use a ladder has been trained by a competent person in the following areas:

- a. The nature of fall hazards in the work area.
- b. The correct procedures for erecting, maintaining, and disassembling the fall protection system to be used.
- c. The proper construction, use, placement, care, and handling of all ladders.
- d. The maximum intended load-carrying capacities of the ladders to be used.

## Annex 3-13 ELECTRICAL SAFETY AND GROUND ASSURANCE PROGRAM

### General Requirements

- A. All temporary and permanent electrical work, installation, and wire capacities shall conform to the National requirements .
- B. Only “Qualified Electricians” shall work on electric circuits or parts, which have not been de-energized. Such persons shall have been trained and be capable of working safely on energized circuits and shall be familiar with the proper use of precautionary techniques, personal protective equipment, insulating and shielding equipment and insulating tools.
- C. Any vehicle or mobile equipment operating in the vicinity of energized overhead power lines shall maintain a minimum safe distance.
- D. Work in confined or enclosed spaces, such as a manhole or vault, that contain exposed energized parts require the use of protective shields, barriers or mats to avoid inadvertent contact by employees. All doors, hinged panels, and similar covers shall be secured to prevent their swinging into an employee and causing contact with energized circuits.
- E. Conductive objects such as pipes, conduits, ducts, etc. are to be handled in such a manner to prevent accidental contact with energized circuits or parts. Effective methods of insulation, guarding, and material handling techniques shall be used.
- F. Portable ladders with metal or conductive siderails are not to be used near electrical hazards
- H. “Unqualified Person”, those persons with little or no training working near electrical hazards shall be trained in and familiar with hazard recognition and safety related work practices respective to their job assignments. When a “Unqualified Person” is working in an area where overhead lines are located the minimum safe distance. If work is to be performed near overhead lines, the lines are to be de-energized and grounded or other protective measures taken such as guarding, isolating or insulating to prevent employee contact, prior to the start of work.
- I. All electrical equipment and conductors shall be approved for use and shall be free from defects or hazards, which could cause electrical shock, injury, or death. All electrical equipment shall be installed and used in accordance to the listing, labeling or certification. Electrical circuits shall have circuit interrupters (circuit breakers or fuses) installed, which are sufficient for the current to be interrupted.
- J. No employee shall be permitted to work close enough to an unprotected electrical power circuit so that he or she may contact the same in the course of his or her work unless the employee is protected against electrical shock by de-energizing the circuit and grounding it or guarding it by effective insulation or other means. All circuit breakers and disconnects are to be labeled as to which circuits or equipment they control. Electrical rooms and areas around electrical panels are not to be used as storage areas. Sufficient access and working space must be provided and maintained around all electrical equipment and electrical panels.
- Q. Electrical equipment or machinery shall be de-energized and rendered inoperative by locking out supply switches prior to performing work on such equipment or machinery unless power must be applied for the purpose of adjustment or electrical trouble- shooting. If lockout devices are not feasible, a tagout system shall be used at all points where the equipment may be energized.
- R. Controls of equipment or circuits to be deactivated during the course of work shall be tagged out. Equipment or circuits that are de-energized shall be locked out, or tagged out where locks are not feasible, at all points where such equipment or circuits can be energized.
- U. Extension cords used with portable electrical tools and appliances shall be of the three-wire type. Cords with the ground probe removed or rendered ineffective shall be removed from service.
- V. Electrical cords and trailing cables shall be covered, elevated, or otherwise protected from damage, which

could create a hazard to employees or other persons in the area.

- W. All 120-volt, single-phase, 15 and 20 ampere receptacle outlets on construction sites which are not a part of the permanent wiring of the building or structure and which are in use by employees shall have approved ground-fault circuit interrupters for personnel protection. The Principal's Project Superintendent is responsible for implementing the Assured Grounding Program and also the Ground Fault Protection.
- A. Persons working on or near exposed energized parts shall not wear conductive articles of jewelry or clothing such as but not limited to; watches, bracelets, rings, necklaces, metalized belts, cloth with conductive thread or metal headgear, unless they are rendered non-conductive by covering, wrapping or other insulating means.

#### **LIGHTING AND ILLUMINATION**

- A. Where the use of artificial light is required, it shall be maintained while workers are entering or leaving the area.
- B. Areas requiring the continuous use of artificial light shall be inspected regularly and defective lamps replaced.
- C. Temporary lights shall be equipped with guards to prevent accidental contact with the bulb. Guards are not required when the construction of the reflector is such that the bulb is deeply recessed.
- D. Approved explosion proof electrical lighting shall be the only means used for artificial illumination in areas where flammable liquids, vapors, fumes, dust, or gases are present and are creating a potential explosion hazard.
- E. In addition to providing the required illumination intensities, consideration should be given to the selection and placement of lights, which will provide minimum glare, eliminate harsh shadows, and provide adequate illumination to work efficiently and safely.
- F. Exposed or empty light sockets, and broken bulbs shall not be permitted.
- G. Adequate light shall be provided throughout the building and in all work areas throughout the project, particularly passageways and stairways, and wherever necessary to avoid a hazard due to lack of light. Low voltage (12V) lighting shall be used in moist and/or other hazardous locations such as drums, tanks, and vessels. However, 120-volt lights may be used if protected by a ground-fault circuit interrupter.

#### **TEMPORARY INSTALLATION AND MAINTENANCE**

- A. Clearances for open conductors shall conform to the requirements in the National Electrical Code. Flexible cords used with temporary lights shall be rated for hard or extra hard usage.
- B. D. Flexible cords and cables shall be protected from damage. Sharp corners and projections must be avoided. Do not run an extension cord or cable through a doorway unless adequate protective measures have been taken to prevent pinch points. Always protect electrical cords from sparks or slag when welding or burning.
- C. E. Electrical cords and cables are not to be placed in areas where they can be driven over by mobile equipment or where they can become a tripping hazard for workers. Electrical cords, cables, welding leads etc., are to be routed where they do not create a tripping hazard. Extension cords shall not be fastened with staples, hung from nails, or suspended by wire or welding rods.
- D. The use of metal "knockout" boxes on extension cords or cables is prohibited.
- E. Lamp holders shall have no live parts, which are exposed to contact. All lamps used for illumination shall be guarded against accidental contact or breakage. Metal guards shall be grounded. Metal shell, paper-lined lamp holders, or receptacles shall not be used.
- F. On circuits exceeding 600 volts, "Danger – High Voltage" signs shall be posted where unauthorized

persons might come in contact with live parts.

- T. No employee shall be permitted to work in any location where there is a possibility of contact with an electric power circuit unless proper protective measures such as de-energizing and grounding the circuit or by effectively guarding or insulating the exposed parts.

#### ASSURED GROUNDING PROGRAM

- A. Each cord set, attachment cap, plug and receptacle of cords sets, and any equipment connected by cord and plug, except those fixed and not exposed to damage, shall be visually inspected before each day's use for external damage, missing or loose pins, insulation damage and possible internal damage. Equipment found to be damaged or defective is not to be used until it has been repaired and tested.
- B. The following tests shall be done on all non-permanent cord sets, receptacles, generators and other equipment, which is required to be grounded.

All equipment grounding conductors shall be tested for continuity and shall be electrically continuous. Inspections of all power cords, tools, and non-permanent cord sets for continuity and ground assurance are to be performed and either a log kept on file with description of outlets, tools and cords, date checked, polarity and ground check.

***Principal's Superintendent has responsibility of inspections of all power cords, tools and non-permanent cords on work site Project. He has responsibility for safety electrical assurance on work site.***

***The Project Superintendent is responsible for the implementation of these rules.***

## Annex 3-14 SIGNS, SIGNALS AND BARRICADES

### Signs and Signals

All signs and symbols shall be visible at all times when work is being performed and shall be removed or covered promptly when the hazard no longer exists. Danger signs shall be used only where an immediate hazard exists. Caution signs shall be used only to warn against potential or to caution against unsafe practices.



D. Safety instructions signs shall be used for general safety information, safety instructions and slogans.



C. Traffic signs shall be posted in areas at points of hazard and shall conform to “NATIONAL STANDARDS” - Manual on Uniform Traffic Control Devices for Streets and Highways.

D. Accident prevention tags shall be used as a temporary means of warning employees of an existing hazard, such as defective tools, equipment, which is out of order, etc. They shall not be used in place of, or as a substitute for, accident prevention signs.



### Metal Guardrails

A. Metal handrail material for a guardrail must be 3.8 cm. nominal size or larger.

B. The top rail must be located 106.7 cm from the top of the rail to the floor or platform level.

C. The mid-rail must be 3.8 cm nominal size or larger and located midway between the top rail and floor or platform level.

D. A toe board made from 6,4 by 10 cm flat metal plate must be installed at the floor or platform level. Vertical support posts must be 3.8 cm nominal size or larger and located at distances not to exceed 3.4 m.



PPE – Personal P



## Protect Yourself At Work

# Checklist :



- Wear Your Helmet
- Wear Your Safety Glasses
- Wear Your Gloves
- Wear Your Safety Shoes
- Wear Your Ear Plug / Muff
- Wear Long Sleeve Shirt
- Wear Long Pants

**Ready? Now You Can Start Working**

## Annex 3-15 HOT WORK ON CONTAINERS AND PIPING SYSTEMS

Explosions, fires and health hazards may result if welding, cutting or other hot work is performed on containers that contain hazardous substances, such as combustible, reactive, or toxic solids, liquids, vapors, dusts and gases. No container or piping system should be presumed to be clean or safe, but containers can be made safe for work by identifying potential hazards and the required protective systems necessary to control hot work.

This rules to ensure that containers, pipelines and work area are safe for welding and cutting. The guidelines are intended to protect personnel and equipment by ensuring that the hazards are understood and adequate precautions are properly taken. The qualified person responsible for the work done on the container or pipeline should ensure that adequate safety precautions are followed.

### Applicability

This rules is applicable to all of the company's projects, unless superseded by a client's standard, including all greenfield and brownfield projects, maintenance, alteration and repair work where it is necessary to weld, burn or cut into existing metal containers and piping.

Cleaning of used piping systems are necessary in all cases before starting hot work.

### Exceptions

An exception does not negate or disregard the intent of a rules; it is a means for developing, documenting and communicating an alternate hazard mitigation plan.

### DEFINITIONS

**Hazardous Substances** - Hazardous substances include but are not limited to those that are explosive, combustible, toxic or corrosive. They may be present in a container or piping system having previously held one of the following:

- A volatile liquid that can release potentially hazardous flammable or toxic vapors or any combination thereof.
- An acid or alkaline material that reacts with metals to produce hydrogen.
- A nonvolatile liquid or solid that at ordinary temperatures will not release potentially hazardous vapors, but will do so if the container is heated. For
- example vapors or fumes that may be generated by the heat of welding or cutting.
- A dust cloud or finely divided airborne particles that may be present in an explosive concentration.
- A flammable or toxic gas.

**Competent Person** - means a person designated by the employer to act on the employer's behalf who is capable of identifying existing and potential hazards in the workplace and the proper methods to control them in order to protect workers, and has the authority necessary to take prompt corrective measures to eliminate or control such hazards.

**Lower Explosive Limit (LEL)** – The minimum concentration of vapor or gas in air below which a flame is not propagated on contact with an ignition source.

**Flash Point.** – The flash point of a liquid is the lowest temperature at which the liquid releases vapor in sufficient amount to form an ignitable mixture with air near its surface.

**Hot Work** - Hot work is defined as any work that will generate sufficient heat to ignite flammable materials. Examples of hot work include, but are not limited to welding, flame cutting, grinding, using heaters, electrical tools, battery operated tools and mobile equipment operation. The use of pagers, cellular phones,

radios, flashlights, battery powered test equipment and cameras may be considered hot work.

In general, the use of hand tools, pneumatic wrenches, and water-cooled cutting, would not be considered hot work. However, personnel should evaluate the actual working conditions and if the potential exists for easily ignitable vapors to be present, then appropriate measures should be taken. Appropriate measures may include performing gas testing for flammable materials, mechanical ventilation systems, or full use of the hot work permit.

**Fire Watch** - An individual dedicated to monitoring the hot work site for any change in conditions or for signs of fires including small or smoldering fires. A fire watch is responsible for shutting the job down if a hazardous situation develops, for activating fire protection equipment and for summoning emergency responders if necessary.

**Pipeng system Contents** - The piping system should be emptied and drained thoroughly, including all internal piping, traps, and standpipes. Sludge and sediment should be removed. All residue and used cleaning agents should be disposed of in an environmentally safe manner according to local, state, and federal regulations. The same safe practices should be used on adjacent or interconnected container compartments regardless of which compartment is to be welded.

**Unknown Substances** - Cleaning and welding a piping that has held unknown substances should not be done since this practice involves unknown risk. If the source and content of the material in the container cannot be determined, and if a chemical analysis cannot be performed, the container should be disposed of in an environmentally responsible manner according to local, state, and federal regulations.

**Qualified Personnel** - Qualified personnel should designate the cleaning procedure to assure that the cleaning can be carried out safely in an environmentally responsible manner that can render the container free of all hazardous materials. Cleaning of containers or systems pipen that have held hazardous materials must be performed by qualified personnel familiar with the hazardous characteristics of the contents and the proper method of cleaning, ventilation is not available, an independent source of breathing air must be provided.

**Other Precautions** - Appropriate steps should be taken to protect personnel cleaning the container against exposure to hazardous substances that may be present during the cleaning operation. Many times the cleaning material itself can pose a hazard. Safety equipment may include, but is not limited to; an airline respirator or appropriate cartridge respirator, rubber apron, face shield, impervious gloves impervious boots, rain or slicker suit, and safety glasses.

**Preparation for Welding and Cutting** - The immediate area outside and inside the container should be cleared of all obstacles and hazardous materials. When repairing vessels, container or piping in place; care should be taken to prevent entry of hazardous substances released beneath the floor or soil beneath the container.

**Ventilation** - Ventilation should be adequate to provide a safe work atmosphere prior to and during welding. It may be necessary to test for toxic or flammable vapors and to verify that the oxygen content of the atmosphere in the work area is maintained within accepted limits where adeq.

### **Annex 3-16 PROCESSES IN PIPE SPOOL FABRICATION**

Before a project is started, the required materials, such as pipes, flanges, fittings, and valves are shipped to the fabrication shop and stored in the designated area. The standard procedure for the management of the material see the document ***GAL-IV Ltd material management***.

Once all the material required for an isometric is available, that isometric is released to the shop for fabrication.

Pipes, the main component of spools, must first be cut into pieces of the size required by the drawings.

After pipes are cut, the cutting operators use disk grinders to smooth the end surface of the pipes and bevel them if required.

Then pipes are moved to fitting stations to be joined together.

Once the pipes and other components of the spool, such as reducers, valves, and flanges, are fit, overhead cranes are used to move the assemblies to the welding stations.

Fitters usually assemble than 2inch diameter/h. Welding is performed via two methods: roll welding and position welding. In roll welding, the welder fixes one end of the pipe into a pipe turner and rotates the assemblies while welding them.

Position welding is used when the pipes cannot be rotated by a turner, or when components are not round in shape. Position welding is a difficult procedure, and takes longer to perform than roll welding. Assemblies may move between fitting and welding stations several times before roll welding is finished or the final spool is ready to be position welded. When spools are complete, they go through quality control.

Then, based on the drawing requirements, they may be hydrotested or undergo other processes such as surface treatment and painting. Our typical processes in pipe spool fabrication are illustrated below

### **Annex 3-17 FIRST AID AND MEDICAL**

The Principal's Company provides first aid services and arranges for emergency transportation of employees who sustain occupational injuries or illnesses on the work site.

There shall be available on each shift all projects, no matter what size; a person trained in standard First Aid and CPR (Cardiopulmonary resuscitation). This person will be the Principal's Superintendent and Project management/foreman. Employees at the Principal site are trained in first aid by the Department SHE.

On a project where there is a Principal Superintendant, he/she shall be responsible for rendering first aid with at least one more foreman(s) trained in first aid.

First aid supplies will be available to all employees for the treatment of work related injuries and sudden illnesses. The Project Superintendent or his/her designee must document each instance of first aid treatment on the first aid log and inform Project Management Contractor.

***The Principal is also responsible for ensuring that emergency phone numbers are posted.***

Medical cases which require treatment beyond first aid will be referred to an off-site medical facility as determined by the severity of the injury or illness. Arrangements with the medical facilities, i.e., doctors, hospitals, etc., prearranged by the Principal prior to startup of the project.

In all cases where treatment is provided by a medical facility, the insurance department at the Principal is to be notified in order to coordinate treatment, return to work and payment.

**Transportation Non-Emergency** - Non-emergency transportation shall be provided to the first aid station.

#### **Transportation Emergency:**

- The method of transportation to the hospital or first aid facility is to be prearranged.
- In a situation where the injured cannot be moved, the person on the project (Foreman or Principal's Superintendent) responsible for first aid will go to the location and administer first aid and coordinate emergency transportation.
- The proper handling of injured or ill employees and their transportation to a hospital is of crucial importance.
- In cases of a medical injury, the Principal Superintendent designee shall call the medical facility and while the ambulance is en-route or certainly while the victim is still in the emergency facility to give them all the available information regarding the nature and the extent of the injury or illness. A drug and alcohol screen will be requested in addition to any treatment.

#### **Injury Management:**

- An employee who has sustained on-the-job injury or illness may return to work provided that the attending physician has approved such return in writing and provided that the normally assigned job of that employee is still available and he meets any physical restrictions or limitations.
- Employees who are given restriction to their work will not be permitted to return to work until a review of the case has been made by the responsible person of the Principal and Project Management of Contractor.

**First Aid Kits and Medical Supplies** - First aid kits of appropriate size should be maintained on each project. The Principal Project Superintendent is responsible to ensure that the first aid kits are maintained and restocked on a regular basis.

#### **Responsibilities and Organization:**

A. The Project Superintendent is responsible for ensuring that the appropriate safety related reports concerning occupational injury/illness are properly completed and maintained.

- B. The Principal's physician is responsible for maintaining accurate records of medical treatment and providing the Contactor's Company with a copy of these records.
- C. Employer's First Report of Injury is used to advise the insurance company of an injury and possible worker's compensation claim. This must be completed within 24 hours of an injury/ illness and sent to the home office.
- D. The Accident/ Incident Report, (See Section 11 Incident Investigation of SHE Manual) is to be filled out on all injury cases involving a doctor's care or incidents resulting in property or equipment damage.
- Investigate the accident and note all factors, which contributed to the cause.
  - List all steps, procedures, actions or measures taken to prevent the same type of accident from happening again.
  - All blanks are to be filled in. If line is non-applicable, mark it N/A.
  - 5 Copy of all documents to be filed in the project safety files.

## Annex 3-18 SAFETY RECOMMENDATIONS FOR THE USE OF CUTTING AND GRINDING WHEELS FOR ANGLE GRINDERS

Safety Recommendations

### SAFETY RECOMMENDATIONS FOR THE USE OF CUTTING AND GRINDING WHEELS FOR ANGLE GRINDERS

**PASS ON THIS LEAFLET TO THOSE USING CUTTING AND GRINDING WHEELS**  
 The recommendations contained in this leaflet should be followed by all users of abrasive products in the interests of their personal safety

#### GENERAL PRINCIPLES OF SAFETY

Abrasive wheels improperly used can be very dangerous. This leaflet covers the use of Type 27, 41 and 42 bonded abrasive wheels on angle grinders.

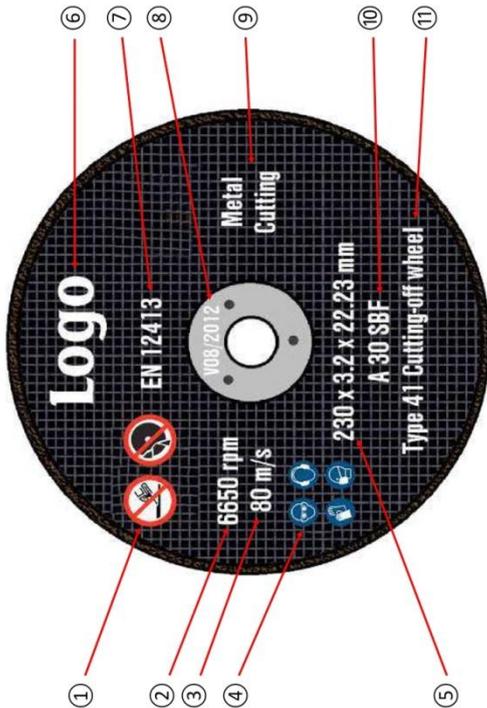


Types of wheels used for:	
Grinding  TYPE 27	Cutting-off  TYPE 41 TYPE 42
Recommended guards for grinding  	Recommended guard for cutting-off  
For 180 & 230 mm diameter wheels	For all wheel diameters

HSE

Safety Recommendations

### Explanation of marking required by EN 12413 \*



1 Restriction of use	6 Name of manufacturer, supplier, importer, or Registered Trade Mark
2 Maximum rotational frequency (rpm)	7 Declaration of conformity
3 Maximum operating speed	8 Expiry date / traceability code
4 Safety pictograms (PPE) Mandatory in France	9 Type of use (optional)
5 Dimensions (mm)	10 Specification mark
	11 ISO type nr / shape (optional)

\* EN 12413 marking shows that the producer has followed the essential safety requirements of the European safety standard for reinforced resinoid cutting and grinding wheels in order to reduce the risks for the end-user. The markings from 1 to 11 listed above, except n°4, are mandatory for products marked EN 12413.

Safety Recommendations

<p><b>DO'S</b></p> <p>Ensure work piece is secure</p>	<p><b>DON'TS</b></p> <p>Never cut an unstable work piece</p>
<p>Use protective equipment</p>	<p>Never cut without protective equipment</p>
<p>Type 41 Type 42</p>	<p>Do not grind with a cutting wheel</p>
<p>Only use for cutting off</p> <p>Type 27</p>	<p>Do not use for grinding unless stated as suitable</p>
<p>Always straight cutting</p>	<p>Never twist in the cut</p>
<p>Let the wheel cut freely</p>	<p>Never force the cut</p>

HSE

<p><b>DO'S</b></p> <p>Ensure the blade bears the mark EN 12413 and displays and expiry date</p>	<p><b>DON'TS</b></p> <p>Do not use a blade without the EN 12413 mark</p>
<p>Always read the safety instructions</p>	<p>Don't throw away the instructions before reading</p>
<p>Examine the blade for damage or unusual stains</p>	<p>Never use damaged blades</p>
<p>Check that the speed marked on the machine is not greater than the speed marked on the wheel</p>	<p>Do not use wheel if the speed is lower than the speed marked on the machine or if no speed is marked on the wheel</p>
<p>Type 41 Type 42 Type 27</p> <p>Align flanges correctly</p>	<p>Flanges incorrectly aligned</p>
<p>Ensure the guard is fitted</p>	<p>Never remove the guard</p>

### Annex 3-19 Dimensional Tolerances for Pre-Fabricated Pipind Assemblies

Dimensional control of prefabricated piping spools shall be performed in a systematic manner, assuring that the final installation will be correct.

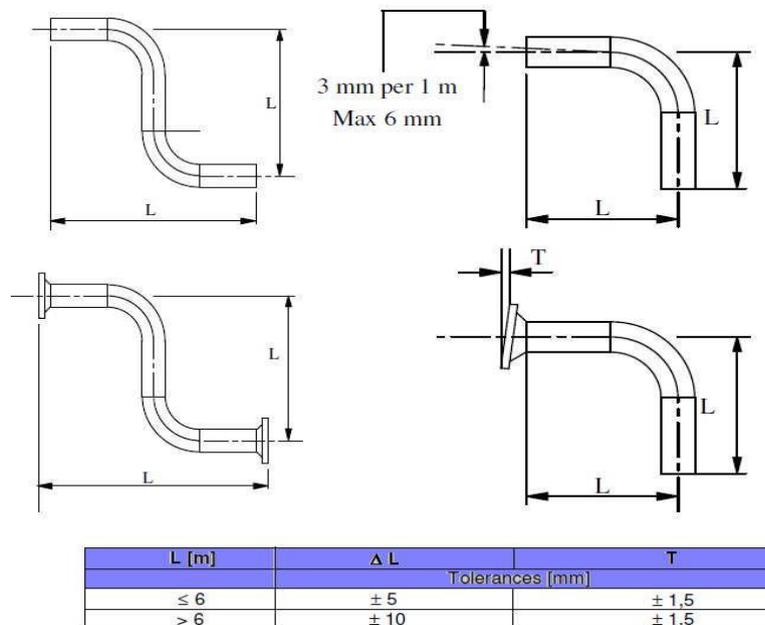
Prefabricated spools for offshore installation shall be 100 % dimensionally controlled. The tolerances on linear dimensions (intermediate or overall) are illustrated in Figure 1 and Figure 2.

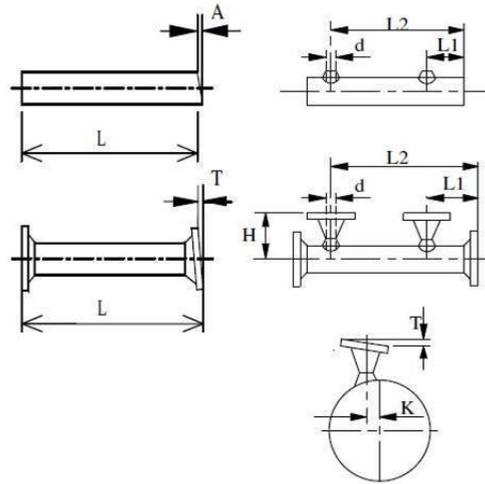
These tolerances are not accumulative.

Angularity tolerances across the face of flanges, weld end preparation and rotation of flanges shall be as stated in Figure 1 and Figure 2.

Closer tolerances on weld end preparations than stated in Figure 1 and Figure 2, may be specified in the relevant welding specification for the material in question, and shown on the fabrication isometric(s).

When closer tolerances other than those given above are required, these shall be as specified on the isometric drawing in question.





L [m]	L	A	T		2 in ≤ d ≤ 10 in	12 in ≤ d ≤ 20 in	d > 20 in
				Tolerances [mm]			
≤ 6	± 3	± 1,5	± 1,5	L1	± 3	± 5	± 5
> 6	± 5	± 1,5	± 1,5	L2	± 3	± 5	± 5
				H	± 3	± 3	± 3
				T	± 1,5	± 1,5	± 1,5
				K	± 2	± 3	± 3
d = nominal diameter							

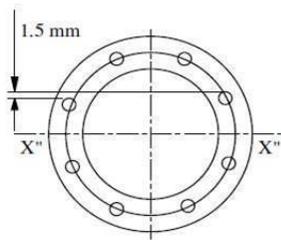


Figure 2 - Tolerances for prefabricated piping assemblies

Note:

- 1) Before reworking any spools contact engineering department in order to check complete isometric.
- 2) Cut to fit requirement to be stated on fabrication isometrics (typically 100 mm).
- 3) Bolt holes on flanges shall straddle the horizontal or vertical lines or plant north/south centre lines when orientation is not given on drawings.

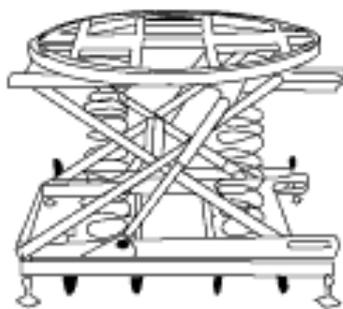
### Annex 3-20 WELDING - ERGONOMICS

#### What are ergonomic risk factors associated with welding?

- Lifting heavy loads (cylinders, cables, etc.).
- Awkward body postures (outreached arms, awkward position of neck and head, kneeling/squatting).
- Static body positioning (long duration of tasks, manual precision).
- Continuous force (grip strength).

#### What are some tips for a good working posture while welding?

- Learn to recognize symptoms of work-related musculoskeletal disorders (WMSDs; also called repetitive strain injuries or RSIs). Repeated uncomfortable postures and tasks can cause injury.
- Avoid awkward body positions which cause fatigue, reduce concentration and lead to poor welds which may need to be repeated.
- Always use your hand to lower your helmet. Do not use a "jerking" motion of your neck and head.
- Position yourself in a stable, comfortable posture.
- Position the welding item as flat as possible, on a horizontal surface, between waist and elbow height.
- Position stool or scaffolding at a comfortable height to allow working in a seated position.
- Avoid working in one position for long periods of time.
- Work with material slightly below elbow level when working in a sitting position.
- Work with material between waist and elbow heights for comfort and precision when working in a standing position.
- Use a foot rest if standing for long periods.
- Always store materials and tools within normal reach.
- Use positioning aids to accommodate work posture.



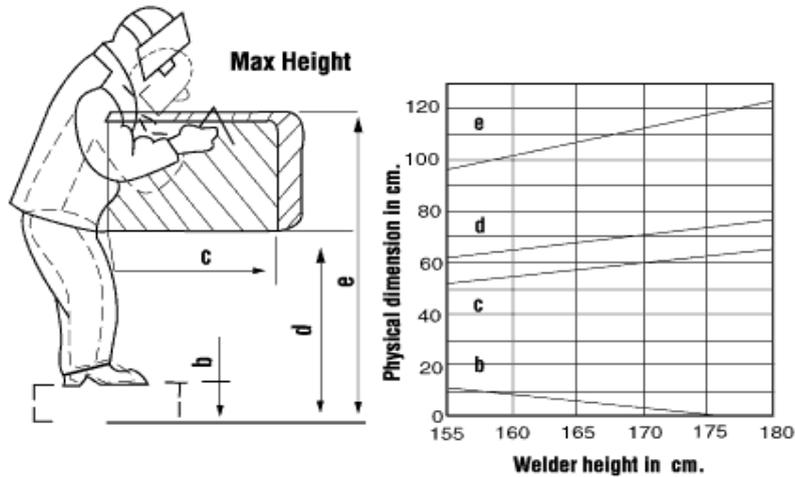
**Turntable**



**Scissor Lift**

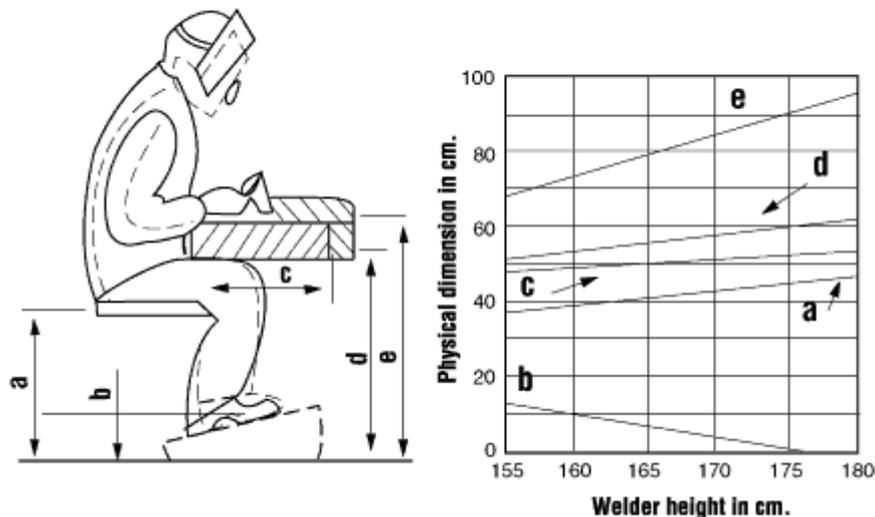
What is an example of a standing workbench design?

### Standing Workbench Design



WHAT IS AN EXAMPLE OF A SEATED WORKBENCH DESIGN?

### Seated Workbench Designs



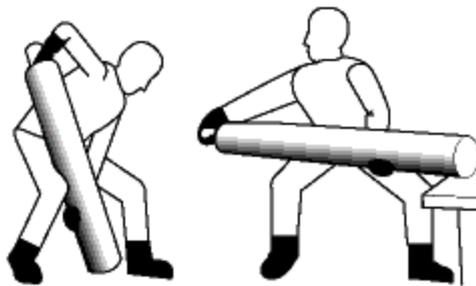
<b>a</b> = seat height	<b>d</b> = height of the Welding table
<b>b</b> = foot rest height	<b>e</b> = maximum height of the piece being welded
<b>c</b> = maximum reach on the table	

Source: Golavatjuk et.al. creation of optimum labour conditions for electric welders with regard to ergonomic requirements. IIW Colloquium on Welding and Health, Lisboa (1980)

What should I know before lifting cylinders manually?

- Find out the weight of an object before attempting to lift it.
- DO NOT lift full or partially full cylinders on your own.
- Use a lifting aid if the object is heavy.

- Use a trolley or a mechanical lift to lift or move compressed gas cylinders.
- Get help with heavy or awkward loads if a lifting aid is not available.
- Do a few warm up stretches before lifting.
- Protect hands and feet in case the load falls.
- Place forward foot around the cylinder if it must be lifted manually.
- Lower the cylinder across thigh by pressing down with rear hand while holding cylinder underneath and slightly beyond center point.
- Raise end to desired height.
- Push cylinder forward by rear hand.



#### **What should I know when moving cylinders?**

- Make sure the cylinder cap is secured.
- Tilt the cylinder slightly on its edge and roll it slowly in the direction desired. Move short distances only.
- Use a cylinder trolley for longer distances.
- Place one hand on top of the cap and the other hand on the shoulder of the cylinder.
- Always chain the cylinder to the trolley.

#### **What should I know about lighting and colour?**

##### **Lighting**

- Ensure general lighting is adequate to allow safe access and handling of equipment.
- Use additional task lighting for precision work.
- Avoid excessive glare from light sources or reflections.
- Prevent excessive contrast between the workpiece and background.